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SCE&G®
A SCANA COMPANY

February 17, 2014
NND-14-0037
10 CFR 50.90

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

Virgil C. Summer Nuclear Station (VCSNS) Unit 2
Combined License No. NPF-93
Docket No. 52-027

Subject: PAR 13-41 Preliminary Amendment Request: Coating Thermal Conductivity

Reference: 1. VCSNS License Amendment Request (LAR) 13-41 dated November 26, 2013, NND-13-0695, (ADAMS Accession Number ML13338A570)

2. Southern Nuclear Operating Company Preliminary Amendment Request (PAR): Coating Thermal Conductivity, PAR-13-039, dated January 21, 2014 (ND-14-0141).

3. Southern Nuclear Operating Company Supplement to Preliminary Amendment Request (PAR): Coating Thermal Conductivity, PAR-13-039S, dated February 13, 2014 (ND-14-0200).

In accordance with the provisions of VCSNS Unit 2 Combined License (COL) number NPF-93, condition 2.D.(1), Changes During Construction, South Carolina Electric & Gas Company (SCE&G) hereby requests a no objections determination per the preliminary amendment request (PAR) process. PAR 13-41, contained in Enclosure 1 to this letter, references SCE&G correspondence letter number NND-13-0695, dated November 26, 2013, in which SCE&G requested an amendment (LAR 13-41) to the COLs for VCSNS Units 2 and 3 to revise the identified methodology to determine the effective thermal conductivity resulting from oxidation of the inorganic zinc (IOZ) used in the containment vessel coating system.

SCE&G requests a no objections determination to PAR 13-41 to allow construction activities to proceed in accordance with the current integrated schedule for Unit 2. In order to avoid unnecessary construction delays during the NRC's evaluation of the related

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license amendment request, the determination of whether the NRC has any objection to SCE&G proceeding with construction according to the proposed licensing basis modification identified in the subject PAR/LAR is requested to be provided by March 20, 2014. Delayed determination regarding this PAR could result in a delay in the installation of the first ring of the lower containment vessel.

A description of the requested change and the reason for the change are contained in Enclosure 1 to this letter. Section 9 of Enclosure 1 identifies the scope of the "no objection" sought in this PAR. This PAR has been developed consistent with guidance provided in the most recent revision to the Interim Staff Guidance on Changes during Construction Under 10 CFR Part 52, COL-ISG-25 [ML13045A125], and corresponds accurately and technically with the above-mentioned LAR 13-41. The technical scope of this PAR is consistent with the technical scope of the LAR as accepted by the NRC for technical review [ML14013A161].

This letter contains no regulatory commitments.

Should you have any questions, please contact 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 17th day of February, 2014.

Sincerely,

Ronald A. Jones
Vice President
New Nuclear Operations

JE/RAJ/je

Enclosure 1: V.C. Summer Nuclear Station Unit 2 – Preliminary Amendment Request Regarding Coating Thermal Conductivity

Enclosure 2: V.C. Summer Nuclear Station Unit 2 – Supplemental Information to Preliminary Amendment Request Regarding Coating Thermal Conductivity

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South Carolina Electric & Gas Company

NND-14-0037

Enclosure 1

Virgil C. Summer Nuclear Station (VCSNS) Unit 2

Preliminary Amendment Request
Regarding
Coating Thermal Conductivity

(PAR 13-41)

Pursuant to 10 CFR 50.90, South Carolina Electric & Gas Company (SCE&G) has proposed a License Amendment Request (LAR 13-41) to change the Virgil C. Summer Nuclear Station (VCSNS), Units 2 and 3 licensing basis documents associated with Combined License Numbers NPF-93 and NPF-94, respectively. Accordingly, SCE&G requests the determination of whether the NRC has an objection to proceeding with the installation of the plant structures as identified in the Preliminary Amendment Request (PAR 13-41) provided below which is consistent with LAR 13-41.

PAR Request Number:	Station Name:	Unit Number(s):	PAR Request Date:
PAR 13-41	VCSNS	☒ 2 ☐ 3	February 17, 2014

1. NRC PAR Notification Requested Date (see Block 9 for basis): March 20, 2013

2. License Amendment Request References (as applicable):

☒ **LAR submittal date and SCE&G Correspondence No.:** November 26, 2013, NND-13-0695

☐ **Expected LAR submittal date:**

3. Brief Description of Proposed Change:

This proposed change would revise the licensing basis for the Combined Licenses to allow use of a new methodology (found in WCAP-15846 Addendum 1 as attached to LAR 13-41) for determining the effective thermal conductivity of the inorganic zinc (IOZ) coating system. This new methodology eliminates non-mechanistic modeling of IOZ thermal conductivity and accounts for a commercially available coating when determining the conservatism of the thermal conductivity value utilized in the WGOTHIC modeling. The new methodology results in a thermal conductivity value greater than the thermal conductivity value used in the design and licensing basis analysis. Since a higher thermal conductivity value is better for heat transfer, the values used in the design and licensing basis analysis continue to be conservative and bounding. Therefore, the thermal conductivity value used in the design and licensing basis analysis is not changed and there is no change to the calculated design basis peak pressure reported in the UFSAR. The coating utilized for this project meets the criteria identified in the WCAP addendum for its use.

Note that the value of the WGOTHIC model input is not proposed to be changed, only the method for determining the conservatism of the model input when compared to the effective thermal conductivity of the available coatings.

4. Reason for License Amendment Request:

WCAP-15846, "WGOTHIC Application to AP600 and AP1000," describes specific modeling and defines methods used to develop conservative input for the WGOTHIC code to create a bounding containment peak pressure evaluation model (Updated Final Safety Analysis Report (UFSAR) Section 6.2, Reference 20). This containment evaluation model is used to calculate the design basis peak pressure reported in the UFSAR. WCAP-15846 provides the thermal conductivity value of the inorganic zinc (IOZ) coating to use for application to the AP1000 plant in support of containment response analyses. To

conservatively account for the oxidation of the zinc constituent of the IOZ coating system, the methodology contained in WCAP-15846 stipulates that the overall thermal conductivity of the coating system is reduced by a factor of four to conservatively account for the effects of oxidation. This is a conservative but non-mechanistic assumption and when applied to available coatings would result in an unrealistic value for the input to the WGOTHIC model. Thus, a new method is proposed to show the conservatism of the existing WGOTHIC input (see UFSAR Table 6.2.1.1-8) as it relates to the effective thermal conductivity of the available coatings.

5. Is Exemption Request Required? ☐ **Yes** ☒ **No**

If Yes, Briefly Describe the Reason for the Exemption. Not Applicable

6. Identify Applicable Precedents: No precedents identified.

7. Preliminary Assessment of Significant Hazards Consideration [10 CFR 50.92(c)]:

The requested change would revise the licensing basis documents to include a new methodology for determining the effective thermal conductivity for the primary containment inorganic zinc coating. Reference to and general discussion of the use of the methodology in WCAP-15846, Addendum 1, "Effective Thermal Conductivity Model of Inorganic Zinc Coating for Application to AP1000," Revision 0, October 2013, is proposed to be included in Updated Final Safety Analysis Report (UFSAR) Section 1.6 Table 1.6-1, Subsection 6.2.1.1.3, and Subsection 6.2.7.

The requested amendment proposes changes to UFSAR Tier 2 information.

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:

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

Response: No

Implementation of a methodology which specifies an effective thermal conductivity and oxidation progression for the inorganic zinc coating of the containment vessel is used to eliminate non-mechanistic modeling of inorganic zinc thermal conductivity in the containment integrity analyses to show that the value for inorganic zinc thermal conductivity used in the containment integrity analyses is conservative, but is not used to change any of the parameters used in those analyses. There is no change to any accident initiator or condition of the containment that would affect the probability of any accident. The containment peak pressure analysis as reported in the UFSAR is not affected; therefore, the previously reported consequences are not affected.

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

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 amendment to implement a methodology which specifies an effective thermal conductivity and oxidation progression and effects for the inorganic zinc coating of the containment vessel is used to eliminate non-mechanistic modeling of inorganic zinc thermal conductivity in the containment integrity analyses to show that the value for inorganic zinc thermal conductivity used in the containment integrity analyses is conservative, but is not used to change any of the parameters used in the containment peak pressure analysis. The change in methodology does not change the condition of containment; therefore, no new accident initiator is created. The containment peak pressure analysis as currently evaluated is not affected, and the consequences previously reported are not changed. The new methodology does not change the containment; therefore, no new fault or sequence of events that could lead to containment failure or release of radioactive material is created.

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

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

Response: No

The proposed implementation of a methodology which specifies an effective thermal conductivity and oxidation progression and effects for the inorganic zinc coating of the containment vessel is used to eliminate non-mechanistic modeling of inorganic zinc thermal conductivity in the containment integrity analyses to show that the value for inorganic zinc thermal conductivity used in the containment integrity analyses is conservative, but is not used to change any of the parameters used in the containment peak pressure analysis. The change in methodology does not change the condition of the containment and the integrity of the containment vessel is not affected. The containment peak pressure analysis as currently evaluated is not affected, and the consequences previously reported are not changed. No safety analysis or design basis acceptance limit/criterion is changed by the proposed change, thus no margin of safety is reduced.

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

Based on the above, it is concluded that the 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.

8. Preliminary Assessment of Categorical Exclusion from Environmental Review [10 CFR 51.22]:

This review supports a request to amend the licensing basis documents to allow departure from the plant-specific Design Control Document (DCD) as incorporated into the Updated Final Safety Analysis Report (UFSAR) related to a new methodology used to determine effective thermal conductivity and oxidation progression for the inorganic zinc coating of the containment vessel.

The proposed change requires revisions to UFSAR information.

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 Part 20, or would change an inspection or surveillance requirement. However, facility construction and operation following implementation of the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed 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 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 change is 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 change does 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 provides an alternate methodology of determining the effective

thermal conductivity and oxidation progression for the inorganic zinc coating of the containment vessel. Plant radiation zones (addressed in UFSAR Section 12.3) are not affected, and there are no changes to the controls required under 10 CFR Part 20 that preclude a significant increase in occupational radiation exposure. Therefore, the 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 do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in the individual or cumulative occupational radiation exposure. Accordingly, the 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.

9. Impact of Change on Installation and Testing Schedules:

SCE&G has determined that the need date for associated construction activities related to LAR 13-41 is currently scheduled for April 17, 2014. As such, this PAR requests a "no objections" finding related to this license amendment by March 20, 2014, which would allow for appropriate notifications and "hold" releases to allow construction to continue. With an allowed placement of the first ring of the lower containment vessel under the "no objections" finding, the need date for the license amendment, i.e., the point at which SCE&G would not risk further construction under the "no objections" finding, is currently identified as November 4, 2014.

10. Impact of Change on ITAAC: None

11. Additional Information: None

South Carolina Electric & Gas Company

NND-14-0037

Enclosure 2

Virgil C. Summer Nuclear Station (VCSNS) Unit 2

Supplemental Information to Preliminary Amendment Request Regarding Coating Thermal Conductivity

(PAR 13-41)

This supplemental information is being provided to document the discussions held on the January 30, 2014 public conference call with the Nuclear Regulatory Commission (NRC) related to Reference 2. As described in Enclosure 1, the construction tie for the Thermal Conductivity PAR request has been determined to be ring 1 placement. The WGOTHIC methodology, WCAP-15846, reviewed by the NRC and referenced in the UFSAR requires the thermal conductivity value used in the containment analysis to have been reduced by a factor of 4 to account for the effects of oxidation over plant life. However, the tested thermal conductivity value of the inorganic zinc coating that will be applied on the containment vessel when ring 1 is assembled is less than the value noted in the licensing basis utilizing the factor of 4 methodology. Therefore, LAR 13-41 (Reference 1) proposes a new methodology for determining the affects of oxidation of the inorganic zinc coating.

SCE&G works in conjunction with the Consortium to identify proper construction ties using applicable regulatory requirements and industry guidance. The following points from applicable regulations and guidance are considered germane to the selection of construction ties:

- ISG-25 states that "...changes ... require NRC approval in advance of the construction of the plant change or modification."
- The term construction is defined in 10 CFR 50.10 which states: "Activities constituting construction [is] the ... in-place assembly, ... for: SSCs of a facility as defined in 10 CFR 50.2..."
- 10 CFR 50.59 defines a change as: "... a modification ... [to the] the facility ... that affects ... an evaluation that demonstrates that intended functions will be accomplished."

The activity presented in Reference 1 meets the definition of a "change" as defined in 10 CFR 50.59 since WCAP-15846 is an evaluation that "demonstrates that intended functions will be accomplished". It has been evaluated that this "change" be approved by the NRC based on the criteria specified in 10 CFR 52 Appendix D, Section VIII. ISG-25 requires that a "change", needing NRC approval, be approved or have a PAR no objection "in advance of construction". Construction in this case is placement of ring 1 since the coating will be applied when the ring is "assembled" on the CV bottom head and since 10 CFR 50.10 defines construction as the "in-place assembly".