



November 30, 2016
NND-16-0524
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) Units 2 and 3
Combined License Nos. NPF-93
Docket Nos. 52-027

Subject: Supplement to Preliminary Amendment Request (PAR): Structural
Design of Auxiliary Building Floors (PAR 14-14-02S)

- Reference:
1. South Carolina Electric & Gas Company (SCE&G) Revision 3 to Request for License Amendment LAR 14-14 R3: Structural Design of Auxiliary Building Floors, dated October 24, 2016 [ML16299A064]
 2. South Carolina Electric & Gas Company (SCE&G), Preliminary Amendment Request (PAR) 14-14-02: Structural Design of Auxiliary Building Floors, dated August 17, 2016 [ML16230A589]

Pursuant to 10 CFR 52.98(c) and in accordance with the provisions of 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), submitted a revised request for license amendment to the Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 combined licenses (COLs) numbers NPF-93 and NPF-94, respectively. The revised requested amendment (LAR 14-14 R3) was submitted as indicated by Reference 1 listed above, to revise details of the structural design of auxiliary building floors.

SCE&G originally submitted a Preliminary Amendment Request, PAR 14-14-02 (Reference 2), to allow rebar hooks in the shield building wall at select elevations and at column line I in Unit 2. A “no objection” finding was received on October 12, 2016 [ML16279A411]. This submittal supplements the PAR to allow flexibility to use headed reinforcement at these locations, and conforms with LAR 14-14 R3.

SCE&G is submitting this Preliminary Amendment Request, PAR 14-14-02S, to minimize construction delays for Unit 2 during the NRC’s evaluation of the related license amendment request. The determination of whether the NRC has any objection to SCE&G proceeding with construction based on the proposed plant licensing basis changes identified in the LAR is requested on or before December 8, 2016. Delayed determination regarding this PAR could result in a delay in the construction of VCSNS Unit 2 Auxiliary Building.

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A description of the proposed change and the reason for the change are contained in Enclosure 1 to this letter. This PAR has been developed in accordance with guidance provided in Interim Staff Guidance on Changes during Construction Under 10 CFR Part 52, COL-ISG-25 [ML15058A377], and corresponds accurately and technically with the above-mentioned LAR 14-14 R3. Thus, this requested PAR is based on and consistent with the technical scope of the submitted revised LAR. Section 7 of the Enclosure identifies and details the scope of the "no objection" sought in this PAR.

Should you have any questions, please contact Mr. Nick Kellenberger by telephone at (803) 941-9834, or by email at 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 30th day of November, 2016.

Sincerely,



April R. Rice
Manager
New Nuclear Licensing

MHK/ARR/mhk

Enclosure 1: Virgil C. Summer Nuclear Station Unit 2: Preliminary Amendment Request Regarding Structural Design of Auxiliary Building Floors (PAR 14-14-02S)

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South Carolina Electric and Gas Company

NND-16-0524

Enclosure 1

Virgil C. Summer Nuclear Station (VCSNS) Unit 2

Preliminary Amendment Request

Regarding:

Structural Design of Auxiliary Building Floors

(PAR 14-14-02S)

(This Enclosure consists of 5 pages, including this cover page.)

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Enclosure 1

PAR 14-14-02S: Structural Design of Auxiliary Building Floors

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, South Carolina Electric and Gas Company (SCE&G) requested an amendment to Combined License (COL) Numbers NPF-93 and NPF-94, for Virgil C. Summer Nuclear Station (VCSNS) Unit 2 and 3, respectively. Accordingly, SCE&G requests the determination of whether the NRC has any objection to proceeding with the construction of the VCSNS Unit 2 with the installation of reinforcement (including the pouring of concrete) as identified in the Preliminary Amendment Request (PAR) provided below to be provided by the date shown below.

PAR Number PAR 14-14-02S	Station Name VCSNS	Unit Number <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	PAR Date 11/30/16
1. NRC PAR Notification Requested Date (see Block 7 for basis) <u>December 8, 2016</u>			
2. License Amendment Request References (as applicable) <input checked="" type="checkbox"/> LAR submittal date and SCE&G Correspondence Number: October 24, 2016 / NND-16-0436 <input type="checkbox"/> Expected LAR submittal date: _____			
3. Brief Description of Proposed Change Changes are proposed (in the associated revised License Amendment Request (LAR 14-14 R3)) to the Updated Final Safety Analysis Report (UFSAR) descriptions and figures to address changes in the structural design of selected floors including floors in the CA20 structural module and finned floors in the auxiliary building. The selected floors include the following rooms located in the CA20 structural module, in the south end of the auxiliary building: Piping/Valve Room (Room number 12262), Pipe Chase (Room number 12269), Cask Loading Pit (Room number 12463), Spent Fuel Storage Pit (Room number 12563), Waste Monitor Tank Room B (Room number 12365), RNS Heat Exchanger Room (Room number 12362), Waste Monitor Tank Room A (Room number 12363), Cask Washdown Pit (Room number 12462), and portions of the Fuel Handling Area (Room number 12562). The selected floors also include finned floors located in the following rooms in the north end of the auxiliary building: portions of the Lower MSIV Compartment B (Room number 12404), portions of the Lower VBS B&D Equipment Room (Room number 12405), portions of the Main Control Room (Room number 12401), and portions of VBS MCR/A&C Equipment Room (Room number 12501). The UFSAR text, table, and figures that are proposed to be changed provide information for these floors and are identified as Tier 2* information or as changes in Tier 2 information that are related to involved Tier 2* information. Changes include proposed modifications specific to the critical section, as well as additional clarification to define how similar finned floors other than the critical section and similar concrete on steel plate floors without fins can be different in the design details. The variations in the detail design, which include information such as size and spacing of reinforcement in the floors and the spans of the floors, are the result of variations in the geometry of the floors and variations in the loads for which the floors are designed. The floor designs including the design variations meet design code requirements in ACI 349 and AISC N690. The variations in the structural design details have no impact on the thermal function of the fins.			
4. Reason for License Amendment Request Variation in floor reinforcement design is required because of differing geometry and loads at locations away from the critical section. In the localized areas adjacent to penetrations, openings, and other obstructions			

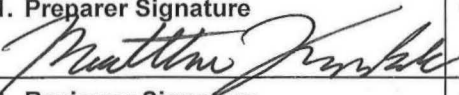
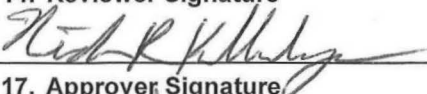
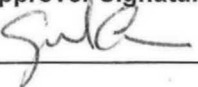
PAR Number	Station Name	Unit Number	PAR Date
PAR 14-14-02S	VCSNS	<input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	11/30/16
<p>the design of the reinforcement may vary to meet design requirements for the floor or the penetration. The design of the floors with the subject variances is in conformance with design and analysis requirements for the structures identified in the UFSAR including ACI 349 and AISC N690.</p> <p>The proposed changes to the size of the steel panels upon which the concrete is placed facilitate the fabrication and construction of the finned floor. The size and number of panels used for the finned floors depend on the size of the room and the fabricator capabilities.</p> <p>Proposed changes are identified for the development of the reinforcement in the floor and for the detail design of the connection of the floor to the wall to be consistent with standard construction practice. These changes are included in the revised UFSAR Figure 3H.5-9, Sheet 2. Note 13 allows for the gap between steel plate and wall and use of a construction joint to vary because these are related to fabrication details and construction sequence. In some of the affected floors where additional top reinforcement is required, smaller top reinforcement bars (arranged in two layers) may be utilized by considering ACI 349 detailing requirements, such as dowel development length. Therefore, Note 14 is added to allow for variation in layers of top reinforcement and top dowels as long as they meet the minimum reinforcement requirement per ACI 349. The North–South designator is removed to clean up and clarify the figure as it does not provide important information. The designation of Wall 11 is revised to a form that is more understandable. These changes do not affect the strength of the floor or connections or the conformance with ACI 349 and AISC N690.</p> <p>The length for the reinforcement bar dowel is removed to allow for different lengths for the reinforcement bar dowels in UFSAR Figure 3H.5-9, Sheet 2, because the ACI code requires different lengths based on the reinforcement size used for other sections. Also, the length of the bottom dowels must be sufficient to incorporate sufficient shear studs to develop the capacity of the dowels and the demand in the bottom plate.</p> <p>Removing the reference to control room ceiling and stiffeners in the existing last paragraph of UFSAR Subsection 3.8.4.4.1 clarifies to which type of floor design the paragraph applies. This change does not change the design and design requirements for the concrete on steel plate floor without fins because the design of these floors does not include reliance on stiffeners. The floors without fins are considered similar to the design methodology described in UFSAR Subsection 3H.5.4 because the finned floors are designed as reinforced concrete slabs, the steel plate provides the bottom layer reinforcement for the concrete slab, and the steel plate is connected to the concrete with shear studs welded to the top of the plate. The absence of fins changes the location of the neutral axis in negative bending and the reliance on compression in the plate which is a difference with the analysis details described in Subsection 3H.5.4.</p> <p>The addition of information about the connection design in UFSAR Subsection 3.8.4.4.1 clarifies the description of the design in the licensing basis for the floor to wall connections for concrete on steel plate floors by adding specific design requirements. These specific design requirements do not change the floor to wall connection design represented in UFSAR Figure 3H.5-9 for finned floors.</p> <p>Revise UFSAR Subsection 3.8.4.4.1 to add information that the orientation of the standard hooks that provide development in the walls for the reinforcement dowels may vary. Floors that are connected to walls in the CA20 module on the south end of the auxiliary building use dowels developed in the wall with a standard hook or may use headed reinforcement. The standard hook details may differ from UFSAR Figure 3H.5-9, Sheet 2, because of potential interferences of the hook extension at the free end of the bar with shear studs, wall truss components, overlay plate anchorage, embedments, and other items within the wall.</p> <p>Changes to equipment weight and location of equipment in the rooms above the finned floors, the seismic analytical model for other sections, and seismic loads as a result of cumulative changes to the structures have resulted in small changes to the Tier 2 and Tier 2* values reported in UFSAR Table 3H.5-13 for the finned floor critical section. The area of reinforcement included to resist negative bending provided by the design is proposed to be added to the table to provide information about the design not originally included in the table. The design presented in UFSAR Table 3H.5-13 is in conformance with design and analysis</p>			

PAR Number PAR 14-14-02S	Station Name VCSNS	Unit Number <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	PAR Date 11/30/16
<p>requirements for the structures identified in the UFSAR including ACI 349 and AISC N690. The presentation of the information in the table is confusing without familiarity with the evaluation and is proposed to be reformatted and revised.</p> <p>Changes are proposed to the size of the precast concrete panels for the reinforced concrete floor shown in UFSAR Figure 3H.5-8 to optimize the construction of the floor. The increase in width also requires an additional row of stirrups to meet ACI 349 Chapter 17 requirements for the precast panel and cast in place concrete to act as a composite section. The orientation of the hooks on the stirrups is changed to facilitate construction. The design with the proposed changes shown in the revised UFSAR Figure 3H.5-8 is in conformance with design and analysis requirements for the structures identified in the UFSAR including ACI 349.</p>			
<p>5. Is an Exemption Request Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If Yes, Briefly Describe Reason for Exemption. Not Applicable</p>			
<p>6. Identify Applicable Precedents</p> <p>No precedence identified.</p>			
<p>7. Impact of Change on Installation and Testing Schedules</p> <p>SCE&G's requested date for approval of this license amendment as identified in the referenced LAR is December 12, 2016. This date was based upon the typical period necessary for reviewing and processing a license amendment request. However, select construction activities are ready to start and will likely delay construction in the near future.</p> <p>As such, this PAR requests a "no objection" finding related to the revised license amendment request by the date identified in Block 1 above (or sooner if reasonably achievable) to allow for appropriate notifications and to allow construction to continue.</p> <p>This "no objection" finding would be specifically applicable to the following Unit 2 areas described below:</p> <ul style="list-style-type: none"> • Installation of rebar hooks and headed reinforcement at column line I, from column line 9.2 to 10' south of column line 11 at approximate elevation 117'-6". The rebar hooks and headed reinforcement provide the wall to floor connection for a portion of the Main Control Room (Room number 12401). • Installation of rebar hooks and headed reinforcement in the shield building wall from column lines L to P at approximate elevations 115'-6" to 117'-6". The rebar hooks and headed reinforcement provide the wall to floor connection for a portion of the Lower MSIV Compartment B (Room number 12404) and a portion of the Lower VBS B&D Equipment Room (Room number 12405). <p>Specifically, SCE&G requests a "no objection" finding to begin installation of reinforcement at the areas specified above within Unit 2 (including the pouring of concrete) in accordance with the design changes proposed in the revised UFSAR description in LAR 14-14 R3.</p> <p>A "no objection" finding for the above activities would allow for Unit 2 construction to proceed.</p>			

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Enclosure 1

PAR 14-14-02S: Structural Design of Auxiliary Building Floors

PAR Number PAR 14-14-02S	Station Name VCSNS	Unit Number <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3	PAR Date 11/30/16
8. Impact of Change on ITAAC None			
9. Additional Information None			
10. Preparer Name (Print) Matthew Kunkle	11. Preparer Signature 	12. Date 11/30/16	
13. Reviewer Name (Print) Nick Kellenberger	14. Reviewer Signature 	15. Date 11/30/16	
16. Approver Name (Print) April Rice	17. Approver Signature 	18. Date 11-30-16	