February ##, 2013
NND-13-####
10 CFR 50.90
10 CFR 52.63

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

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

Subject: LAR 13-03 Request for License Amendment and Exemption: Turbine Building Eccentric and Concentric Bracing

In accordance with the provisions of 10 CFR 50.90, South Carolina Electric & Gas (SCE&G) requests an amendment to the Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 combined licenses (COLs) (License Nos. NPF-93 and NPF-94, respectively). The proposed amendment would allow the use of eccentric and concentric bracing in the main area of the Turbine Building. Because this detail impacts Tier 1 of the Plant-Specific DCD and Appendix C of the COL, this activity has been determined to require prior NRC approval. Also, because the change requires a departure from Tier 1 information, an exemption is requested from the requirements of the Generic DCD Tier 1 in accordance with 52.63(b)(1).

The Description, Technical Evaluation, Regulatory Evaluation (including Significant Hazards Consideration), and Environmental Considerations for the proposed changes in the License Amendment Request (LAR) are contained in Enclosure 1 to this letter. Further justification for the associated exemption request is provided in Enclosure 2 to this letter. The proposed markups depicting the requested changes to Tier 1, COL Appendix C, and the UFSAR are contained in Enclosure 3 to this letter. This letter contains no regulatory commitments.

In order to support the VCSNS Unit 2 construction schedule, SCE&G requests NRC staff review and approval of the license amendment by April 15, 2013. Approval by this date will allow sufficient time to implement the licensing basis changes prior to installation of the Turbine Building bracing. This license amendment will be implemented by SCE&G within 30 days of approval.

In accordance with 10 CFR 50.91, SCE&G is notifying the State of South Carolina of this LAR by transmitting a copy of this letter and enclosures to the designated State Official.

Should you have any questions, please contact Mr. Alfred M. Paglia by telephone at (803) 941-9876, or by email at apaglia@scana.com.

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

Executed on this ___ day of _____, 2013.

Sincerely,

Ronald Jones
Vice President
New Nuclear Operations

JIG/RBC/jig

Enclosure 1: V.C. Summer Nuclear Station Units 2 and 3 – Request for License Amendment: Turbine Building Bracing

Enclosure 2: V.C. Summer Nuclear Station Units 2 and 3 – Exemption Request: Turbine Building Bracing

Enclosure 3: V.C. Summer Nuclear Station Units 2 and 3 – Licensing Basis Proposed Changes

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South Carolina Electric & Gas

NND-13-####

LAR 13-03

Enclosure 1

V.C. Summer Nuclear Station Units 2 and 3

License Amendment Request:

Turbine Building Bracing

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Pursuant to 10 CFR 50.90, South Carolina Electric & Gas (SCE&G) hereby requests an amendment to Combined License Nos. NPF-93 and NPF-94 for V.C. Summer Nuclear Station (VCSNS) Units 2 and 3, respectively.

1. Summary Description

The proposed changes would revise the COL to use concentrically and eccentrically braced frames in the turbine building main area. A mixed bracing system using eccentrically and concentrically braced frames is utilized as a means of preventing the turbine building from collapsing onto the Nuclear Island (NI) during a seismic event. The structural design code is also changed to a code that includes adequate provisions for the new bracing system. The departure from Tier 2 information involves a departure from Tier 1 Section 3.3.

The proposed changes require a change to Updated Final Safety Analysis Report (UFSAR) information (see Section 2 for details), which also require a change to the Tier 1 and COL Appendix C, Tier 2*, or Technical Specification (COL Appendix A) information (see Section 2 for details). This enclosure requests approval of the license amendment necessary to implement this change.

2. Detailed Description

UFSAR Section 3.7.2.8.3 describes the main area of the turbine building as an “eccentrically braced steel frame structure.” A commitment during the design of the AP600 was made at the request of the NRC to design the turbine building with eccentrically braced frames as a way to ensure that the turbine building would not collapse onto the Nuclear Island (NI). This commitment to use Eccentrically Braced Frames (EBF) was made to address concerns over the adequacy of the 1991 Uniform Building Code (UBC) provisions for concentrically braced frames. The AP1000 Final Safety Evaluation Report (FSER) (NUREG-1793, 2004) states that EBF were one measure to help “prevent the turbine building from jeopardizing the safety function of the NI structures during a safe shutdown earthquake (SSE) event.”

Since that time, the first bay was redesigned to seismic Category II. This change to the first bay ensures that the turbine building will not collapse on the NI. This change was communicated to the NRC via Request for Additional Information (RAI) RAI-SRP3.7.1-SEB1-15 and is included in DCD Rev 19.

Geometric restrictions preclude the exclusive use of EBF in the turbine building main area. The American Institute for Steel Construction (AISC) requirement for out-of-plane lateral support for EBF cannot be achieved in all areas of the turbine building.

A combination of Special Concentrically Braced Frames (SCBF) and EBF is proposed below the operating deck in the East–West direction instead of exclusively using EBF due to geometric restrictions between the condensers preventing the use of AISC required out-of-plane lateral supports for EBF. EBF would continue to be exclusively used under the operating deck in the critical North-South direction. SCBF would be used above the main area operating deck due to the inability to provide out-of-plane lateral support at the higher elevations. Using a combination of EBF and SCBF under the turbine generator operating deck in the East-West direction will not impact the protection provided by the EBF used exclusively under the operating deck in the critical North-South direction.

A proposed design code change to the 2006 edition of the International Building Code (IBC-06), with the supporting codes of AISC 341-05, AISC 360-05 (tornado loading) and American Society of Civil Engineers (ASCE) Standard 7-05 (earthquake considerations) will be used collectively to develop a consistent, compatible design for a mixed EBF and SCBF system.

ASCE 7-05 specifies a response modification factor (R Factor) of 6.0 for mixed bracing systems; thus, the R Factor for the turbine building will be modified accordingly.

The proposed Tier 1 Departure and COL Appendix C Amendment:

- Section 3.3 – adds explanation that the non-seismic portion of the turbine building is designed with a combination of concentrically and eccentrically braced framing.

The proposed COL Appendix C Amendment:

- Section 1.4 – deletes “EBF” from list of acronyms.

The proposed Tier 2 Departure:

- UFSAR Table 1.1-1 (Sheet 2 of 4) - adds “International Building Code”
- UFSAR Subsection 1.2.1.6.1 - adds IBC as the design code for turbine building main area structure
- UFSAR Subsection 3.2.2.6 – adds text differentiating between which Non-Seismic buildings will be designed to UBC and which will be designed to IBC
- UFSAR Subsection 3.2.6 - adds IBC to applicable references.
- UFSAR Subsection 3.3.2.3 - modifies the tornado loading code from AISC S355 to AISC 360
- UFSAR Subsection 3.3.4 - adds ASCE 7-05 and AISC 360 as the references
- UFSAR Subsection 3.7.2 – adds clarification that the IBC seismic loads applied to the turbine building main area are equivalent to UBC Zone 3.
- UFSAR Subsection 3.7.2.8.3 - revises earthquake factors, modified response modification factor and added references.
- UFSAR Subsection 3.7.6 - adds IBC-06, along with affiliated codes AISC 341-05, ASCE 7-05 and AISC 360 to the references.
- UFSAR Subsection 19.55.3.3 – adds text differentiating between which NS buildings will be designed to UBC and which will be designed to IBC
- UFSAR Subsection 19.58.2.1 – adds clarification that NS buildings will be desiged to UBC or IBC

3. Technical Evaluation

System Description

As discussed in Tier 1 and COL Appendix C, Section 3.3, the turbine building main area is a non-safety related structure that 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 structure is adjacent to the Nuclear Island (NI) structures consisting of the auxiliary building, shield building, and containment internal structures. The turbine building is located on a separate foundation. The turbine building consists of two separate superstructures, the first bay and the main area, both supported on a common reinforced concrete basemat. The first bay, immediately adjacent to the auxiliary building, consists of a combination of reinforced concrete walls and steel framing with reinforced concrete and steel grated floors.

As discussed in UFSAR Subection 3.7.3.13.2, non-seismic walls, platforms, stairs, ladders, grating, handrail installations, or other structures next to safety-related Structures, Systems, and Components (SSCs) are evaluated to determine if their failure is credible. If a non-seismic SSC is capable of being dislodged from its supports, the trajectory of its fall is evaluated for potential adverse impacts. As discussed in UFSAR Subsection 19.55.2.2.6, to protect the adjacent NI auxiliary building, the first bay of the turbine building has been classified as seismic Category II.

Turbine Building Seismic Interaction - As discussed in UFSAR Subection 3.7.2.8.3, the first bay of the turbine building is analyzed for the safe SSE and is designed in accordance with ACI-349 (concrete features) and AISC-N690 (steel features). It protects the adjacent NI auxiliary building from the turbine building main area during a seismic event. The turbine building is designed in accordance with ACI-318 for concrete structures and with AISC for steel structures. As discussed in UFSAR Subsection 19.55.2.2.6, the turbine building and auxiliary building are designed such that, upon the unlikely event of a catastrophic equipment failure in the turbine building results in airborne debris, debris that penetrates the auxiliary building roof structure and results in a steam line break would not increase core damage frequency and would not affect any passive safety systems used for safe shutdown. The Seismic Margin Analysis (SMA) assumes the turbine building fails, as discussed in UFSAR Subsection 19.55.3.1.

Supporting Technical Details

The turbine building first bay is seismic Category II. The turbine building main area is a nonsafety-related, non-seismic structure. Geometric restrictions preclude the exclusive use of EBF in the turbine building main area. The AISC requirement for out-of-plane lateral support for EBF could not be achieved in all areas of the turbine building because of these limitations.

The bracing design used in the turbine building main area under the operating deck in the East-West direction will be changed to a combination of SCBF and EBF instead of exclusively being EBF. SCBF is used instead of EBF due to geometric restrictions at the column lines between the condensers that prevent the use of out-of-plane lateral supports required for EBF per AISC. The EBF is exclusively maintained in the North-South direction, which is the direction of a postulated turbine building collapse that could result in a collapse on the NI structures (based on the orientation of the Turbine Building with respect to the NI). SCBF are used above the turbine building main area operating deck where the mass from the turbine and operating deck are not a concern, and where the required out-of-plane lateral supports for EBF cannot be achieved due to the single open space at higher elevations.

Because UBC-97 and related reference codes and standards do not provide guidance for the analysis and design of mixed frame systems, the design code is changed to IBC-06, with the supporting codes of AISC 341-05, AISC 360-05 (tornado loading) and ASCE 7-05 (earthquake considerations); together, these codes are used to develop a consistent, compatible design for a mixed EBF and SCBF system.

ASCE 7-05 specifies an R Factor of 6.0 for mixed bracing systems. The R factor accounts for the ductility of the building and modifies the seismic lateral design loads accordingly; the smaller the R factor the greater the lateral design load. The R factor for the turbine building will be modified to this value, which is conservative compared to the current UFSAR value of 7.0. Because a mixed bracing system is required per IBC to use the lower R factor between concentric and eccentric bracing, the resulting analysis is equal to or more conservative than the current UFSAR design. Note that R factor was previously referred to as the “Resistance Modification Factor,” but is proposed to be changed in accordance with terminology in ASCE 7-05. This is only a terminology change and has no impact on the structural design or analysis. The turbine building would be subject to Tier 1 and COL Appendix C Table 3.3-6 items 1, 12 and 13.

Using a combination of EBF and SCBF and changing the structural design code for the turbine building main area does not constitute a change to procedures or method of control and does not change a test or experiment. The proposed changes do not constitute a change to a method of evaluation or use of an alternate method of evaluation from that described in the UFSAR that is used in establishing design bases or in the safety analyses. The turbine building main area is designed in accordance with IBC 2006 and its associated reference standards. The seismic analysis is performed with loads in accordance with IBC requirements for an earthquake magnitude equivalent to UBC zone 3. IBC-06 is a widely accepted design code for non-safety, non-seismic designs similar to UBC-97, and takes into account lessons learned with respect to earthquake experience and mixed bracing systems.

Because the plant-specific DCD and UFSAR text is revised to refer to a “mix of concentrically and eccentrically braced framing” rather than “eccentrically braced framing” alone, the abbreviation EBF that was used for eccentrically braced framing is no longer used in the plant-specific Tier 1 material or the UFSAR. Accordingly, it is proposed that the abbreviation “EBF” and the defined term “eccentrically braced framing” be deleted from plant-specific Tier 1 Section 1.4, List of Acronyms and Abbreviations. This is an editorial change only, and has no impact on the technical information presented in the UFSAR or plant-specific Tier 1 document.

Based on the discussions above, the proposed changes do not adversely affect the design function of any SSC described in the UFSAR.

Summary

The proposed changes would revise the Combined License to use concentrically and eccentrically braced frames in the turbine building main area. The proposed changes involve departures from Tier 2, Tier 1, and COL Appendix C.

These improvements do not adversely affect any design function. The proposed changes do not involve an adverse change to the method of evaluation for establishing design bases or safety analyses. They do not represent a change to a design feature credited in the ex-vessel severe accident assessment. Tests, experiments, and procedures described in the licensing basis are unchanged by this activity.

4. Regulatory Evaluation

4.1 Applicable Regulatory Requirements/Criteria

10 CFR 52, Appendix D, VIII.B.5.a requires prior NRC approval for Tier 1 changes. The proposed change affects Tier 1 Section 3.3, and thus, NRC approval is required.

10 CFR 50, Appendix A, General Design Criterion (GDC) 1, Quality standards and records, requires structures, systems, and components important to safety to be designed, fabricated, erected, and tested to quality standards commensurate with the importance of safety functions to be performed. Because, using special concentric bracing in the turbine building and changing the turbine building main area structural design codes does not modify the quality standards, the changes do not affect compliance with GDC 1.

10 CFR 50, Appendix A, General Design Criterion (GDC) 2, Design bases for protection against natural phenomena, requires structures, systems, and components important to safety to 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. Because there is no safety-related equipment, which would require protection from natural phenomena, in the Turbine Building, the 10 CFR 50 General Design Criteria, including GDC 2, are generally not applicable to the Turbine Building design. The Turbine Building is classified as non-seismic, except for the first bay which is classified as seismic Category I. The first bay is designed to seismic Category I structure tornado loading, as discussed in UFSAR Section 3.3.2.3. The seismic Category II first bay is designed and physically arranged such that the safe shutdown earthquake could not cause unacceptable structural interaction with or failure of the adjacent seismic Category I Nuclear Island structures. Because the new design code still requires the same evaluations for natural phenomena as the previous code (as required for the new bracing design), the changes do not affect compliance with GDC 2.

4.2 Precedent

No precedent is identified.

4.3 Significant Hazards Consideration

The proposed changes would revise the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License to use concentrically and eccentrically braced frames in the turbine building main area and modify the applicable design code. The proposed changes involve departures from Tier 2, Tier 1, and COL Appendix C.

An evaluation to determine whether or not a significant hazards consideration is involved with the proposed 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 turbine building bracing design is changed to a mixed bracing system which uses special concentric and eccentric bracing. The turbine building does not contain safety-related systems or components. The response of the safety related systems, structures and components in the Nuclear Island to earthquakes and postulated accidents are not affected by the bracing design of the turbine building. The main area of the turbine building continues to meet its design function of preventing the turbine building from a potential collapse on the first bay. The first bay of the turbine building is designed to prevent the collapse of the main area of the Turbine Building onto the Nuclear Island during a seismic event. The proposed changes do not affect or impact this design capability. Based on the above, there is no change in the probability of an accident previously evaluated. The activity does not introduce a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that result in significant fuel cladding failures. Accordingly, there is no change in the consequences of an accident previously evaluated.

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

The turbine building bracing design is changed to a mixed bracing system which uses SCBF and EBF. The main area of the turbine building continues to meet its design function of preventing the turbine building from a potential collapse on the first bay. The design function of the turbine building first bay to provide the intended limitations to a potential collapse onto the nuclear island during a seismic event is retained. The turbine building structure does not involve any accident initiating component, and therefore changes to use SCBF and EBF would not introduce new accident components or faults.

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 turbine building bracing design is changed to a mixed bracing system which uses SCBF and EBF. The main area of the turbine building continues to meet its design function of preventing the turbine building from a potential collapse on the first bay. The seismic analysis is performed with loads in accordance with IBC requirements for an earthquake magnitude equivalent to UBC zone 3. IBC-06 is a widely accepted design code for non-safety, non-seismic designs similar to UBC-97, and takes into account lessons learned with respect to earthquake experience and mixed bracing systems.

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

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. The above evaluations demonstrate that the requested changes can be accommodated without an increase in the probability or consequences of an accident previously evaluated, without creating the possibility of a new or different kind of accident from any accident previously evaluated, and without a significant reduction in a margin of safety. Having arrived at negative declarations with regard to the criteria of 10 CFR 50.92, this assessment determined that the requested change does not involve a Significant Hazards Consideration.

5. Environmental Considerations

The details of the proposed changes are provided in Sections 2 and 3 of this licensing amendment request

This review supports a request to amend the Combined Licenses (COLs) NPF-93 and NPF-94 for VCSNS Units 2 and 3 to allow departures from various elements of the certification information in Tier 1 of the generic AP1000 DCD and an amendment to the corresponding elements in Appendix C of the VCSNS Units 2 and 3 COLs. The proposed changes to Tier 1, Tier 2, and COL Appendix C material makes changes related to the turbine building main area bracing design and turbine building main area design codes and requirements.

This review has determined that the proposed departure would require an amendment from the VCSNS Units 2 and 3 COLs; however, a review of the anticipated construction and operational impacts of the proposed amendment has determined that it 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 proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) the proposed amendment does not involve a significant reduction in a margin of safety. Therefore, it is concluded that the proposed 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 amendment changes the turbine building main area bracing to use eccentrically braced frames and special concentrically braced frames and change to associated design codes. The changes to the turbine building main area bracing affects features of the building structure that are unrelated to any aspects of plant construction or operation that would introduce any changes 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, these changes do not diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation. Therefore, it is concluded that the proposed 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 changes to the structure of the turbine building main area only affects areas of the plant that contain non-radioactive plant systems. Consequently, these changes have no impact on individual or cumulative occupational radiation exposure during plant operation. Therefore, it is concluded that the proposed amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above review of the proposed amendment, it has been determined that anticipated construction and operational impacts of the proposed amendment does 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 proposed 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 is not required.

6. References

None

South Carolina Electric & Gas

NND-13-####

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Enclosure 2

V.C. Summer Nuclear Station Units 2 and 3

Exemption Request:

Turbine Building Bracing

1. Purpose

SCE&G 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 departure from elements of the certification information in Tier 1 of the Generic 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 certification information in DCD Tier 1. The Tier 1 information for which a plant-specific departure and exemption is being requested includes a change which specifies the turbine building bracing as a mix of eccentric and concentric bracing.

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

- Section 3.3
  - Added explanation that the non-seismic portion of the turbine building is designed with a combination of concentrically and eccentrically braced framing.

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. 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 V.C. Summer Nuclear Station (VCSNS) Units 2 and 3, respectively.

UFSAR Section 3.7.2.8.3 describes the main area of the turbine building as an "eccentrically braced steel frame structure." A commitment during the design of the AP600 was made at the request of the NRC to design the turbine building with eccentrically braced frames as a way to ensure that the turbine building would not collapse onto the Nuclear Island (NI). This commitment to use Eccentrically Braced Frames (EBF) was made to address concerns over the adequacy of the 1991 Uniform Building Code (UBC) provisions for concentrically braced frames. The AP1000 FSER (NUREG-1793, 2004) states that EBF were one measure to help "prevent the turbine building from jeopardizing the safety function of the NI structures during an SSE event."

Since that time, the first bay was redesigned to Seismic Category-II. This change to the first bay ensures that the turbine building will not collapse on the NI. This change was communicated to the NRC via Request For Information (RAI) RAI-SRP3.7.1-SEB1-15 and is included in DCD Revision 19.

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

3. Technical Justification of Acceptability

As discussed in Tier 1, Section 3.3, the turbine building main area is a non-safety related structure that 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 structure is adjacent to the Nuclear Island (NI) structures consisting of the auxiliary building, shield building, and containment internal structure. No turbine building function is impacted by this exemption, and the turbine building main area continues to be designed to prevent a collapse of the turbine building on the first bay.

Detailed technical justification for this exemption is provided in the associated License Amendment Request.

4. Justification of 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. Because SCE&G has identified changes to the Tier 1 information 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.1].

The requested exemption satisfies the criteria for granting specific exemptions, as described below.

4.1 This exemption is authorized by law

The NRC has authority under 10 CFR §50.12, §52.7, and 52.63 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).

4.2 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 52, Appendix D, Section III.B would allow changes to elements of the plant-specific Tier 1 DCD to depart from the AP1000 certified (Tier 1) design information. The plant-specific Tier 1 DCD 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 plant-specific DCD. Because the change to the turbine building main area bracing maintains its design functions, the new design will continue to protect the health and safety of the public. Therefore, no adverse safety impact which would present any additional risk to the health and safety is present. The affected ITAAC in the plant-specific Tier 1 DCD will also continue to provide the detail necessary to support their performance.

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.

4.3 This exemption is consistent with the common defense and security

The exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would change elements of the plant-specific Tier 1 DCD by departing from the AP1000 certified (Tier 1) design information. The exemption does not alter the design, function, or operation of any 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.

4.4 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 "[a]pplication 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 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 Unit 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.

The proposed change to alter the bracing of the turbine building facilitates construction and safe operation by maintaining the design functions of the Turbine Building. This change does not impact the ability of any SSCs to perform their functions or negatively impact safety. Accordingly, this exemption from the certification information will enable the licensee to safely construct and operate the AP1000 facility consistent with the design certified by the NRC in 10 CFR 52, Appendix D. Therefore, special circumstances are present, because application of the current generic 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.

4.5 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 and the understanding that these changes support the construction on the turbine building, it is likely that this exemption will be requested by other AP1000 licensees. However, if this is not the case, the special circumstances continue to outweigh any decrease in safety from the reduction in standardization because the key design functions of Turbine Building associated with this request will continue to be maintained. This exemption request and the associated marked-up tables and figure demonstrate that there is a minimal change from the generic AP1000 DCD, minimizing the reduction in standardization and consequently the safety impact from the reduction. 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.

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

The exemption revises the plant-specific DCD Tier 1 information by altering the description of the bracing used in the non-seismic portion of the turbine building. The bracing continues to ensure that the turbine building functions are still met. Because these functions continue to be met, there is no reduction in the level of safety.

Therefore, the design change will not result in a significant decrease in the level of safety.

5. Environmental Consideration

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed exemption 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. Specific justification is provided in Section 5 of the corresponding amendment request. Accordingly, the proposed exemption meets the eligibility criterion 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 proposed exemption.

6. Conclusion

The proposed changes to Tier 1 are necessary to revise the turbine building design description in plant-specific DCD Tier 1. The exemption request meets the requirements of 10 CFR 52.63, 10 CFR 52.7, 10 CFR 50.12, 10 CFR 51.22, and 10 CFR 52 Appendix D. 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.

7. References

1) Westinghouse Electric Company, “AP1000 Design Control Document,” Revision 19, June 2011.

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Enclosure 3

V.C. Summer Nuclear Station Units 2 and 3

License Amendment Request:

Licensing Basis Proposed Changes

(Note that the sheet numbers and the total number of sheets for the marked-up Tables provided in this Enclosure may be changed by the incorporation of this and other departures. These changes are considered editorial and do not require evaluation in this submittal.)

COL Appendix C, Section 1.4

[VCSNS Unit 2 COL, Appendix C, pg. C-40]

[VCSNS Unit 3 COL, Appendix C, pg. C-40]

Delete “EBF” from the list of acronyms as shown:

***	***
EAL	Emergency Action Level
~~EBF~~	~~Eccentrically Braced Framing~~
ECS	Main ac Power System
***	***

Tier 1 Section 3.3

(This change is also incorporated into VCSNS Unit 2 and Unit 3 COLs, Appendix C)

[VCSNS Tier 1, pg. 3.3-1]

[VCSNS Unit 2 COL, Appendix C, pg. C-407]

[VCSNS Unit 3 COL, Appendix C, pg. C-407]

Revise the fourth paragraph as follows:

The turbine building is a non-safety related structure that 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 is located on a separate foundation. The turbine building structure is adjacent to the nuclear island structures consisting of the auxiliary building to the south and the annex building to the south and east. The turbine building consists of two separate superstructures, the first bay and the main area, both supported on a common reinforced concrete basemat. The first bay, next to the auxiliary building, 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. 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)~~.

UFSAR Table 1.1-1

"AP1000 Acronyms"

Table 1.1-1 (Sheet 3 of 8)

AP1000 Acronyms

***	***
IBC	International Building Code
* * *	***

UFSAR Section 1.2.1.6.1

"Plant Arrangement"

Revise the fifth bullet, as follows:

- The main area of the turbine building structure is designed to ~~Uniform~~International Building Code requirements. The first bay of the turbine building is designed to Category II requirements. The turbine building is supported on a single basemat foundation.

UFSAR Section 3.2.2.6

"Equipment Class D"

Revise the eighth paragraph, as follows:

The NS buildings (except for the NS portions of the turbine building outlined in Table 3.2-2) containing Class D structures, systems, and components, as well as the anchorage of the structures, systems, and components to the building, are designed to the seismic requirements of the Uniform Building Code (Reference 15). The NS portions of the turbine building are designed to the requirements of the International Building Code, IBC-06 (Reference 19). The systems and components are not designed for seismic loads. However, when Class D structures, systems, and components are located near a Class A, B, or C structure, system, or component, the requirements for seismic Category II may apply.

UFSAR Section 3.2.6

"References"

Revise section to add one reference, as follows:

19. International Building Code, 2006.

UFSAR Section 3.3.2.3

"Effect of Failure of Structures or Components Not Designed for Tornado Loads"

Revise the fifth paragraph, as follows:

The main area of the turbine building is classified as nonseismic and is designed to seismic Category I structure tornado loading. The acceptance criteria for tornado loading are based on ACI 318 for concrete structures using a load factor of 1.0 and on 1.7 times the AISC ~~S355~~360 allowables for steel structures. Siding is permitted to blow off during the tornado.

UFSAR Section 3.3.4

"References"

Revise section to add two references, as follows:

8. American Society of Civil Engineers, "Minimum Design Loads for Buildings and Other Structures," ASCE 7-05.

9. AISC 360, "Specification for Structural Steel Buildings," March 9, 2005.

UFSAR Section 3.7.2

"Seismic System Analysis"

Revise the third paragraph, as follows:

Seismic Category I building structures are on the nuclear island. Other building structures are classified nonseismic or seismic Category II. Nonseismic structures are analyzed and designed for seismic loads according to the Uniform Building Code (Reference 2) requirements for Zone 2A. The main area of the turbine building structure is analyzed and designed for seismic loads in accordance with International Building Code requirements for an earthquake magnitude equivalent to the Uniform Building Code, Zone 3. Seismic Category II building structures are designed for the safe shutdown earthquake using the same methods and design allowables as are used for seismic Category I structures. The acceptance criteria are based on ACI 349 for concrete structures and on AISC N690 for steel structures including the supplemental requirements described in Subsections 3.8.4.4.1 and 3.8.4.5. The seismic Category II building structures are constructed to the same requirements as the nonseismic building structures, ACI 318 for concrete structures and AISC-S355 for steel structures.

UFSAR Section 3.7.2.8.3

"Turbine Building"

Revise the fourth paragraph, as follows:

For the non-seismic portion of the Turbine Building, seismic design is upgraded ~~from Zone 2A, Importance Factor of 1.25, to Zone 3 with an Importance Factor of 1.0~~ in order to provide margin against collapse during the safe shutdown earthquake. The turbine building is a~~n eccentrically~~ braced steel frame structure designed to meet the following criteria:

Revise the first bullet, as follows:

The turbine building is designed in accordance with the 2006 International Building Code (Reference 40). This references ACI-318 for concrete structures and ~~with~~ AISC for steel structures. Seismic loads are defined in accordance with the International Building Code with the maximum considered earthquake spectral parameters S_{DS} = 0.9, S_{D1} = 0.54 for Site Class D. This is consistent with the 1997 Uniform Building Code provisions for Zone 3 with an Importance Factor of 1.0. For a~~n eccentrically~~ braced structure that has a mix of eccentric and special concentric bracing, the response~~resistance~~ modification factor is ~~7~~6 (ASCE 7-05, ~~UBC 97, r~~Reference ~~1~~42) using strength design. ~~When using allowable stress design, the allowable stresses are not increased by one third for seismic loads and the resistance modification factor is increased to 10 (UBC 91).~~

Revise the second bullet, as follows:

The design ~~of the lateral bracing system~~ complies with the seismic requirements for eccentrically braced frames and special concentrically braced frames given in ~~Section 9.3 of~~ the 2005 AISC Seismic Provisions for Structural Steel Buildings (Reference ~~34~~41). Quality assurance is in accordance with ASCE 7-~~98~~05 (Reference ~~35~~42) ~~for the lateral bracing system~~.

UFSAR Section 3.7.6

"References"

Revise section to add four references, as follows:

40. International Building Code, 2006.

41. AISC 341-05, "Seismic Provisions for Structural Steel Buildings," March 9, 2005, including Supplement No. 1 dated November 16, 2005.

42. ASCE 7-05, "Minimum Design Loads for Buildings and Other Structures."

43. AISC 360, "Specification for Structural Steel Buildings," March 9, 2005.

UFSAR Section 19.55.3.3

"Seismic Event Trees"

Revise EQ-STRUC, Group 2, as follows:

The first bay (the portion of the turbine building adjacent to the nuclear island outlined in Table 3.2-2 and including the portion of the basemat under this area) of the turbine building is classified as Seismic Category II, and the ~~remaining bays are~~ main area of the turbine building structure is designed to meet the ~~uniform~~ International ~~b~~Building ~~c~~Code ~~(UBC)~~. For the SMA model, it is assumed to have failed. Thus no credit is taken for systems in this building.

UFSAR Section 19.58.2.1

"Severe Winds and Tornadoes"

Revise Paragraph 10, as follows:

The structures protecting nonsafety-related features of the AP1000 are designed according to ~~u~~Uniform ~~b~~Building ~~c~~Code or International Building Code and have some level of protection against seismic and high wind events. As long as the external event winds are less than the operating basis winds (145 mph, per Chapter 2), the nonsafety features of the AP1000 will be unaffected. If the winds exceed the operating basis values, then the integrity of the nonsafety relates structures may be compromised.

Revise Paragraph 16, as follows:

In Table 19.58-3, none of the initiating event frequencies were sufficiently low to be removed from further consideration. Therefore, the CDF calculation was performed. In each case, the resultant CDF is less than 1.0E-08 events/yr. The Category 4 and Category 5 hurricane frequency is considered to be extremely conservative at 1.00E-02 events/yr. An event with the conservative initiating event frequency, and the worst case sensitivity study (Case 3), the resultant CDF is still less than the CDF criterion of 1.0E-08 events/yr. Case 2 is considered to be the representative model for high winds, with Case 1 and Case 3 being treated as sensitivity studies on the baseline. Case 3 is conservative in that it assumes total failure of the standby non-safety systems (CVS, RNS, SFW, automatic DAS, and diesel generators) for all high wind events. As AP1000 non-safety structures have been designed to ~~a~~ building codes that offer~~s~~ an added level of protection, the above failures are considered extreme and conservative. Therefore, while the total Case 3 CDF does fall above the 1.0E-08 events/yr CDF screening criteria, the results are considered very conservative for the above reasons. Therefore, no further detailed PRA is necessary for the AP1000 high winds and tornados analysis.