

SummerRAIsPEm Resource

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South Carolina Electric and Gas Company
Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3

NND-17-XXXX

Enclosure 1

**Request for License Amendment:
Reconciliation of Nuclear Island As-Built
Concrete Sections and Key Dimensions
(LAR 17-XX)**

(This Enclosure consists of 13 pages, including this cover page.)

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DRAFT

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, South Carolina Electric and Gas Company (SCE&G), on behalf of itself and the South Carolina Public Service Authority (Santee Cooper), the licensee for Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3, requests an amendment to Combined License (COL) Numbers NPF-93 and NPF-94, for VCSNS Units 2 and 3, respectively.

1. SUMMARY DESCRIPTION

To improve the efficiency of addressing potential future deviations from the building structure wall, roof and floor thicknesses specified in Combined License (COL) Appendix C (and plant-specific Design Control Document (DCD) Tier 1), a change is proposed to Table 3.3-6 to specifically allow deviations in wall, roof and floor thicknesses (including tolerances) to be reconciled in the following Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC):

- 3.3.00.02a.ii.a (containment internal structures)
- 3.3.00.02a.ii.b (shield building)
- 3.3.00.02a.ii.c (non-radiologically controlled area of the auxiliary building)
- 3.3.00.02a.ii.d (radiologically controlled area of the auxiliary building)
- 3.3.00.02a.ii.e (annex building)
- 3.3.00.02a.ii.f (turbine building)
- 3.3.00.03a (containment internal structures shield walls and floors)
- 3.3.00.03b (shield building shield walls)
- 3.3.00.03c (non-radiologically controlled area of the auxiliary building shield walls and floors)
- 3.3.00.03d (radiologically controlled area of the auxiliary building shield walls and floors)
- 3.3.00.04a (annex building shield walls and floors)
- 3.3.00.04b (radwaste building waste accumulation room shield walls)

The requested amendment proposes changes to COL Appendix C and the corresponding plant-specific Tier 1 information. This enclosure requests approval of the license amendment necessary to implement the proposed changes. Enclosure 2 provides the exemption request that seeks approval for the departure from plant-specific Tier 1 material.

2. DETAILED DESCRIPTION

In the course of early construction, deviations in structure wall or floor thicknesses, or alignment have occurred which do not adversely impact the ability of the structures to withstand design-basis loads, provide radiation shielding, or fulfill its fire barrier function, as applicable. Deviations of building structural sections from the approved design identified during construction are documented and evaluated in accordance with the site nonconformance and disposition process. However, to maintain compliance with certain ITAAC contained in Tier 1 Table 3.3-6, which require the specified wall, floor and roof thicknesses identified in Tier 1 Table 3.3-1 to be met, the conditions have required either new license amendments to modify the ITAAC requirements, costly and time-consuming repairs, or both.

Examples include:

- 1) V.C. Summer LAR 14-07 to increase the tolerance between module CA04 and the adjacent CB65 and CA01 modules.
- 2) Vogtle LAR 15-015 to increase the tolerance between CA04 and CB65 due to a deformation which resulted in a small section of the wall having additional thickness.
- 3) Vogtle LAR 16-003 to increase the concrete wall thickness tolerance for the column line N Wall from column lines 2 to 4 from elevation 100'-0" to 135'-3".
- 4) Vogtle Unit 3 had an embed plate in the battery room J-wall "twist" slightly during concrete placement, causing a portion of the plate to be embedded deeper in the wall, resulting in the wall thickness at that location being less than the required -1" tolerance. To restore ITAAC compliance, a section of concrete was hydrolased out so the embed could be reset, and concrete re-placed.
- 5) At V.C. Summer Unit 2, a slight misalignment in the set of module CA20 led to the rebar couplers in the module not lining up with the rebar in walls J-1 and J-2. The structural resolution to make the connection requires making the walls slightly thicker (~1 to 2 inches) for about one foot of wall length. To support ITAAC compliance, V.C. Summer LAR 15-20 was submitted to address the deviation from the ITAAC wall thickness requirements for this section.

To improve the efficiency of addressing potential future discrepant conditions, COL Appendix C (and plant-specific DCD Tier 1) a change is proposed to modify Table 3.3-6 to specifically allow deviations in wall, roof and floor thicknesses (including tolerance) to be reconciled in the reports required for the structural ITAAC identified in Section 1, "Summary Description," above.

Licensing Basis Change Descriptions

The following licensing basis changes are proposed:

Changes are proposed to the ITAAC and/or the ITAAC acceptance criteria contained in Tier 1 Table 3.3-6 that require reports to be prepared that conclude the walls, roofs and floors of the identified plant structures conform to specified thicknesses. The proposed changes allow deviations from the specified wall, roof and floor thicknesses to be reconciled by evaluation and/or analysis and described in the ITAAC reconciliation reports.

The affected ITAAC contained in COL Appendix C (and plant-specific DCD Tier 1) are identified in Table 1 below.

Table 1		
Structure	COL Appendix C Table 3.3-6 ITAAC	Plant-Specific Tier 1 Table 3.3-6 Item
Containment internal structures	3.3.00.02a.ii.a	2.a)ii.a
Shield building	3.3.00.02a.ii.b	2.a)ii.b
Non-radiologically controlled area of the auxiliary building	3.3.00.02a.ii.c	2.a)ii.c
Radiologically controlled area of the auxiliary building	3.3.00.02a.ii.d	2.a)ii.d
Annex building	3.3.00.02a.ii.e	2.a)ii.e
Turbine building	3.3.00.02a.ii.f	2.a)ii.f
Containment internal structures shield walls and floors	3.3.00.03a	3.a)
Shield building shield walls	3.3.00.03b	3.b)
Non-radiologically controlled area of the auxiliary building shield walls and floors	3.3.00.03c	3.c)
Radiologically controlled area of the auxiliary building shield walls and floors	3.3.00.03d	3.d)
Annex building shield walls and floors	3.3.00.04a	4.a)
Radwaste building waste accumulation room shield walls	3.3.00.04b	4.b)

3. TECHNICAL EVALUATION

The proposed activity revises the Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) contained in the Combined License (COL) Appendix C (and plant-specific DCD Tier 1) identified in Table 1 above to allow reconciliation of deviations of as-built wall, floor and roof thicknesses. The affected ITAAC require floor, wall, and/or roof structures for the containment internal structures, the shield building, the auxiliary building, the turbine building, the annex building and the radwaste building be of a specified thickness.

Implementation of ITAAC requires the entire building section (except for designed opening and penetrations) to be within the specified construction tolerance, without exception (i.e., this is not an average thickness). NRC inspection has been consistent with this approach.

To improve the efficiency of addressing potential future discrepant conditions, COL Appendix C (and plant-specific DCD Tier 1) Table 3.3-6 is modified to specifically allow deviations in wall, roof and floor thicknesses (including tolerances) to be reconciled as described above.

As described in UFSAR subsection 1.2.2, the nuclear island structures include the containment (the steel containment vessel and the containment internal structures) and the shield and auxiliary buildings. The containment, shield and auxiliary buildings are structurally integrated on a common basemat which is embedded below the finished plant grade level. The containment

vessel is a cylindrical welded steel vessel with elliptical upper and lower heads, supported by embedding a lower segment between the containment internal structures concrete and the basemat concrete.

As described in UFSAR subsection 1.2.4.1, the containment, including its internal structures, functions to limit the release of radioactivity following postulated design basis accidents and provide shielding for the reactor core and the reactor coolant system during normal operations. The containment internal structures also provide for compartmentalization and separation of components for protection of equipment against the effects of pipe ruptures. The primary containment is also an integral part of the passive containment cooling system.

The shield building cylinder is a composite steel and concrete (SC) structure except for the portion surrounded by the auxiliary building, which is reinforced concrete (RC). As identified in UFSAR subsection 1.2.4.2, the shield building, in conjunction with the internal structures of the containment building, provides shielding for the reactor coolant system and the other radioactive systems and components housed in the containment during normal plant operations. The shield building provides shielding for radioactive material that may be dispersed throughout containment following an accident. The shield building also provides protection of the containment from external events, such as tornadoes and tornado generated missiles.

As identified in UFSAR subsection 1.2.4.2, the function of the reinforced concrete auxiliary building is to provide protection and separation for the seismic Category I mechanical and electrical equipment located outside the containment building. The auxiliary building provides protection for the safety-related equipment against the consequences of either a postulated internal or external event. The auxiliary building also provides shielding for the radioactive equipment and piping that is housed within the building.

Additionally, as identified in UFSAR subsection 9.5.1.1.1, the nuclear island structures are subdivided into fire areas, with selected walls and floors providing a fire barrier function.

The portion of the annex building adjacent to the nuclear island is a structural steel and reinforced concrete seismic Category II structure and houses the control support area, non-1E electrical equipment, hot machine shop, and other plant support facilities. The annex building provides no safety-related function, but as described in UFSAR subsection 3.2.1.1.2, it performs the important-to-safety function of maintaining its integrity following a seismic event to preclude adverse interaction with the seismic Category I auxiliary building.

As described in UFSAR subsection 1.2.7, the radwaste building is a steel framed structure that includes facilities for segregated storage of various categories of waste prior to processing, for processing by mobile systems, and for storing processed waste in shipping and disposal containers. Liquid radwaste processing areas are designed to contain any liquid spills. As identified in UFSAR subsection 12.3.2.2.5, shielding is provided as necessary for the waste storage areas in the radwaste building to meet the radiation zone and access requirements. No safety-related equipment is located in the radwaste building.

As described in UFSAR subsection 1.2.8, the turbine building houses the main turbine generator and the power conversion cycle equipment and auxiliaries. There is no safety-related equipment in the turbine building. The turbine building consists of two separate superstructures,

the first bay and the main area, both supported on a common reinforced concrete basemat. The turbine building first bay, adjacent to the auxiliary building, is a seismic Category II structure that consists of a combination of reinforced concrete walls and steel framing with reinforced concrete and steel grated floors. It is classified as a seismic Category II structure due to its immediate proximity to the auxiliary building. Thus, the turbine building first bay performs the important-to-safety function of maintaining its integrity following a seismic event to preclude adverse interaction with the seismic Category I auxiliary building.

The turbine building first bay provides the additional important-to-safety function of providing protection of auxiliary building Wall 11 openings from tornado missiles and turbine building first bay Wall 11.2 provides the additional important-to-safety function of providing protection of auxiliary building Wall 11 from the dynamic effects of pipe failure events in the non-seismic portion of the turbine building. The main area of the turbine building, immediately to the north of the first bay, is a steel framed building with reinforced concrete and steel grated floors. It is classified as a non-seismic structure. The non-seismic portion of the turbine building is designed with a mix of concentrically and eccentrically braced framing (EBF).

This activity does not change the requirement to comply with applicable concrete and structural codes for these structures as defined in the licensing basis. That is, the proposed changes do not alter the requirement that seismic Category I and II structures comply with applicable design codes, including ACI 349-01 and ANSI/AISC N690-94 including the supplemental requirements described in UFSAR subsection 3.8.4.4.1, "Seismic Category I Structures," UFSAR subsection 3.8.4.5, "Structural Criteria," and the guidance contained in NRC Regulatory Guides 1.69, 1.115, 1.142, and 1.143 as discussed in UFSAR Appendix 1A, "Conformance with Regulatory Guides." Likewise, the proposed changes would not alter the existing design requirements for the non-seismic radwaste building as described in UFSAR subsection 3.7.2.8.2, or the non-seismic portion of the turbine building, as described in UFSAR subsection 3.7.2.8.3.

Several structural ITAAC in Tier 1 Table 3.3-6 already contain provisions to allow reconciliation of deviations that occur during construction from a design loads standpoint. Specifically, ITAAC 3.3.00.02a.i.a through 3.3.00.02a.i.d allow for the reconciliation of deviations encountered during construction of the containment internal structures, the shield building, and the non-radiological and radiological portions of the auxiliary building to confirm that the structures conform to the approved design, and are capable of withstanding design basis loads. The design functions of these seismic Category I structures include providing separation and support for equipment, separation for protection against postulated internal design basis events (such as the effects of pipe ruptures, internal flooding, and fires), and as applicable, protection against postulated external events (such as seismic events, external flooding, tornadoes and tornado-generated missiles). As the capability of these structures to withstand these postulated events, and support their design functions, is contingent upon the capability of the structures to withstand the design loads associated with these events, the allowance for reconciliation of design loads in ITAAC 3.3.00.02a.i.a through 3.3.00.02a.i.d tacitly already allow for reconciliation of deviations that could adversely impact the capability of these structures to perform the bulk of their design functions. The only other design functions (applicable to most, but not all of these structures) that is not reconciled adequately via reconciliation of their design loads, are their shielding and fire barrier functions. Since the effectiveness of a structure to provide a shielding or fire barrier function is, in part, a function of its material and thickness, and the building structure ITAAC do not currently allow for reconciliation of the wall, floor, and roof

thicknesses, the shielding and fire barrier design functions are the only building structure design functions that cannot be fully reconciled in their respective ITAAC closure reports. Resolution of deviations from the building structure dimensions require a change to the ITAAC acceptance criteria.

The proposed solution involves allowing deviations in wall thickness, provided they are structurally reconciled, and do not result in an adverse change to a radiation zone. This provides assurance the overall building section is consistent with the Table 3.3-1 description.

It should be noted that deviations of building structural sections from the approved design identified during construction are documented and evaluated in accordance with the site nonconformance and disposition process. This corrective action program, in conjunction with required structural fabrication and placement inspections, provides assurance that nonconforming conditions are identified and evaluated as each structural section is being fabricated or set so the reconciliations required by ITAAC 3.3.00.02a.i.a through 3.3.00.02a.i.d are a confirmation of technical evaluations previously performed and final as-built configuration.

This proposed change involves no changes to the design of the facility. The proposed changes do not affect any of the design functions of the auxiliary, containment or shield buildings described in the UFSAR. The proposed change only requests a revision to the methods for dispositioning and reconciling concrete wall, roof and floor construction deviations.

The proposed changes do not affect the radiological source terms (i.e., amounts and types of radioactive materials released, their release rates and release durations) used in the accident analyses. The equipment involved in these proposed changes does not affect safety-related equipment or a fission product barrier. No system or design function or equipment qualification is adversely affected by the proposed changes. The changes do not result in a new failure mode, malfunction or sequence of events that could adversely affect a radioactive material barrier or safety-related equipment. The proposed changes do 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.

The structures, systems and components (SSCs) affected by this license amendment request are not used to contain, control, channel, monitor, process or release radioactive and non-radioactive materials. The types and quantities of expected effluents are not changed, and no effluent release path is adversely affected by the proposed changes. Therefore, the proposed changes do not affect radioactive or non-radioactive material effluents.

Plant radiation zones (as described in UFSAR Section 12.3), controls under 10 CFR 20, and expected amounts and types of radioactive materials are not affected by the proposed changes. Therefore, individual and cumulative radiation exposures do not change.

Summary

A change is proposed to revise COL Appendix C (and plant-specific DCD Tier 1) Table 3.3-6 to include a statement in ITAAC requiring a report concluding the walls, roofs and floors of the identified structures conform to the specified thicknesses, to allow deviations from wall, roofs and floor thicknesses to be reconciled within the ITAAC reconciliation reports listed in Table 1 above.

The proposed changes do not adversely affect any safety-related equipment or function, design function, radioactive material barrier, or safety analysis.

4. REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 52.98(f) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL. The proposed changes involve a revision to COL Appendix C (and plant-specific DCD Tier 1) Inspections, Tests, Analyses and Acceptance Criteria (ITAAC). Therefore, NRC approval is required prior to making the plant-specific proposed revisions in this license amendment request.

10 CFR 50, Appendix A, General Design Criterion (GDC) 1, *Quality standards and records*, requires 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. By continuing to follow the guidelines of the NRC Regulatory Guides and industry standards, the requirements of GDC 1 have been maintained.

10 CFR 50, Appendix A, GDC 2, *Design bases for protection against natural phenomena*, requires that structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their safety functions. Because there is no change to the expected responses to natural phenomena, there are no changes to the conformance with GDC 2.

10 CFR 50, Appendix A, GDC 4, *Environmental and dynamic effects design bases*, requires 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. The proposed changes do not alter the environmental conditions associated with normal operation, and because the same design criteria are used before and after the change, the containment internal structures continue to be able to withstand similar conditions.

4.2 Precedent

The Economic Simplified Boiling-Water Reactor (ESBWR) Certified Design (see Design Control Document, Revision 10 (April 2014), Tier 1, Table 2.16.5-2, Design Commitment 3), contains the following:

**Table 2.16.5-2
ITAAC For The Reactor Building**

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
3. The critical dimensions used for seismic analyses and the acceptable tolerances are provided in Table 2.16.5-1.	Inspection of the RB will be performed. Deviations from the design conditions will be analyzed using the design basis loads.	Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 2.16.5-1 will demonstrate that the as-built RB will withstand the design basis loads specified in the Design Description of this Subsection 2.16.5 without loss of structural integrity or the safety-related functions.

Accordingly, the NRC has previously approved, in the ESBWR design certification, provisions to allow reconciliation of deviations in critical structural dimensions in their ITAAC closure report, and is thus a precedent relevant to this license amendment request. The proposed activity adds similar provisions to the affected ITAAC in COL Appendix C, Table 3.3-6 to enable reconciliation of deviations from the specified building structure wall, floor and roof thicknesses. This precedent is applicable to the AP1000 plants because the AP1000 and ESBWR Certified Designs ITAAC (Tier 1) requirements are intended to accomplish the same objective of demonstrating these structures remain in compliance with applicable codes and supplemental requirements contained within the licensing basis, and be demonstrated acceptable to perform their design functions. Similar to the AP1000 Table 3.3-1 wall and floor thickness requirement tables, the ESBWR Tier 1 Table 2.16.5-1 identifies critical dimensions of walls and floors of the ESBWR reactor building (i.e., similar to those listed in COL Appendix C, Table 3.3-1). The ESBWR ITAAC noted above allows deviations in building dimensions and tolerances to be part of reconciliation rather than having to pursue a LAR for each occasion in which is a deviation outside the specified tolerances. This proposed change brings the AP1000 ITAAC into alignment with the ESBWR ITAAC for reconciliation of structural integrity.

4.3 Significant Hazards Consideration

The LAR proposes changes to Combined License (COL) Appendix C (and plant-specific DCD Tier 1) Table 3.3-6 to allow reconciliation of as-built deviations from the wall, floor and roof thickness dimensions and tolerances specified in Tier 1 Table 3.3-1.

The requested amendment requires revisions to COL Appendix C (and plant-specific DCD Tier 1) information.

An evaluation to determine whether a significant hazards consideration is involved with the requested amendment was completed by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

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

Response: No

The proposed changes maintain compliance with applicable design codes, including ACI 349-01 and ANSI/AISC N690-94. This activity does not change requirements related to compliance to applicable concrete and structural codes for these structures. The walls, roofs and floors are still able to withstand the design basis loads without a loss of structural integrity or their safety-related or important to safety functions.

The proposed revisions do not affect the support, design, or operation of mechanical and fluid systems required to mitigate the consequences of an accident. 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 do the proposed revisions 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.

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

Response: No

This activity does not change any requirements related to compliance to applicable concrete and structural codes for these structures. That is, the proposed changes maintain compliance with applicable design codes, including ACI 349-01 and ANSI/AISC N690-94. This activity does not affect the operation of any systems or equipment that may initiate a new or different kind of accident, or alter any SSC such that a new accident initiator or initiating sequence of events is created. The proposed change to include structural reconciliation in the reports already required by Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) to reconcile deviations of as-built wall, roof and floor thicknesses still allows the structures to maintain their ability to withstand design-basis loads and provide radiation shielding or fire barrier functions as needed.

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

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

Response: No

The proposed change to include structural reconciliation in the reports already required by ITAAC to reconcile applicable deviations of as-built wall and floor thicknesses still allows the structures to maintain their ability to withstand design-basis loads and provide radiation shielding and fire protection function as needed. This activity does not alter safety-related equipment, applicable design codes, code compliance, design function or safety analysis. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the proposed revisions, and no margin of safety is reduced.

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

Based on the above, it is concluded that the requested amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of “no significant hazards consideration” is justified.

4.4 Conclusions

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) 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.

5. ENVIRONMENTAL CONSIDERATIONS

The requested amendment revises the evaluation and reconciliation timing for concrete walls and floor deviations to specifically allow deviations in wall and floor thicknesses (including tolerance) to be reconciled in the reports already required by ITAAC 3.3.00.02a.i.a through 3.3.00.02a.i.d as described in the Combined License (COL) Appendix C [and plant-specific Design Control Document (DCD) Tier 1] information.

Facility construction and operation following implementation of the requested amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the requested amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), in that:

- (i) *There is no significant hazards consideration.*

As documented in Section 4.3, Significant Hazards Consideration, of this license amendment request, an evaluation was completed to determine whether or not a significant hazards consideration is involved by focusing on the three standards set forth

in 10 CFR 50.92, "Issuance of amendment." The Significant Hazards Consideration determined that (1) the requested amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) the requested amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) the requested amendment does not involve a significant reduction in a margin of safety. Therefore, it is concluded that the requested amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

- (ii) *There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.*

The proposed revisions are unrelated to any aspect of plant construction or operation that would introduce any change to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents), or affect any plant radiological or non-radiological effluent release quantities. Furthermore, the proposed revisions do not affect any effluent release path or diminish the design functions or operational features that are credited with controlling the release of effluents during plant operation. Therefore, it is concluded that the requested amendment does not involve a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite.

- (iii) *There is no significant increase in individual or cumulative occupational radiation exposure.*

The proposed revisions do not adversely affect walls, floors, or other structures that provide shielding. Plant radiation zones are not affected, and there are no changes to the controls required under 10 CFR Part 20 that preclude a significant increase in occupational radiation exposure. Therefore, the requested amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above review of the requested amendment, it has been determined that anticipated construction and operational impacts of the requested amendment do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the requested amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the requested amendment and proposed exemption.

6. REFERENCES

None

South Carolina Electric and Gas Company
Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3

NND-17-XXXX

Enclosure 2

Exemption Request:

**Reconciliation of Nuclear Island As-Built
Concrete Sections and Key Dimensions
(LAR 17-XX)**

(This Enclosure consists of 8 pages, including this cover page)

NND-17-XXXX

Enclosure 2

Exemption Request: Reconciliation of Nuclear Island As-Built Concrete Sections and Key Dimensions (LAR 17-XX)

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1.0 PURPOSE

South Carolina Electric and Gas Company (SCE&G), the Licensee, requests a permanent exemption from the provisions of 10 CFR 52, Appendix D, Section III.B, *Design Certification Rule for the AP1000 Design, Scope and Contents*, to allow a plant-specific departure from elements of the certification information in Tier 1 of the plant-specific AP1000 Design Control Document (DCD). The regulation, 10 CFR 52, Appendix D, Section III.B, requires an applicant or licensee referencing Appendix D to 10 CFR Part 52 to incorporate by reference and comply with the requirements of Appendix D, including certified information in the DCD Tier 1. The Tier 1 information for which a plant-specific departure and exemption is being requested is related to select items in Table 3.3-6 that address conformance with structural dimensions to allow reconciliation of deviations of as-built wall, roof, and floor thicknesses.

This request for exemption will apply the requirements of 10 CFR 52, Appendix D, Section VIII.A.4 to allow departures from Tier 1 information due to the following proposed changes to the system-based design descriptions in Table 3.3-6:

Structure	Plant-Specific Tier 1 Table 3.3-6 Item
Containment internal structures	2.a)ii.a
Shield building	2.a)ii.b
Non-radiologically controlled area of the auxiliary building	2.a)ii.c
Radiologically controlled area of the auxiliary building	2.a)ii.d
Annex building	2.a)ii.e
Turbine building	2.a)ii.f
Containment internal structures shield walls and floors	3.a)
Shield building shield walls	3.b)
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Radiologically controlled area of the auxiliary building shield walls and floors	3.d)
Annex building shield walls and floors	4.a)
Radwaste building waste accumulation room shield walls	4.b)

This request will provide for the application of the requirements for granting exemptions from design certification information, as specified in 10 CFR Part 52, Appendix D, Section VIII.A.4, 10 CFR 52.63, §52.7, and §50.12.

2.0 BACKGROUND

SCE&G is the holder of Combined License Nos. NPF-93 and NPF-94, which authorizes construction and operation of two Westinghouse Electric Company AP1000 nuclear plants, named Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3, respectively.

To improve the efficiency of addressing potential future discrepant conditions, plant-specific DCD Tier 1 Table 3.3-6 is modified to specifically allow deviations in wall, roof, and floor thicknesses, including tolerances to be reconciled in the Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) listed in the table above.

An exemption from elements of the AP1000 certified (Tier 1) design information to allow a departure from the design description is requested.

3.0 TECHNICAL JUSTIFICATION OF ACCEPTABILITY

The proposed activity revises the ITAAC contained in the plant-specific DCD Tier 1 identified in Table 1 above to allow reconciliation of deviations of as-built wall, floor, and roof thicknesses. The ITAAC noted require floor, wall, and roof structures for the containment internal structures, the shield building, the auxiliary building, the turbine building, the annex building and the radwaste building to be a specified thickness.

In the course of early structural construction, minor deviations in wall or floor thicknesses, or alignment have occurred which do not adversely impact the nuclear island's ability to withstand design-basis loads, to provide radiation shielding and/or to fulfill its fire barrier function, as applicable. However, to maintain compliance with ITAAC contained in Tier 1 Table 3.3-6 which requires the specified wall, floor and roof thicknesses contained in Tier 1 Table 3.3-1 to be met, the conditions have required either new License Amendments and/or Exemption Requests to modify the ITAAC requirements, costly and time-consuming repairs, or both.

Licensee implementation of ITAAC requires the entire building section (except for designed opening and penetrations) to be within the stated construction tolerance, without exception (i.e., this is not an average thickness). NRC inspection has been consistent with this approach.

To improve the efficiency of addressing potential future discrepant conditions, plant-specific DCD Tier 1 Table 3.3-6 is modified to specifically allow deviations in wall, roof and floor thicknesses (including tolerances) to be reconciled in the ITAAC listed in the table above.

4.0 JUSTIFICATION FOR PROPOSED EXEMPTION

10 CFR Part 52, Appendix D, Section VIII.A.4 and 10 CFR 52.63(b)(1) govern the issuance of exemptions from elements of the certified design information for AP1000 nuclear power plants. Since SCE&G has identified changes to the Tier 1 information as discussed in Enclosure 1 of the accompanying License Amendment Request, an exemption from the certified design information in Tier 1 is needed.

10 CFR Part 52, Appendix D, and 10 CFR 50.12, §52.7, and §52.63 state that the NRC may grant exemptions from the requirements of the regulations provided six conditions are met:

1) the exemption is authorized by law [§50.12(a)(1)]; 2) the exemption will not present an undue risk to the health and safety of the public [§50.12(a)(1)]; 3) the exemption is consistent with the common defense and security [§50.12(a)(1)]; 4) special circumstances are present [§50.12(a)(2)]; 5) the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption [§52.63(b)(1)]; and 6) the design change will not result in a significant decrease in the level of safety [Part 52, App. D, VIII.A.4].

The requested exemption to improve the efficiency of addressing potential future discrepant conditions satisfies the criteria for granting specific exemptions, as described below.

1. This exemption is authorized by law

The NRC has authority under 10 CFR 52.63, §52.7, and §50.12 to grant exemptions from the requirements of NRC regulations. Specifically, 10 CFR 50.12 and §52.7 state that the NRC may grant exemptions from the requirements of 10 CFR Part 52 upon a proper showing. No law exists that would preclude the changes covered by this exemption request. Additionally, granting of the proposed exemption does not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations.

Accordingly, this requested exemption is "authorized by law," as required by 10 CFR 50.12(a)(1).

2. This exemption will not present an undue risk to the health and safety of the public

The proposed exemption from the requirements of 10 CFR Part 52, Appendix D, Section III.B would allow changes to elements of the Tier 1 DCD to depart from the AP1000 certified (Tier 1) design information. The plant-specific Tier 1 will continue to reflect the approved licensing basis for VCSNS Units 2 and 3, and will maintain a consistent level of detail with that which is currently provided elsewhere in Tier 1 of the DCD. Therefore, the affected plant-specific Tier 1 ITAAC will continue to serve its required purpose, while allowing more efficient and comprehensive evaluation and reconciliation of deviations when constructing walls and floors.

The proposed changes will not impact the ability of the components to perform their design functions. 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, and the change described does not create any new accident precursors. Therefore, no adverse safety impact that would present any additional risk to the health and safety is present. The affected Design Description in the plant-specific Tier 1 DCD will also continue to provide the detail necessary to support the performance of the associated ITAAC.

Therefore, the requested exemption from 10 CFR 52, Appendix D, Section III.B would not present an undue risk to the health and safety of the public.

3. The exemption is consistent with the common defense and security

The proposed exemption from requirements of 10 CFR Part 52, Appendix D, Section III.B would allow changes to elements of the plant-specific DCD Tier 1 information to depart from the AP1000 certified design. The exemption does not alter the design, function, or operation of any structures or plant equipment that is necessary to maintain a safe and secure status of the plant. The proposed exemption has no impact on plant security or safeguards procedures.

Therefore, the requested exemption is consistent with the common defense and security.

4. Special circumstances are present

10 CFR 50.12(a)(2) lists six “special circumstances” for which an exemption may be granted. Pursuant to the regulation, it is necessary for one of these special circumstances to be present in order for the NRC to consider granting an exemption request. 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 rule under consideration in this request for exemption is 10 CFR Part 52, Appendix D, Section III.B, which requires that a licensee referencing the AP1000 Design Certification Rule (10 CFR Part 52, Appendix D) shall incorporate by reference and comply with the requirements of Appendix D, including Tier 1 information. The VCSNS Units 2 and 3 COLs reference the AP1000 Design Certification Rule and incorporate by reference the requirements of 10 CFR Part 52, Appendix D, including Tier 1 information. The underlying purpose of Appendix D, Section III.B is to describe and define the scope and contents of the AP1000 design certification, and to require compliance with the design certification information in Appendix D.

This activity does not change the requirement to comply with applicable concrete and structural codes for these structures as defined in the licensing basis. That is, the proposed changes do not alter the requirement that seismic Category I and II structures comply with applicable design codes.

The proposed changes do not impact the ability of any structures, systems, or components to perform their functions or negatively impact safety. Accordingly, this exemption from the certification information will enable the Licensee to more efficiently construct and safely operate the AP1000 facility consistent with the intent of the scope and contents of the design certified by the NRC in 10 CFR Part 52, Appendix D.

Therefore, special circumstances are present, because application of the current plant-specific certified design information in Tier 1 as required by 10 CFR Part 52, Appendix D, Section III.B in the particular circumstances discussed in this request is not necessary to achieve the underlying purpose of the rule.

5. The special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.

Based on the nature of the changes to the plant-specific Tier 1 information in the proposed areas and the understanding that these changes are related to the acceptance criteria and not system functions, these changes will not have a negative impact on safety. If other AP1000 licensees do not elect to request this exemption, the special circumstances continue to outweigh any decrease in safety from the reduction in standardization because the key design functions associated with this request will continue to be maintained. The proposed change involves no changes to the design of the facility. The proposed changes do not affect any of the design functions of the auxiliary, containment or shield buildings described in the UFSAR. The proposed change only requests a revision to the methods for dispositioning and reconciling concrete wall, roof and floor construction deviations. This exemption request and the associated marked-up table demonstrate that there is a minimal change from the generic AP1000 DCD, minimizing the reduction in standardization and negating any possible safety impact from the reduction.

The structures, systems and components (SSCs) affected by this license amendment and exemption request are not used to contain, control, channel, monitor, process or release radioactive and non-radioactive materials. The types and quantities of expected effluents are not changed, and no effluent release path is adversely affected by the proposed changes. Therefore, the proposed changes do not affect radioactive or non-radioactive material effluents.

Therefore, the special circumstances associated with the requested exemption outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.

6. The design change will not result in a significant decrease in the level of safety.

The requested exemption does not adversely impact the level of safety because the changes associated with this exemption request will not adversely affect the ability of any systems or equipment to perform their design functions, there are no new failure modes introduced by these changes and the level of safety provided by the current systems and equipment is maintained. It is concluded that the change associated with this proposed exemption will not result in a significant decrease in the level of safety.

5.0 RISK ASSESSMENT

A risk assessment was not determined to be applicable to address the acceptability of this proposal.

6.0 PRECEDENT EXEMPTIONS

None identified.

7.0 ENVIRONMENTAL CONSIDERATION

A review of the requested amendment has determined that anticipated construction and operational effects of the proposed amendment do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the requested amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment of the proposed amendment and exemption is not required.

8.0 CONCLUSION

The proposed changes to Tier 1 information are necessary and the exemption request was confirmed to meet the requirements of 10 CFR 52.63, "*Finality of Design Certifications*," 10 CFR 50.12, "*Specific Exemptions*," and 10 CFR 52 Appendix D, "*Design Certification Rule for the AP1000*." Specifically, the exemption request meets the criteria of 10 CFR 50.12(a)(1) in that the request is authorized by law, presents no undue risk to public health and safety, and is consistent with the common defense and security. Furthermore, approval of this request does not result in a significant decrease in the level of safety, presents special circumstances, does not present a significant decrease in safety as a result of a reduction in standardization, and meets the eligibility requirements for categorical exclusion.

9.0 REFERENCES

None

South Carolina Electric and Gas Company
Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3

NND-17-XXXX

Enclosure 3

Proposed Changes to Licensing Basis Documents
(LAR 17-XX)

Note: Added text is Blue Underline

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(This Enclosure consists of 7 pages, including this cover page)

Tier 1 (and COL Appendix C) Table 3.3-6, Inspections, Tests, Analyses, and Acceptance Criteria

Table 3.3-6 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
<p>2.a) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.</p>	<p>i)</p>	<p>i.a) i.b) i.c) i.d)</p>
	<p>ii) An inspection of the as-built concrete thickness will be performed. <u>Deviations from the design conditions will be analyzed using the design basis loads.</u></p>	<p>ii.a) A report exists that concludes that the containment internal structures as built concrete thicknesses conform to the building sections defined in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built containment internal structures withstand the design basis loads as specified in the Design Description, without loss of structural integrity or the safety-related functions.</u></p> <p>ii.b) A report exists that concludes that the as built concrete thicknesses of the shield building sections conform to the building sections defined in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built shield building sections withstand the design basis loads as specified in the Design Description, without loss of structural integrity or the safety-related functions.</u></p>

Tier 1 (and COL Appendix C) Table 3.3-6 (cont.)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
		<p>ii.c) A report exists that concludes that as-built concrete thicknesses of the non-radiologically controlled area of the auxiliary building sections conform to the building sections defined in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built nonradiologically controlled area of the auxiliary building sections withstand the design basis loads as specified in the Design Description, without loss of structural integrity or the safety-related functions.</u></p> <p>ii.d) A report exists that concludes that the as-built concrete thicknesses of the radiologically controlled area of the auxiliary building sections conform to the building sections defined in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built radiologically controlled area of the auxiliary building sections withstand the design basis loads as specified in the Design Description, without loss of structural integrity or the safety-related functions.</u></p>

Tier 1 (and COL Appendix C) Table 3.3-6 (cont.)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
		<p>ii.e) A report exists that concludes that the as-built concrete thicknesses of the annex building sections conform with the building sections defined in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built annex building sections withstand the design basis loads as specified in the Design Description, without loss of structural integrity or the safety-related functions.</u></p> <p>ii.f) A report exists that concludes that the as-built concrete thicknesses of the turbine building sections conform to the building sections defined in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built turbine building sections withstand the design basis loads as specified in the Design Description, without loss of structural integrity or the safety-related functions.</u></p>

Tier 1 (and COL Appendix C) Table 3.3-6 (cont.)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
<p>3. Walls and floors of the nuclear island structures as defined on Table 3.3-1 except for designed openings or penetrations provide shielding during normal operations.</p>	<p>Inspection of the as-built nuclear island structures wall and floor thicknesses will be performed. <u>Deviations from the design conditions will be analyzed to ensure adequate shielding during normal operations.</u></p>	<p>a) A report exists and concludes that the shield walls and floors of the containment internal structures as defined in Table 3.3-1, except for designed openings or penetrations, are consistent with the concrete wall thicknesses provided in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built containment internal structures, except for designed openings or penetrations, provide adequate shielding during normal operations (i.e., no change to the radiation zone classification noted in UFSAR subsection 12.3.1.2).</u></p> <p>b) A report exists and concludes that the shield walls of the shield building structures as defined in Table 3.3-1 except for designed openings or penetrations are consistent with the concrete wall thicknesses provided in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built shield walls of the shield building structures, except for designed openings or penetrations, provide adequate shielding during normal operations (i.e., no change to the radiation zone classification noted in UFSAR subsection 12.3.1.2).</u></p>

Tier 1 (and COL Appendix C) Table 3.3-6 (cont.)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
		<p>c) A report exists and concludes that the shield walls and floors of the non-radiologically controlled area of the auxiliary building as defined in Table 3.3-1 except for designed openings or penetrations are consistent with the concrete wall thicknesses provided in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built shield walls and floors of the non-radiologically controlled area of the auxiliary building, except for designed openings or penetrations, provide adequate shielding during normal operations (i.e., no change to the radiation zone classification noted in UFSAR subsection 12.3.1.2).</u></p> <p>d) A report exists and concludes that the shield walls and floors of the radiologically controlled area of the auxiliary building as defined in Table 3.3-1 except for designed openings or penetrations are consistent with the concrete wall thicknesses provided in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built shield walls and floors of the radiologically controlled area of the auxiliary building, except for designed openings or penetrations, provide adequate shielding during normal operations (i.e., no change to the radiation zone classification noted in UFSAR subsection 12.3.1.2).</u></p>

Tier 1 (and COL Appendix C) Table 3.3-6 (cont.)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
<p>4.a) Walls and floors of the annex building as defined on Table 3.3-1 except for designed openings or penetrations provide shielding during normal operations.</p>	<p>Inspection of the as-built annex building wall and floor thicknesses will be performed. <u>Deviations from the design conditions will be analyzed to ensure adequate shielding during normal operations.</u></p>	<p>A report exists and concludes that the shield walls and floors of the annex building as defined on Table 3.3-1 except for designed openings or penetrations are consistent with the minimum concrete wall thicknesses provided in Table 3.3-1. <u>Reconciliation of construction deviations from the critical dimensions and tolerances specified in Table 3.3-1 will demonstrate the as-built shield walls and floors of the annex building, except for designed openings or penetrations, provide adequate shielding during normal operations (i.e., no change to the radiation zone classification noted in UFSAR subsection 12.3.1.2).</u></p>
<p>4.b) Walls of the waste accumulation room in the radwaste building except for designed openings or penetrations provide shielding during normal operations.</p>	<p>Inspection of the as-built radwaste building wall thicknesses will be performed. <u>Deviations from the design conditions will be analyzed to ensure adequate shielding during normal operations.</u></p>	<p>A report exists and concludes that the shield walls of the waste accumulation room in the radwaste building except for designed openings or penetrations are consistent with the minimum concrete wall thickness of 1'-4", and a minimum concrete wall thickness of 1'-8" near the radwaste bunkers. <u>Reconciliation of construction deviations from the minimum wall thickness of 1'-4", and a minimum wall thickness of 1'-8" near the radwaste bunkers, will demonstrate the as-built shield walls of the waste accumulation room in the radwaste building, except for designed openings or penetrations, provide adequate shielding during normal operations (i.e., no change to the radiation zone classification noted in UFSAR subsection 12.3.1.2).</u></p>