SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS

RELATED TO EXEMPTION AND AMENDMENT NO. 24

TO THE COMBINED LICENSE NO. NPF-93

AND LICENSE NO. NPF-94

SOUTH CAROLINA ELECTRIC AND 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 July 17, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14202A088), South Carolina Electric and 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) is to address proposed changes related to the design details of the containment internal structural wall modules (CA01, CA02, and CA05). The proposed changes to Tier 2 information in the VCSNS Updated Final Safety Analysis Report (UFSAR), and the involved plant-specific Tier 1 and corresponding COL Appendix C information would allow the use of thicker than normal faceplates to accommodate local demand or connection loads in certain areas without the use of overlay plates or additional backup structures. Additional proposed changes to Tier 2 information and involved Tier 2* information would allow:

(1) a means of connecting the structural wall modules to the base concrete through use of structural shapes, reinforcement bars, and shear studs extending horizontally from the structural module faceplates and embedded during concrete placement as an alternative to the use of embedment plates and vertically oriented reinforcement bars,

(2) a variance in structural module wall thicknesses from the thicknesses identified in UFSAR Figure 3.8.3-8, “Structural Modules – Typical Design Details,” for some walls that separate equipment spaces from personnel access areas,

(3) the use of steel plates, structural shapes, reinforcement bars, or tie bars between the module faceplates, as needed to support localized loads and ensure compliance with applicable codes,

(4) revision to containment internal structure (CIS) evaluations, and

(5) clarification to the definition of in-containment "structural wall modules," clarifying that the west wall of the In-containment Refueling Water Storage Tank (IRWST) is not considered a "structural wall module," that the CIS critical sections identified in VCSNS Units 2 and 3 UFSAR Subsection 3.8.3.5.8.1 present design summaries for areas of "large" demand in lieu of areas of "largest" demand, and revising the VCSNS Units 2 and 3 UFSAR in several places to provide consistency in terminology used to identify the structural wall modules.

The licensee has also requested an exemption from the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, Appendix D, "Design Certification Rule for the AP1000 Design," Section III.B, "Scope and Contents," to allow a departure from the elements of the certification information in Tier 1 of the generic design control document (DCD).[1]

In letters dated September 25, 2014, and January 5, 2015 (ADAMS Accession Nos. ML14268A554 and ML15006A290, respectively), the licensee supplemented the application, which was considered in the NRC staff's proposed no significant hazards consideration determination as published in the *Federal Register* on February 3, 2015 (80 FR 5798).

In order to modify the UFSAR (the plant-specific DCD) Tier 1 information, the NRC must find the licensee's exemption request included in its submittal for the LAR acceptable. The staff's review of the exemption request as well as the license amendment request is included in this safety evaluation.

2.0 Regulatory Evaluation

Tier 1 Information is defined in 10 CFR Part 52, Appendix D, Section II.D, "Definitions." Information in 10 CFR Part 52, Appendix D, Section II.D.3 lists inspections, tests, analyses, and acceptance criteria (ITAAC) as part of the definition for Tier 1 information. The information that the licensee is requesting to change is referenced in the ITAAC Tables. Therefore, the information is considered Tier 1 information.

Regulations in 10 CFR Part 52, Appendix D, Section VIII.A.4 state that exemptions from Tier 1 information are governed by the requirements of 10 CFR 52.63(b)(1) and 10 CFR 52.98(f) and also state that the Commission may deny such a request if the design change causes a significant reduction in plant safety otherwise provided by the design.

Regulations in 10 CFR 52.63(b)(1) allow the licensee to request NRC approval for an exemption from one or more elements of the certification information. The Commission may only grant

[1] While the licensee describes the requested exemption as being from Section III.B of 10 CFR Part 52, Appendix D, the entirety of the exemption pertains to proposed departures from Tier 1 information in the generic DCD. In the remainder of this evaluation, the NRC will refer to the exemption as an exemption from Tier 1 information to match the language of Section VIII.A.4 of 10 CFR Part 52, Appendix D, which specifically governs the granting of exemptions from Tier 1 information.

such a request if it complies with the requirements of 10 CFR 52.7, "Specific exemptions," which in turn points to the requirements listed in 10 CFR 50.12, "Specific exemptions," for specific exemptions, and if the special circumstances present outweigh the potential decrease in safety due to reduced standardization. Therefore, any exemption from the Tier 1 information certified by Appendix D to 10 CFR Part 52, "Design Certification Rule for the AP1000 Design," must meet the requirements of 10 CFR 50.12, 52.7 and 52.63(b)(1).

Regulations in 10 CFR 52.98(f) state that any modification to, addition to, or deletion from the terms and conditions of a COL, including any modification to, addition to, or deletion from the ITAAC contained in the license, is a proposed amendment to the license. Appendix C of COLs NPF-91 and NPF-92 contain tables and a figure which the licensee is proposing to modify. Therefore, the proposed change requires a license amendment.

Regulations in 10 CFR Part 52, Appendix D, Section VIII.B.5.a require prior NRC approval for Tier 2 departures that involve changes to Tier 1, Tier 2* information or the Technical Specifications. The proposed changes affect Tier 1 and Tier 2* information and thus require prior NRC approval.

Regulations in 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix A, "General Design Criteria for Nuclear Power Plants," General Design Criterion (GDC) 1, "Quality Standards and Records," require that structures, systems, and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed.

Regulations in 10 CFR Part 50, Appendix A, GDC 2, "Design Bases for Protection against Natural Phenomena," require that structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions.

Regulations in 10 CFR Part 50, Appendix A, GDC 4, "Environmental and Dynamic Effects Design Bases," require that structures, systems, and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing and postulated accidents, including loss-of-coolant accidents.

Regulations in 10 CFR Part 50, Appendix S, "Earthquake Engineering Criteria for Nuclear Power Plants," require that nuclear power plants shall be designed so that, if safe-shutdown earthquake (SSE) ground motion occurs, certain structures, systems and components (SSCs) will remain functional and within applicable stress, strain, and deformation limits. The required safety functions of structures, systems, and components must be assured during and after the vibratory ground motion associated with the SSE ground motion through design, testing, or qualification methods.

3.0 Technical Evaluation

3.1 Evaluation of Exemption

INTRODUCTION

The regulations in Section III.B of Appendix D to 10 CFR Part 52 require a holder of a COL

referencing Appendix D to 10 CFR Part 52 to incorporate by reference and comply with the requirements of Appendix D, including certified information in Tier 1 of the generic AP1000 DCD.

As defined in Section II of Appendix D to 10 CFR Part 52, Tier 1 information includes ITAAC. Therefore, a licensee referencing Appendix D incorporates by reference all the ITAAC contained in the generic DCD. These ITAAC, along with the plant-specific ITAAC, were contained in Appendix C of the COL at its issuance. The proposed changes would depart from VCSNS Units 2 and 3, Tier 1 information by revising Note 3 to Table 3.3-1, "Definition of Wall Thickness for Nuclear Island Buildings, Turbine Building, and Annex Building." Specifically, the note would be revised to add the following:

> Where faceplates with a nominal thickness of [1.27 centimeters (cm)] 0.5 inches are used in the construction of the wall modules, the wall thicknesses in this column apply. Where faceplates thicker than the nominal 0.5 inches are used in the construction of the structural wall modules, the wall thicknesses in the area of the thicker faceplates are greater than indicated in this column by the amount of faceplate thickness increase over the nominal [1.27 cm] 0.5 inches. Overlay plates are not considered part of the faceplates, and thus are not considered in the wall thicknesses identified in this column.

The proposed change would also correct inconsistencies between Tier 1 and UFSAR Tier 2 and Tier 2* information. Specifically, the licensee proposes to change the description "South wall of the west steam generator cavity" in Tier 1 Table 3.3-7 to "South wall of the west steam generator compartment" to be consistent with Tier 2* Figure 3.8.3-18 and elsewhere in the VCSNS Units 2 and 3 UFSAR.

The proposed changes impact Tier 1 of the Plant-Specific DCD and Appendix C of the COL. An exemption is needed because Section VIII.A.4 of Appendix D to 10 CFR Part 52 requires a licensee to obtain an exemption to depart from the Tier 1 information of the generic AP1000 DCD.

In summary, the end result of this exemption would be that the licensee can implement modifications to Tier 1 information described and justified in LAR 14-05 if and only if the NRC approves LAR 14-05. This is a permanent exemption limited in scope to the particular Tier 1 information specified.

As stated in Section VIII.A.4 of Appendix D to 10 CFR Part 52, an exemption from Tier 1 information is governed by the requirements of 10 CFR 52.63(b)(1) and 52.98(f). Additionally, the Commission will deny an exemption request if it finds that the requested change to Tier 1 information will result in a significant decrease in safety. Pursuant to 10 CFR 52.63(b)(1), the Commission may, upon application by an applicant or licensee referencing a certified design, grant exemptions from one or more elements of the certification information, so long as the criteria given in 10 CFR 52.7 are met, and that the special circumstances as defined by 10 CFR 50.12 outweigh any potential decrease in safety due to reduced standardization.

Pursuant to 10 CFR 52.7, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 52. Regulations in 10 CFR 52.7 further state that the Commission's consideration will be governed by 10 CFR 50.12, "Specific Exemptions," which states that an exemption may be granted when: (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) special circumstances

are present. Regulations in 10 CFR 50.12(a)(2) list six special circumstances for which an exemption may be granted. It is necessary for one of these special circumstances to be present in order for the NRC to consider granting an exemption request. The licensee stated that the requested exemption meets the special circumstances of 10 CFR 50.12(a)(2)(ii). That subsection defines special circumstances as when "application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule." The staff's analysis of each of these findings is presented below.

3.1.1 Authorized by Law

This exemption would allow the licensee to implement approved changes to Tier 1 Table 3.3-1 and the correction of inconsistencies between Tier 1 and UFSAR Tier 2 and Tier 2* information. This is a permanent exemption limited in scope to particular Tier 1 information, and subsequent changes to Tier 1 Table 3.3-1 or any other Tier 1 information, would be subject to the exemption process specified in Section VIII.A.4 of Appendix D to 10 CFR Part 52. As stated above, 10 CFR Part 52, Appendix D, Section VIII.A.4 allows the NRC to grant exemptions from one or more elements of the Tier 1 information. The NRC staff has determined that granting of the licensee's proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, as required by 10 CFR 50.12(a)(1), the exemption is authorized by law.

3.1.2 No Undue Risk to Public Health and Safety

The underlying purpose of Appendix D to 10 CFR Part 52 is to ensure that the licensee will construct and operate the plant based on the approved information found in the DCD incorporated by reference into the licensing basis. The changes to the design details for the structural wall modules and the correction of inconsistencies between Tier 1 and UFSAR Tier 2 and Tier 2* information, does not have an adverse impact on the response of the nuclear island structures to safe shutdown earthquake ground motions or loads due to anticipated transients or postulated accident conditions, nor do they change the seismic Category I classification. These changes will not impact the ability of the structures to perform their design function. Because the changes will not alter the operation of any plant equipment or systems, these changes do not present an undue risk from existing equipment or systems. These changes do not add any new equipment or system interfaces to the current plant design. The changes do not introduce any new industrial, chemical, or radiological hazards that would represent a public health or safety risk, nor do they modify or remove any design or operational controls or safeguards intended to mitigate any existing onsite hazards. Furthermore, the proposed changes would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in significant fuel cladding failures. Accordingly, these changes do not present an undue risk from any new equipment or systems. Therefore, as required by 10 CFR 50.12(a)(1), the staff finds that there is no undue risk to public health and safety.

3.1.3 Consistent with Common Defense and Security

This exemption would allow the licensee to implement approved changes to Tier 1 Table 3.3-1 and the correction of inconsistencies between Tier 1 and UFSAR Tier 2 and Tier 2* information. This is a permanent exemption limited in scope to particular Tier 1 information. Subsequent changes to Table 3.3-1 or any other Tier 1 information would be subject to full compliance by the licensee as specified in VIII.A.4 of Appendix D to 10 CFR Part 52. The changes do not alter

or impede the design, function, or operation of any plant SSCs associated with the facility's physical or cyber security, and therefore does not affect any plant equipment that is necessary to maintain a safe and secure plant status. In addition, the changes have no impact on plant security or safeguards. Therefore, as required by 10 CFR 50.12(a)(1), the staff finds that the common defense and security is not impacted by this exemption.

3.1.4 Special Circumstances

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule. The underlying purposes of Tier 1 information is to ensure that the licensee will construct and operate the plant based on the approved information found in the AP1000 DCD that was incorporated by reference into the licensing basis. The changes to the design details for the structural wall modules maintain the design margins of the internal containment structures. These changes are necessary to enhance the ability of the licensee to construct the plant based on the information in the certified design, by clarifying the information found in Table 3.3-1 and the correction of inconsistencies between Tier 1 and UFSAR Tier 2 and Tier 2* information. If this exemption is not granted, and the proposed changes in the LAR are not allowed to be implemented, then the Tier 1 ITAAC would not conform to the UFSAR Tier 2 design descriptions, and the performance of the Tier 1 ITAAC would not accurately verify construction of the proposed design. Therefore, because the application of the specified Tier 1 in this circumstance does not serve the underlying purpose of the rule, the staff finds that the special circumstances required by 10 CFR 50.12(a)(2)(ii) for the granting of an exemption from Tier 1 information exist.

3.1.5 Special Circumstances Outweigh Reduced Standardization

This exemption would allow the implementation of changes to Table 3.3-1 and the correction of inconsistencies between Tier 1 and UFSAR Tier 2 and Tier 2* information, proposed in the LAR. Based on the nature of the proposed changes to the generic Tier 1 information and the understanding that these changes were identified during the design finalization process for the AP1000, this exemption may be requested by other AP1000 licensees and applicants. However, a review of the reduction in standardization resulting from the departure from the standard DCD determined that even if other AP1000 licensees and applicants do not request this same departure, the special circumstances will continue to outweigh any decrease in safety from the reduction in standardization because the key design functions of the containment internal structural wall modules associated with this request will continue to be maintained. So while the text in the Table 3.3-1 may be changed, the changes have no effect on any SSCs meeting their design function. Based on this, as required by 10 CFR Part 52.63(b)(1), the staff finds that the special circumstances outweigh the effects the departure has on the standardization of the AP1000 design.

3.1.6 No Significant Reduction in Safety

This exemption would allow the implementation of changes to Table 3.3-1 and the correction of inconsistencies between Tier 1 and UFSAR Tier 2 and Tier 2* information, proposed in the LAR. The proposed changes to the design details for the structural wall modules maintain the design margins of the internal containment structures. The proposed changes to Table 3.3-1 will not adversely affect the ability of the SSCs to perform their design functions and the level of safety

provided by the SSCs is unchanged; therefore, as required by 10 CFR Part 52, Appendix D, Section VIII.A.4, the staff finds that granting the exemption would not result in a significant decrease in the level of safety otherwise provided by the design.

3.2 Evaluation of Proposed Changes

To perform the technical evaluation, the NRC staff considered VCSNS Units 2 and 3 UFSAR Sections 3.7, "Seismic Design," and 3.8, "Design of Category I Structures." The staff also examined portions of NUREG–1793, Supplement 2, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Plant Design" (NUREG-1793) (ADAMS Accession No. ML112061231), and the "Final Safety Evaluation Report for the Virgil C. Summer Nuclear Station Units 2 and 3 Combined License Application," (ADAMS Accession No. ML110450305) documenting the staff's technical evaluation of those aspects of the AP1000 DCD and VCSNS Units 2 and 3 COL application, respectively. The staff reviewed the licensee's proposed actions to evaluate the impact of the requested VCSNS Units 2 and 3 UFSAR changes related to the structural modules, CA01, CA02, and CA05, on the overall safety of the plant.

The design of the AP1000 steel-concrete (SC) composite wall modules used for the containment internal structures (CIS) and portions of the auxiliary building is described in the UFSAR Subsection 3.8.3.1.3, ''Structural Wall Modules." The SC composite wall modules are constructed of steel faceplates connected by trusses and welded to the faceplates. The modules are filled with concrete. The primary purpose of the trusses is to stiffen and support the faceplates during handling, erection, and concrete placement. The nominal thickness of the steel faceplates is 1.27 cm (0.5 inch) and the nominal spacing of the trusses is 76.2 cm (30 inches). Shear studs are welded to the inside faces of the module faceplates to develop full composite action between the concrete and steel faceplates. The shear studs and trusses are designed in accordance with the provisions of the American Institute of Steel Construction (AISC), Standard AISC N690-1994, "Specification for the Design, Fabrication, and Erection of Steel Safety Related Structures for Nuclear Facilities." AISC N690-1994 references the American Welding Society (AWS) D1.1 for structural welding.

The concrete-filled structural wall modules are designed as reinforced concrete structures in accordance with applicable portions of American Concrete Institute (ACI) code ACI-349-01, "Building Code Requirements for Nuclear Safety-Related Structures," and AISC N690-1994 code requirements. Module-to-module welds are full-penetration welds such that full capacity of the steel plates is developed across the joint. After the wall modules are welded together, concrete is poured in-between the steel faceplates, which serve as forms. Once the concrete in the wall modules cure, the concrete, trusses, faceplates, and the shear studs act as a lateral force resisting system, behaving as a shear wall, to resist design basis demands.

In the LAR, the licensee proposed to depart from the Tier 2* and Tier 2 material in the VCSNS Units 2 and 3 UFSAR Subsections 3.8.3.1.3, "Structural Wall Module"; 3.8.3.5.3, "Structural Wall Module"; 3.8.3.5.3.5, "Design of Trusses"; 3.8.3.5.8.1, "Structural Wall Modules"; 3.8.3.8, "Construction Inspection"; Table 3.8.3-3, "Definition of Critical Locations and Thicknesses for Containment Internal Structures"; Table 3.8.3-4 (Sheets 1, 2, and 3), "Design Summary of West Wall of Refueling Canal Design Loads, Load Combinations, and Comparison to Acceptance Criteria Mid-Span at Mid-Height"; Table 3.8.3-5 (Sheets 1, 2, and 3), "Design Summary of South Wall of Steam Generator Compartment Design Loads, Load Combinations, and Comparison to Acceptance Criteria Mid-Span at Mid-Height"; Table 3.8.3-6 (Sheets 1, 2, and 3), "Design Summary of North-East Wall of IRWST Design Load, Load Combinations, and Comparison to Acceptance Criteria Mid-Span at Mid-Height"; Figure 3.8.3-1 (Sheets 1, 2, 3, 4,

and 5 of 7), “Structural Modules in Containment Internal Structures”; Figure 3.8.3-8 (Sheets 1 and 2 of 3), “Structural Modules – Typical Design Details”; and Figure 3.8.3-18, “Location of Structural Wall Modules,” to address design changes that are pertinent to specific wall modules in the containment internal structures.

These proposed changes are related to the internal containment structural wall modules faceplate nominal thickness, and wall thickness. Also proposed are changes to the design of the module mechanical connections, the use of steel plates with increased thickness in localized areas, and the use of structural shapes, reinforcement bars or tie bars between the faceplates to address out-of-plane loads. Specifically, the proposed changes include the following:

(1) Adding additional details for the structural module for CA01, CA02, and CA05 connections to the base concrete,

(2) Increasing structural wall module faceplate thickness in some areas of the CA01, CA02, and CA05 modules to support local load demand,

(3) Changing the wall thickness of wall module for CA01 and CA05 to satisfy shielding requirements and to accommodate equipment space,

(4) Providing additional out-of-plane shear reinforcement in localized areas of the wall modules for CA01, CA02 and CA05 to resist shear demands, and

(5) Revising applicable sections of the licensing basis document as a result of the proposed changes.

In the LAR, Enclosures 1, 3, and 5, the licensee proposed a VCSNS Units 2 and 3 Tier 1 change to revise Note 3 in the plant-specific Tier 1 Table 3.3-1, “Definition of Wall Thickness for Nuclear Island Buildings, Turbine Building, and Annex Building,” that identifies where thicker faceplates are used in the construction of the structural wall modules. Structural modules CA01 and CA05 use thicker faceplates in some limited locations. The thicker plates permit larger attachments or connection loads without use of overlay plates. In addition, overlay plates are used in some locations of the structural modules CA01, CA02, and CA05 to support equipment attachments. The licensee stated that the overlay plates are not attached to the module faceplates and thus wall thickness values are not changed in the Table. According to the licensee, these structural modules are classified as Category I structures and are designed to all applicable loads including, but not limited to, dead, live, thermal, pressure, safe shutdown earthquake, and loads due to postulated pipe breaks. In the LAR, Enclosure 5, the licensee also proposed clarification changes to the plant-specific Tier 1 Table 3.3-7, “Nuclear Island Critical Structural Sections” to be consistent with applicable sections and Figure 3.8.3-18 of the VCSNS Units 2 and 3 UFSAR.

The licensee provided supplemental information to respond to requests for additional information (RAIs) that were asked of Southern Nuclear Operating Company (SNC) for the Vogtle Electic Generating Plant (VEGP) Unit 3 and 4 LAR 14-001 which was identical in technical content. LAR 14-001 was subsequently approved as VEGP Amendment 29.

The staff's evaluation of these design changes are summarized below.

3.2.1 Structural Module Connection to Base Concrete

Figure 3.8.3-8 (Sheet 2), of the VCSNS Units 2 and 3 UFSAR shows the attachment method for the structural modules, typically comprised of mechanical connectors, bolts or welds, used between the module faceplate and the embedment. The embedment or anchor is set in the base concrete prior to module placement.

In the LAR, the licensee stated that in some cases as shown in VCSNS Units 2 and 3 Figure 3.8.3-8 (Sheet 2), a single module faceplate extends to a lower elevation than the opposite faceplate due to plant layout constraints. The licensee further stated that this offset module base configuration is in various locations for modules CA01, CA02, and CA05.

The connection of the lower faceplate in portions of modules CA01 and CA05 to the base concrete is detailed to transfer forces from the faceplates to the base concrete using horizontally oriented reinforcement bars, structural shapes, shear studs, or shear lugs which are mechanically attached or welded to the lower module faceplate, and are embedded in the base concrete. Since these items are embedded in the concrete after the module is set in place, this method of anchoring the module does not require separate mechanical connections as the current method shown in VCSNS Units 2 and 3 UFSAR Figure 3.8.3-8. The licensee stated that the connection design is in accordance with applicable portions of ACI 349-01 and AISC N690-1994. According to the licensee, the proposed alternative methods of attachment provide a direct load path between the steel faceplates to the reinforcement bars in the base concrete.

Also, the licensee stated that the proposed changes to the design details include shear friction reinforcement that may be included in the construction joint at the transition between the base concrete and concrete in the module. The licensee stated that the added shear friction reinforcement is not part of the mechanical connection between the module and base concrete and that the shear friction reinforcement at the construction joints is spaced and sized in accordance with ACI 349-01 requirements and is not connected to the module faceplates.

Similarly, the licensee stated that, in some cases, the structural module may need additional reinforcement bars that are not connected to the module faceplate and are developed in accordance with the ACI 349-01 code. The horizontally oriented connection reinforcement bar dowels are sized for the design loads and load combination in accordance with the shear friction provisions of ACI 349-01, Section 11.7. Alternatively, structural shapes such as angles or channels welded to the faceplates may be used to provide shear transfer by considering the bearing strength of the concrete in combination with tension anchors per ACI 349-01 Appendix B requirements. In the case of compression forces, the forces are transferred through the concrete within the composite section directly to the reinforced concrete. Also, any additional reinforcement required for detailing concrete at module walls where offset in faceplate elevation occurs is provided in accordance with ACI 349-01. These connections are applicable to modules CA01 and CA05 and are designed in accordance with applicable portions of ACI 349-01 and AISC N690-1994 code provisions.

The staff performed a review of the licensee's proposed VCSNS Units 2 and 3 UFSAR changes and concluded that the licensee's proposed changes to provide additional details identifying the area of alternative methods of transferring forces horizontally from the wall modules to the base concrete is acceptable because the licensee's connection design approach is in accordance with acceptable standards including ACI 349-01 and AISC N690-1994, and the proposed

connection designs utilize acceptable means to anchor the modules into the base concrete using studs, reinforcement bars, and steel shapes. Also, the continued Tier 2* requirement to the use of ACI 349-01, Appendix B design provisions for anchoring to concrete is acceptable. Moreover, the licensee remains bound by the requirements prescribed in Section 3.8.4.2 of the VCSNS Units 2 and 3 UFSAR which states that the overall design of the structural modules will continue to be in accordance with ACI 349-01 and AISC N690-1994.

3.2.2 Structural Module Faceplate Thickness

In Enclosure 3 of the LAR, the licensee proposed changes to VCSNS Units 2 and 3 UFSAR Subsection 3.8.3.1.3 related to Tier 2* and Tier 2 information for the faceplate thickness of CA01 and CA05 modules. In the VCSNS Units 2 and 3 UFSAR Table 3.8.3-3, the licensee proposed to increase in localized regions within modules CA01 and CA05 the faceplate thicknesses from 1.27 cm (0.5 inch) nominal thickness up to 1.5 inches in order to support local demands or connection loads without the use of overlay plates. Similarly, the licensee added Note 4 for the faceplate thickness for CA01 and CA05 as a result of the design change. To support the loading associated with the steam generator lateral supports, the nominal faceplate thickness of 0.5 inch is increased to 3.0 inches. The licensee stated that where necessary, faceplates thicker than nominal thickness will be used to support local demands for areas subjected to out of plane loading and in areas of increased loading due to equipment supports, pipe supports, component support attachments, and in some cases, floor module connections.

The staff reviewed the LAR, along with the referenced enclosures and observed that on page 3 of Enclosure 3, the licensee stated that "[i]n some locations within the CA01 and CA05 structural wall modules, the faceplate thickness is greater than the nominal thickness to support local demand." The staff finds that the term "some" does not provide an indication of the extent of the plate increases. In VEGP RAI 7645, Question 6, the staff requested the licensee to quantify the amount of coverage of the thicker plate use.

In its supplement dated January 5, 2015, the licensee provided a description of the extent of the use of the thicker plates and the use of the overlay plates. For module CA05, a thicker plate is used in the area inside the northeast corner of the module where it transitions at lower elevation from 2 feet 0 inches (where the wall thickness is reduced to accommodate equipment) to 4 feet 6 inches. For module CA01, approximately 10 percent of the faceplate area has a plate thickness of 1.0 inch, approximately 5 percent of the faceplate area has a faceplate thickness of 1.5 inches, and less than 0.5 percent of the faceplate area has a thickness of 3.0 inches. Additionally, the licensee stated that the faceplate thicknesses may be increased to up to 3.0 inches to support loading associated with the steam generator support.

For the overlay plates, the licensee stated that the plates are attached in some locations within structural modules CA01, CA02 and CA05. The licensee stated in Enclosure 5 that where overlay plates are to be used, holes are drilled into the in-containment structural wall module faceplates to accept the deformed bar overlay plate anchors. The licensee further stated that these overlay plates are not directly attached to the faceplate but are anchored independently from the faceplates to the concrete of the in-containment structural wall module. Hence, the overlay plates are not considered part of the in-containment structural wall module faceplates.

To justify these changes, the licensee performed an assessment to determine the impact of increasing the faceplate thickness on the global seismic model of the applicable areas of the affected structural models and concluded that the impact on the calculated loads for the critical locations for the structural models are insignificant and the required thickness of the faceplates

is not affected. The licensee concluded that the design basis is established via the Tier 2* requirement to meet ACI 349-01 and AISC N690-1994, considering the site-specific and plant-specific loads.

Staff reviewed VCSNS Units 2 and 3 UFSAR Section 3.8.3.2, "Applicable Codes, Standards and Specification," where ACI 349-01 and AISC N690-1994 codes are listed for the design of the containment internal structures along with relevant information in the enclosures of the LAR and considered the proposed changes to be acceptable. The basis for the staff's conclusion is the licensee's continued obligation to carry out the faceplate thickness increases and the overlay plates design in accordance with acceptable standards including ACI 349-01 and AISC N690-1994 codes. Moreover, and as stated in the supplement addressing the VEGP RAI 7645, the extent of the thicker plates is limited such that the global seismic response for the containment internal structures continues to be bounded by the AP1000 certified design and the associated analyses results.

3.2.3 Structural Wall Module Thickness Change

In the LAR, Enclosures 3 and 5, the licensee proposed to change Tier 2* information by adding information related to the CA01 and CA05 wall thickness in VCSNS Units 2 and 3 Figure 3.8.3-1 (Sheets 2 and 4); and Figure 3.8.3-8. The current configuration shown in Figure 3.8.3-8 (Sheet 1) specifies the wall thickness for the structural wall modules as either 2 feet 6 inches or nominal 4 feet 0 inches. The licensee further stated that the thickness requirement was intended for the major structural walls of the structural modules such as the primary and secondary shield walls around the reactor vessel and the steam generator, and the wall thicknesses are intended for structural and shielding purposes.

Additionally, the licensee stated that some other wall modules also have structural and shielding requirements and as a result, some walls require thicknesses greater than 4 feet 0 inches to satisfy the shielding requirements. The proposed wall thickness used in the structural wall modules is 4 feet 6 inches maximum and 1 foot 6 inches minimum as shown in Figure 3.8.3-1 (Sheets 2 and 4) of Enclosure 4 (not publicly available – contains security-related information). The licensee stated that the affected modules wall thicknesses are determined based on radiation protection and that the modules are designed to the requirements in applicable portions of ACI 349-01 and AISC N690-1994. The licensee further stated that the actual structural model wall thicknesses were considered in the global finite element re-analysis of the nuclear island.

The NRC staff reviewed the proposed change and the relevant portions of the licensing basis including VCSNS Units 2 and 3 UFSAR Section 3.8.3.2, "Applicable Codes, Standards and Specification," for the design bases commitment of ACI 349-01 and AISC N690-1994 codes as well as the supplemental requirements in VCSNS Units 2 and 3 UFSAR Subsection 3.8.3.5.3. The staff finds that the changes to Figures 3.8.3-1 (Sheets 2 and 4) enhance the clarity of the figures and the consistency of the figures with the actual construction. Moreover, the wall segments with changed wall thickness in CA01 and CA05, for the purpose of accommodating other design considerations such as shielding or access, will continue to be designed and analyzed using methods and meeting standards consistent with the AP1000 certified design and, hence, acceptable to the staff. In addition, the proposed wall thickness change is such that the global seismic response for the containment internal structures continues to be bound by the AP1000 certified design and the associated analyses results.

3.2.4 Structural Wall Module Out-of-Plane Shear Reinforcement

In Enclosure 3 of the LAR, the licensee proposed changes to VCSNS Units 2 and 3 UFSAR Subsection 3.8.3.1.3, 3.8.3.5.3.5, and 3.8.3.5.8.1 by inserting additional structural elements to support localized out-of-plane loads and sustain structural integrity. These structural elements are steel plates, structural shapes, reinforcement bars, or tie bars installed between the structural wall module faceplates and embedded in the concrete. Also, the licensee stated that the trusses, connecting steel faceplates, structural shapes, reinforcement bars, and tie bars are designed according to applicable requirements of AISC N690-1994 and ACI 349-01.

The staff reviewed the proposed change in Enclosures 1 and 3 of the LAR, specifically changes related to the out-of-plane loads and structural integrity of modules CA01, CA02, and CA05. The staff noted that the licensee did not provide sufficient information related to the out-of-plane loads and structural integrity of the CA02 module. In VEGP RAI 7645, Question 4, the staff requested that the licensee provide a quantitative assessment of the design margin for module CA02 including the proposed design changes.

In its supplement to address VEGP RAI 7645, Question 4, the licensee stated that calculation, "APP-CA02–S3C-004, CA02 Module Detailed Analysis and Qualification Report," which evaluates the out-of plane shear loading on module CA02 in the containment structural wall had been completed. Furthermore, the licensee stated that, "the calculation addresses the mechanical loading only; separate analysis is being performed to address the thermal stresses on the module." The analysis addressing thermal stresses evaluates the out-of-plane shear loadings on the CA02 structural wall module from all applicable load combinations and assesses the connection element sizes and embedment lengths required to meet the requirements in applicable portions of the ACI 349-01 and AISC N690-1994 codes.

The licensee participated in a public meeting on December 18, 2014 (ADAMS Accession No. ML14357A601) with the NRC staff and representatives from Westinghouse Electric Company (WEC) and the SNC. SCE&G, SNC and WEC presented a summary of their assessment of the three modules, including CA02, subjected to all applicable loads including thermal loads. In its summary, the licensee indicated that CA01, CA02, and CA05 remain structurally adequate for all design basis load combinations, including pressure, seismic and thermal loads due to flooding. Moreover, the presenters indicated that the faceplate thickness does not need to be changed (beyond the areas identified in this LAR) and that the design margin reported in the VCSNS Units 2 and 3 UFSAR remains unchanged under the applicable design basis load combinations. The licensee also submitted information, in Supplement 2 to the LAR, Enclosure 5, dated January 5, 2015, providing the same conclusions.

Based on its review of the proposed changes and the results of the licensee's assessment of the modules' integrity, the staff finds the proposed changes related to the out-of-plane shear reinforcement to be acceptable. The basis for the staff's conclusion is the licensee's continued obligation to carry out the additional components' design in accordance with acceptable standards including ACI 349-01 and AISC N690-1994 codes. Moreover, and based on the results of the calculations performed by the licensee, the modules continue to have adequate structural integrity and design margin under all applicable design basis load combinations.

3.2.5 Licensing Basis Changes

In Enclosures 3, 4, and 5 of the LAR, the licensee proposed the licensing basis change descriptions to the affected subsections of the VCSNS Units 2 and 3 UFSAR to be consistent

with the proposed wall module faceplate thickness for CA01 and CA05; clarification changes in Tier 2* Table 3.8.3-3 - deleting the term “Maximum,” revising the required faceplate thickness values, and clarifying the location of the wall modules to be consistent with applicable sections and Figure 3.8.3-18 of the VCSNS Units 2 and 3 UFSAR; revised Figure 3.8.3.-1 (Sheets 1, 2, 3, 4, and 5 of 7) by adding a note to show elevation; revised Figure 3.8.3-8 (Sheets 1 and 2) - adding notes related to module CA01 and CA05 faceplate thicknesses and the identification of wall thickness differences for the modules in the figure; revised Tier 2* Tables 3.8.3-4, 3.8.3-5, and 3.8.3-6 to reflect the new load results, the required face plate thicknesses, the maximum principle stresses, the stress intensity ranges, and to clarify the location of the modules; and revised Table 3.3-7 to be consistent with applicable sections and Figure 3.8.3-18 of the VCSNS Units 2 and 3 UFSAR.

The licensee proposed to revise Subsection 3.8.3.5.3 of the VCSNS Units 2 and 3 UFSAR for consistency as a result of the proposed changes to the notes in Figure 3.8.3-8, Subsections 3.8.3.1 and 3.8.3.1.3, and Tier 2* information related to structural module connection to the base concrete. Currently, Figure 3.8.3-8 of the VCSNS Units 2 and 3 UFSAR identifies a typical mechanical attachment of the structural module faceplate to the base concrete, showing the module attachment to an embedment plate with vertically oriented reinforcement bars embedded in the concrete. The licensee-proposed changes to the text in VCSNS Units 2 and 3 UFSAR Subsection 3.8.3.1.3 including additional alternate details for these connections; horizontally oriented reinforcement bars, structural shapes, and shear studs mechanically attached or welded to the lower module faceplate, and embedded in the base concrete to transfer forces horizontally from the wall module faceplate to the base concrete.

The staff reviewed the proposed changes along with the referenced enclosures, the additional information in the affected subsections, tables, and figures in the VCSNS Units 2 and 3 UFSAR and finds the proposed changes to be acceptable. Moreover, the proposed changes are consistent with other changes evaluated in Sections 3.2.1, 3.2.2, 3.2.3, and 3.2.4 of this Safety Evaluation Report.

3.2.6 Clarification and Consistency Changes

The LAR has proposed a number of changes to the VCSNS Units 2 and 3 UFSAR that provide clarification or editorial changes.

The licensee has proposed a clarification to VCSNS Units 2 and 3 UFSAR Section 3.8.3.5.3 to clarify that structural elements such as the west wall of the in-containment refueling water storage tank are not considered “structural wall modules.” VCSNS UFSAR Section 3.8.3.1.3, “Structural Wall Modules” states the following: “Structural wall modules consist of steel faceplates connected by steel trusses. The primary purpose of the trusses is to stiffen and hold together the faceplates during handling, erection, and concrete placement.” Accordingly, structural elements in which concrete is not placed are not “structural wall modules.” VCSNS Units 2 and 3 UFSAR Section 3.8.3.1.3 describes the west wall of the in-containment refueling water storage tank as follows: “On the west side [of the in-containment refueling water storage tank], along the containment vessel wall, the tank wall consists of a stainless steel plate stiffened with structural steel sections in the vertical direction and angles in the horizontal direction.

The NRC staff reviewed the proposed change and finds it acceptable on the basis that it adds clarity and consistency to the licensing basis. Moreover, the change is acceptable because the licensee remains committed to design the structural wall modules (i.e., with concrete fill) as well

as the structural modules (i.e., without concrete fill) to codes and standards acceptable to the staff.

The LAR has also proposed the following editorial changes to the VCSNS Units 2 and 3 UFSAR relating to containment internal structural module design details to provide for consistency with regard to terminology:

1. Plant-specific Tier 1 and associated COL Appendix C Table 3.3-7, would be revised to change an entry in the list of "Containment Internal Structures," from "South wall of the west steam generator cavity," to "South wall of the west steam generator compartment."

2. The bulleted list at the beginning of UFSAR Subsection 3.8.3.5.8.1, and the identifying information contained in UFSAR Table 3.8.3-3 would be revised to change "South wall of the west steam generator cavity," to "South wall of the west steam generator compartment."

3. Identifying information contained in UFSAR Table 3.8.3-3 would be revised to change the "Applicable Column Lines" description of "Module Wall 1" from "West wall of refueling cavity," to "Southwest wall of refueling cavity," and the "Applicable Column Lines" and "Applicable Elevation Range" information for "Module Wall 2" to identify the area as "steam generator compartment" in lieu of "steam generator cavity."

4. The title of UFSAR Table 3.8.3-4 and the applicable identification on UFSAR Figure 3.8.3-18 would be revised to refer to the corresponding critical section as "Southwest Wall of Refueling Canal Cavity."

5. The title of UFSAR Table 3.8.3-5 is revised to refer to the corresponding critical section as "South Wall of West Steam Generator Compartment."

The NRC staff has reviewed the above-described editorial changes and concludes that they are acceptable as they add clarity and consistency to the licensing basis.

Conclusion

The staff reviewed the licensee's proposed changes provided in the LAR. Based on the staff's technical evaluation, the staff finds that:

(1) The proposed changes to provide additional details identifying the area of alternative methods of transferring forces horizontally from the wall modules to the base concrete is acceptable because the licensee's connection design approach is in accordance with acceptable standards including ACI 349-01 and AISC N690-1994, and the proposed connection designs utilize acceptable means to anchor into concrete including studs, reinforcement bars, and steel shapes.

(2) The proposed change to increase the structural wall module faceplate thickness in some locations to accommodate areas subject to higher out-of-plane loads is acceptable because the licensee will carry out the faceplate thickness increases and the overlay plates design in accordance with acceptable standards including ACI 349-01 and AISC N690-1994 codes. Moreover, the extent of the thicker plates is limited such that the

global seismic response for the containment internal structures continues to be bound by the certified design and the associated analyses results.

(3) The proposed change to modify the wall thicknesses of the CA01 and CA05 modules to satisfy the shielding requirements and to accommodate equipment space is acceptable because the changes to the figures enhance the clarity of the figures and the consistency of the figures with the actual construction. Moreover, the wall segments with changed wall thickness in CA01 and CA05 will continue to be designed and analyzed using methods and meeting standards consistent with the AP1000 certified design. In addition, the proposed wall thickness change is such that the global seismic response for the containment internal structures continues to be bound by the certified design and the associated analyses results.

(4) The proposed changes to provide additional out-of-plane shear reinforcement in localized areas of the wall modules for CA01, CA02, and CA05 to resist shear demands are acceptable because the licensee will carry out the additional components' design in accordance with acceptable standards including ACI 349-01 and AISC N690-1994 codes. Moreover, the modules continue to have adequate structural integrity and design margin under all applicable design basis load combinations.

For the reasons specified above, the NRC staff finds that the proposed UFSAR changes to Subsections 3.8.3.1.3, 3.8.3.5.3, 3.8.5.3.5, 3.8.3.5.8.1, and 3.8.3.8 are acceptable. The staff also finds the proposed UFSAR changes to Table 3.8.3-3, Table 3.8.3-4 (Sheets 1, 2, and 3), Table 3.8.3-5 (Sheets 1, 2, and 3), Table 3.8.3-6 (Sheets 1, 2, and 3), and Table 3.3-7 acceptable. Similarly, the staff finds the proposed UFSAR changes to Figure 3.8.3-1 (Sheets 1, 2, 3, 4, and 5 of 7), Figure 3.8.3-8 (Sheets 1 and 2 of 3) and Figure 3.8.3-18 acceptable.

Based on these findings, the NRC staff concludes that there is reasonable assurance that the requirements of GDC 1, GDC 2, and GDC 4 of Title 10 CFR 50, Appendix A ("General Design Criteria for Nuclear Power Plants"); 10 CFR Part 50, Appendix S; and Appendix D to 10 CFR 52 will continue to be met. Therefore, the staff finds the proposed changes to be acceptable.

Also, as noted above in Section 3.2.6, the proposed clarification and editorial changes proposed in the LAR are acceptable.

4.0 Final No Significant Hazards Consideration

The NRC's regulations in 10 CFR 50.92, "Issuance of Amendment," state that the NRC may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility, in accordance with the amendment, would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, or (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety. The Commission previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (80 FR 5798, dated February 3, 2015).

As required by 10 CFR 50.91(a), the NRC staff presents an evaluation of the issue of no significant hazards consideration as follows:

Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The design function of the internal containment structures is to provide support, protection, and separation for the seismic Category I mechanical and electrical equipment located in those structures. These structures are structurally designed to meet seismic Category I requirements as defined in Regulatory Guide 1.29.

The changes to the design details for the structural modules do not have an adverse impact on the response of the nuclear island structures to safe shutdown earthquake ground motions or loads due to anticipated transients or postulated accident conditions, nor do they change the seismic Category I classification. Evaluations have been performed which determined that the proposed changes do not have a significant impact on the calculated loads for the affected structural modules, or critical locations, and no significant impact on the global seismic model. The changes to the design details for the structural modules do not impact the support, design, or operation of mechanical and fluid systems. There is no change to plant systems or the response of systems to postulated accident conditions. There is no change to the predicted radioactive releases due to postulated accident conditions. The plant response to previously evaluated accidents or external events is not adversely affected, nor does the change described create any new accident precursors.

Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed changes are to revise design details for the internal containment structural modules. The changes do not change the design requirements of the nuclear island structures, nor do they change the seismic Category I classification. The changes to the design details for the internal containment structural modules do not change the design function, support, design, or operation of mechanical and fluid systems. The changes to the design details for the internal containment structural modules do not result in a new failure mechanism for the nuclear island structures or introduce any new accident precursors. As a result, the design function of the nuclear island structures is not adversely affected by the proposed change.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

The requested amendment proposes changes to the structural details associated with the in-containment structural modules. The purpose of these changes is to ensure that the requirements contained in the applicable construction codes are met. As discussed in UFSAR, Section 3.8.3.5, "Design Procedures and Acceptance Criteria," the in-containment structural modules are designed in accordance with ACI 349 and AISC N690. Thus, the identification of additional structural module connection details, the increase in structural module faceplate and wall thicknesses, and the addition of additional reinforcement in specific areas are proposed to ensure that the codes of record, and the associated margins contained therein, continue to be met as specified in the design basis. Structural and seismic analysis of the modified sections in accordance with the methodologies identified in the UFSAR has confirmed that the applicable requirements of ACI 349 and AISC N690 continue to be met for affected in-containment structural modules.

As a result, the proposed changes do not adversely affect any safety related equipment or other design functions, design code compliance, design analysis, safety analysis input or result, or design/safety margin. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the proposed changes.

Therefore, the requested amendment does not involve a significant reduction in a margin of safety.

Based on the above evaluation, the NRC staff concludes that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has made a final determination that no significant hazards consideration is involved for the proposed amendment and that the amendment should be issued consistent with 10 CFR 50.92, “Issuance of Amendment.”

5.0 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.

6.0 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, “Standards for Protection Against Radiation.” 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. As described above in Section 4.0 of this safety evaluation, the NRC staff has found that the amendment involves no significant hazards consideration. 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.

Because the exemption is necessary to allow the changes proposed in the license amendment, and because the exemption does not authorize any activities other than those proposed in the license amendment, the environmental consideration for the exemption is identical to that of the license amendment. Accordingly, the exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of the exemption.

7.0 Conclusion

The staff has determined that pursuant to Section VIII.A.4 of Appendix D to 10 CFR Part 52, the exemption (1) is authorized by law, (2) presents no undue risk to the public health and safety, (3) is consistent with the common defense and security, (4) is a special circumstance (5) that outweighs the reduction in standardization, and (6) does not significantly reduce the level of safety at the licensee's facility. Therefore, the staff grants the licensee an exemption from the Tier 1 information specified by the licensee.

The staff has concluded, based on the considerations discussed in Section 3.2 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.

8.0 References

1. Request for License Amendment and Exemption 14-05: Containment Internal Structural Wall Module Design Details, letters from South Carolina Electric and Gas Company, dated July 17, 2014 (ADAMS Accession No. ML14202A088), September 25, 2014 (ADAMS Accession No. ML14268A554), and January 5, 2015 (ADAMS Accession No. ML15006A290).

2. Virgil C. Summer Nuclear Station, Units 2 and 3 Updated Final Safety Analysis Report (UFSAR), Revision 2, dated June 26, 2013. (ADAMS Accession No. ML13200A269).

3. AP1000 Design Control Document, Revision 19, dated June 13, 2011 (ADAMS Accession No. ML14206A861).

4. Virgil C. Summer Nuclear Station Final Safety Evaluation Report (FSER) dated August 17, 2011 (ADAMS Accession No. ML111920401-letter, ADAMS Accession No. ML110450305—FSER package).

5. 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).