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NND-14-0383
10 CFR 50.90

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

Subject: LAR 13-09 S1 License Amendment and Exemption Request: Annex and
Radwaste Building Changes

- Reference:
- 1 South Carolina Electric & Gas Company (SCE&G) Request for License Amendment and Exemption: Annex and Radwaste Building Changes February 27, 2014 (NND-14-0048). (ML14065A022)
 - 2 Letter from Ravindra G. Joshi (NRC) to Ronald Jones (SCE&G), Virgil C. Summer Nuclear Station Units 2 and 3: Request for Additional Information Letter No. 01 Related to Exemption and License Amendment Request (LAR) 13-09, for Virgil C. Summer Nuclear Station Units 2 and 3: Annex and Radwaste Building Changes (ML14125A297)

In accordance with the provisions of 10 CFR 50.90, South Carolina Electric & Gas Company (SCE&G) requests an amendment to the Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 combined licenses (COLs) numbers NPF-93 and NPF-94, respectively. The proposed amendment would depart from VCSNS Units 2 and 3 plant-specific Design Control Document (DCD) Tier 1 and Tier 2 material contained within the Updated Final Safety Analysis Report (UFSAR), as well as COL Appendix C material, to modify the annex and radwaste buildings.

Enclosure 5 contains SCE&G's Response to NRC's Request for Additional Information Letter No. 1 (Reference 2). Enclosure 6 and 7 contain editorial revisions to Enclosure 1 and 3 previously submitted with Reference 1. Enclosure 8 contains Enclosure 4 figure updates in accordance with Enclosure 5. **Enclosure 4 submitted in Reference 1 was requested to be withheld under the provisions of 10 CFR 2.390(d), the same request applies for Enclosure 8.**

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NRD

The supplemental information provided in this letter does not impact the scope of the requested amendment, nor the conclusions of the regulatory evaluation (including the significant hazards consideration determination and the environmental considerations).

In order to support the VCSNS Unit 2 construction schedule, SCE&G requests NRC staff review and approval of the license amendment by December 18, 2014. This date was extended from the original September 18, 2014 based on refinements of the construction schedule. Approval by this date will still allow sufficient time to implement the licensing basis changes prior to affected construction activities. SCE&G expects to implement the proposed amendment within 30 days of approval.

This letter contains no regulatory commitments.

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

Should you have any questions, please contact Mrs. April Rice by telephone at (803) 941-9858, or by email at arice@scana.com.

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

Executed on this 9th day of July, 2014.

Sincerely,



April Rice
Manager, Nuclear Licensing
New Nuclear Operations

MMD/AR/mmd

Enclosure 5: Virgil C. Summer Nuclear Station Units 2 and 3 – SCE&G Response to NRC Request for Additional Information Letter No. 1 (LAR-13-09 S1)

Enclosure 6: Revisions to Enclosure 1 Virgil C. Summer Nuclear Station Units 2 and 3 – License Amendment Request: Annex and Radwaste Building Changes (LAR 13-09 S1)

Enclosure 7: Revisions to Enclosure 3 Virgil C. Summer Nuclear Station Units 2 and 3 – Proposed Changes (Public Information) (LAR 13-09 S1)

Enclosure 8: Revisions to Enclosure 4 Virgil C. Summer Nuclear Station Units 2 and 3 – **Proposed Changes (Protected Information) – Security-Related Information (SUNSI) – Withhold from Public Disclosure Under 10 CFR 2.390(d) (LAR 13-09 S1)**

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

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Enclosure 5

**SCE&G Response to NRC Request for Additional Information Letter No. 1
(LAR 13-09 S1)**

Question 1

Section 20.11 01 (b) of 10 CFR Part 20 states that the licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses that are as low as is reasonably achievable (ALARA).

Section 2.2 of Enclosure 1 (page 4 of 19) proposes to modify the configuration of the radwaste building to add three bunkers for storage of moderate and high activity waste. Section 2.2 also states that since both packaged and unpackaged waste will contain moderate or high activity, both types of waste (packaged and unpackaged) will be stored in the bunkers.

- a) In order to ensure that doses to personnel working in the Waste Accumulation Room, including workers moving waste into or removing waste from the three proposed bunkers, are maintained ALARA, describe your criteria for determining what types of wastes will be stored in each of the three proposed bunkers (e.g., will certain bunkers be used for packaged vs. unpackaged waste or for moderate vs. high activity waste).
- b) In order to minimize the dose to workers in the Waste Accumulation Room, describe your criteria for determining what wastes will be stored in the bunkers and what wastes will be stored outside the bunkers in the Waste Accumulation Room.

SCE&G Response to Question 1

General Note: When responding to the questions in this RAI, conventions are applied from approved design certifications, and from the Code of Federal Regulations for interpreting dose rates. These conventions are slightly different, depending upon whether the dose rate is being used for the designation of dry waste for segregation, or for the assignment of plant radiation zones to a given space. When designating waste for segregation, (including low-activity waste, moderate-activity waste, and high-activity waste), contact dose rates are considered as described in the DCD, Section 11.4.2.3.3. When discussing plant radiation zones, dose rates at 30 centimeters from a surface are evaluated, consistent with the definitions of radiation area, and high radiation area described in 10 CFR 20.1003.

- a) The purpose of the three proposed bunkers is for storage of moderate activity packaged or unpackaged waste. The bunkers may also be used for storage of high activity packaged or unpackaged waste with the implementation of portable shielding on the top and the open sides of the bunkers in accordance with SCE&G's ALARA program. There is no distinction between the bunkers as to the type of radioactive waste that may be stored in any particular bunker, although the design basis for the facility involves waste with surface dose rates at or below 100 mrem/hr. A shielding calculation has been performed which demonstrates that, when waste with surface dose rates ≤ 100 mrem/hr is stored in the bunkers, for the Radwaste Building (RB) proposed updated design described in the License Amendment Request (LAR), the Waste Accumulation Room is a Zone IV area, which is unchanged from the current design, and the RB roof, which is a restricted access area, is a Zone II area. This shielding calculation can be made available for NRC review upon request.
- b) As noted in the response to Item a above, only moderate or high activity waste is intended to be stored in the bunkers. Generally, only low or low-to-moderate activity waste is to be stored in the Waste Accumulation Room outside of the bunkers. The storage and handling of this waste is in conformance with the ALARA policy as documented in UFSAR Section 12.1 and the Radiation Protection Program description in Appendix 12AA.

Question 2

Section 20.1101 (b) of 10 CFR Part 20 states that the licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses that are as low as is reasonably achievable (ALARA).

Section 2.2 of Enclosure 1 (page 4 of 19) states that three bunkers will be added to the Waste Accumulation Room in the Radwaste Building to allow for the segregation of moderate or high activity waste from the remainder of the low activity waste. This section also states that the use of these bunkers to separate the moderate or high activity waste from the remainder of the low activity waste in the Waste Accumulation Room reduces operational exposure while workers handle low activity waste. Although this section states that these bunkers will be used for the storage of moderate or high activity waste, it does not include any information on the shielding effectiveness of the bunkers, other than stating that these bunkers will be added "to maintain acceptable radiation levels on the Radwaste Building roof and to maintain portions of the radwaste building at radiation Zone I levels as defined in UFSAR Tier 2 Figure 12.3-1 (sheet 1 of 16)." Further, this section states that the three bunkers will have removable steel plates.

- a) In order to assure that doses to personnel working in the Waste Accumulation Room are maintained ALARA, 1) verify that you have performed a shielding analysis of the proposed bunkers and associated removable steel plates to justify that dose rate levels in the Waste Accumulation Room will not exceed the designated radiation Zone IV classification from radioactive waste stored in the three proposed bunkers, and 2) provide the results of this analysis.
- b) The installation and/or removal of the removable steel plates from the bunkers in the Waste Accumulation Room could result in the expenditure of unnecessary dose to the workers performing this operation. Justify the design decision to use removable steel plates on the bunkers to provide additional shielding for the radioactive waste stored in the bunkers versus designing the bunker walls with adequate shielding to maintain dose rates outside the bunkers at acceptable levels.
- c) Describe the criteria for when these removable steel plates will be used. Describe how these removable steel plates will be added to the doors of the bunkers without impeding accessibility to the bunkers (due to the weight of the steel plates).

SCE&G Response to Question 2

- a) It has been verified that a shielding analysis has been performed of the proposed bunkers. The results of that analysis show that the Waste Accumulation Room can be maintained as a radiation Zone IV, assuming the surface dose rate limit of 100 mrem/hr (note that this surface dose rate limit ensures that Zone IV levels will be individually met for these waste containers, as the dose rate at 30 cm will be lower than the surface dose rate of 100 mrem/hr) is maintained for wastes along with implementation of an ALARA program by SCE&G. The shielding calculations show that waste monitor tank contributions within the Waste Accumulation Room are Zone I (<1 mrem/hr), even considering design basis sources. As noted in the response to Item b of this RAI question, the removable shield plates on the front openings of the bunker are provided for ALARA purposes only and are not credited to maintain the radiation zoning of the facility. These removable shield plates allow for the storage of high level waste in the bunkers provided that the storage and

handling of this waste is in conformance with the ALARA policy as documented in UFSAR Section 12.1 and the Radiation Protection Program description in Appendix 12AA.

- b) The removable shielding plates for the front opening of the bunkers are not required for the storage of moderate activity waste and were not credited in the shielding analysis. The removable plates are included in the design as an option for the operator and are recommended to allow personnel to have maximum flexibility to operate the facility in an ALARA manner and ensure exposure to plant operating personnel within the limits of 10 CFR 20. For instance, by placing high level waste in the bunkers, if the operators use the front plates, it will significantly reduce exposure in the remainder of the Waste Accumulation Room. The plates are not required, because, as noted in the RAI question, there is a concern that extra time spent moving the plates could increase operator dose beyond what the operator would receive if he were to quickly locate the waste into the bunker without front plates and exit the room. In this manner, the proposed modifications to the design allow for an ALARA-based decision on whether to use the plates for various plant configurations, considering actual site conditions (as opposed to the design basis conditions considered in the standard plant design). This allowance is intended to reduce personnel exposure through the targeted application of removable shielding where such applications are warranted based upon ALARA considerations.

Note that use of the removable steel plates is consistent with the Radwaste Building design description in UFSAR Subsection 12.3.2.2.5 which states that temporary partitions and shield walls will be provided, as required, to supplement the permanent shield walls surrounding the Waste Accumulation Room inside the Radwaste Building (RB).

- c) As noted in the response to Item b above, the removable steel plate(s) can be used for those conditions, such as when placing high level waste in the bunkers, where doses to the workers in the Waste Accumulation Room will be reduced compared with not installing the plates, considering the additional exposure involved when installing the plates. Note that plant procedures will not require that the removable plates be used in all cases where radioactive waste is installed in the bunkers. The determination of the need for these plates will be on a case-by-case basis and will include such ALARA considerations as the level of radioactivity in the bunker, the amount of time operators will be working in the Waste Accumulation Room, and the additional dose incurred by installation of the plates.

The removable steel plate(s) can be installed on the bunker openings using a forklift and completely cover the bunker opening. Therefore, when the steel plate(s) are installed, the associated bunkers cannot be accessed. Access to the bunker can be regained by removal of the plate(s) using a forklift.

Question 3

Section 3.2 of Enclosure 1 (page 8 of 19) states that three bunkers will be added to the Waste Accumulation Room in the radwaste building “to allow temporary shielding to maintain acceptable radiation levels on the radwaste building roof”.

- a) Since the bunkers are being added to maintain acceptable radiation levels on the radwaste building roof, state why the shielding on the bunkers is referred to as “temporary shielding.”
- b) Verify that routine radiation surveys will be performed on the building roof above the radwaste building to ensure that the radiation zone levels on the roof will not exceed radiation Zone I criteria due to the storage of radioactive waste in the bunkers in the Waste Accumulation Room.

SCE&G Response to Question 3

- a) The reference to “temporary shielding” in the technical evaluation of the Radwaste Building changes is intended to indicate that there is flexibility in the revised Radwaste Building design described in the LAR to allow for additional shielding above the bunkers, in addition to the design basis shielding, for cases where high level waste is being stored in the bunkers. Note that this temporary shielding is in addition to the permanent top plate shielding for the bunkers which was included in the shielding calculation which demonstrates that the Radwaste Building roof is a Zone II area. Note that both the temporary shielding and permanent top shielding are removable to allow access for the overhead crane for movement of radioactive waste inside the bunkers.
- b) UFSAR Subsection 12AA.5.4.1 provides an overview of the radiological surveillance program. As noted in that subsection, the frequency and extent of the radiological surveys depend upon several factors, such as location, actual or potential radiation levels, plant operational status and work in progress, and accessibility/occupancy. The frequency of the surveys may be weekly, monthly, quarterly, semi-annually, annually, or as directed by the Radiation Protection Manager. Site specific procedures will define the survey frequencies and extent and will include the roof of the Radwaste Building to confirm that radiation levels on the roof do not exceed radiation Zone II criteria as a result of waste stored in the bunkers. The implementation of the Radiation Protection Program elements, which includes radiation surveys, is identified in UFSAR Section 13.4.

Note that the LAR does not identify the Radwaste Building roof as Zone I; for the roof, it discusses maintaining acceptable radiation levels, which this RAI confirms as Zone II. The statement in the Technical Evaluation section of the LAR for the Radwaste Building configuration changes which states “and to maintain portions of the Radwaste Building at radiation Zone I levels” applies to portions of the Radwaste Building which do not include the roof.

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Enclosure 5 – SCE&G Response to NRC Request for Additional Information

Letter No. 1

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Question 4

Section 20.1101 (b) of 10 CFR Part 20 states that the licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses that are as low as is reasonably achievable (ALARA). In addition, Regulatory Guide 8.8 states that radiation shields should be designed to maintain occupational radiation exposures ALARA.

Section 3.2 of Enclosure 1 (page 8 of 19) proposes that the thickness of the shield walls for the portion of the Waste Accumulation Room associated with the original Packaged Waste Room be reduced from 2' to 1'-4". In order to ensure that this decrease in the thickness of these shield walls will not result in increased dose rates in the rooms adjacent to the Waste Accumulation Room (i.e., the Mobile Systems Facility and the Monitor Tanks Room) from wastes stored in the Waste Accumulation Room, verify that you have performed a shielding analysis to justify this proposed change in shield wall thickness and provide the results of this analysis.

SCE&G Response to Question 4

It has been verified that a shielding calculation, specific to the AP1000 Radwaste Building, has been performed. Internal masonry unit walls, including the walls between the Waste Accumulation Room and the Mobile Systems Facility (MSF) and the Waste Monitor Tank (WMT) Room, were modeled as 1'-4" thick concrete walls with a density of 140 pcf. Waste with a surface dose rate of 100 mrem/hr was modeled within the Waste Accumulation Room. The results show that the doses in the MSF will be no greater than Zone II (peak dose rate of 0.29 mrem/hr to the east, and 1.4 mrem/hr in the corridor to the north) considering contributions from waste in the Waste Accumulation Room. The WMT room doses will not exceed Zone IV (33 mrem/hr) considering contributions from waste in the Waste Accumulation Room and contributions from the WMTs with design basis sources. These zone designations are the same as those identified for the current design on UFSAR Figure 12.3-1 (Sheet 14) which are Zone II for the Mobile Systems Facility and Zone IV for the WMT Room, when operating with design basis sources. As noted in the response to RAI Question 8d, the WMT Room is a Zone II during typical operations, when the WMTs contain only mildly activated water. Therefore, there is no increase in the dose rate to these areas as a result of these LAR changes.

Question 5

There appear to be some inconsistencies in the descriptions of the volume of radwaste that will be stored in the radwaste building.

- a) UFSAR Section 11.4.2.1 states that the available minimum useful storage volume for packaged waste in the Waste Accumulation Room is 3900 cubic feet (10 feet deep, 30 feet long, and 13 feet high). UFSAR Section 11.4.2.5.2 states that the waste accumulation room contains three 1000 cubic feet bunkers (10 feet x 10 feet x 10 feet), with a total volume of 3000 cubic feet. On the basis of this information, it appears that the storage volume provided by the three bunkers is 77% of the useful storage volume for packaged waste in the Waste Accumulation Room. However, in UFSAR Figure 12.3-1 (sheet 14 of 16), it does not appear that the three bunkers occupy such a large percentage of the waste accumulation room. Please clarify this apparent inconsistency.
- b) Tier 1 Table 3.3-6 Item 6.b originally listed the volume of the radwaste building package storage room as being greater than or equal to 1293 cubic feet. Since the licensee proposes to remove the wall separating the Packaged Waste Storage Room and the Waste Accumulation Room and designate the new larger room as the Waste Accumulation Room, Item 6.b was modified to change the name of the room as well as to change the minimum volume of the room from 1293 cubic feet to 1417 cubic feet.
 - 1) State the basis for the initial minimum volume of 1293 cubic feet for the Packaged Waste Storage Room.
 - 2) Specify whether the minimum volume of the Waste Accumulation Room was increased from 1293 to 1417 cubic feet because of the increase in room volume obtained from removal of the wall separating the two original rooms, or whether this change was made to make the minimum room volume consistent with the expected annual shipped volume of 1417 cubic feet for dry waste listed in Tier 2 Table 11.4-1.

SCE&G Response to Question 5

- a) Although the marked-up UFSAR text in Subsection 11.4.2.1 states that the available minimum useful storage volume for packaged waste in the Waste Accumulation Room is 3900 cubic feet, the actual volume for the proposed revised Waste Accumulation Room is much larger, because of the merging of the Packaged Waste Room (PWR) and original Waste Accumulation Room. The 3900 cubic feet useful storage volume was applicable to the original PWR alone and is currently described in the UFSAR as approximately the storage volume available in the PWR for storage of packaged waste. Because the modified Waste Accumulation Room, which combines the PWR and original Waste Accumulation Room, is much larger in volume than just the PWR alone, the modified text states that the 3900 cubic feet useful storage volume is the minimum available storage volume for storage of packaged waste in the Waste Accumulation Room. The intent of not changing the 3900 cubic feet value is to show that the proposed design modifications to the Radwaste Building maintain at least the same capability as the unmodified design for storage of packaged waste.
- b) Tier 1 Table 3.3-6 Item 6.b
 - 1) The minimum volume of 1293 cubic foot for the Radwaste Building Packaged Waste Storage Room that is provided in Tier 1 Table 3.3-6, Item 6b is based on the minimum

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volume estimated for waste storage as opposed to the actual building volume. Note also that this minimum volume in Tier 1 Table 3.3-6, Item 6b is provided in the certified and approved Revision 19 of the AP1000 DCD.

- 2) As indicated above, the minimum volume for the Radwaste Building Packaged Waste Storage Room that is provided in Tier 1 Table 3.3-6, Item 6b is based on the minimum volume estimated for waste storage as opposed to the actual building volume. Based on that, the volume of 1417 cubic feet is not based on the removal of the wall separating the Packaged Waste Storage Room from the original Waste Accumulation Room, but rather is based on the expected disposal volume of dry waste per year of 1417 cubic feet which is provided in UFSAR Tier 2, Subsection 11.4.2.1.

Question 6

In Enclosure 3 (page 13 of 15), the proposed changes to UFSAR Figure 12.3-1, (Sheet 14 of 16), included adding notes to the figure. These notes indicate that dose rates in certain areas in the radwaste building may be higher than initially indicated in the AP1000 DCD. In addition, the LAR indicates that high activity waste will be stored in the proposed Waste Accumulation Room bunkers. Finally, the removal of the wall that originally separated the Waste Accumulation Room and the Packaged Waste Storage Room adds some additional space in the Waste Accumulation Room for the storage of waste. These changes all indicate that there is a potential for a larger source term in the radwaste building than what was initially indicated in the AP1000 DCD. The LAR should include an evaluation of these potential increases in source term against the criteria contained in Regulatory Guide 1.143, Revision 2, Regulatory Positions 5 and 6, and determine if the increased source term 1) is acceptable for the current Radwaste Building SSC design and 2) is consistent with radioactivity limits for systems as described in UFSAR Appendix 1A and Chapter 11. Likewise, any increases in the total activity stored in the radwaste building as a result of an increased source term from packaged waste, should be evaluated against the criteria in NUREG-0800 Section 11.4A.

SCE&G Response to Question 6

None of the changes to the Radwaste Building (RB) described in the LAR are a result of nor will they lead to an increased source term for radioactive waste in that building. This is evidenced by the fact that there are no changes to any of the already approved source term values currently provided in UFSAR Tables 11.4-1 through 11.4-9 as a result of this LAR. The purpose of these LAR changes is to update the RB design to ensure that adequate shielding exists to handle the source terms as already provided in these UFSAR tables. Note that the shielding analysis for the RB used surrogate waste containers with dose rates that are intended to be bounding, and are not necessarily related to any specific activity or concentration value referenced in Regulatory Guide 1.143, Revision 2. The changes in this LAR do not relieve the operational requirement of ensuring that the total activity stored in the RB is within the limits mentioned in Regulatory Guide 1.143, Revision 2.

The addition of Notes D.1 and D.2 to Figure 12.3-1 (Sheet 14) indicating that dose rates may be locally exceeded in certain instances reflects the possible (but not expected or normal) situation in which operators will arrange radioactive waste storage containers in such a way as to locally exceed a radiation zone. For example, if three containers of waste, each with a surface reading of 70 mrem/hr, are co-located within the Waste Accumulation Room, there could exist a small, localized portion of the Waste Accumulation Room that experiences dose rates above Zone IV levels. This is not expected because an ALARA review or programmatic ALARA approach to waste storage would be likely to identify an optimum means of waste storage that does not involve co-locating such containers. These notes were added to the LAR for completeness and for consistency with notes that already exist for other buildings with radioactive components such as the Nuclear Island (Figure 12.3-1, Sheets 8 and 9, Note 1) and the Annex Building (Figure 12.3-1, Sheet 13, Note 1) and were not added to address an increased source term. Notes D.1 through D.3 were added to define the call-outs for those notes which are already identified in the existing UFSAR Figure 12.3-1 (Sheet 14). Additionally Note D.4 with its call-out is being added to that figure by this LAR.

The addition of the bunkers provides the necessary shielding to handle the existing radioactive source terms and maintain the existing zone designations for the areas inside and outside the Radwaste Building (RB). The added room volume due to removal of the wall that separated the

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Packaged Waste Room from the Waste Accumulation Room does not result in an increase to the source terms, which are unchanged by this LAR.

It should also be noted that the current RB design described in the UFSAR already has a much greater volume than the estimated solid radwaste volumes provided in UFSAR Table 11.4-1 which are the basis for the source terms. Consequently, the potential for exceeding the source terms based on available building volume already exists. As a result, administrative controls will be used to ensure that the source term limits are not exceeded. These administrative controls are necessary with the modified design, as they were necessary with the design approved as part of the AP1000 license certification. The administrative controls will be a part of SCE&G's ALARA program. NEI Template NEI-07-08A is one example of an ALARA program, including administrative controls, which may be employed by SCE&G.

Question 7

USFAR Section 11.4 indicates that certain types of radwaste will be processed and stored in the auxiliary building, instead of in the radwaste building. Specifically, UFSAR Section 11.4.2.1 indicates that "High activity filter cartridges fill three drums per year (22.5 cubic feet per year) and are stored in portable processing or storage casks in the rail car of the auxiliary building," which is a Seismic Category I building. UFSAR Section 11.4.2.3.3 defines high-activity wastes as wastes having contact dose rates greater than 100 mrem/hr at the time of initial waste segregation.

One of the proposed changes to UFSAR Figure 12.3-1 (sheet 14 of 16) is the addition of Notes C and D. Note D.2 indicates that spent filter cartridges stored in the waste accumulation room in the radwaste building could also have dose rates which could exceed 100 mrem/hr.

Please, explain the apparent discrepancy between Section 11.4.2.1, which states that high activity filter cartridges will be stored in the auxiliary building and Note D.2 for Figure 12.3-1, which states that high activity filter cartridges could be stored in the radwaste building. Evaluate this potential increase in source term in the radwaste building against the criteria contained in Regulatory Guide 1.143, Revision 2 and NUREG-0800 Section 11.4A, as discussed in question 6 above.

SCE&G Response to Question 7

As noted in the response to Question 6, the added Note D.2 to Figure 12.3-1 (Sheet 14) indicating that dose rates may be locally exceeded in certain instances reflects the possible (but not expected or normal) situation in which operators will arrange radioactive waste storage containers in such a way as to locally exceed a radiation zone due to a combination of dose rates from various sources. Further discussion of a possible situation is included in the response to Question 6. The note was added for completeness and consistency with similar notes for the Nuclear Island and the Annex Building. The reference to spent filter cartridge was intended as an example case for the Radwaste Building, and was not intended to apply to high-activity filters. It should be noted that the note makes no mention of high-activity filters, and is intended to apply to moderate or low activity spent filters.

This note is not intended to communicate that the design intent is for storage of high-activity filter cartridges in the Radwaste Building. The design intent remains that high-activity filter cartridges be stored in the filter storage area of the Auxiliary Building. The purpose of note D.2 is to communicate that an integrated approach to ALARA, waste storage, and administrative controls is necessary. In particular, this note conveys the idea that, just because a spent filter container may read less than Zone IV levels, the local dose rate around this container considering other sources could exceed Zone IV.

Because the design intent related to storage of high-activity spent filters is not changing, and because the source terms in the Radwaste Building are not being modified, no change to the classification of the Radwaste Building, with respect to Regulatory Guide 1.143 is required.

Question 8

The staff requests that the licensee clarify the following issues related to some of the UFSAR Figures in Enclosure 4 (pages 5, 12, 13, 15 of 15):

- a) The change "bubble" through the center of the Waste Accumulation Room in the Radwaste Building in UFSAR Figures 1.2-22 and 9A-4 (pages 5 and 12 of 15) is stepped, while the change "bubble" "through the center of the same room in UFSAR Figure 12.3-1 (sheet 14 of 16) (LAR page 13 of 15) is straight. Since this change "bubble" represents the removal of the wall separating the Packaged Waste Storage Room and the Waste Accumulation Room in the original UFSAR in all three of these figures, explain why the shape of the change "bubble" differs between these figures.
- b) In the revised UFSAR Figures of the Radwaste Building (Figures 1.2-22, 9A-4 and 12.3-1 (sheet 14 of 16)), explain the reason for the addition of the additional wall adjacent to the outer building wall on the south end of the Monitor Tanks Room.
- c) In the revised UFSAR Figures of the Radwaste Building (Figures 1.2-22, 9A-4 and 12.3-1 (sheet 14 of 16)), explain the reason for the addition of the wall on the north end of the Monitor Tanks Room.
- d) In revised UFSAR Figure 12.3-1 (sheet 14 of 16), the radiation zone designations in two of the rooms have changed. Provide the basis for the radiation zone changes in the following rooms:
 - HVAC Equipment Room (Zone III to Zone I)
 - Monitor Tanks Room (Zone III to Zone II)
- e) In revised UFSAR Figure 12.3-3 (sheet 14 of 16) (LAR page 15 of 15), describe why the middle mobile system shown in the Mobile Systems Facility is depicted in a lighter shade than the two adjoining mobile systems.
- f) In the existing radwaste building design, a shield wall is located inside the east entrance to the Packaged Waste Storage Room. This shield wall provides a labyrinth entrance to this room and does not permit a line of sight view of the packaged waste that would be stored in this room. However, in the proposed redesign of the Waste Accumulation Room, the shield wall opposite the entrance is removed and the entrance door is replaced by what appears to be a sliding door.
 - 1) Verify that the above proposed modifications to the Waste Accumulation Room design (i.e., removal of the labyrinth entranceway and use of a sliding door on the entranceway on the east side of the Waste Accumulation Room) will not result in a potential increase in doses to personnel working in the adjacent Mobile Systems Facility due to an increase in the area dose rates in this room from stored waste in the Waste Accumulation Room.
 - 2) UFSAR Section 3.2 (Enclosure 1) proposes to decrease the thickness of the shield wall on the east side of the Waste Accumulation Room from 2' to 1'-4". Verify that the proposed sliding entranceway on the east entrance to the Waste Accumulation Room will provide an equivalent amount of shielding as the shield wall to this room to ensure that doses in the adjoining Mobile Systems Facility are maintained ALARA.

SCE&G Response to Question 8

- a) The bubble in question which encompasses the removal of the separation wall between the Packaged Waste Room and the Waste Accumulation Room as well as the shield wall in front of the door to the Packaged Waste Room should look the same for the three figures. Each bubble should have a straight vertical right side edge (no step) representing the removal of the common wall between the Packaged Waste and Waste Accumulation Room, and a left side edge which has a slight bulge in one location to represent the removal of the shield wall in the Packaged Waste Room in front of the door. The bubbles have been corrected on all of the figures. Note that although the bubbles in the different figures may not look exactly the same, the meaning and intent for all of these markups is the same, as described above.
- b) The additional wall adjacent to the outer building wall on the south end of the Monitor Tanks Room was added to provide sufficient shielding of the south yard area from the Waste Monitor Tanks to maintain the south yard area at Zone I. This was verified in the shielding calculation performed for the proposed Radwaste Building design.
- c) The additional wall on the north end of the Monitor Tanks Room was added to provide sufficient shielding of the hallway to the HVAC Equipment Room in the Radwaste Building to maintain the hallway as a Zone I area. This was verified in the shielding calculation performed for the proposed Radwaste Building design.
- d) The change in radiation zone designations for the HVAC Equipment Room and the Monitor Tanks Room to lower dose level zones is a result of updated calculations using updated Waste Monitor Tank (WMT) source terms which are more typical for normal operation. During typical operations, the WMTs contain only mildly activated water resulting in Zone II or lower dose levels on the tanks surfaces. Based on the WMT design intent (i.e., holding water to be released to the environment) and industry information, the calculation assumes that the fluid in the WMTs has a fraction of the maximum WLS activity for design basis conditions. If a plant were to operate with significant fuel failures, it would be necessary to first use the Auxiliary Building monitor tanks rather than the Radwaste Building tanks. Consequently, the assumption of normal operating source terms is appropriate and results in the revised zone classifications for the HVAC Equipment Room and the Monitor Tanks Room. Note that the design basis radiation zone information is still included as a note to the radiation zone drawing to ensure that SCE&G considers both possible waste monitor tank conditions (expected operations and design basis conditions).
- e) The lighter shade for the middle mobile system compared with the two adjoining mobile systems was not intended and all mobile systems should be depicted with the same shading. The lighter shade for the middle mobile system is the result of a graphical issue.
- f) Radwaste Building Design
 - 1) The proposed sliding door that was added to the east wall of the Waste Accumulation Room is a six-inch steel shield door which has the equivalent shielding capability as the one-foot, four-inch concrete wall to which it is attached. This input was used in the shielding calculation which was performed that establishes the

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Enclosure 5 – SCE&G Response to NRC Request for Additional Information

Letter No. 1

LAR 13-09 S1

Mobile Systems Facility as a Zone II area, which is unchanged from the designation in the current UFSAR.

- 2) As noted in the response to Item 8.f1 above, the proposed sliding door will provide an equivalent amount of shielding as the shield wall to the Mobile Systems Facility.

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

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Enclosure 6

**Revisions to Enclosure 1
License Amendment Request:
Annex and Radwaste Building Changes (LAR 13-09 S1)**

(LAR 13-09 S1)

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Enclosure 6 – Revisions to Enclosure 1 License Amendment Request: Annex and
Radwaste Building Changes
LAR 13-09 S1

With this supplement, South Carolina Electric & Gas Company (SCE&G) has made an editorial clarification and correction to Enclosure 1 submitted with Reference 1. The Page number indicated below refers to an Enclosure 1 page.

Change Summary:

Throughout Enclosure 1 the terms plant-specific DCD Tier 1 and plant-specific Tier 1 are used as synonymous terms.

Enclosure 1 Page 18 of 19, in the title line of Section 5 (ii), the word “hat” is corrected to read “that.” The sentence now reads as follows:

“There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.”

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

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Enclosure 7

**Revisions to Enclosure 3
Proposed Changes (Public Information)**

(LAR 13-09 S1)

With this supplement, South Carolina Electric & Gas Company (SCE&G) has made some editorial corrections to Enclosure 3 submitted with Reference 1. The page numbers indicated below refer to Enclosure 3 pages.

Change Summary:

Page 3 of 13:

Tier 1, Table 3.3-6, *Inspections, Tests, Analyses, and Acceptance Criteria* [VCSNS Tier 1, pages 3.3-21 & 3.3-22]

[VCSNS Unit 2 COL, Appendix C, pages C-427 & C-428]

[VCSNS Unit 3 COL, Appendix C, pages C-427 & C-428]

For Row 6.b of the table, an update was made in the first cell to change the word “package” to “packaged”, and in the second cell the word accumulation was added after storage. The row now reads as follows:

(Excerpts from) Table 3.3-6 Inspections, Tests, Analyses, and Acceptance Criteria		
6.b) The radwaste building packaged -waste- storage <u>accumulation</u> room has a volume greater than or equal to 1293 - <u>1417</u> cubic feet.	An inspection of the radwaste building packaged waste storage - <u>accumulation</u> room (50352 <u>50351</u>) is performed.	The volume of the radwaste building package -waste storage - <u>accumulation</u> room (50352 <u>50351</u>) is greater than or equal to 1293 - <u>1417</u> cubic feet.

Page 4 of 13:

Tier 1, Table 3.5-5, *Area Radiation Monitors* [VCSNS Tier 1, pages 3.5-4]

[VCSNS Unit 2 COL, Appendix C, page C-444]

[VCSNS Unit 3 COL, Appendix C, page C-444]

For Row 7 of the table, an update was made in the second cell to change RMS-RE014 to RMS-RY014. The row now reads as follows:

Table 3.5-5 Area Radiation Monitors	
Liquid and Gaseous Radwaste Area ^(†)	RMS-RY014

Page 7 of 13:

UFSAR, Table 9A-3, Fire Protection Summary

For 5031 AF 50351 Waste Accumulation Room, the Plastic Heat Value was corrected from “7.3E+07” to “7.3E+06”

For 5031 AF 50351 Waste Accumulation Room, the “Net Cat.” deleted “Comb. Load” was corrected from “272000” to “277000” as shown in the UFSAR Rev 2.

For 5031 AF 50351 Waste Accumulation Room, the “Net Cat.” the Total Heat Value was corrected from “4.3+08” to “4.3E+08”

For deleted 5031 AF 50352, “Package Waste Storage Room” was corrected to “Package Waste Storage” as shown in the UFSAR Rev 2.

For 5031 AF 50355 Monitor Tank Room, the “Net Cat.” values for “Comb. Load” and “Equiv. Dur.” were added as 18600 and 14 as shown in the UFSAR Rev 2.

The updated table now reads as follows:

(Excerpt from)										
Table 9A-3										
FIRE PROTECTION SUMMARY										
Fire Area/ Zone ⁽¹⁾	Safety Area ? ⁽²⁾	Floor Area Sq Ft	Combust. Material ⁽³⁾	Fire Sev. Cat.	Amount	Heat Value (Btu)	Comb. Load, Btu/Sq Ft	Equiv. Boundary Dur. Fire Res ⁽⁴⁾ (Min) (Hours)	Detect. Cap.	Fixed Suppression Capability ⁽⁵⁾
5031 AF 50351 WASTE ACCUMULATION ROOM			LUBE OIL	E	300	4.5E+07			HEAT	PREACTION SPRINKLERS HOSE STATION
			CABLE INS	C	1500 2000	1.5E+07 2.0E+07				
			CLOTH	B	10000	8.0E+07				
			PAPER	C	2500	1.9E+07				
			TRASH	B	31000	2.4E+08				
			PLASTIC	D	500-550	6.6E+06 7.3E+06				
			WOOD	C	400-800	3.4E+06 6.7E+06				
			RUBBER	D	500	6.1E+06				
			VOLATILESE	E	10	1.4E+06				
		1500 2310		NET CAT.	E	TOTAL:	4.2E+08 4.3E+08	277000 184000	208 138	
5031-AF-50352			CABLE-INS	C	500	5.1E+06			HEAT	PREACTION
PACKAGED-WASTE			PLASTIC	D	50	6.6E+05				SPRINKLERS
STORAGE			WOOD	C	400	3.4E+06				HOSE-STATION

(Excerpt from)						
Table 9A-3						
FIRE PROTECTION SUMMARY						
	810	NET CAT. D	TOTAL:	9.1E+06	11000	8
5031 AF 50353 HVAC EQUIPMENT ROOM		CABLE INS C	1100	1.1E+07		HEAT HOSE STATION
		PLASTIC D	20	2.6E+05		
		LUBE OIL E	2	3.0E+05		
		VOLATILESE	10	1.4E+06		
	840	NET CAT. D	TOTAL:	1.3E+07	16000	11
5031 AF 50354 TRUCK STAGING AREA		CABLE INS C	400	4.1E+06		HEAT PREACTION SPRINKLERS HOSE STATION
		PLASTIC D	20	2.6E+05		
		LUBE OIL E	2	3.0E+05		
		VOLATILESE	10	1.4E+06		
		FUEL OIL E	100	1.4E+07		
	792	NET CAT. E	TOTAL:	2.0E+07	26000	19
5031 AF 50355 MONITOR TANK ROOM		CABLE INS C	1600	1.6E+07		NONE HOSE STATION
		VOLATILESE	40	5.4E+06		
		LUBE OIL E	5	7.6E+05		
	1210	NET CAT. E	TOTAL:	2.3E+07	18600	14
FIRE AREA TOTAL:	12483	NET CAT. E	TOTAL:	6.0E+08	47805 48065	36

Page 9 of 13:

The title “UFSAR, Subsection 11.4.2.1, *General Description*, ninth and tenth paragraphs” is revised to “UFSAR, Subsection 11.4.2.1, *General Description*, tenth and eleventh paragraphs”

Page 9 of 13:

In the second paragraph the color scheme in the sentence

“The available minimum useful storage volume for packaged waste in the packaged waste storage-accumulation room”

is revised as follows to denote a change for the word “for packaged waste” and “accumulation”

The available minimum useful storage volume for packaged waste in the packaged-waste storage-accumulation room