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May 4, 2017

NND-17-0231  
10 CFR 50.90  
10 CFR 52.63

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

Subject: VCSNS Units 2 & 3 LAR 17-11: Request for License Amendment and  
Exemption: Revision of ITAAC 2.6.03.04i, Class 1E Motor-Operated Valve  
Terminal Voltage Testing

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, South Carolina Electric & Gas Company (SCE&G), acting on behalf of itself and The South Carolina Public Service Authority (Santee Cooper), the Licensees for 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. The requested amendment includes changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the incorporated plant-specific Design Control Document Tier 2 information and involves related changes to COL Appendix C (and corresponding plant-specific Tier 1) information. Pursuant to the provisions of 10 CFR 52.63(b)(1), an exemption from elements of the design as certified in the 10 CFR Part 52, Appendix D, Design Certification Rule, is also requested for the plant-specific Tier 1 material departures.

This License Amendment Request proposes to revise COL Appendix C, Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Table 2.6.3-3, ITAAC 2.6.03.04i. The revision proposes to change the Inspections, Tests, and Analyses (ITA) and Acceptance Criteria (AC) related to this design commitment to prescribe voltage tests in conjunction with an analysis, rather than voltage testing only. This ITAAC is intended to ensure that IDS functionality supports the actuation of Class 1E motor-operated valves and its revision is necessary to support successful ITAAC closure by the Licensee.

The proposed COL Appendix C (and corresponding plant-specific Tier 1) changes require additional changes to corresponding UFSAR Tier 2 information in Subsection 8.3.2.5.9.

Enclosure 1 of this letter provides the description, technical evaluation, regulatory evaluation (including the Significant Hazards Consideration Determination), and environmental considerations for the proposed changes in this License Amendment Request (LAR).

Enclosure 2 provides the exemption request including background and supporting information.

Enclosure 3 provides markups depicting the requested changes to current licensing basis documents.

SCE&G requests staff review and approval of this license amendment and exemption by March 3, 2018, to support the development of completion package for ITAAC 2.6.03.04i. Delayed approval of this request could result in a delay in the closure of the ITAAC. Southern Nuclear Operating Company has indicated that its request date is April 30, 2018.

SCE&G expects to implement the proposed amendment (through incorporation into the licensing basis documents; e.g., the UFSAR) within 30 days of the approval of the requested changes.

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 to the designated state official.

Should you have any questions about this letter, please contact Nick Kellenberger, Supervisor, Nuclear Licensing, by telephone at (803) 941-9834, or by email at [nicholas.r.kellenberger@scana.com](mailto:nicholas.r.kellenberger@scana.com).

This letter contains no regulatory commitments.

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

Executed on this 4<sup>th</sup> day of May, 2017.

Sincerely,



April R. Rice  
Manager, Nuclear Licensing  
New Nuclear Deployment

DK/ARR/dk

- Enclosure 1: Request for License Amendment: Revision of ITAAC 2.6.03.04i, Class 1E Motor Operated Valve Terminal Voltage Testing (LAR 17-11)
- Enclosure 2: Exemption Request: Revision of ITAAC 2.6.03.04i, Class 1E Motor-Operated Valves Terminal Voltage Testing (LAR 17-11)
- Enclosure 3: Proposed Changes to Licensing Basis Documents (LAR 17-11)

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

**NND-17-0231**

**Enclosure 1**

**Request for License Amendment:**

**Revision of ITAAC 2.6.03.04i,**

**Class 1E Motor-Operated Valve**

**Terminal Voltage Testing**

**(LAR 17-11)**

(Enclosure 1 consists of 13 pages, including this cover page)

NND-17-0231

Enclosure 1

LAR 17-11: Revision of ITAAC 2.6.03.04i, Class 1E Motor-Operated Valve Terminal Voltage Testing

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Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, South Carolina Electric & Gas Company, acting on behalf of itself and The South Carolina Public Service Authority (Santee Cooper), the Licensees for Virgil C. Summer Nuclear Station (VCSNS) Units 2 & 3, hereby requests an amendment to Combined License (COL) Nos. NPF-93 and NPF-94 for VCSNS Units 2 and 3, respectively. The proposed changes to COL Appendix C (and corresponding plant-specific Tier 1 information) affect Table 2.6.3-3. The proposed changes to COL Appendix C also require additional changes to UFSAR Tier 2 Subsection 8.3.2.5.9.

## 1. SUMMARY DESCRIPTION

The proposed changes would revise the Combined License (COL) in regard to the Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) involving the Class 1E dc and uninterruptible power supply system (IDS). These changes support verification of the acceptability of the voltage transfer across applicable IDS circuits supplying motor-operated valves (MOVs). The proposed changes would remove the requirement for the ITAAC to be completed by discharging and maintaining IDS batteries at 210 Vdc while repeatedly cycling MOVs to ensure that they operate properly. Instead, the revised ITAAC would accomplish this necessary verification by a combination of testing and analyses that will demonstrate that adequate voltage is provided to each of the Class 1E MOVs to support operation.

The requested amendment requires changes to the Updated Final Safety Analysis Report (UFSAR) in the form of departures from the plant-specific DCD Tier 2 information (as detailed in Section 2) and involves changes to COL Appendix C (and associated plant-specific Tier 1). This enclosure requests approval of the license amendment necessary to implement the COL Appendix C changes and the involved UFSAR changes. Another enclosure requests exemptions necessary to implement the involved changes to the plant-specific Tier 1 information.

## 2. DETAILED DESCRIPTION

As described in COL Appendix C Subsection 2.6.3, the Class 1E dc and uninterruptible power supply system (IDS) provides dc and uninterruptible ac electrical power for safety-related equipment during normal and off-normal conditions. The IDS provides the following safety-related design functions:

- a) The IDS provides electrical independence between the Class 1E divisions.
- b) The IDS provides electrical isolation between the non-Class 1E ac power system and the non-Class 1E lighting in the Main Control Room (MCR).
- c) Each IDS 24-hour battery bank supplies a dc switchboard bus load for a period of 24 hours without recharging.
- d) Each IDS 72-hour battery bank supplies a dc switchboard bus load for a period of 72 hours without recharging.
- e) The IDS spare battery bank supplies a dc load equal to or greater than the most severe switchboard bus load for the required period without recharging.
- f) Each IDS 24-hour inverter supplies its ac load.
- g) Each IDS 72-hour inverter supplies its ac load.
- h) Each IDS 24-hour battery charger provides the protection and safety monitoring system (PMS) with two loss-of-ac input voltage signals.

- i) The IDS supplies an operating voltage at the terminals of the Class 1E MOVs identified in Tier 1 Subsections 2.1.2, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.3.2, 2.3.6 and 2.7.1 that is greater than or equal to the minimum specified voltage.

During planning and preparation related to IDS Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) closure, it was identified that issues exist with COL Appendix C Table 2.6.3-3 related to Design Commitment 4.i). The IDS supports the safety-related operation of over 50 MOVs. IDS battery functionality is demonstrated by Design Commitments 4.c), 4.d), and 4.e) in COL Appendix C Table 2.6.3-3. Class 1E MOV functionality is demonstrated by the tests and acceptance criteria associated with design commitments that are discussed in COL Appendix C Subsections 2.1.2, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.3.2, 2.3.6 and 2.7.1. Therefore, the intent of COL Appendix C Table 2.6.3-3, item 4.i) is to demonstrate that with the battery voltage at no greater than 210 Vdc the IDS can supply a voltage to the Class 1E MOV terminals that is greater than or equal to the minimum specified voltage necessary for the valves to operate. This action ensures that the MOVs are able to perform their safety-related functions over the necessary 24-hour post-accident time frame for MOVs.

The current testing and acceptance criteria of COL Appendix C Table 2.6.3-3, item 4.i) requires that IDS batteries are reduced to and maintained at 210 Vdc while repeatedly cycling more than 50 MOVs to ensure that IDS provides sufficient voltage for MOV operation. This current ITAAC requirement places unnecessary stress on the batteries, is not sufficiently comprehensive, and does not facilitate ITAAC closure for the design commitment. Discharging and maintaining IDS batteries at 210 Vdc with repeated cycling to test more than 50 MOVs results in a decreased battery life for each of the batteries used to support ITAAC closure.

The existing acceptance criteria value of 200 Vdc is not consistent with the lower end of typical voltage ranges of MOVs. Valve vendor literature specifies a typical voltage range of 180-280 Vdc for MOVs used in Class 1E AP1000 applications assuming a nominal input voltage of 250 Vdc. Analyses have shown that minimum voltages less than 200 Vdc are acceptable for proper operation of the Class 1E MOVs. Therefore, limiting the minimum voltage to 200 Vdc is not needed to meet the design commitment.

In addition, the 200 Vdc minimum acceptance voltage measurement at the motor starter input terminal does not ensure proper valve operation. The voltage at the motor control center is indirectly related to the voltage at the MOV terminals. This relationship between the motor starter input terminal voltage and the MOV terminal voltage is not a constant value and, therefore, cannot be used in an acceptance criteria. Measurement of voltage directly at the MOV terminal provides an accurate measurement of the voltage available for use by each motor-operated valve. Therefore, the ITAAC acceptance criteria is changed to measure the voltage at the MOV terminal instead of the motor starter input terminal.

Furthermore, the existing ITAAC test requirement does not specify the conditions under which the testing will occur and, thus, does not accurately represent the conditions under which voltage would be transferred from the batteries to the valves during normal and post-accident plant conditions. Conditions such as elevated cable resistance for cables inside containment due to accident temperatures, elevated cable resistance for fire-wrapped trays in the auxiliary building, and design loading of the inverter and DC distribution panels cannot

be replicated during completion of this ITAAC. In order to address the need to include these design conditions and facilitate an improved methodology for ITAAC closure, it is proposed to use analysis in combination with testing to demonstrate that the design commitment is met. This analysis uses conservative factors to account for additional voltage loss across IDS circuits as a result of the design conditions that cannot be met during ITAAC closure. This methodology supports ITAAC closure by providing a conservative analysis that meets the intent of the ITAAC, which is to ensure that all Class 1E MOVs that are supported by the IDS are able to operate over their full 24-hour post-accident time frame.

This activity proposes to revise COL Appendix C Table 2.6.3-3, item 4.i) to remove the incongruous test requirements related to battery restriction and MOV operation which do not align with the purpose of the ITAAC and add increased difficulty to ITAAC completion.

The inspections, tests, and analyses portion of item 4.i) in Table 2.6.3-3 is proposed to be changed to:

1. Test the IDS by measuring the voltage at both the IDS battery and MOV motor terminals while each specified MOV is stroked.
2. Perform analysis to verify that the voltage at the MOV motor terminals is greater than or equal to the minimum design voltage of each MOV with an IDS battery terminal voltage of 210 Vdc.

The acceptance criterion of the ITAAC is proposed to be changed to verify that IDS can provide a voltage greater than each valve's minimum design voltage to the input terminals of MOVs during valve stroking during starting and when power is supplied under design conditions from IDS batteries with battery terminal voltage of 210 Vdc.

#### Licensing Basis Change Descriptions

The following changes to COL Appendix C (and corresponding plant-specific Tier 1) and UFSAR Tier 2 information are proposed:

##### COL Appendix C (and corresponding plant-specific Tier 1)

- Table 2.6.3-3, item 4.i) Inspections, Tests, and Analyses is changed to test the IDS by measuring the voltage at both the IDS battery and MOV motor terminals while each specified MOV is stroked.
- Table 2.6.3-3, item 4.i) Inspections, Tests, and Analyses is changed to additionally ensure that analysis has been performed to verify that the voltage at the MOV motor terminals is greater than or equal to the minimum design voltage of each MOV with an IDS battery terminal voltage of 210 Vdc.
- Table 2.6.3-3, item 4.i) Acceptance Criteria is changed to verify that a report exists and concludes that IDS can provide a voltage greater than each valve's minimum design voltage to the input terminals of specified MOVs during valve stroking when power is supplied under design conditions from IDS batteries with a battery terminal voltage of 210 Vdc.

UFSAR Subsection 8.3.2.5.9

- UFSAR Subsection 8.3.2.5.9 is changed to state that testing and analysis will be used to verify that a voltage is provided from the IDS batteries to the Class 1E MOV terminals that is greater than or equal to the minimum specified voltage necessary for the valves to operate. Class 1E MOVs are tested by measuring the voltage at both the IDS battery and MOV while each MOV is stroked during starting. The results are compared in a voltage analysis which verifies that the voltage at the MOV motor terminals is greater than or equal to the minimum design voltage of each MOV with an IDS battery terminal voltage of 210 Vdc.
- The title of UFSAR Subsection 8.3.2.5.9 is changed to clarify that the section is discussing voltage testing for Class 1E MOVs.

**3. TECHNICAL EVALUATION**

The design commitment of COL Appendix C Table 2.6.3-3, item 4.i) requires that the IDS batteries are able to supply voltage to the Class 1E MOV terminals that is greater than or equal to the minimum specified voltage necessary for the valves to operate. The IDS supports the safety-related operation of over 50 MOVs, which are described in Tier 1 Subsections 2.1.2, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.3.2, 2.3.6 and 2.7.1. IDS battery functionality is demonstrated by Design Commitments 4.c), 4.d), and 4.e) in COL Appendix C Table 2.6.3-3. Class 1E MOV functionality is supported by the design commitments that are described in Tier 1 Subsections 2.1.2, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.3.2, 2.3.6 and 2.7.1. Therefore, the intent of COL Appendix C Table 2.6.3-3, item 4.i) is to demonstrate that with the battery voltage at no greater than 210 Vdc, the IDS can supply a voltage to the Class 1E MOV terminals that is greater than or equal to the minimum specified voltage necessary for the valves to operate. This action ensures that the MOVs are able to perform their safety-related functions over the necessary 24-hour post-accident time frame for MOVs.

This current ITAAC requirement places unnecessary stress on the batteries, is not sufficiently comprehensive, and does not facilitate ITAAC closure for the design commitment. The current ITAAC requires the as-built IDS batteries to be used to complete the ITAAC. This means that the as-built IDS plant batteries would need to be discharged and maintained at 210 Vdc with repeated cycling to test more than 50 MOVs. This action would result in a decreased battery life for each of the batteries used to support ITAAC closure. Therefore, it is detrimental to the plant to perform the ITAAC as it is currently written.

Furthermore, the existing ITAAC test requirement does not specify the conditions under which the testing will occur and, thus, do not accurately represent the conditions under which voltage would be transferred during normal and post-accident plant conditions. Conditions such as elevated cable resistance for cables inside containment due to accident temperatures, elevated cable resistance for fire-wrapped trays in the auxiliary building, and design loading of the inverter and DC distribution panels cannot be replicated during completion of this ITAAC. In order to address the need to include these design conditions and facilitate an improved methodology for ITAAC closure, it is proposed to use analysis in combination with testing to demonstrate that the design commitment is met. This analysis will account for these design conditions.

The acceptance criterion of COL Appendix C Table 2.6.3-3, item 4.i) is changed to verify that that IDS can provide a voltage greater than each valve's minimum design voltage to the input terminals of specified MOVs valves during valve stroking when power is supplied under design conditions from IDS batteries with battery terminal voltage at 210 Vdc. The proposed ITAAC change verifies the acceptability of the measured voltage transfer across the as-built IDS system. This ITAAC methodology is preferential because it more completely verifies that the IDS design commitment is met, while simultaneously removing unnecessary stress on equipment during completion of the ITAAC. This new ITAAC continues to ensure that IDS provides voltage so that the Class 1E MOVs that are powered by IDS are able to perform their safety-related active functions over the necessary 24-hour post-accident time frame for MOVs.

The proposed change does not affect or require any change to the AP1000 probabilistic risk assessment (PRA) presented in UFSAR Chapter 19, including the Fire PRA, results and insights (e.g., core damage frequency and large release frequency). The proposed change does not result in any changes to the existing failures of the IDS included in the PRA model, and no new postulated failures of the IDS are required in the PRA model. Therefore, there are no changes required to initiating event frequencies and system logic models of the PRA. The existing PRA risk significance investment protection determination for the IDS is not affected.

The proposed change does not affect a structure, system or component (SSC), function or feature used to the prevention or mitigation of accidents or their safety / design analyses. The changes do not affect any SSC accident initiator or initiating sequence of events, or adversely affect any safety-related SSC or function used to mitigate an accident.

The proposed change does not involve a change to a fission product barrier. The changes cannot result in a new failure mode, malfunction or sequence of events that could affect safety. The changes would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in significant fuel cladding failures.

The proposed changes do not adversely affect any safety-related equipment, design code limit, safety-related function, safety-related design analysis, safety analysis input or result, or design or safety margin. No safety analysis or design basis acceptance limit or criterion would be challenged or exceeded.

There are no fire area changes required because of these proposed changes. The physical design and operation of the IDS, as described in the UFSAR, is not changed, and thus there are no changes required to the fire protection analysis described in UFSAR Appendix 9A.

There are no radiation zone changes or radiological access control changes required because of this proposed changes. The physical design and operation of the IDS, as described in the UFSAR, is not changed, and thus there are no changes required to the radiation protection design features described in UFSAR Section 12.3.

The proposed change does not affect the containment, control, channeling, monitoring, processing or releasing of radioactive and non-radioactive materials. The proposed change

does not adversely affect the containment and control of radioactive and non-radioactive materials inside containment, and does not adversely affect the containment boundary. The proposed change does not adversely affect the design functions of any SSC to prevent the unmonitored release of airborne radioactivity to the atmosphere or adjacent plant areas. Therefore, no effluent release path is affected by this change. In addition, the types and quantities of expected effluents are not changed by the proposed change. Therefore, radioactive or non-radioactive material effluents are not affected by this change.

### Summary

The proposed changes to COL Appendix C (and corresponding plant-specific Tier 1) and associated UFSAR design information will not adversely affect 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(c) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL, including any modification to, addition to, or deletion from the inspections, tests, analyses, or related acceptance criteria contained in the license. The proposed changes involve a departure from COL Appendix C Inspections, Test, Analyses and Acceptance Criteria (ITAAC) information and involved UFSAR changes. Therefore, this activity requires an amendment to the COL. Accordingly, NRC approval is required prior to making the plant specific changes in this license amendment request.

10 CFR 52, Appendix D, Section VII.B.5.a allows an applicant or licensee who references this appendix to depart from Tier 2 information, without prior NRC approval, unless the proposed departure involves a change to or departure from Tier 1 information, Tier 2\* information, or the Technical Specifications, or requires a license amendment under paragraphs B.5.b or B.5.c of the section. The proposed change involves a change to COL Appendix C (and plant-specific Tier 1) ITAAC information. Therefore, NRC approval is required prior to making the change to Tier 2 information.

10 CFR Part 50, Appendix A, General Design Criteria (GDC) 17 requires that an onsite electric power system and an offsite electric power system be provided to permit functioning of structures, systems, and components important to safety. The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure. The proposed changes to ITAAC used to verify the acceptability of the IDS voltage transfer across the as-built system does not affect the electrical independence and redundancy of the IDS. The proposed ITAAC change is a suitable alternative to the tests, analysis, and acceptance criteria of COL Appendix C, because it verifies the acceptability of the measured voltage transfer across the as-built IDS system. Therefore, the proposed changes comply with the requirements of GDC 17.

10 CFR Part 50, Appendix A, GDC 18 requires that electric power systems important to safety be designed to permit appropriate periodic inspection and testing of important areas and features. The systems shall be designed with a capability to test periodically (1) the operability and functional performance of the components of the systems, such as onsite power sources, relays, switches, and buses, and (2) the operability of the systems as a whole. The proposed change to ITAAC used to verify the acceptability of the IDS voltage transfer across the as-built system does not affect the ability to perform periodic inspection and testing of important areas and features related to IDS. Therefore, the proposed changes comply with the requirements of GDC 18.

Based on the above, 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.

#### **4.2 Precedent**

No precedent is identified.

#### **4.3 Significant Hazards Consideration Determination**

The proposed changes would revise the Combined License (COL) in regard to the test method and acceptance criteria related to demonstrating that Class 1E dc and uninterruptible power supply system (IDS) batteries can supply a voltage to the Class 1E motor-operated valves (MOVs) that is greater than or equal to the minimum specified voltage necessary for the valves to operate over the necessary 24-hour post-accident time frame for MOVs. The requested amendment proposes a change to Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a change to the COL Appendix C and corresponding plant-specific Tier 1 information.

The 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 proposed change revises COL Appendix C and UFSAR information concerning testing and acceptance criteria details of the IDS. The proposed change supports verification of the acceptability of the voltage transfer across applicable IDS circuits supplying MOVs. COL Appendix C is proposed to be revised to use a combination of testing and analyses which will demonstrate that adequate voltage is provided to each of the Class 1E MOVs to support operation. Testing is proposed to measure the voltages at the MOV terminals and the IDS battery terminals while each MOV is stroked. Analysis is proposed to verify that the voltage at the MOV terminals is greater than or equal to the minimum design

voltage of each MOV with an IDS battery terminal voltage of 210 Vdc. Also, COL Appendix C acceptance criteria is proposed to be changed to use a report to conclude that IDS can provide a voltage greater than each valve's minimum design voltage to the input terminals of specified motor-operated valves when power is supplied under design conditions from IDS batteries with battery terminal voltage at 210 Vdc while each specified motor-operated valve is stroked. UFSAR Subsection 8.3.2.5.9 is also changed to describe this COL Appendix C ITAAC methodology as discussed above.

This change does not adversely affect the design functions of the IDS, including the Class 1E battery banks and the MOVs that they support. The intent of COL Appendix C Table 2.6.3-3, item 4.i) is to verify that IDS can deliver adequate voltage to the input terminals of MOVs under design basis conditions. Therefore, the proposed changes meet the purpose of the ITAAC and do not change the design or functionality of any safety-related structure, system or component (SSC). The proposed change does not have an adverse effect on any of the design functions of any plant systems. The proposed change does not adversely affect plant electrical systems, and does 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 changes create any new accident precursors.

Therefore, the requested 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 proposed change revises COL Appendix C and UFSAR information concerning the testing and acceptance criteria of IDS functionality. The proposed change supports verification of the acceptability of the voltage transfer across applicable IDS circuits supplying MOVs. COL Appendix C is proposed to be revised to use a combination of testing and analyses which will demonstrate that adequate voltage is provided to each of the Class 1E MOVs to support operation. Testing is proposed to measure the voltages at the MOV terminals and the IDS battery terminals while each MOV is stroked. Analysis is proposed to verify that the voltage at the MOV terminals is greater than or equal to the minimum design voltage of each MOV with an IDS battery terminal voltage of 210 Vdc. Also, COL Appendix C acceptance criteria is proposed to be changed to use a report to conclude that IDS can provide a voltage greater than each valve's minimum design voltage to the input terminals of specified motor-operated valves when power is supplied under design conditions from IDS batteries with battery terminal voltage at 210 Vdc while each specified motor-

operated valve is stroked. UFSAR Subsection 8.3.2.5.9 is also changed to describe this COL Appendix C ITAAC methodology as discussed above.

The intent of COL Appendix C Table 2.6.3-3, item 4.i) is to verify that IDS can deliver adequate voltage to the input terminals of MOVs under design basis conditions. The proposed changes do not change the design or functionality of safety-related SSCs. The proposed change does not adversely affect plant electrical systems, and does not adversely affect the design function, support, design, or operation of mechanical and fluid systems. The proposed change does not result in a new failure mechanism or introduce any new accident precursors. No design function described in the UFSAR is adversely affected by the proposed changes.

Therefore, the requested 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 revises COL Appendix C and UFSAR information concerning the testing and acceptance criteria of IDS functionality. The proposed change supports verification of the acceptability of the voltage transfer across applicable IDS circuits supplying MOVs. COL Appendix C is proposed to be revised to use a combination of testing and analyses which will demonstrate that adequate voltage is provided to each of the Class 1E MOVs to support operation. Testing is proposed to measure the voltages at the MOV terminals and the IDS battery terminals while each MOV is stroked. Analysis is proposed to verify that the voltage at the MOV terminals is greater than or equal to the minimum design voltage of each MOV with an IDS battery terminal voltage of 210 Vdc. Also, COL Appendix C acceptance criteria is proposed to be changed to use a report to conclude that IDS can provide a voltage greater than each valve's minimum design voltage to the input terminals of specified motor-operated valves when power is supplied under design conditions from IDS batteries with battery terminal voltage at 210 Vdc while each specified motor-operated valve is stroked. UFSAR Subsection 8.3.2.5.9 is also changed to describe this COL Appendix C ITAAC methodology as discussed above.

The intent of COL Appendix C Table 2.6.3-3, item 4.i) is to verify that under design basis conditions IDS can deliver adequate voltage to the input terminals of MOVs. Therefore, the proposed changes meet the purpose of the ITAAC and do not reduce a margin of safety. No safety analysis or design basis acceptance limit/criterion is challenged or exceeded by the proposed changes, and no margin of safety is reduced.

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

Based on the above, 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.

#### 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

This review supports a request to amend the Combined License (COL) in regards to COL Appendix C information related to the Class 1E dc and uninterruptible power supply system (IDS) testing, analyses and acceptance criteria changes which will continue to verify the functionality of IDS related to the overall voltage transfer of the as-built circuit. This new testing and acceptance criteria replaces existing testing and acceptance criterion in COL Appendix C Table 2.6.3-3. The requested amendment also requires changes to Updated Final Safety Analysis Report (UFSAR) Tier 2 Subsection 8.3.2.5.9.

This review has determined that the proposed changes require an amendment to the COL. However, a review of the anticipated construction and operational effects of the requested amendment has determined that 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 Determination, 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 Determination 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 changes 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 changes do not

affect any effluent release path or 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 change in the requested amendment to IDS testing and acceptance criteria does not affect or alter any walls, floors, or other structures that provide shielding. Plant radiation zones and controls under 10 CFR 20 preclude a significant increase in occupational radiation exposure. Therefore, 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 effects 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), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment and proposed exemption.

## **6. REFERENCES**

None.

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

**NND-17-0231**

**Enclosure 2**

**Exemption Request:**

**Revision of ITAAC 2.6.03.04i,**

**Class 1E Motor-Operated Valve**

**Terminal Voltage Testing**

**(LAR 17-11)**

(Enclosure 2 consists of 9 pages, including this cover page)

## 1.0 PURPOSE

South Carolina Electric & Gas Company (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 departure from elements of the certification information in Tier 1 of the generic 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 DCD Tier 1. The Tier 1 information for which a plant-specific departure and exemption is being requested is Table 2.6.3-3, Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) for the Class 1E dc and uninterruptible power supply system (IDS). The Licensee proposes changes to this table, Design Commitment 4.i, Inspections, Tests, and Analyses (ITA) and Acceptance Criteria (AC) to replace unnecessarily restrictive IDS voltage testing requirements with a combination of testing and analysis to facilitate ITAAC closure.

This request for exemption provides the technical and regulatory basis to demonstrate that 10 CFR 52.63, §52.7, and §50.12 requirements are met and will apply the requirements of 10 CFR 52, Appendix D, Section VIII.A.4 to allow a departure from generic Tier 1 Table 2.6.3-3 information within the aforementioned ITAAC.

## 2.0 BACKGROUND

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

As described in COL Appendix C, Subsection 2.6.3, the IDS provides dc and uninterruptible ac electrical power for safety-related equipment during normal and off-normal conditions. The IDS also provides the safety-related design function of ensuring that 24-hour and 72-hour battery banks provide power to their applicable loads over those periods without recharging.

In addition to the safety-related design functions above, the IDS also provides the safety related design function of supplying an operating voltage that is greater than or equal to the minimum specified voltage at the terminals of the Class 1E MOVs identified in Tier 1 Subsections 2.1.2, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.3.2, 2.3.6 and 2.7.1.

DCD Tier 1 Table 2.6.3-3, ITAAC 4i, verifies that the IDS provides sufficient voltage to the Class 1E MOVs, identified in the above Tier 1 sections, to perform their design function. This ITAAC is not meant to verify the functionality of IDS batteries, since ITAAC 4c, 4d, and 4e, are appropriate to verify IDS battery functionality. In addition, it is not meant to verify valve functionality, since valve functionality is demonstrated by ITA and AC associated with design commitments that are discussed in Tier 1 Sections 2.1.2, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.3.2, 2.3.6 and 2.7.1. Therefore, the intent of ITAAC 4i is to demonstrate that, with the battery voltage at no greater than 210 Vdc, the IDS can supply a voltage to the Class 1E MOV terminals that is greater than or equal to the minimum specified voltage necessary for the valves to operate.

The current ITAAC 4i ITA and AC requirements for specified battery terminal and valve motor starter input terminal voltages do not facilitate ITAAC closure due to several factors discussed in the Technical Evaluation section of the accompanying License Amendment Request.

To address these challenges, the Licensee proposes to revise plant-specific DCD Tier 1 ITAAC 2.6.03.04i by changing the ITA from measuring only the IDS voltage at the motor starter input terminals during stroking, to measuring the voltage at the IDS battery and MOV input terminals while stroking each valve. In addition, the ITA is revised to prescribe, in conjunction with voltage testing, an analysis to verify that the voltage at the MOV motor terminals is greater than or equal to the minimum required voltage to operate the valves. This analysis will consider environmental conditions affecting voltage drop discussed in the Technical Evaluation of the accompanying License Amendment Request. The AC of ITAAC 2.6.03.04i is also revised to require a report, rather than a voltage measurement, concluding that the voltage provided by the IDS is greater than or equal to the minimum required MOV voltage.

Proposed Departures from Certified Tier 1 Information are as follows:

The Licensee proposes to revise plant-specific DCD Tier 1 ITAAC 2.6.03.04i ITA and AC voltage testing requirements to incorporate a combination of voltage testing and analysis to read as follows:

- ITA: Testing will be performed by measuring the voltage at both the IDS battery and motor-operated valve motor terminals while each specified motor-operated valve is stroked during motor starting. Analyses will be performed to verify that the voltage at the motor-operated valve motor terminals is greater than or equal to the minimum design voltage of each motor-operated valve with an IDS battery terminal voltage of 210 Vdc.
- AC: A report exists and concludes that IDS can provide a voltage greater than each valve's minimum design voltage to the input terminals of specified motor-operated valves when power is supplied under design conditions from IDS batteries with battery terminal voltage at 210 Vdc while each specified motor-operated valve is stroked.

### 3.0 TECHNICAL JUSTIFICATION OF ACCEPTABILITY

Tier 1 Table 2.6.3-3 contains ITAAC that reflect the AP1000 design commitments regarding the IDS. ITAAC 4i validates that the IDS supplies an operating voltage at the terminals of the Class 1E MOVs, as described above in Section 2.0, that is greater than or equal to the minimum specified voltage. The intent of ITAAC 4i is to demonstrate that, with the battery voltage at no greater than 210 Vdc, the IDS can supply a voltage to the Class 1E MOV terminals that is greater than or equal to the minimum specified voltage necessary for the valves to operate.

The current testing and acceptance criteria of ITAAC 4i requires that IDS batteries are reduced to and maintained at 210 Vdc while repeatedly cycling more than 50 MOVs to ensure that the IDS provides sufficient voltage for MOV operation. This current ITAAC requirement places unnecessary stress on the batteries, is not sufficiently comprehensive,

and does not facilitate ITAAC closure for the design commitment. Discharging and maintaining the IDS batteries at 210 Vdc with repeated cycling to test more than 50 MOVs results in a decreased battery life for each of the batteries used to support ITAAC closure.

The existing acceptance criteria value of 200 Vdc is not consistent with the lower end of typical voltage ranges of MOVs. Valve vendor literature specifies a typical voltage range of 180-280 Vdc for MOVs used in Class 1E AP1000 applications assuming a nominal input voltage of 250 Vdc. Analyses have shown that minimum voltages less than 200 Vdc are acceptable for proper operation of the Class 1E MOVs. Therefore, limiting the minimum voltage to 200 Vdc in the ITA is inordinately restrictive with respect to the ITAAC design commitment and hinders ITAAC closure.

In addition, the 200 Vdc minimum acceptance voltage measurement at the motor starter input terminal does not ensure proper valve operation. The voltage at the motor control center is indirectly related to the voltage at the MOV terminals. This relationship between the motor starter input terminal voltage and the MOV terminal voltage is not a constant value and, therefore, cannot be used in an acceptance criteria. Measurement of voltage directly at the MOV terminal provides an accurate measurement of the voltage available for use by each motor-operated valve.

Furthermore, the existing ITAAC test requirement does not specify the conditions under which the testing will occur and, thus, does not accurately represent the conditions under which battery voltage would be available to the valves during normal and post-accident plant conditions. Conditions such as elevated cable resistance for cables inside containment due to accident temperatures, elevated cable resistance for fire-wrapped trays in the Auxiliary Building, and design loading of the inverter and DC distribution panels cannot be replicated during completion of this ITAAC.

To facilitate the ITAAC closure process, the Licensee proposes to depart from plant-specific DCD Tier 1 Table 2.6.3-3, ITAAC 4i, to revise the test requirements related to battery voltage restriction and MOV operation which do not align with the intent of the ITAAC and add increased difficulty to ITAAC closure. The Licensee proposes to test the IDS by measuring the voltage at both the IDS battery terminals and MOV motor terminals while each specified MOV is stroked. In addition, an analysis is performed to verify that the voltage at the MOV motor terminals is greater than or equal to the minimum design voltage of each MOV starting with an IDS battery terminal voltage of 210 Vdc.

The acceptance criterion of the ITAAC is also proposed to be changed to verify that the IDS can provide a voltage greater than each valve's minimum design voltage to the input terminals of MOVs during valve stroking, both while starting and when power is supplied under design conditions, from IDS batteries starting with a battery terminal voltage of 210 Vdc.

Licensee revision of plant-specific DCD Table 2.6.3-3, ITAAC 4i, does not adversely impact the requirements of the ITAAC. The intent of ITAAC 4i is to demonstrate that, the IDS, with the battery supplying no greater than 210 Vdc, can supply a voltage to the Class 1E MOV terminals that is greater than or equal to the minimum specified voltage necessary for the valves to operate. The proposed revisions to plant-specific DCD Table 2.6.3-3, ITAAC 4.i, clarify the methods used to satisfy the intent of this ITAAC. ITAAC closure under these conditions ensures that the MOVs are able to perform their safety-related functions.

In addition, the proposed changes do not impact the safety-related design function of the IDS system. No safety-related systems are adversely impacted and no IDS design functions are altered. The changes to the table do not introduce any new failure modes, environmental impacts or changes to established safety analyses. The proposed revision to plant-specific DCD Tier 1 Table 2.6.3-3, ITAAC 4i, makes no physical changes to the plant.

Detailed technical justification supporting this request for exemption is provided in Section 3 of the associated License Amendment Request in Enclosure 1 of this letter.

#### 4.0 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. 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 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 52, Appendix D, Section III.B would allow changes to plant-specific DCD Tier 1 Table 2.6.3-3, ITAAC 4i, to depart from the AP1000 certified (Tier 1) design information. The plant-specific DCD 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 DCD Tier 1 Table 2.6.3-3, ITAAC 4i, will continue to serve its intended purpose.

Also, the proposed changes to ITAAC 4i to revise the ITA and AC facilitate ITAAC closure. This revision fulfills the intent of the ITAAC by revising the testing requirements and acceptance criteria to address the circumstances described in sections 2.0 and 3.0 above. Without these revisions, the plant IDS batteries could be adversely affected due to repeated MOV cycling in a discharged state. Revising the ITAAC as proposed ensures that the underlying purpose of the ITAAC is met, provides a clear path to ITAAC closure by the Licensee, and ensures the health and safety of the public.

The proposed exemption proposes no physical changes to the plant structures, systems, or components (SSC), plant configuration, or plant design. The changes facilitate ITAAC closure by the Licensee and fulfill the intent of the ITAAC to verify that the IDS can supply a voltage to the Class 1E MOV terminals that is greater than or equal to the minimum specified voltage necessary for the valves to operate. Therefore, there is no undue risk to the public health and safety.

The changes to plant-specific Tier 1 Table 2.6.3-3, ITAAC 4i, do not represent any adverse impact to the design function of the IDS or Class 1E MOVs. It will continue to protect the health and safety of the public in the same manner and does not introduce any new industrial, chemical, or radiological hazards that would represent a public health or safety risk, nor do they modify or remove any design or operational controls or safeguards intended to mitigate any existing on-site hazards. Furthermore, the proposed change would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in fuel cladding failures.

Accordingly, this change does not present an undue risk from any existing or proposed equipment or systems.

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 requested exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would allow the licensee to depart from elements of the plant specific DCD Tier 1 design information. The proposed 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) and 10 CFR 50.12(a)(2)(iv).

Section 50.12(a)(2)(ii) 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 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.

The proposed change would revise plant-specific Tier 1 Table 2.6.3-3, ITAAC 4i, the intent of which is to ensure that IDS functionality supports the actuation of Class 1E MOVs. The proposed changes do not affect any function or feature used for the prevention and mitigation of accidents or their safety analyses. No safety-related structure, system, component (SSC) or function is changed or adversely impacted. The proposed changes do not involve nor interface with any SSC accident initiator or initiating sequence of events related to the accidents evaluated and therefore do not have an adverse effect on any SSC’s design function. 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 Part 52, Appendix D.

Therefore, special circumstances in Section 50.12(a)(2)(ii) 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.

Additionally, Section 50.12(a)(2)(iv) defines special circumstances as when “The exemption would result in benefit to the public health and safety that compensates for any decrease in safety that may result from the grant of the exemption.”

As described above, the exemption would allow the Licensee to modify information in Tier 1 Table 2.6.3-3 for ITAAC 4i. Without these changes, the plant IDS batteries could be adversely affected due to repeated MOV cycling in a discharged state during ITAAC closure. In addition, the current ITAAC wording prescribes a more restrictive closure process as the ITA specifies a voltage at the motor starter terminals that exceeds that voltage required by the Class 1E MOVs for operation. Removing these impediments by revising ITAAC 4i provides a benefit to the public health and safety by facilitating successful ITAAC closure.

Therefore, special circumstances in Section 50.12(a)(2)(iv) are present, because the proposed exemption facilitate ITAAC closure, resulting in a benefit to the public health and safety.

**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 facilitate closure of ITAAC 4i, from DCD Tier 1

Table 2.6.3-3, it is expected that this exemption may be requested by other AP1000 licensees and applicants. However, a review of the reduction in standardization resulting from the departure from the DCD determined that even if other AP1000 licensees and applicants do not request this same departure and exemption, the special circumstances will continue to outweigh any decrease in safety from the reduction in standardization because the proposed changes to Tier 1 Table 2.6.3-3, ITAAC 4i, fulfill the intent of the ITAAC and thereby facilitate successful ITAAC closure.

The changes proposed by the Licensee described in this exemption request and the associated License Amendment Request do not result in a decrease in safety resulting from the reduction in standardization due to the proposed exemption. The proposed exemption relates to the LAR that updates the content of Table 2.6.3-3, ITAAC 4i, and facilitates the ITAAC closure process. The Licensee (and other licensees) likely would address the related ITAAC in the same manner with or without the exemption.

Nonetheless, even if the potential reduction in standardization could result in a decrease in safety, any potential decrease in safety is outweighed by the special circumstances described above. The justification provided in the license amendment request and this exemption request and the associated licensing basis mark-ups demonstrate that there is a limited change from the standard information provided in the generic AP1000 DCD, and that the information changed is unnecessary to achieve the underlying purpose of the rule. Moreover, as explained above, the exemption would allow the Licensee to revise the ITAAC 4i to improve closure process and ensure that the as-built plant conforms to the design commitment in the ITAAC. These benefits, including benefits to the public health and safety to ensure that the ITAAC are fully completed, outweigh any potential decrease in safety that may result from the reduction in standardization caused by the exemption.

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 exemption revises the plant-specific DCD Tier 1 Table 2.6.3-3 information regarding the terminal voltage testing of Class 1E MOVs, as discussed in Section 2.0. The changes to ITAAC 4i facilitate ITAAC closure and meet the intent of the table by revising the ITA and acceptance criteria. There are no proposed changes to plant SSCs or design functions and the proposed changes do not impact safety related equipment. The proposed changes do not create the possibility of a new or different accident from any accident previously evaluated or reduce any margin of safety as the intent of testing requirement for Class 1E MOV voltages supplied by IDS remains the same. Since the intent of DCD Tier 1 Table 2.6.3-3. ITAAC 4i, continues to be met by the revised information in the table and the proposed changes facilitate ITAAC closure, there is no reduction 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.

## 7.0 ENVIRONMENTAL CONSIDERATION

The Licensee requests a departure from elements of the certified information in Tier 1 of the generic AP1000 DCD. The Licensee has determined that the proposed departure would require a permanent exemption from the requirements of 10 CFR 52, Appendix D, Section III.B, Design Certification Rule for the AP1000 Design, Scope and Contents, with respect to installation or use of facility components located within the restricted area, as defined in 10 CFR Part 20, or which changes an inspection or a surveillance requirement; however, the Licensee evaluation of the proposed exemption has determined that the proposed exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Based on the above review of the proposed exemption, the Licensee has determined that the proposed activity 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 exemption 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 exemption is not required.

Specific details of the environmental considerations supporting this request for exemption are provided in Section 5 of the associated License Amendment Request provided in Enclosure 1 of this letter.

## 8.0 CONCLUSION

The proposed changes to plant-specific DCD Tier 1 Table 2.6.3-3, ITAAC 4i, are necessary to facilitate ITAAC closure. The exemption request meets the requirements of 10 CFR 52.63, Finality of design certifications, 10 CFR 52.7, Specific exemptions, 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, satisfies the underlying purpose of the AP1000 Design Certification Rule, and does not present a significant decrease in safety as a result of a reduction in standardization.

## 9.0 REFERENCES

None.

**South Carolina Electric & Gas Company**

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

**NND-17-0231**

**Enclosure 3**

**Proposed Changes to**

**Licensing Basis Documents**

**(LAR 17-11)**

**Note:**

Added text is shown as bold Blue Underline

Deleted text is shown as bold ~~Red-Strikethrough~~

Omitted text is shown as three asterisks ( \* \* \* )

(Enclosure 3 consists of 3 pages, including this cover page)

**Revise COL Appendix C (and Plant-Specific Tier 1) Table 2.6.3-3 as follows:**

<b>Table 2.6.3-3 Inspections, Tests, Analyses, and Acceptance Criteria</b>		
<b>Design Commitment</b>	<b>Inspections, Tests, Analyses</b>	<b>Acceptance Criteria</b>
<p>4.i) The IDS supplies an operating voltage at the terminals of the Class 1E motor operated valves identified in Tier 1 Material subsections 2.1.2, 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.3.2, 2.3.6 and 2.7.1 that is greater than or equal to the minimum specified voltage.</p>	<p>Testing will be performed by <u>measuring the voltage at both the IDS battery and motor-operated valve motor terminals while each specified motor-operated valve is stroked during motor starting.</u> <u>Analyses will be performed to verify that the voltage at the motor-operated valve motor terminals is greater than or equal to the minimum design voltage of each motor-operated valve with an IDS battery terminal voltage of 210 Vdc.</u> <del>stroking each specified motor-operated valve and measuring the terminal voltage at the motor starter input terminals with the motor operating. The battery terminal voltage will be no more than 210 Vdc during the test.</del></p>	<p><u>A report exists and concludes that IDS can provide a voltage greater than each valve's minimum design voltage to the input terminals of specified motor-operated valves when power is supplied under design conditions from IDS batteries with battery terminal voltage at 210 Vdc while each specified motor-operated valve is stroked.</u></p> <p><del>The motor starter input terminal voltage is greater than or equal 200 Vdc with the motor operating.</del></p>

NND-17-0231

Enclosure 3

LAR 17-11: Revision of ITAAC 2.6.03.04i, Class 1E Motor-Operated Valve Terminal Voltage Testing

**Revise UFSAR Tier 2 Subsection 8.3.2.5.9 as follows:**

**8.3.2.5.9 Class 1E Motor-Operated Valves Terminal Voltage Testing**

Testing and analysis are used to verify that a voltage is provided from the IDS batteries to the Class 1E motor-operated valve terminals that is greater than or equal to the minimum specified voltage necessary for the valves to operate. Class 1E motor-operated valves are tested by measuring the voltage at both the IDS battery and motor-operated valve while each motor-operated valve is stroked during starting. The results are compared in a voltage analysis which verifies that the voltage at the motor-operated valve motor terminals is greater than or equal to the minimum design voltage of each motor-operated valve with an IDS battery terminal voltage of 210 Vdc.

~~The operating voltage supplied to Class 1E motor-operated valves is measured to verify the motor starter input terminal voltage is above the minimum design value of 200 Vdc. The battery terminal voltage will be no more than 210 Vdc during the test to represent the conditions at the battery end of life.~~