

COL Section 13.3 SER Boilerplate

[Reviewer's notes: This outline has been developed based upon the approach that the application contains five basic parts: The first section follows the NRO template and provides a roadmap for this section of the SER and an overall summary of the evaluation, and four Appendices: 1) if needed, the evaluation of departures, information items and supplemental items in the DCD, 2) additional required emergency planning and preparedness information, which provides for the evaluation of information not required to be in the emergency plan, 3) the evaluation of the onsite emergency plan, and 4) the FEMA's evaluation of the offsite emergency plans, which accommodates the inclusion of their findings and determination.

The reviewer should summarize any RAIs and the subsequent responses in the applicable Technical Information section of each Appendix. In the Technical Evaluation section of each Appendix, the reviewer will need to provide a statement regarding the acceptability of each RAI.

When the response to an RAI is not acceptable, the reviewer will need to develop Open Items for it in the respective Technical Information section.

The summaries of the regulations in the Regulatory Basis sections of Appendix C are needed since the requirements in some sections of Appendix E to 10 CFR Part 50 were split to fit into one of the 16 Planning Standards. This ensures clarity related to which portion of Appendix E was reviewed rather than stating that the applicant complied with "applicable portions" of the regulations.

ITAAC should be addressed in the respective regulation or evaluation criterion portion of the SER. In addition, a complete ITACC Table is to be included at the end of the "Onsite Emergency Plan" Appendix of the SER.

The format is based on NRO guidance dated June 6, 2008, for COL applications that reference a design certification. NRO has also developed guidance for the other reactor designs. However, since most of EP is programmatic (excluding the TSC/OSC, etc. described in the design certification), this boilerplate should be applicable for all designs.]

VIRGIL C. SUMMER NUCLEAR STATION SAFETY EVALUATION REPORT INPUT

November 16, 2008

13.0 CONDUCT OF OPERATIONS

13.3 Emergency Planning

13.3.1 Introduction

This section addresses the design features, facilities, functions, and equipment necessary for emergency planning that must be considered in the design basis of a standard plant. The design features pertaining to emergency planning in the [AP1000 Standard Plant] scope include the technical support center (TSC) and the operational support center (OSC).

This section also addresses emergency planning for the [Virgil C. Summer Nuclear Station (VCSNS)] site. In Part 5, "Emergency Plan" of the combined license (COL) [South Carolina Electric & Gas (SCE&G)] provided the emergency plan for responding to a broad range of radiological emergencies, including hostile actions, at the [VCSNS Units 2 and 3] site as required by 10 CFR 50.47(b) and Appendix E to 10 CFR 50. In addition, Part 5 includes, as supplemental information, current state and local emergency planning documents. The information provided by the applicant provides the basis for the evaluation of the adequacy of the onsite, state and local emergency plans the [VCSNS] site and a determination as to whether there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

FEMA reviewed the offsite emergency plans for the states of [South Carolina], the local government plans for [Fairfield, Newberry, and Lexington, and Richland] counties in [South Carolina], and the applicant's responses to requests for additional information (RAIs). On ----, FEMA provided its interim findings report. (see ADAMS Accession ML----) The NRC staff has reviewed the FEMA report, and their overall conclusions are reflected in Section 13.3.6.

13.3.2 Summary of the Application

In Section 13.3, "Emergency Planning," of Part 2, "Final Safety Analysis Report," (FSAR) of the [VCSNS] COL application, the applicant incorporated by reference [Revision 16 of the generic AP1000] design certification document (DCD) [without any departures] [OR with the following Tier 2 Departure from the AP1000 DCD, Revision 16]:

- [Example: BLN DEP 18.8-1 is related to the locations of the technical support center and the operational support center for each unit.]

In Section 13.3, "Emergency Planning," of Part 2, "FSAR," of the [SCE&G] COL Application, the applicant provided the following standard STD COL information items and supplemental information items to resolve AP1000 DCD COL action items:

COL information items:

1
2 - **[Example:** STD COL 13.3-1 addresses the need for COL applicants referencing the
3 AP1000 certified design to address emergency planning including post-72 hour actions and
4 communications interfaces.]

5
6 - **[Example:** STD COL information item 13.3-2 addresses the need for COL applicants
7 referencing the AP1000 certified design to address activation of the emergency operations
8 facility with the current operating practice and
9 NUREG-0654/FEMA-REP-1].

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11 Supplemental information:

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13 - **[Example:** STD SUP 13.3-1 provides milestones for emergency planning implementation].

14 Part 5, "Emergency Planning," of the COL application contains the **[VCSNS Units 1 and 2]**,
15 Emergency Plan (the **[VCSNS]** Emergency Plan). The **[VCSNS]** Emergency Plan consists of a
16 basic plan and ten appendices. The ten appendices provide additional detailed information
17 regarding various aspects of the **[VCSNS]** Emergency Plan. Supplemental information includes
18 the detailed evacuation time estimate report and current state and local emergency plans.

19 This section also addresses operational programs related to emergency planning. Information
20 regarding emergency planning Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)
21 is included in Part 10, "Proposed Combines License Conditions (Including ITAAC)," Revision 0,
22 of the COL application.

23 24 **13.3.3 Regulatory Basis**

25 The regulatory basis of the information incorporated by reference is documented in NUREG-
26 1793, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design,"
27 dated September 2004. The regulatory basis for the subsequent change **will be** documented in
28 NUREG-1793, Supplement **[insert supplement number and date]**.

29 In its review of the application, the staff also considered the regulatory requirements of 10
30 CFR 52.79(a)(21) and 10 CFR 52.79(a)(22)(i), which require that the application include
31 emergency plans that comply with the requirements of 10 CFR 50.47 and Appendix E to 10
32 CFR Part 50, and emergency plan certifications from State and local governmental agencies
33 with emergency planning responsibilities.

34
35 The staff also considered 10 CFR 52.81, which (in part) requires the staff to review the
36 application according to the standards set out in 10 CFR Part 50. In addition, the staff
37 considered the applicable requirements in 10 CFR 52.77, 10 CFR 52.80, 10 CFR 50.33(g),
38 and 10 CFR 100.21.

39
40 Guidance concerning the review and evaluation of emergency planning information
41 submitted in a COL application, and for determining compliance with the applicable
42 regulations, is contained in Section 13.3, "Emergency Planning," of the Standard Review
43 Plan (SRP) (NUREG-0800). The SRP identifies NUREG-0654/FEMA-REP-1, Revision 1,
44 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and
45 Preparedness in Support of Nuclear Power Plants," NUREG-0696, "Functional Criteria for
46 Emergency Response Facilities," and various other related guidance that the staff should
47 consider during its review. The applicable application acceptance criteria are identified in
48 Section 13.3.II of the NUREG-0800.

The regulatory basis for the acceptance of operational program #14 dealing with emergency planning is established in 10 CFR 50.47(b)(14) and section IV.F. "Training," of Appendix E to 10 CFR Part 50.

13.3.4 Technical Evaluation

The NRC staff reviewed conformance of Section 13.3, "Emergency Planning," of Part 2, "FSAR," of the [VCSNS] COL Application, the [VCSNS] Emergency Plan in Part 5, "Emergency Planning," of the [VCSNS] COL Application, and the emergency planning inspections, tests, analyses, and inspection criteria (EP ITAAC) (Part 10), for conformance with the applicable standards and requirements identified in Section 13.3, "Emergency Planning," of the Standard Review Plan (SRP) (NUREG-0800). In addition, during the week of [dates], the staff conducted a site area visit to the proposed VCSNS Units 2 and 3 site. The visit included reviews of the proposed plant location and evacuation routes within the 10-mile emergency planning zone (EPZ).

Revision 16 to the AP1000 DCD is being reviewed by the staff under docket number 52-006. The revision involves changing the Tier 1 designation that the TSC is located in the Control Support Area (CSA) to Tier 2*. **Confirmation Item ----** was created to track the completion of the Revision 16 approval process, since the safety evaluation for the location of the TSC described in the [VCSNS] COL Application is based upon the Tier 2* designation, not a Tier 1 designation. The NRC staff's evaluation of the related BLN DEP 18.8-1 is also contained in Appendix A.

The NRC staff's review of the information provided in the application that is not related to the [VCSNS] Emergency Plan is contained in Appendix B, "Introductory Emergency Planning Information," of this section of the SER. The NRC staff's review of the [VCSNS] Emergency Plan is contained in Appendix C of this section of the SER. In addition, the NRC staff's review of the emergency planning information related to STD COL 13.3-1 and 2 and [If applicable] SUP COL 13.3-1 is also contained in Appendix B of this section of the SER.

The NRC staff, in consultation with FEMA, has reviewed the emergency plans for the states of [South Carolina], the local government plans for [Fairfield, Newberry, Lexington, and Richland] counties, and the applicant's responses to requests for additional information (RAIs) on [date] and [If applicable: date]. On [date], and [If applicable: date], FEMA provided its interim finding, which are provided in Appendix D of this section. The staff has reviewed the FEMA reports and concurs with the FEMA findings and determinations on offsite emergency planning.

The NRC staff also reviewed the application against the generic emergency planning ITAAC provided in Table 14.3.10-1, "Emergency Planning—Generic Inspections, Tests, Analyses, & Acceptance Criteria (EP ITAAC)," pursuant to Section 14.3.10, "Emergency Planning—Inspections, Tests, Analyses, and Acceptance Criteria," of the Standard Review Plan (SRP) (NUREG-0800), March 2007.

The use of the 10 CFR 50.54(q) process, along with the ITAAC schedule required by 10 CFR 52.99(a), will provide for the orderly development, implementation, and transition of the applicant's emergency plans.

Pursuant to 10 CFR 52.79(a)(21) and 10 CFR 52.81, the staff reviewed the COL application according to the standards set out in 10 CFR Part 50, including 10 CFR 50.47 and Appendix E to 10 CFR Part 50. Under 10 CFR 50.47(a)(1)(ii), no initial combined license under 10

CFR Part 52 will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. In addition, under 10 CFR 50.47(a)(2), the NRC will base its finding on a review of the FEMA findings and determinations as to whether State and local emergency plans are adequate, and whether there is reasonable assurance that they can be implemented, and on the NRC assessment as to whether the applicant's onsite emergency plans are adequate and whether there is reasonable assurance that they can be implemented. Implementation milestones associated with the emergency plans are provided below under Section 13.3.5, "Post-Combined Operating License Activities."

13.3.5 Post-Combined Operating License Activities

Activities that the COL holder (i.e., licensee) shall perform after the COL is issued, that are applicable to emergency planning, consist of the ITAAC that are made conditions to the COL pursuant to 10 CFR 52.97(c). The proposed COL ITAAC that are applicable to emergency planning for [VCSNS] are included in Table 3.1-1, "Inspections, Tests, Analyses, and Acceptance Criteria," of the AP1000 Design Control Document (DCD) and Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," of Part 10, "Proposed Combined License Conditions (Including ITAAC)," of the COL Application. As required by 10 CFR 52.97(b), these include the inspections, tests, and analyses that the COL licensee shall perform, and the acceptance criteria that, if met, are necessary and sufficient to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the provisions of the *Atomic Energy Act*, and the Commission's rules and regulations. Table [or Tables] 13.3-1, "Emergency Planning ITAAC for Bellefonte," included at the end of Appendix C to this SER section, contains the emergency planning ITAAC for [VCSNS].

The following are applicable Operational Program No. 14 ("Emergency Planning") implementation milestones, and license condition.

Implementation milestones

- A full participation exercise conducted within 2 years of scheduled date for initial loading of fuel.
- Onsite exercise conducted within 1 year before the schedule date for initial loading of fuel.
- Applicant's onsite detailed implementing procedures for its onsite emergency plan submitted at least 180 days prior to schedule date for initial loading of fuel.

License Condition

- 13.3-1: Complete a fully developed set of emergency action levels (EALs) for [VCSNS Units 2 and 3], which are based on in-plant conditions and instrumentation, including onsite and offsite monitoring; have been discussed and agreed on by the applicant or licensee, and State and local governmental authorities; and approved by the NRC. (See Section 13.3.1C.D, "Emergency Classification System.")

13.3.6 Conclusion

The NRC staff concludes that the information pertaining to emergency planning in Section 13.3, "Emergency Planning," of Part 2, "FSAR," of the VCSNS Units 2 and 3 COL application, is within the scope of the AP1000 certified design, and adequately incorporates by reference those elements of the AP1000 Design Control Document that address emergency planning, and is thus acceptable. In addition, the staff has reviewed the application's additional COL information items and supplemental information items against the relevant NRC regulations and guidance, including the acceptance criteria identified in Section 13.3.II of NUREG-0800, "Standard Review Plan," (SRP) and conclude that the applicant is in compliance with NRC regulations. The STD COL information items have been adequately addressed by the applicant and can be considered closed.

In addition, the staff reviewed a Tier 2 departure associated with the AP1000 DCD, identified by the applicant in Part 2 (Section 13.3) of the FSAR, against the relevant regulations and acceptance criteria identified in Section 13.3.II of the SRP. The staff concludes that the departure is appropriate, does not require prior NRC approval, and is consistent with NRC regulations. [Placeholder: pending resolution of Confirmation Item ----] There are no Tier 1 departures or supplements associated with emergency planning in the application.

The NRC staff concludes that, provided that License Condition 13.3-1 and the enumerated ITAAC are met, the [VCSNS] onsite emergency plan establishes an adequate planning basis for an acceptable state of onsite emergency preparedness, and there is reasonable assurance that the plan can be implemented.

FEMA concluded that the offsite State and local emergency plans are adequate to cope with an incident at [VCSNS], and that there is reasonable assurance that these plans can be implemented. On the basis of the NRC review of these FEMA's findings, the staff concludes that the Bellefonte offsite emergency plans establish an adequate planning basis for an acceptable state of offsite emergency preparedness, and there is reasonable assurance that the plans can be implemented.

Pursuant to 10 CFR 52.80(a), the [VCSNS] Nuclear Plant, Unit(s) 2 and 3, COL application includes the proposed inspections, tests, and analyses that the licensee shall perform, and the acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, the facility has been constructed and will operate in conformity with the license, the provisions of the Atomic Energy Act, and the NRC's rules and regulations. The COL inspections, tests, analyses, and acceptance criteria (ITAAC) that are applicable to emergency planning for [VCSNS] Nuclear Plant, Unit(s) 2 and 3, are acceptable and included in Table 13.3-1, "Emergency Planning ITAAC for [VCSNS]," of SER Appendix C.

The staff concludes that the emergency plans provide an adequate expression of the overall concept of operation and describe the essential elements of advanced planning and the provisions made to cope with emergency situations. As such, the staff concludes that the overall state of onsite and offsite emergency preparedness, when fully implemented, will meet the applicable requirements of 10 CFR 50.33, 10 CFR 50.34, 10 CFR 50.47, Appendix E to 10 CFR Part 50, 10 CFR 52.77, 10 CFR 52.79, 10 CFR 50.80, 10 CFR 52.81, and 10 CFR 100.21. Further, pursuant to 10 CFR 50.47(a)(1)(ii), the staff concludes that, subject to License Condition(s) 13.3-1, [insert other License Conditions] and satisfactory completion

1 of the ITAAC, there is reasonable assurance that adequate protective measures can and will
2 be taken in the event of a radiological emergency at the [VCSNS] site, and that emergency
3 preparedness at [VCSNS] Nuclear Plant, Unit(s) 2 and 3, is adequate to support full-power
4 operations.

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2 **[Place holder; if needed to minimize discussion in the introduction.]**

3 **Appendix A - COL Information Items, Supplemental Information Items**
4 **and Departures**

5 **[Reviewer's note: see the Bellefonte SER for an example.]**

Appendix B – Additional Required Emergency Planning Information

13.3.1B Introduction

This section of the SER contains the evaluation of the additional required information provided in the COL application as it relates to emergency planning and preparedness. This information includes material that is required to be in the application, but is not appropriate to be in the onsite and offsite emergency plans.

In its review of the introductory information, the staff considered the following regulatory requirements:

13.3.1B.1 Regulatory Basis: 10 CFR 50, Appendix E. Section III, “The Final Safety Analysis Report,” requires in part that the Final Safety Analysis Report (FSAR) contain plans for coping with emergencies. Parts of 10 CFR 50, Appendix E, Section IV, “Content of the Emergency Plans,” and 10 CFR 52.79(a)(21), “Contents of the applications; technical information in the final safety analysis report,” and 10 CFR 50.34(b)(6)(v), “Final Safety Analysis Report” also require that the Final Safety Analysis Report (FSAR) contain an onsite emergency plan that complies with 10 CFR 50.47 and Appendix E to 10 CFR 50.

Technical Information in the application: Section ---- of the ---- Plan [states/describes/identifies/lists/contains/etc.] that [summarize the key content of the information from the emergency plan that addresses the evaluation criterion (don’t copy the information verbatim)]. **[Note:** The applicant / staff “stated”; and the plan “states”.]

Technical Evaluation: [If applicable: Address the adequacy of the RAI response.] **[Modify as needed]** COL Information Item 13.3-1 in Chapter 13.3, “Emergency Planning,” of Part 2, “FSAR,” of the COL Application states that the onsite emergency plan for (**insert plant and unit name**) was submitted as a separate document. The separate document is contained in Part 5, “Emergency Planning,” of the COL application. The onsite emergency plan for (**insert plant and unit name**) includes ten appendices that provide additional detailed information on various aspects of the onsite emergency plan. The applicant also provided supplemental information to the onsite emergency plan that includes a detailed evacuation time estimate analysis.

13.3.1B.2 Regulatory Basis: 10 CFR 50.33(g) and 10 CFR 52.77 require, in part, the submittal of State and local emergency plans.

Technical Information in the application: Section ---- of the ---- Plan

Technical Evaluation: [If applicable: Address the adequacy of the RAI response.] The applicant submitted offsite emergency plans for State and local governmental entities that are wholly or partially within the plume exposure pathway EPZ. These State and local governmental entities include: **[list States and local entities]**. The offsite emergency plans for the following State governments wholly or partially with in the ingestion pathway EPZ were also submitted: **[list states]**. The results of the FEMA review of, and their findings and determinations related to, the offsite plans for the ---- plant are contained in Appendix D, “Offsite Emergency Plans,” of this section of the SER.

13.3.1B.3 Regulatory Basis: 10 CFR 50.33, “Contents of the application; general information.” 10 CFR 50.33(g) requires, in part, a description of the plume exposure pathway and ingestion

1 pathway emergency planning zones (EPZs). 10 CFR 52.77, "Contents of applications; general
2 information" requires the application to contain all the information required by 10 CFR 50.33. In
3 addition, 10 CFR 50.47(c)(2) also specifies the sizes of the EPZs.

4 **Technical Information in the application:** Section ---- of the ---- Plan

5 **Technical Evaluation:** [If applicable: Address the adequacy of the RAI response.] The onsite
6 emergency plan describes the plume exposure pathway EPZ for nuclear power reactors as
7 consisting of an area about 10 miles in radius and the ingestion pathway EPZ consisting of an
8 area about 50 miles in radius. The exact size and configuration of the EPZs surrounding a
9 particular nuclear power reactor were determined in relation to the local emergency response
10 needs and capabilities as they are affected by such conditions as demography, topography,
11 land characteristics, access routes, and jurisdictional boundaries.

12
13 **13.3.1B.4 Regulatory Basis:** 10 CFR 52.79, "Contents of the applications; technical
14 information in the final safety analysis report." 10 CFR 52.79(a)(22)(i) requires certifications from
15 the State and local governmental agencies with emergency planning responsibilities that (1) the
16 proposed emergency plans are practicable; (2) these agencies are committed to participating in
17 any further development of the plans, including any required field demonstrations; and (3) these
18 agencies are committed to executing their responsibilities under the plans in the event of an
19 emergency; [If applicable: 10 CFR 52.79(b)(4) requires that the FSAR include any new or
20 additional information that that updates and corrects that was provided under 10 CFR 52.17(b).]
21 [If applicable: 10 CFR 52.79(b)(5) states that if emergency plans are approved as part of the
22 early site permit, new certifications meeting the requirements of 10 CFR 52.79(a)(22) are not
23 required.]

24 **Technical Information in the application:** Section ---- of the ---- Plan

25 **Technical Evaluation:** [If applicable: Address the adequacy of the RAI response.] The
26 applicant provided certifications from the State and local governmental agencies with
27 emergency planning responsibilities which stated that (1) the proposed emergency plans were
28 practicable; (2) these agencies were committed to participating in any further development of
29 the plans, including any required field demonstrations; and (3) these agencies were committed
30 to executing their responsibilities under the plans in the event of an emergency.

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32 **13.3.1B.5 Regulatory Basis:** 10 CFR 50.34, "Content of construction permit and operating
33 license applications; technical information," and 10 CFR 52.79, "Contents of applications;
34 technical information in final safety analysis report." 10 CFR 50.34(h)(1)(i) and 10 CFR
35 52.79(a)(41) require that the application include an evaluation of the facility against the
36 Standard Review Plan. Section 13.3, "Emergency Planning," Revision 3, of NUREG-0800,
37 "Standard Review Plan," dated March 2007, provides guidance for the review of onsite
38 emergency plans for nuclear power plants. 10 CFR 50.34(h)(2) and (3) require that the
39 evaluation identify and describe all differences from the SRP acceptance criteria in SRP Section
40 13.3 and evaluate how the proposed alternatives to the SRP criteria provide an acceptable
41 method of complying with the Commission's regulations. Where differences existed, the
42 evaluation should discuss how the proposed alternative provides an acceptable method of
43 complying with Commission's regulations, or portions thereof, that underlie the corresponding
44 SRP acceptance criteria.

45 **Technical Information in the application:** Section ---- of the ---- Plan ...

Technical Evaluation: [If applicable: Address the adequacy of the RAI response.] **[10 CFR 52.79(a)(41) and 10 CFR 52.79(h)(1)(i)]** In section ----- of the application, the applicant included an evaluation of the facility against the March 2007 version of the Standard Review Plan (SRP). **[10 CFR 50.34(h)(2) and (3)]** The evaluation identified and described all differences from the SRP acceptance criteria in SRP Section 13.3 and evaluated how the proposed alternatives to the SRP criteria provide an acceptable method of complying with the Commission's regulations. [If applicable: Where differences existed, the evaluation discussed how the alternative proposed provides an acceptable method of complying with those rules or regulations of [the] Commission, or portions thereof, that underlie the corresponding SRP acceptance criteria. **[OR discuss RAIs to resolve discrepancies.]**

13.3.1B.6 Regulatory Basis: [If applicable: 10 CFR 52.73, Relationship to other Subparts," states, in part, that the applicant for COL may reference a standard design.

Technical Information in the application: Section ---- of the ---- Plan

Technical Evaluation: [If applicable] Address the adequacy of the RAI response.] The AP1000 design certification document (DCD) is incorporated into the COL Application by reference. [If applicable] Departures from, and supplements to, the AP1000 DCD are addressed in Appendix A, "COL Information Items, Supplemental Information Items and Departures," to this section of the SER.

13.3.1B.7 Regulatory Basis: [If applicable: 10 CFR 52.73, "Relationship to other Subparts," states, in part, that the applicant for COL may reference an Early Site Permit.

Technical Information in the application: Section ---- of the ---- Plan

Technical Evaluation: [If applicable: Address the adequacy of the RAI response.] [If applicable: **[10 CFR 52.79(b)(4) and 10 CFR 52.73]** Since the early site permit (ESP) for [insert plant name] approved the onsite emergency plan, [or major features of emergency plans,] the applicant included new [and additional] information that updates and corrects the information that was provided under 10 CFR 52.17(b). [If applicable: The applicant discusses whether the new [and additional] information materially changes the bases for compliance with the applicable requirements.] **[Note:** Any discussion regarding bases for compliance should be included in this section of the SER and not the emergency plan evaluation part.]

[If applicable: The applicant identified [did not identify] changes to the emergency plans [or major features of emergency plans] that were incorporated into the proposed facility emergency plan that constituted or would constitute a decrease in effectiveness under 10 CFR 50.54(q).]

[If applicable: The applicant provided certifications from the State and local governmental agencies with emergency planning responsibilities that (1) the proposed emergency plans are practicable; (2) these agencies are committed to participating in any further development of the plans, including any required field demonstrations; and (3) these agencies are committed to executing their responsibilities under the plans in the event of an emergency.] **[OR if applicable:** As specified in **10 CFR 52.79(b)(5)**, complete and integrated emergency plans were approved as part of the ESP for [insert plant name] and new certifications meeting the requirements of 10 CFR 52.79(a)(22)(i) were not required.]

13.3.1B.8 Regulatory Basis: [If applicable] 10 CFR 52.81, "Standards for review of applications" states that COL applications will be reviewed according to the standards in 10 CFR Parts 50 and 100. Therefore, the requirements of 10 CFR 100, "Reactor Site Criteria,"

Subpart B, "Evaluation Factors for Stationary Power Reactor Site Applications on or after January 10, 1997," are applicable. 10 CFR 100.1(c) requires the identification of physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans; 10 CFR 100.21(g) in 10 CFR 100.21, "Non-seismic siting criteria," requires that applications for site approval must identify physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans.

Technical Information in the application: Section ---- of the ---- Plan

Technical Evaluation: [If applicable: Address the adequacy of the RAI response.] [Note: For a greenfield site, the applicant will need to address 10 CFR 100.1(c), 10 CFR 100.21, and 10 CFR 100.21(g), which require the identification of physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans.] Address the adequacy of the RAI response.]

[If applicable] In Appendix A, "Evacuation Time Estimates," to the ---- Emergency Plan, the applicant concluded that there are no physical characteristics unique to the ---- site that pose a significant impediment to the development of the proposed emergency plans. This conclusion is based on the information contained in Appendix A and the report titled "---- Nuclear Plant, Development of Evacuation Time Estimates," dated September 2007, for the plume exposure pathway EPZ.

[If applicable] Since an emergency plan already exists for the site, the applicant addresses the requirements in 10 CFR 100.1(c) and 100.21(g) by stating that there are no impediments to the development of an emergency plan.] [If applicable: In ---- section of the application, the applicant concluded that there are no physical characteristics unique to the [site name] site that pose a significant impediment to the development of the proposed emergency plans for the [insert plant name]. This conclusion is based on the [insert applicant name] consideration of the general description of the site and the area population, as specified in evaluation criteria [J.8, J.10.I, J.10.m], ¹ in a recently developed [insert date] ETE for the [site name] 10-mile plume exposure pathway EPZ. This [insert date] ETE is included as Enclosure ---, "Evacuation Time Estimate for the [insert plant name]," of the application. ESP Plan Section J, "Protective Response," and SER Section 13.3.---- discuss the ETE in more detail.]

13.3.1B.9 Conclusion Related to the Additional Required Emergency Planning Information in the Application

The NRC staff reviewed the information (excluding the information related to onsite and offsite emergency plans) provided in the [insert applicant's name] combined license (COL) application for [indicate site name]. The staff reviewed the information related to onsite emergency preparedness against the applicable requirements of 10 CFR 50, Appendix E, Section III; 10 CFR 50.33(g); 10 CFR 50.34(b)(6)(v); 10 CFR 50.34(h)(1)(i),(2) and (3); 10 CFR 52.77; 10 CFR 50.47(c)(2); 10 CFR 52.79(a)(21); 10 CFR 52.79(a)(22)(i); [if applicable: 10 CFR 52.73; 10 CFR 52.77; 10 CFR 52.81; [if applicable: 10 CFR 52.79(b)(4); [if applicable: 10 CFR 52.79(b)(5)]; 10 CFR 100.1(c); 10 CFR 100.21(g); and Subsection 13.3 of NUREG-0800.

¹ The bracketed, alphanumeric designations used throughout Section 13.3 of this SER identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with regulations.

1 The staff concludes that, the content of the COL application (excluding the information related to
2 onsite and offsite emergency plans) is adequate.

3 **[If applicable:] License Conditions**

4 **[Note:** Refer to the Licensee Conditions here and in overall summary.]

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Appendix C - Onsite Emergency Plan

13.3.1C Introduction

The NRC evaluates emergency plans for nuclear power reactors to determine whether there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. This Appendix to the SER provides the results of the review of the onsite emergency plan for the proposed reactors at the Virgil C. Summer Nuclear Station (VCSNS).

Part 2, "FSAR," of the combined license (COL) Application states in Section 13.3, "Emergency Planning," that the VCSNS Units 2 and 3 Emergency Plan is contained in a separate document. The separate document is Part 5, "Emergency Planning," of the COL application. Also included as part of the onsite emergency plan are ten appendices, which provide additional detailed information on various aspects of the VCSNS Emergency Plan. In addition, the VCSNS Units 2 and 3 Emergency Plan includes a set of inspections, tests, analyses, and acceptance criteria (ITAAC) to address those aspects of the VCSNS Units 2 and 3 Emergency Plan that cannot be completed at the COL application phase.

The following SER subsections describe the NRC staff's evaluation of the onsite emergency plan for the VCSNS site and parallels the planning standards in NUREG-0654/FEMA-REP-1, Criteria for preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," issued November 1980.

13.3.1C.A Assignment of Responsibility (Organizational Control)

13.3.1C.A.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(1) requires that primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the EPZs be assigned, the emergency responsibilities of the various supporting organizations be specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(1), the NRC staff evaluated it against the detailed evaluation criteria² in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [A.1.a.] Section 1.A, "Concept of Operations," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan provides a list of State, local, Federal and private sector organizations that are intended to be part of the overall Emergency Response Organization (ERO). Responsibilities of participating agencies are discussed in the following sections: Section A.1.a.1, "Federal Agencies" (pages A-1/4); Section A.1.a.2, "State Agencies," (pages A-4/5); Section A.1.a.3, "County Government Agencies," (page A-5); Section A.1.a.4, "Private Agencies," (page A-5). In **RAI 13.03-17(A)** the staff requested additional information related to the specific roles of private agencies in emergency response and associated Letters of Agreement. In a response letter dated May 8, 2009, the applicant provided copies of the Letters of Agreement or Memorandum of Understanding for organizations listed in Appendix 2, "Letters of Agreement."

Technical Evaluation: The staff finds the applicant's response to **RAI 13.03-17(A)** to be acceptable and therefore resolved.

Technical Information in the Emergency Plan: [A.1.b.] Section A.1.b, "Concept of Operations," of the VCSNS Units 2 and 3 Emergency Plan provides the concept of operations for South Carolina Electric & Gas (SCE&G) and its relationship to the total response effort. Additional information related to SCE&G can be found in Final Safety Analysis Report (FSAR) Chapter 13, "Conduct of Operations."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the applicant's operational role, its concept of operations, and its relationship to the total effort.

Technical Information in the Emergency Plan: [A.1.c.] A block diagram outlining the interrelationships of participating organizations is provided in Figure A-1, "Agency Response Organization Interrelationships," (Page A-8). Figure A-2, "VCSNS Augmented Emergency Response Organization Interrelationships," (Page A-9) contains a block diagram of the interrelationships of the emergency response organizations following activation of the Emergency Operation Facility (EOF). In **RAI 13.03-17(B)** the staff requested a revision to Figure A-1 that would identify interaction between DOE, the VCSNS site, and state agencies. In a response letter dated May 8, 2009 (pg. 2), the applicant committed to revise Section A.1.a.1.c to read as follows:

If VCSNS or the affected states deem that assistance from DOE is necessary or desirable, they will request that assistance using the proper channels. VCSNS will

² The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

1 contact the US NRC Headquarters and the affected state(s) will make contact through
2 DHS.

3 **Technical Evaluation:** The staff finds the additional information and textual revisions submitted
4 in response to **RAI 13.03-17(B)** to be acceptable. **Confirmatory Action NRC Item 13.03-01**
5 was created to track the proposed revision.

6 **Technical Information in the Emergency Plan: [A.1.d.]** Section A.1.c, Concept of
7 Operations,” (page A-6) of the VCSNS Units 2 and 3 Emergency Plan states the Emergency
8 Director (ED) is responsible for coordinating emergency response action of the station, and the
9 Emergency Public Information Organization (EPI) with affected State and county agencies. This
10 position is held by a senior VCSNS employee. The senior operations person on shift will serve
11 as the Interim Emergency Director (IED) until relieved by the ED.

12
13 **[A.1.e.]** Section A.1.d, Concept of Operations,” (page A-6) of the VCSNS Units 2 and 3
14 Emergency Plan states procedures for training and maintenance of the emergency organization
15 are in place to ensure 24-hour-per-day staffing for emergency response. Section A.4,
16 “Continuous Coverage,” states that VCSNS maintains 24-hour emergency response capability.
17

18 **Technical Evaluation: [A.1.d.]** A specific individual was identified by title who shall be in
19 charge of the emergency response, and **[A.1.e.]** the VCSNS Units 2 and 3 Emergency Plan
20 describes provisions for 24-hour per day emergency response, including 24-hour per day
21 manning of communications links.
22

23 **Technical Information in the Emergency Plan: [A.3.]** Section A.3, “Agreements in Planning
24 Effort,” of the VCSNS Units 2 and 3 Emergency Plan states written agreements between
25 VCSNS and other support organizations have been developed. Agreements identify the
26 emergency measures to be provided, the mutually accepted criteria for implementation, and the
27 arrangements for exchange of information. A list of Letters of Agreement is provided in
28 Appendix 2, “Letters of Agreement.” In **RAI 13.03-17(C)** the staff requested the applicant
29 provide Letters of Agreement to verify agreements have been made. The applicant addressed
30 **RAI13.03-17(C)** in their response to **RAI 13.03-17(A)**. In their response the applicant provided
31 copies of the Letters of Agreement or Memorandum of Understanding for organizations listed in
32 Appendix 2.

33 **Technical Evaluation:** The staff found the applicant’s response to **RAI 13.03-17(A)** to be
34 acceptable and therefore resolved.

35 **Technical Information in the Emergency Plan: [A.4.]** Section A.4, “Continuous Coverage,” of
36 the VCSNS Units 2 and 3 Emergency Plan states that VCSNS maintains 24-hour emergency
37 response capability. The normal on-shift complement is trained to handle emergency situations
38 and will provide the initial response until relieved/augmented by the ERO. Personnel from the
39 unaffected unit(s) will also be available. The ED has the authority and responsibility for assuring
40 continuity of resources in the event of the activation of the ERO. In **RAI 13.03-17(D)** staff
41 requested additional information to identify a 24-hour point of contact. In a response letter
42 dated May 8, 2009 (pgs. 2/3), the applicant stated that the Control Room is the location of the
43 24-hour communication point of contact. The IED or the ED, which ever is in command, came
44 be contacted through the use of the ESSX Line provided in the Control Room, Technical
45 Support Center (TSC), and the EOF.

46 **Technical Evaluation:** The staff finds the additional information submitted in response to **RAI**
47 **13.03-17(D)** to be acceptable and therefore resolved.

1 In determining whether the proposed emergency plan met the applicable regulatory
2 requirements related to the area of "Assignment of Responsibility (Organization Control)," the
3 NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50.

4 **13.3.1C.A.2 Regulatory Basis:** 10 CFR 50, Appendix E. Section III., "The Final Safety
5 Analysis Report," requires that onsite emergency plans be an expression of the overall concept
6 of operation by describing the essential elements of advance planning that have been
7 considered and the provisions that have been made to cope with emergency situations. The
8 plans must also incorporate information about the emergency response roles of supporting
9 organizations and offsite agencies. The information in the onsite emergency plan shall be
10 sufficient to provide assurance of coordination among the supporting groups and with the
11 licensee.

12 **Technical Information in the Emergency Plan:** Chapter 13, "Conduct of Operations," of the
13 VCSNS Final Safety Analysis Report (FSAR) describes the organization of the V.C. Summer
14 Nuclear Station (VCSNS) site and outlines individual responsibilities. A list of staffing is
15 provided in Table 13.1-201, "Generic Position/Site Specific Position Cross Reference," (pages
16 13.1-28/32). Minimum Staffing for the VCSNS site is provided in Table 13.1-202, "Minimum On-
17 Duty Operations Shift Organization for Two-Unit Plant," (page 13.1-33). Section 13.3-2 of the
18 FSAR states the emergency plan describes the plans for coping with emergency situations,
19 including communications interfaces and staffing of the emergency operations facility. Section
20 A, "Assignment of Responsibility," of the VCSNS Units 2 and 3 Emergency Plan describes the
21 primary responsibilities and organizational control of South Carolina Electric & Gas (SCE&G),
22 Federal, State, county, and other support organizations. A block diagram outlining the
23 interrelationships of supporting organizations is provided in Figure A-1, "Agency Response
24 Organization Interrelationships," (Page A-8). A list of Letters of Agreement is provided in
25 Appendix 2, "Letters of Agreement."

26
27 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan provides an expression of
28 the overall concept of operation by describing the essential elements of advance planning that
29 have been considered and the provisions that have been made to cope with emergency
30 situations. The VCSNS Units 2 and 3 Emergency Plan also incorporates information about the
31 emergency response roles of supporting organizations and offsite agencies. The information in
32 the onsite emergency plan is sufficient to provide assurance of coordination among the
33 supporting groups and with the licensee.

34
35 **13.3.1C.A.3 Regulatory Basis:** Section IV.A.8. of Appendix E "Content of Emergency
36 Plans," to 10 CFR 50, "Emergency Planning and Preparedness for Production and Utilization
37 Facilities" requires the identification of State and local officials responsible for planning for,
38 ordering, and controlling appropriate protective actions, including evacuations when necessary.

39 **Technical Information in the Emergency Plan:** Section A, "Purpose," to Part 1 of the VCSNS
40 Units 2 and 3 Emergency Plan states that the emergency plan establishes protective actions
41 that are necessary in order to limit and mitigate the consequences of emergencies. The South
42 Carolina Emergency Management Division (SCEMD) is responsible for proposing Protective
43 Action Recommendations (PARs) to the Governor of South Carolina. The SCEMD will also
44 coordinate the implementation of the governors PARs. Final recommendations for protective
45 actions will be made by the governor. Protective Actions are discussed in detail in Section J,
46 "Protective Response." Section 5, "Emergency Measures," of each unit annex provides a
47 description of unit-specific personnel protective actions, assembly areas, and evacuation routes.

1 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan identifies State and/or local
2 officials responsible for planning for, ordering, and controlling appropriate protective actions,
3 including evacuations when necessary.

4
5 **13.3.1C.A.4 Conclusion for Assignment of Responsibility (Organizational Control)**

6 The staff has reviewed the onsite emergency plan and the applicant's responses to **RAIs 13.03-**
7 **17(A), (B), (C) and (D)** in regards to Planning Standard A of NUREG-0654/FEMA-REP-1 and
8 the requirements of 10 CFR 50.47(b)(1) and applicable parts of Section III and Section IV.A.8 of
9 Appendix E to 10 CFR Part 50. Final determination regarding this planning standard will be
10 based on verification of **Confirmatory Action NRC Item 13.03-01**.

13.3.4C.B Onsite Emergency Organization

13.3.1C.B.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(2); Planning Standard B, requires that on-shift facility licensee responsibilities for emergency response be unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available, and the interfaces among various onsite response activities and offsite support and response activities be specified.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(2), the NRC staff evaluated it against the detailed evaluation criteria³ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [B.1.] Section B, "Emergency Response Organization," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan describes staffing requirements and responsibilities to provide initial emergency response actions. A description of responsibilities of the normal staff complement is provided in Section B.1, "On-Shift Emergency Response Organization [ERO] Assignments." The initial response to an emergency event will be provided by personnel on-shift that are trained and capable of performing response actions. Table 2-1, "V.C. Summer ERO On-shift Staffing," and Table B-1a, "Shift Emergency Response Organization," of each unit annex, outlines the unit on-shift emergency organization and its relation to the normal staff complement. The full ERO, discussed in Section B.5.a, "Onsite ERO," will be activated at an Alert, Site Area Emergency, or General Emergency.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan specifies the onsite emergency organization of plant staff personnel for all shifts and its relation to the responsibilities and duties of the normal staff complement.

Technical Information in the Emergency Plan: [B.2.] Section B.2, "Authority over the Emergency Response Organization," of the VCSNS Units 2 and 3 Emergency Plan states the Interim Emergency Director (IED) (Shift Supervisor from affected unit) or Emergency Director (ED) has overall authority and responsibility for coordinating all emergency response activities at the VCSNS. The Unit 1 Shift Supervisor will be designed as the IED if multiple units simultaneously enter an emergency or a site emergency occurs. The IED assumes control of the Control Room until relieved by on-call ERO members in the Emergency Operations Facility (EOF) or by the Emergency Plant Operations Supervisor (EPOS). The ED will assume responsibility for the emergency response effort once the EOF has attained minimum staffing.

Technical Evaluation: The applicant designated an individual as emergency coordinator who shall be on shift at all times, and who shall have the authority and responsibility to immediately and unilaterally initiate any emergency actions, including providing protective action recommendations to authorities responsible for implementing offsite emergency measures.

Technical Information in the Emergency Plan: [B.3.] Section B.3, "Criteria for Assuming Command and Control (Succession)," of the VCSNS Units 2 and 3 Emergency Plan states the IED has the authority and responsibility for emergency response until relieved by the ED. The

³ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

Emergency Plant Manager (EPM) in the ERO will relieve the IED and is responsible for continued assessment of the emergency and functions of the ERO, but does not assume the ED's duties. Overall authority is transferred directly to the ED as soon as possible. The Control Room is relieved of responsibility after the declaration of an Alert or higher, by the EPOS prior to transfer to the ED. Authority does not transfer to the EOF until adequate staff is present and have been fully briefed; status of the plant is well understood by the relieving individual; and transfer of authority from IED to ED has been made. The ED may alter the ERO if necessary.

Technical Evaluation: In addition, the VCSNS Units 2 and 3 Emergency Plan identifies a line of succession for the emergency coordinator position, and identifies the specific conditions for higher level utility officials assuming this function.

Technical Information in the Emergency Plan: [B.4.] Section B.4, "Non-Delegable Duties," of the VCSNS Units 2 and 3 Emergency Plan lists those duties that may not be delegated to other elements of the emergency organization. These duties include event classification; making Protective Action Recommendations (PARs) for the general public; notification of offsite authorities; and approving company press releases pertaining to the emergency. The IED is responsible for the initial classification of the event and performing non-delegable duties until relieved by the EPOS or the ED. The ED will assume all non-delegable responsibilities from the EPOS or the IED.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes the functional responsibilities assigned to the emergency coordinator, and clearly specifies which responsibilities may not be delegated to other elements of the emergency organization. Among the responsibilities that were not delegated included the decision to notify and to recommend protective actions to authorities responsible for offsite emergency measures.

Technical Information in the Emergency Plan: [B.5.] Interrelationships of the overall ERO are diagramed in Figure B-1a, "Overall ERO command Structure" (page B-13). Activities performed by the On-site ERO are listed on page B-4. The Onsite ERO functions under the direction of the EPM. On-call ERO personnel are immediately available during normal working within 75 minutes. Responsibilities of individual position within the On-Site ERO are described in Section B.5.a, "Onsite ERO." Organization of the On-site ERO is diagramed in Figure B-1b, "On-site Emergency Response Organization" (page B-14). Table 2-1, "V.C. Summer ERO On-shift Staffing," and Table B-1a, "Shift Emergency Response Organization," of each unit annex, outlines the unit on-shift emergency organization and its relation to the normal staff complement. The staffing requirements for the ERO are provided in Table B-1b, "Staffing Requirements for the VCSNS ERO," (page B-17/18).

The Off-site ERO, headed by the EOM, is responsible for off-site activities that include supporting on-site activities and coordinating public information. Responsibilities of individual position within the Off-Site ERO are described in Section B.5.b, "Offsite ERO." Organization of the Off-site ERO is diagramed in Figure B-1c, "Off-site Emergency Response Organization" (page B-15). The EPI, operating under the Company Spokesperson, is responsible for providing information to the public. The EPI consists of corporate and station personnel involved with emergency response that will coordinate with offsite agencies. Responsibilities of individual position within the EPI are described in Section B.5.c, "EPI Organization." Organization of the EPI is diagramed in Figure B-1d, "Emergency Public Information Organization" (page B-17).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan specified the positions or title and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. For emergency situations, specific assignments were made for all shifts and for plant staff members, both onsite and away from the site. These assignments covered the emergency functions in Table B-1, entitled "Minimum Staffing Requirements for Nuclear Power Plant Emergencies." The minimum on-shift staffing levels were as indicated in Table B-1. The applicant described the augmentation of on-shift capabilities within a short period after declaration of an emergency. This capability was indicated in Table B-1 of the VCSNS Units 2 and 3 Emergency Plan.

Technical Information in the Emergency Plan: [B.6.] Section B.6, "Emergency Response Organization Block Diagram," of the VCSNS Units 2 and 3 Emergency Plan states that Table B-1a, "Shift Emergency Response Organization," of each unit annex and Table B-1b, "Staffing Requirements for the VCSNS ERO," (page B-17/18) lists the key positions of the ERO and the supporting positions assigned to interface with Federal, State, and county authorities. Figure B-1a, "Overall ERO command Structure," (page B-13) illustrates the interrelationships of the overall ERO organization. Figure B-1b, "On-site emergency Response organization," (page B-14) through Figure B-1d, "Emergency Public Information Organization" (page B-14) illustrates the interrelationships within the individual organizations. Figure B-1b includes Technical Support Center (TSC), Operational Support Center (OSC), and Emergency Operations Facility (EOF). Specific responsibilities and the interrelationships are discussed in detail in Section B.5, "Emergency Response Organization Positional Responsibilities."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan specified the interfaces between and among the onsite functional areas of emergency activity, licensee headquarters support, local services support, and State and local government response organization. The interfaces were illustrated in a block diagram, and included the onsite TSC, OSC, and the applicant's near-site EOF.

Technical Information in the Emergency Plan: [B.7.] Corporate management, administrative, and technical support personnel who will augment the plant staff are detailed in Sections B.5.a, "Onsite ERO," Sections B.5.b, "Offsite ERO," and Sections B.5.c, "EPI Organization," of the VCSNS Units 2 and 3 Emergency Plan.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan specified the corporate management, administrative and technical support personnel who will augment the plant staff, as specified in Table B-1, "Minimum Staffing Requirements for Nuclear Power Plant Emergencies," in the following areas:

- a. logistics support for emergency personnel, e.g., transportation, communications, temporary quarters, food and water, sanitary facilities in the field, and special equipment and supplies procurement;
- b. technical support for planning and reentry/recovery operations;
- c. management level interface with governmental authorities; and
- d. release of information to news media during an emergency (coordinated with governmental authorities).

Technical Information in the Emergency Plan: [B.8.] Section B.7, "Industry/Private Support Organizations," of the VCSNS Units 2 and 3 Emergency Plan states VCSNS retains contractors to provide supporting services. A contract/purchase order with a private contractor is equivalent

to an agreement letter for the duration of the contract. Services are currently provided by Institute of Nuclear Power Operations (INPO), American Nuclear Insurers (ANI), Department of Energy (DOE) Radiation Emergency Assistance Center/Training Site (REAC/TS), Manufacturer Design and Engineering Support.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan specified the contractor and private organizations that may be requested to provide technical assistance to, and augmentation of, the emergency organization.

Technical Information in the Emergency Plan: [B.9.] Section B.8, "Supplemental Emergency Assistance to the ERO," of the VCSNS Units 2 and 3 Emergency Plan states VCSNS maintains agreements with outside agencies that will provide assistance when called on during an emergency or during the recovery phase. Agreements identify the emergency measures to be provided, the criteria for implementation, and the arrangements for exchange of information. Names of support agencies are provided in Appendix 2, "Letters of Agreement." Services to be provided include: Law enforcement; Fire protection; Ambulance services; Medical and hospital support; transportation and treatment of injured station personnel. Additional information on transportation and treatment of injured station personnel is described in Section L, "Medical and Public Health Support."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan also identified the services to be provided by local agencies for handling emergencies (e.g., police, ambulance, medical, hospital, and fire-fighting organizations). The applicant provided for transportation and treatment of injured personnel who may also be contaminated. Copies of the arrangements and agreements reached with contractor, private, and local support agencies were appended to the plan. The agreements delineated the authorities, responsibilities, and limits on the actions of the contractor, private organization, and local services support groups.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Onsite Emergency Organization," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50.

13.3.1C.B.2 Regulatory Basis: 10 CFR 50, Appendix E.IV.A.1 requires that the emergency plan describe the normal plant operating organization.

Technical Information in the Emergency Plan: Section 13.1, Organizational Structure of the Applicant," of the Final Safety Analysis Report (FSAR) provides an outline of the structure of South Carolina Electric & Gas and the normal plant operating organization. The normal plant personnel complement is discussed in Section B.1, "On-Shift Emergency Response Organization Assignments," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan. Table 2-1, "V.C. Summer ERO On-shift Staffing," and Table B-1a, "Shift Emergency Response Organization," of each unit annex, outlines the unit on-shift emergency organization and its relation to the normal staff complement.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the normal plant operating organization.

13.3.1C.B.3 Regulatory Basis: 10 CFR 50, Appendix E.IV.A.2.a. requires that the emergency plan describe the onsite emergency response organization with a detailed

discussion of the authorities, responsibilities, and duties of the individual(s) who will take charge during an emergency.

Technical Information in the Emergency Plan: The normal plant personnel complement is discussed in Section B.1, "On-Shift Emergency Response Organization Assignments," of the VCSNS Emergency Plan. Table 2-1, "V.C. Summer ERO On-shift Staffing," and Table B-1a, "Shift Emergency Response Organization," of each unit annex, outlines the unit on-shift emergency organization and its relation to the normal staff complement. Section B.5.a, "Onsite ERO," discusses the responsibilities of each position during an emergency.

Technical Evaluation: In addition, the VCSNS Units 2 and 3 Emergency Plan describes the onsite emergency response organization with a detailed discussion of the authorities, responsibilities, and duties of the individual(s) who will take charge during an emergency.

13.3.1C.B.4 Regulatory Basis: E.IV.A.2.b requires that the emergency plan describe the onsite emergency response organization with a detailed discussion of the plant staff emergency assignments.

Technical Information in the Emergency Plan: A discussion of staff assignments during an emergency is provided in Section B.1, "On-shift Emergency Response Organization." Table 2-1, "V.C. Summer ERO On-shift Staffing," (page 5) of each unit annex describes the emergency response responsibilities of on-shift personnel. Table B-1a, "Shift Emergency Response Organization," (page 7) of each unit annex, outlines the unit on-shift emergency organization and its relation to the normal staff complement. A detailed discussion of staff responsibilities can be found in Section B.5, "Emergency Response Organization Positional Responsibilities."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the onsite emergency response organization with a detailed discussion of the plant staff emergency assignments.

13.3.1C.B.5 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.A.2.c. requires that the emergency plan describe the onsite emergency response organization with a detailed discussion of the authorities, responsibilities, and duties on an onsite emergency coordinator who shall be in charge of the exchange of information with offsite authorities responsible for coordinating and implementing offsite emergency measures.

Technical Information in the Emergency Plan: Section B.1, "On-Shift Emergency Response Organization Assignments," of the VCSNS Units 2 and 3 Emergency Plan states that the Vice President, Nuclear Operations has the overall authority of station operations. The Shift Supervisor is responsible for actual operation of plant systems. Section B.2, "Authority over the Emergency Response Organization," states that the Interim Emergency Director (IED) or Emergency director (ED) has overall authority and responsibility for coordinating all emergency response activities. The Unit 1 Shift Supervisor will be designed as the IED if multiple units simultaneously enter into an emergency. Section B.3, "Criteria for Assuming Command and Control (Succession)," outlines the process used to pass responsibility and control as the emergency progresses.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the onsite emergency response organization with a detailed discussion of the authorities, responsibilities, and duties on an onsite emergency coordinator who shall be in charge of the exchange of

information with offsite authorities responsible for coordinating and implementing offsite emergency measures.

13.3.1C.B.6 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans."

10 CFR 50, Appendix E.IV.A.4. requires that the emergency plan identify, by position and function to be performed, the persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.

Technical Information in the Emergency Plan: Section B.5.b.3, "Dose Assessor," states the Dose Assessor is responsible for operation of the dose assessment program, interpreting data from the field, and providing PARs to the Offsite Radiological Assessment Manager. As discussed in Section B.5.b.2, "Offsite Radiological Assessment Manager," the Offsite Radiological Assessment Manager will use the dose projections as the basis for recommending changes to event classifications, PARs, and assisting the Emergency Offsite Manager (EOM) on evaluating needs of the public. The Health Physics Network Communicator provides the Offsite Radiological Assessment Manager updates and responds to inquiries from the NRC on dose projections as discussed in Section B.5.b.4, "Health Physics Network Communicator." Additional information on the process used to make dose projections can be found in Section I.4, "Effluent Monitor Data and Dose Projection." The dose projection model is discussed in Section 4.2.F, "Dose Projection Model," of each unit annex.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan identifies, by position and function to be performed, the persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.

13.3.1C.B.7 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans."

10 CFR 50, Appendix E.IV.A.5. requires that the emergency plan identify, by position and function to be performed, other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons with special qualifications, such as consultants, who are not employees of the licensee and who may be called upon for assistance for emergencies, shall also be identified. The special qualifications of those persons shall be described.

Technical Information in the Emergency Plan: Discussion of licensee employees with special qualifications for coping with emergency conditions is detailed in Sections B.5.a, "Onsite ERO," Sections B.5.b, "Offsite ERO," and Sections B.5.c, "EPI Organization," of the VCSNS Units 2 and 3 Emergency Plan. Contractors that will be providing assistance during emergencies are discussed in Section B.7, "Industry/Private Support Organizations." Outside organizations that provide support services are discussed in Section B.8, "Supplemental Emergency Assistance to the ERO."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan identifies, by position and function to be performed, other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons with special qualifications, such as consultants, who are not employees of the licensee, and who may be called upon for assistance for emergencies were also identified. The special qualifications of those persons were described.

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13.3.1C.B.8 Conclusion for Onsite Emergency Organization:

On the basis of its review of the onsite emergency plan as described above for onsite emergency organization, the NRC staff concludes that the information provided in the VCSNS Units 2 and 3 Emergency Plan is acceptable and meets the requirements of 10 CFR 50.47(b)(2) and Sections IV.A.1, A.2.a, A.2.b, A.2.c, A.4, and A.5 of Appendix E to 10 CFR Part 50.

13.3.1C.C Emergency Response Support and Resources

13.3.1C.C.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(3); Planning Standard C. requires that arrangements for requesting assistance and effectively using resources have been made, arrangements to accommodate State and local staff at the licensee's near-site Emergency Operations Facility (EOF) have been made, and other organizations capable of augmenting the planned response have been identified.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(3), the NRC staff evaluated it against the detailed evaluation criteria ⁴ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [C.1. a. and b.] Section C.1, "Federal Response Support and Resources," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states assistance from Federal agencies is provided through the National Response Plan (NRP) with the Nuclear Regulatory Commission (NRC) as the lead agency. In **RAI 13.03-18(A)** the staff requested the applicant revise the VCSNS Units 2 and 3 Emergency Plan to correctly reference the Nation Response Framework (NRF) that has replaced the NRP. In a response letter dated May 8, 2009 (pgs. 32/33), the applicant committed to revise the VCSNS Units 2 and 3 Emergency Plan to correctly reference the NRF and not the NRP. Corrections will be made on pages A-1, A-3, and C-1.

The shift supervisor will become the Interim Emergency Director (IED) and is responsible for notifying offsite support government agencies. The Emergency Director (ED) is responsible for requesting assistance from non-VCSNS Emergency Response Organizations (EROs). Department of Homeland Security (DHS) and the Department of Energy (DOE) are responsible for implementation of the NRP. A discussion of the interactions with these Federal organizations and the resources they will provide can be found in Section A, "Assignment of Responsibility." Resources from Federal agencies will be made available in an expeditious and timely manner.

Technical Evaluation: The staff finds the additional information and textual revisions submitted in response to **RAI 13.03-18(A)** to be acceptable. **Confirmatory Action NRC Items 13.03-02 through 13.03-05** was created to track the proposed revisions.

Technical Information in the Emergency Plan: [C.1.c.] Section C.1.c, "Federal Response Support and Resources," of the VCSNS Units 2 and 3 Emergency Plan states emergency facilities have sufficient equipment and communication capabilities to accommodate Federal representatives. Working areas are provided for their use. Accommodations for response team members in each facility, provided on page C-1, are based on the NRC Response Coordination Manual 1996 (RCM-96) or NUREG-0728. In **RAI 13.03-18(B)** staff requested additional information regarding specific resources made available to Federal response teams. In a response letter dated May 8, 2009 (pgs. 33/34), the applicant committed to revise Section C.1 of the VCSNS Emergency Plan to read as follows:

d. Communication pathways provided in each of these facilities include access to dedicated landline telephones, wireless telephones and FTS telephones as provided by the NRC and include the Reactor Safety Counterpart Link (RSCL), Management Counterpart Link (MCL), the Protective Measures Counterpart Link (PMCL), and the Local Area Network (LAN). These FTS lines are in place in the appropriate VCSNS

⁴ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

emergency response facilities and are for use by the NRC Response Team upon their arrival. The VCSNS ERO does not normally utilize these communication links.

Technical Evaluation: The staff finds the additional information and textual revisions submitted in response to **RAI 13.03-18(B)** to be acceptable. **Confirmatory Action NRC Item 13.03-06** was created to track the proposed revision.

Technical Information in the Emergency Plan: [C.2.b.] Section C.2, "Liaisons," of the VCSNS Units 2 and 3 Emergency Plan states site personnel are assigned as technical liaisons to the State of South Carolina and the Emergency Operation Centers (EOCs) of surrounding counties when they are activated. They are responsible for interpreting Emergency Action Levels (EALs), explaining accident conditions, and providing technical information regarding the affected unit's actions by the station's ERO.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states the applicant will prepare for the dispatch of a representative to principal offsite governmental EOCs.

Technical Information in the Emergency Plan: [C.3.] Section C.3, "Radiological Laboratories," of the VCSNS Units 2 and 3 Emergency Plan states the onsite laboratory includes equipment for chemical analyses and for the analysis of radioactivity and is the central point for receipt and analysis of all onsite samples. Additional laboratory support can be available at the Department of Health and Environmental Control (DHEC) in approximately two to three hours. The DHEC also has a mobile laboratory for analyzing environmental samples.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan identifies radiological laboratories and their general capabilities and expected availability to provide radiological monitoring and analyses services which can be used in an emergency.

Technical Information in the Emergency Plan: [C.4.] Section C.4, "Other Assistance," of the VCSNS Units 2 and 3 Emergency Plan states other companies' operating nuclear facilities are available to provide assistance and support through the Institute of Nuclear Power Operations (INPO). Facilities, organizations, and individuals, to provide support are listed in the Emergency Planning Telephone Directory. A general description of services is provided on page C-2. In **RAI 13.03-18(C)** the staff requested a revision to the last sentence of Section C.4 to clarify the call-out for the appendix that contains Letters of Agreement (Appendix 2). In a response letter dated May 8, 2009 (pgs. 33/34), the applicant committed to correct this sentence to correctly identify Appendix 2 and not Appendix 3 as the source of this information.

Technical Evaluation: The staff finds the correction submitted in response to **RAI 13.03-18(C)** to be acceptable. **Confirmatory Action NRC Item 13.03-07** was created to track the proposed revision.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Emergency Response Support and Resources," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50.

13.3.1C.C.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.A.6. requires a description of the local offsite services to be provided in support of the licensee's emergency organization.

1 **Technical Information in the Emergency Plan:** Local offsite services to be provided in
2 support of the licensees Emergency Response Organization (ERO) are discussed in Sections
3 B.7, "Industry/Private Support Organizations"; Section B.8, "Supplemental Emergency
4 Assistance to the ERO"; and Section C.4, "Other Assistance" of the V.C. Summer Nuclear
5 Station (VCSNS) Units 2 and 3 Emergency Plan.

6 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes the local offsite
7 services to be provided in support of the licensees' emergency organization.

8
9 **13.3.1C.C.3 Regulatory Basis:** 10 CFR 50, Appendix E.IV., "Content of Emergency Plans."
10 10 CFR 50, Appendix E, IV.A.7. requires the identification of, and assistance expected from,
11 appropriate State, local, and Federal agencies with responsibilities for coping with emergencies.

12 **Technical Information in the Emergency Plan:** A discussion of the interactions with Federal
13 organizations that will be providing assistance in an emergency and their responsibilities can be
14 found in Section A, "Assignment of Responsibility," of the VCSNS Units 2 and 3 Emergency
15 Plan.

16 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan identifies the assistance
17 expected from appropriate State, local, and Federal agencies with responsibilities for coping
18 with emergencies.

19
20 **13.3.1C.C.4 Conclusion for Emergency Response Support and Resources**

21 The staff has reviewed the onsite emergency plan and the applicant's responses to **RAI 13.03-**
22 **18(A), (B) and (C)** in regards to Planning Standard C of NUREG-0654/FEMA-REP-1 and the
23 requirements of 10 CFR 50.47(b)(3) and Sections IV.A.6 and A.7 of Appendix E to 10 CFR Part
24 50. Final determination regarding this planning standard will be based on verification of
25 **Confirmatory Action NRC Items 13.03-02 through 13.03-07.**

13.3.1C.D Emergency Classification System

13.3.1C.D.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(4) requires that a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(4), the NRC staff evaluated it against the detailed evaluation criteria⁵ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [D.1. and D.2.] [D.1 is ITAACable] Section -- of the --- Plan includes [or refers to] a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

Technical Evaluation: [D.1.] [Placeholder: address adequacy of RAI response.] An emergency classification and emergency action level scheme has been established by the applicant. The specific instruments, parameters or equipment status are shown for establishing each emergency class, in the in-plant emergency procedures. The plan identifies the parameter values and equipment status for each emergency class. **[Potential interface:** SRP Section 2.3.3 (meteorological instrumentation)]

[D.2.] [Placeholder: address adequacy of RAI response.] The initiating conditions included the example conditions found in Appendix 1 to NUREG-0654/FEMA-REP-1 and all postulated accidents in the Final Safety Analysis Report (FSAR) for the nuclear facility.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Emergency Classification Sysytem," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50.

13.3.1C.D.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E, IV.B. requires that the means to be used for determining the magnitude of and for continually assessing the impact of the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. These initial emergency action levels shall be discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC.

Technical Information in the Emergency Plan: Section ---- of the ---- Plan describes the means to be used for determining the magnitude of and for continually assessing the impact of the release of radioactive materials, including emergency action levels that are to be used as

⁵ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels are based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. These initial emergency action levels were discussed and agreed on by the applicant and State and local governmental authorities, and approved by the NRC.

Technical Evaluation: [Placeholder: Adequacy of RAI Response] The means to be used for determining the magnitude of and for continually assessing the impact of the release of radioactive materials, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies are described. In addition, the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety are also described. The emergency action levels are based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. These initial emergency action levels were discussed and agreed on by the applicant and State and local governmental authorities, and approved by the NRC.

13.3.1C.D.3 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.C. requires that the entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization be described. The communication steps to be taken to alert or activate emergency personnel under each class of emergency shall also be described. Emergency action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, such as the pressure in containment and the response of the Emergency Core Cooling System) for notification of offsite agencies shall be described. The existence, but not the details, of a message authentication scheme shall be noted for such agencies. The emergency classes defined shall include: (1) notification of unusual events, (2) alert, (3) site area emergency, and (4) general emergency. These classes are further discussed in NUREG-0654/FEMA-REP- 1.

Technical Information in the Emergency Plan: Section ----- in the ----- Plan

Technical Evaluation: [Placeholder: Adequacy of RAI Response] The ----- Plan describes the entire spectrum of emergency conditions that involve the alerting or activating of progressively larger segments of the total emergency organization. The ----- Plan also describes the communication steps to be taken to alert or activate emergency personnel under each class of emergency. Emergency action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, such as the pressure in containment and the response of the Emergency Core Cooling System) for notification of offsite agencies were described. The existence, but not the details, of a message authentication scheme were noted. The emergency classes were defined as: (1) notification of unusual events, (2) alert, (3) site area emergency, and (4) general emergency.

13.3.1C.D.4 Conclusion for Emergency Classification System

1 **[NOTES:** As of August 2008, the staff has not determined the best way to address an
2 incomplete set of EALs. On February 22, 2008, the NRC found NEI 99-01, Rev, 5 acceptable
3 for use. NEI 07-01 is under review. **[If applicable:** This conclusion is conditioned upon the
4 acceptable resolution by the applicant of the unresolved issues associated with a revision of the
5 Units 3 and 4 ITAAC tables, and development of EALs that are consistent with Regulatory
6 Guide 1.101; addressed in the NSIR/DPR draft FSER transmittal memorandum.]

7
8 The applicant has committed to meet the following license conditions and ITAAC, with the
9 associated dates, for the emergency preparedness program:

10 **[If applicable] License Conditions**

11 **[Note:** Refer to the License Conditions here and in overall summary.]

13.3.1C.E Notification Methods and Procedures

13.3.1C.E.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(5) requires that procedures be established for notification by the licensee of State and local response organizations, and for notification of emergency personnel by all response organizations. In addition, the content of initial and follow-up messages to response organizations and the public was established. Also, the means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone was established.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(5), the NRC staff evaluated it against the detailed evaluation criteria ⁶ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [E.1.] Section E.1, "Bases for Emergency Response Organization Notification," of the V. C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states in cooperation with State and county authorities VCSNS has established mutually agreeable methods and procedures for notification of offsite response organizations consistent with the emergency classification and action level scheme. Notifications include a means of verification or authentication such as the use of dedicated communications networks, verification code words, or providing call-back verification phone numbers. Appendix 3, "Procedure Cross-Reference to the Emergency Plan," identified "Notification" as the implementing procedure. **VCSNS Units 2 and 3 ITAAC 9.1** states that detailed implementing procedures will be submitted to NRC no less than 180 days prior to fuel load.

VCSNS Units 2 and 3 ITAAC 2.1 has been proposed to test the capabilities of the system used to notify State and local authorities (see Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC)," of the V. C. Summer Nuclear Station, Units 2 and 3, COL Application.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan refers to procedures which describe mutually agreeable bases for notification of response organizations, consistent with the emergency classification and action level scheme set forth in Appendix 1 to NUREG-0654/FEMA-REP-1. These procedures include the means for verification of messages.

Technical Information in the Emergency Plan: [E.2.] Section E.2, "Notification and Mobilization of Emergency Response Personnel," (page E-1) of the VCSNS Units 2 and 3 Emergency Plan states that procedures are established for notification and mobilizing emergency response personnel. Appendix 3, "Procedure Cross-Reference to the Emergency Plan," identified "Notification" as the implementing procedure. A summary of the methods used to notify the Emergency Response Organization (ERO) is provided in Section E.2. **VCSNS Units 2 and 3 ITAAC 9.1** states that detailed implementing procedures will be submitted to NRC no less than 180 days prior to fuel load.

VCSNS Units 2 and 3 ITAAC 2.2 has been proposed to test the capabilities of the system used to notify licensee response organizations and their mobilization procedures (see Table 3.8-1,

⁶ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

“Inspections, Tests, Analyses, and Acceptance Criteria,” in Part 10, “Proposed Combined License Conditions and ITAAC),” of the V. C. Summer Nuclear Station, Units 2 and 3, COL Application.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan also refers to procedures for alerting, notifying, and mobilizing emergency response personnel.

Technical Information in the Emergency Plan: [E.3.] Section E.3, “Initial Notification Messages,” (page E.3) of the VCSNS Units 2 and 3 Emergency Plan states that the following items are included as a part of the message form content: event classification; whether a release is taking place; potentially affected subareas when a General Emergency is declared; and whether offsite protective measures may be necessary.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency plan, in conjunction with State and local organizations, establishes the contents of the initial emergency messages to be sent from the plant. These messages contain information about the class of emergency, whether a release is taking place, potentially affected population and areas, and whether protective measures may be necessary.

Technical Information in the Emergency Plan: [E.4.] Section E.4, “Follow-Up Messages,” (pages E-3/4) of the VCSNS Units 2 and 3 Emergency Plan states that updates are provided on a prearranged frequency and contain prearranged information plus information requested at the time of notification.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan makes provisions for follow-up messages from the facility to offsite authorities, which contain the following information:

- a. location of incident and name and telephone number (or communications channel identification) of caller;
- b. date and time of incident;
- c. class of emergency;
- d. type of actual or projected release (airborne, waterborne, surface spill), and estimated duration/impact times;
- e. estimate of quantity of radioactive material release or being released, and the points and height of releases;
- f. chemical and physical form of released material, including estimates of the relative quantities and concentration of noble gases, iodines, and particulates;
- g. meteorological conditions at appropriate levels (wind speed, direction (to and from), indicator of stability, precipitation, if any);
- h. actual or projected dose rates at site boundary; projected integrated dose at site boundary;
- i. projected dose rate and integrated dose at the projected peak and at 2, 5 and 10 miles, including sector(s) affected;
- j. estimate of any surface radioactive contamination in-plant, onsite, or offsite;
- k. licensee emergency response actions underway;
- l. recommended emergency actions, including protective measures;
- m. request for any needed onsite support by offsite organizations; and
- n. prognosis for worsening or termination of event, based on plant information.

Technical Information in the Emergency Plan: [E.6.] Section E.6, "Notification of the Public," (page E-4) of the VCSNS Units 2 and 3 Emergency Plan states that prompt notification to the general public within the 10-mile plume exposure pathway Emergency Planning Zone (EPZ) consists of two principle elements, fixed sirens (Alert and Notification Systems (ANS) and the Emergency Alert System (EAS) radio stations. The VCSNS personnel will activate the ANS upon direction by State or local authorities as specified in agreements. In **RAI 13.03-19** the staff requested additional information on special arrangements for coverage of the plume exposure pathway EPZ for those that may not receive notification. In a response letter dated May 8, 2009 (pg 35), the applicant stated that county governments have the responsibility for implementation of special arrangements made for members of the public that may not receive notification. Additional information related to these special arrangements will be provided in emergency response plans for the affected counties.

VCSNS Units 2 and 3 ITAAC 2.3 has been proposed to test the capabilities of the site to alert the public in the plume exposure pathway EPZ (see Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC)," of the V. C. Summer Nuclear Station, Units 2 and 3, COL Application.

Technical Evaluation: The staff finds the additional information submitted in response to **RAI 13.03-19** to be acceptable and therefore resolved.

Technical Information in the Emergency Plan: [E.7.] Section E.7, "Messages to the Public," (pages E-4/5) of the VCSNS Units 2 and 3 Emergency Plan states that VCSNS will provide message content support when requested. The State has developed public EAS messages based on the classification scheme. Appendix 2, Annex C, "Sample Emergency Alert System Message," (pages Annex C-2-1/8) of the South Carolina Operational Radiological Emergency Response Plan contains sample EAS messages with content for sheltering and evacuation and refers to information in the safety information brochure/calendar.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan discusses written messages intended for the public developed by the State of South Carolina, consistent with the licensee's classification scheme. In particular, draft messages to the public giving instructions with regard to specific protective actions to be taken by occupants of affected areas, were prepared. The messages included the appropriate aspects of sheltering, ad hoc respiratory protection, e.g., handkerchief over mouth, thyroid blocking or evacuation.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Notification Methods and Procedures," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50 and 10 CFR 50.72.

13.3.1C.E.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.D.1. requires that administrative and physical means for notifying local, State, and Federal officials and agencies and agreements reached with these officials and agencies for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary, shall be described. This description shall include identification of the appropriate officials, by title and agency, of the State and local government agencies within the EPZs.

Technical Information in the Emergency Plan: Section E.2, "Notification and Mobilization of Emergency Response Personnel," (pages E-1/2) of the VCSNS Units 2 and 3 Emergency Plan states that the site will notify State and county agencies within 15 minutes of the initial classification; escalation of classification; issuance of, or change to public Protective Action Recommendations (PARs); and changes in radiological release status. Section E.6, "Notification of the Public," states that notification to the general public consists of fixed sirens [Alert and Notification Systems (ANS)] and the Emergency Alert System (EAS) radio stations. The VCSNS personnel will activate the ANS upon direction by State or local authorities. Appendix 2, "Letters of Agreement," contains a list of the entities VCSNS has agreements with.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the administrative and physical means for notifying local, State, and Federal officials and agencies. In addition, the VCSNS Units 2 and 3 Emergency Plan describes the agreements reached with these officials and agencies for the prompt notification of the public and for public evacuation or other protective measures, should they become necessary. This description included identification of the appropriate officials, by title and agency, of the State and local government agencies within the EPZs.

13.3.1C.E.3 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.D.3. requires that a licensee shall have the capability to notify responsible State and local governmental agencies within 15 minutes after declaring an emergency. The licensee shall demonstrate that the State/local officials have the capability to make a public notification decision promptly on being informed by the licensee of an emergency condition. The design objective of the prompt public notification system shall be to have the capability to essentially complete the initial notification of the public within the plume exposure pathway EPZ within about 15 minutes. The use of this notification capability will range from immediate notification of the public (within 15 minutes of the time that State and local officials are notified that a situation exists requiring urgent action) to the more likely events where there is substantial time available for the State and local governmental officials to make a judgment whether or not to activate the public notification system. Where there is a decision to activate the notification system, the State and local officials will determine whether to activate the entire notification system simultaneously or in a graduated or staged manner. The responsibility for activating such a public notification system shall remain with the appropriate governmental authorities.

Technical Information in the Emergency Plan: Section E.2, "Notification and Mobilization of Emergency Response Personnel," of the VCSNS Units 2 and 3 Emergency Plan states that the VCSNS site will notify State and county agencies within 15 minutes of the initial classification, escalation of classification, issuance of or change to a general public PARs and, changes in radiological release status. Section E.6, "Notification of the Public," states the general public within the 10-mile plume exposure pathway EPZ will be notified through the use of fixed sirens ANS and EAS radio stations. VCSNS personnel activate the ANS upon direction by state or local authorities.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the capability to notify responsible State and local governmental agencies within 15 minutes after declaring an emergency. The design objective of the prompt public notification system shall be to have the capability to essentially complete the initial notification of the public within the plume exposure pathway EPZ within about 15 minutes. The responsibility for activating such a public notification system is described.

13.3.1C.E.4 Regulatory Basis: 10 CFR 50.72(a)(3) requires that the licensee notify the NRC immediately after notification of the appropriate State or local agencies and not later than one hour after the time the license declares one of the emergency classes.

Technical Information in the Emergency Plan: Section E.2.b.2, "NRC [Nuclear Regulatory Commission]," of the VCSNS Units 2 and 3 Emergency Plan states that the NRC will be notified immediately after appropriate State and county agencies but not later than one hour after the time of initial classification, escalation, termination or entry into the recovery phase.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that the licensee will notify the NRC immediately after notification of the appropriate State or local agencies and not later than one hour after the time the license declares one of the Emergency Classes.

13.3.1C.E.5 Regulatory Basis: 10 CFR 50.72(c)(3) requires that with respect to the telephone notifications made under 10 CFR 50.73(a) and (b), in addition to making the required initial notification, each licensee, shall during the course of the event, maintain an open, continuous communication channel with the NRC Operations Center upon request of the NRC.

Technical Information in the Emergency Plan: Section E.2.b.2, "NRC," of the VCSNS Units 2 and 3 Emergency Plan states that the NRC will be notified immediately after appropriate State and county agencies but not later than one hour after the time of initial classification, escalation, termination or entry into the Recovery Phase. Section E.2.b.2, "NRC," states that VCSNS will use a log instead of the Nuclear Power Plant Emergency Notification Form if continuous communications is requested and established.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that with respect to the telephone notifications made under 10 CFR 50.73(a) and (b), in addition to making the required initial notification, each licensee, the licensee will during the course of the event, maintain an open, continuous communication channel with the NRC Operations Center upon request of the NRC.

13.3.1C.E.6 Conclusion for Notification Methods and Procedures

On the basis of its review of the onsite emergency plan and the applicant's responses to **RAI 13.03-19** as described above for notification methods and procedures, the NRC staff concludes that the information provided in the VCSNS Units 2 and 3 Emergency Plan is consistent with Planning Standard E of NUREG-0654/FEMA-REP-1 and the requirements of 10 CFR 50.47(b)(3) and Sections IV.A.6 and A.7 of Appendix E to 10 CFR Part 50.

The applicant has committed to meet the following license conditions and ITAAC, with the associated dates, for the emergency preparedness program:

VCSNS Units 2 and 3, ITAAC 2.1 [E.1.] has been proposed to test the capability to notify responsible State and local organizations within 15 minutes after the licensee declares an emergency.

VCSNS Units 2 and 3, ITAAC 2.1 [E.2.] has been proposed to test the capability to notify emergency response personnel.

- 1 **VCSNS Units 2 and 3, ITAAC 2.1 [E.3.]** has been proposed to test the capability to notify and
- 2 provide instructions to the populace within the plume exposure EPZ.
- 3
- 4

13.3.1C.F Emergency Communications

13.3.1C.F.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(6) requires that provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(6), the NRC staff evaluated it against the detailed evaluation criteria⁷ in NUREG-0654/FEMA-REP-1.

Technical Information in the Plan: [F.1.a.] Section F.1, "Communications/Notifications," (pages F-1/3) of V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states that VCSNS has an offsite notification system, the Electric Switch System Exchange (ESSX) that provides 24-hour communications to State and county warning points within the plume exposure pathway Emergency Planning Zone (EPZ), which are continuously staffed. ESSX is backed up with facsimile, commercial telephone lines, radios and internet.

Technical Evaluation: The communication plans for emergencies included provisions for 24-hour per day notification to and activation of the State/local emergency response network; and at a minimum, a telephone link and alternate, including 24-hour per day manning of communications links that initiate emergency response actions.

Technical Information in the Plan: [F.1.b.] Section F.1, "Communications/Notifications," of VCSNS Units 2 and 3 Emergency Plan states that ESSX provides 24-hour communications to State and county warning points within the plume exposure pathway EPZ. Backup systems to the ESSX are available. In **RAI 13.03-20(A)** the staff requested the applicant clarify whether the ESSX is available in the Technical Support Center (TSC). In a response letter dated May 8, 2009 (pg 36/37), the applicant committed to revise Section F.1.d.1 of the VCSNS Emergency Plan to correctly identify the ESSEX Line as being available in the TSC.

Technical Evaluation: The staff finds the additional information and textual revision submitted in response to **RAI 13.03-20(A)** to be acceptable. **Confirmatory Action NRC Item 13.03-08** was created to track the proposed revision.

Technical Information in the Plan: [F.1.c.] F.1.f, "NRC Communications (ENS and HPN)," (page F-3) of VCSNS Units 2 and 3 Emergency Plan states that the Emergency Notification System (ENS), the Health Physics Network (HPN) or commercial and satellite telephone lines are used to communicate with the Nuclear Regulatory Commission (NRC). Section F.1, "Communications/Notifications," (pages F-1/3) states that Figure F-1, "Notification Scheme (After Full Augmentation)," (page F-4) depicts initial notification paths and organizational titles from VCSNS to Federal, State, and county Emergency Response Organizations (EROs), and supporting industry agencies.

Technical Evaluation: The communication plans for emergencies included provisions for communications as needed with Federal emergency response organizations.

⁷ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

Technical Information in the Plan: [F.1.d.] Section F.1, "Communications/Notifications," (pages F-1/3) of VCSNS Units 2 and 3 Emergency Plan states the ESSX provides 24-hour communications to State and county warning points within the plume exposure pathway EPZ, which are continuously staffed. The ESSX is backed up with facsimile, commercial telephone lines, radios and internet. Field monitoring communications is conducted by a separate radio communication channel with commercial cell phones and satellite phones as backup. Communications are between the affected unit control room, Emergency Operations Facility (EOF) and mobile units.

VCSNS Units 2 and 3 ITAAC 3.1 has been proposed to test the capabilities of the system used to provide prompt communications to the public (see Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC," of the V. C. Summer Nuclear Station, Units 2 and 3, COL Application).

Technical Evaluation: The communication plans for emergencies included provision for communications between the nuclear facility and the licensee's near-site EOF, State and local Emergency Operations Centers (EOCs), and radiological monitoring teams;

Technical Information in the Plan: [F.1.e.] Section F.1.e, "ERO Notification System," (page F-3) of the VCSNS Units 2 and 3 Emergency Plan states ERO members are rapidly notified using pagers as primary and an automated telephone system as a backup notification system. The notification system is designed with redundant power. Procedures identify the course of action should the notification system fail. **VCSNS Units 2 and 3 ITAAC 9.1** states that detailed implementing procedures will be submitted to NRC no less than 180 days prior to fuel load.

Technical Evaluation: The communication plans for emergencies included provision for alerting or activating emergency personnel in each response organization.

Technical Information in the Plan: [F.1.f.] Figure F-1, "Notification Scheme (After Full Augmentation)," (page F-4) of the VCSNS Units 2 and 3 Emergency Plan identifies the ENS/HPN Communicator and the Technical Support Center (TSC) Manager within the TSC, as having responsibility for communications to the NRC Headquarters Duty Officer and the EOF HPN Communicator. Figure F-1 identifies that the NRC Headquarters Duty Officer notifies the NRC Region Duty Officer.

VCSNS Units 2 and 3 ITAAC 3.2 has been proposed to test the capabilities of the system used to provide prompt communications among principal response organizations (see Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC," of the VCSNS Units 2 and 3, COL Application).

Technical Evaluation: provision for communication by the licensee with NRC headquarters and NRC Regional Office EOCs and the licensee's near-site EOF and radiological monitoring team assembly area.

Technical Information in the Plan: [F.2.] Section F.2, "Medical Communications," (page F-3) of the VCSNS Units 2 and 3 Emergency Plan states that commercial telephones are used to communicate with primary and backup medical hospitals and transportation services. In **RAI 13.03-20(C)** the staff requested an explanation of backup communication systems should the

commercial telephone system not be available. In a response letter dated May 8, 2009 (pg 37), the applicant stated that Satellite Telephones will be used for back-up communication as discussed in Section F.1.d.7

Technical Evaluation: The staff finds the clarification submitted in response to **RAI 13.03-20(C)** to be acceptable and therefore resolved

Technical Information in the Plan: [F.3.] Section F.3, "Communications Testing," (page F-3) of the VCSNS Units 2 and 3 Emergency Plan states that silent tests are conducted at least biweekly, growl (or equipment) tests are conducted quarterly and following preventive maintenance and full volume tests are conducted annually. Section N.2.a, Communications Drills," (pages N-2/3) states that monthly drills test the primary and alternate notification methods to the State and local government warning points and EOCs within the plume exposure pathway EPZ and notification to the NRC using the ENS; quarterly drills test the capability to notify the NRC Region and Federal EROs; and annual drills fully test the communications systems outlined in Section F of the VCSNS Units 2 and 3 Emergency Plan.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the conduct of periodic testing of the entire emergency communications system.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Emergency Communications," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50, 10 CFR 50.72, and an NRC Generic Letter.

13.3.1C.F.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E. IV.E.9. requires at least one onsite and one offsite communications system; each system having a backup power source. In addition, it also requires that all communication plans shall have arrangements for emergencies, including titles and alternates for those in charge at both ends of the communication links and the primary and backup means of communication. Where consistent with the function of the governmental agency, these arrangements shall include:

- a. Provision for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communications shall be tested monthly.
- b. Provision for communications with Federal emergency response organizations. Such communications systems shall be tested annually.
- c. Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the near-site emergency operations facility; and among the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams. Such communications systems shall be tested annually.
- d. Provisions for communications by the licensee with NRC Headquarters and the appropriate NRC Regional Office Operations Center from the nuclear power reactor control room, the onsite technical support center, and the near-site emergency operations facility. Such communications shall be tested monthly.

Technical Information in the Plan: Section F.1, "Communications/Notifications," (pages F-1/3) of VCSNS Units 2 and 3 Emergency Plan states the ESSX provides 24-hour communications to State and county warning points within the plume exposure pathway Emergency Planning Zone (EPZ), which are continuously staffed. The local commercial telephone system vendor provides primary and secondary power at their location. The Emergency Response Organization (ERO) Notification System used for rapid notification of

VCSNS ERO members and is designed with redundant power. Backup power is also available for the Emergency Notification System (ENS) and the Health Physics Network (HPN).

[10 CFR 50, Appendix E. IV.E. 9.1.a] Figure F-1, "Notification Scheme (After Full Augmentation)," (page F-4) of the VCSNS Units 2 and 3 Emergency Plan identifies the ENS/HPN Communicator and the Technical Support Center (TSC) Manager, as having responsibility for communications to the Nuclear Regulatory Commission (NRC) Headquarters Duty Officer and the Emergency Operations Facility (EOF) HPN Communicator. In addition, the affected unit control room Shift Supervisor or Emergency Plant Operations Supervisor (EPOS) is responsible for initial notification to State and county warning points/Emergency Operations Center (EOC) Dispatcher/Communicator. After activation the VCSNS EOF, the State/County Communicator provides updates to the State and county warning points. Section F.3, "Communications Testing," (page F-3) and Section N.2.a, "Communications Drills," (pages N-2/3) states that monthly drills are conducted with State and local government warning points and Emergency Operations Centers (EOC)s.

[10 CFR 50, Appendix E. IV.E. 9.1.b.] Section F.1, "Communications/Notifications," (pages F-1/3) of VCSNS Units 2 and 3 Emergency Plan states that Figure F-1, "Notification Scheme (After Full Augmentation)," (page F-4) depicts initial notification paths and organizational titles from VCSNS to Federal, State, and county EROs, and supporting industry agencies. Section F.3, "Communications Testing," (page F-3) and Section N.2.a, "Communications Drills," (pages N-2/3) states that annual drills are conducted to fully test the emergency communications systems outlined in Section F.

[10 CFR 50, Appendix E. IV.E. 9.1.c.] Section F.3, "Communications Testing," (page F-3) and Section N.2.a, "Communications Drills," (pages N-2/3) of the VCSNS Units 2 and 3 Emergency Plan states that annual drills are conducted to fully test the emergency communications systems outlined in Section F. Section N.2.a also states that communication among the control room, TSC, State and local EOCs, field monitoring teams, Operations Support Center (OSC), EOF, and the Joint Information Center (JIC) are included in the annual drill.

[10 CFR 50, Appendix E. IV.E. 9.1.d.] Section F.3, "Communications Testing," (page F-3) and Section N.2.a, "Communications Drills," (pages N-2/3) of the VCSNS Units 2 and 3 Emergency Plan states that monthly drills are conducted to demonstrate the capability to notify the NRC using the ENS. Figure F-3, "NRC Communications for Nuclear Response," (page F-6) shows communication flow between the affected unit control room, TSC, and EOF to the NRC Headquarters and NRC Region.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that at least one onsite and one offsite communications system, each system having a backup power source, is provided. In addition, the applicant's communication plans have arrangements for emergencies, including titles and alternates for those in charge at both ends of the communication links and the primary and backup means of communication. Where consistent with the function of the governmental agency, these arrangements included:

- a. Provisions for communications with contiguous State/local governments within the plume exposure pathway EPZ. Such communications shall be tested monthly.
- b. Provisions for communications with Federal emergency response organizations. Such communications systems shall be tested annually.
- c. Provisions for communications among the nuclear power reactor control room, the onsite technical support center, and the near-site emergency operations facility; and among the

- 1 nuclear facility, the principal State and local emergency operations centers, and the field
2 assessment teams. Such communications systems shall be tested annually.
- 3 d. Provisions for communications by the licensee with NRC Headquarters and the
4 appropriate NRC Regional Office Operations Center from the nuclear power reactor
5 control room, the onsite technical support center, and the near-site emergency
6 operations facility. Such communications shall be tested monthly.

7
8 **13.3.1C.F.3 Regulatory Basis:** 10 CFR 50.72(a)(4) requires that the licensee activate the
9 Emergency Response Data System (ERDS)⁸ as soon as possible but not later than one hour
10 after declaring an Emergency Class of alert, site area emergency, or general emergency. The
11 ERDS may also be activated by the licensee during emergency drills or exercises if the
12 licensee's computer system has the capability to transmit the exercise data.

13
14 **Technical Information in the Plan:** Section F.1.b.5, "ERDS," (page F-2) of the VCSNS Units 2
15 and 3 Emergency Plan states that the ERDS is activated as soon as possible but not later than
16 one hour after declaring an Alert, Site Area or General emergency.

17 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan states that the licensee will
18 activate the ERDS as soon as possible but not later than one hour after declaring an
19 Emergency Class of alert, site area emergency, or general emergency.

20
21 **13.3.1C.F.4 Regulatory Basis:** Generic Letter 91-14, "Emergency Communications,"
22 requires that the following communications paths be provided: Emergency Notification System
23 (ENS), Health Physics Network (HPN), Reactor Safety Counterpart Link (RSCL), Protective
24 measures Counterpart Link (PMCL), Emergency Response Data System (ERDS), management
25 Counterpart Link (MCL), and Local Area Network (LAN)). Provide guaranteed power to the
26 emergency communications equipment per NRC Bulletin 80-15, "Possible Loss of Emergency
27 Notification System (ENS) with Loss of Offsite Power."

28 **Technical Information in the Plan:** Appendix 1, "References," (pages Appendix 1-1/2) of the
29 VCSNS Units 2 and 3 Emergency Plan lists NRC Bulletin 80-15 and NRC Generic Letter 91-14
30 however Reactor Safety Counterpart Link (RSCL), Protective measures Counterpart Link
31 (PMCL), management Counterpart Link (MCL), and Local Area Network (LAN) were not
32 discussed. In **RAI 13.03-20(B)** staff requested additional information on how VCSNS
33 addressed RSCL, PMCL, MCL, and LAN communications paths. In a response letter dated
34 May 8, 2009 (pg 37), the applicant stated that these communication lines are reserved for use
35 by the NRC Site Response Team and VCSNS does not include utilization of these
36 communication links in the Emergency Plan. Testing of these communication lines on a routine
37 basis will be included in accordance with administrative procedures to be developed. In
38 **Supplemental RAI 13.03-38** the staff requested the applicant provide a statement with regard
39 to use of RSCL, PMCL, MCL, and LAN communications paths in the VCSNS Emergency Plan
40 or provide justification for why the statement is not needed. In a response letter dated August
41 27, 2009, the applicant committed to revise the text on pages C-1 and Section C.1.d to include
42 the following statement:

43 Communication pathways provided in each of these facilities include access to
44 dedicated landline telephones, wireless telephones and FTS telephones as provided by
45 the NRC and include the Reactor Safety Counterpart Link (RSCL), Management
46 Counterpart Link (MCL), the Protective Measures Counterpart Link (PMCL), and the
47 Local Area Network (LAN). These FTS lines are in place in the appropriate VCSNS

⁸ Requirements for ERDS are addressed in Section VI of Appendix E to 10 CFR 50.

1 emergency response facilities and are for use by the NRC Response Team upon their
2 arrival. The VCSNS ERO does not normally utilize these communication links.

3 Section E.2.b.2, "NRC," (page E-2) identifies commercial and other dedicated telephone service
4 and "any other method" as backup should the ENS fail. Section F.1.f, "NRC Communications
5 (ENS and HPN)," (page F-3) states backup power is provided for the ENS telephone equipment.

6 **Technical Evaluation:** The staff finds the additional information and textual revisions provided
7 in response to **Supplemental RAI 13.03-38** to be acceptable. In response to **Supplemental**
8 **RAI 13.03-38** the applicant provided revisions to the text on pages C-1 and Section C.1.d.
9 **Confirmatory Action NRC Item 13.03-17** was created to track the proposed revisions.

10 11 **13.3.1C.F.5 Conclusion for Emergency Communications**

12 The staff has reviewed the onsite emergency plan and the applicant's responses to **RAIs 13.03-**
13 **20 (A)(B)(C)** and **Supplemental RAI 13.03-38** with regards to Planning Standard F of
14 NUREG-0654/FEMA-REP-1 and the requirements of 10 CFR 50.47(b)(6) and Section IV.E.9 of
15 Appendix E to 10 CFR Part 50. Final determination regarding this planning standard will be
16 based on verification of **Confirmatory Action NRC Items 13.03-08 and 13.03-17**.

17 The applicant has committed to meet the following license conditions and ITAAC, with the
18 associated dates, for the emergency preparedness program:

19 **VCSNS Units 2 and 3 ITAAC 3.1 [F.1.d.]** has been proposed to test the capabilities of the
20 system used to provide prompt communications to the public

21 **VCSNS Units 2 and 3 ITAAC 3.2 [F.1.f.]** has been proposed to test the capabilities of the
22 system used to provide prompt communications among principal response organizations

13.3.1C.G Public Education and Information

13.3.1C.G.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(7); Planning Standard G. requires that information be made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) be established in advance, and procedures for coordinated dissemination of information to the public be established.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(7), the NRC staff evaluated it against the detailed evaluation criteria⁹ in NUREG-0654/FEMA-REP-1.

Technical Information in the Plan: [G.1.] Section G, "Public Education and Information," of the VCSNS Units 2 and 3 Emergency Plan provides a description of the sites public education information program. The VCSNS site coordinates with State and county agencies to update the Emergency Public Information (EPI) publication annually. The publication is distributed annually to all residents and transient locations, specified in Section G.2, "Public Education Materials," within the 10-mile plume exposure pathway Emergency Planning Zone (EPZ). Information on the contents of the EPI publication is provided on page G-1.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan provides for a coordinated periodic (at least annually) dissemination of information to the public regarding how they will be notified and what their actions should be in an emergency. This information includes:

- a. educational information on radiation;
- b. contact for additional information;
- c. protective measures, e.g., evacuation routes and relocation centers, sheltering, respiratory protection, radioprotective drugs; and
- d. special needs of the handicapped.

Means for accomplishing this dissemination may include, but are not necessarily limited to: information in the telephone book; periodic information in utility bills; posting in public areas; and publications distributed on an annual basis.

Technical Information in the Plan: [G.2.] Section G, "Public Education and Information," of the VCSNS Units 2 and 3 Emergency Plan provides a description of the public education information program. The VCSNS site coordinates with State and county agencies to update the EPI publication annually. The publication is distributed annually to all residents and transient locations within the 10-mile plume exposure pathway EPZ. Section G.2, "Public Education Materials," states that information intended for transients is placed at local business establishments and at the entrances to recreational areas around the VCSNS site. Information on the contents of the EPI publication is provided on page G-1.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes a public information program that provides the permanent and transient adult population within the plume exposure EPZ an adequate opportunity to become aware of the information annually. The program includes provision for written material that is likely to be available in a residence

⁹ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

1 during an emergency. The VCSNS Units 2 and 3 Emergency Plan describes the updating of
2 disseminated information at least annually. Signs or other measures (e.g., decals, posted
3 notices or other means, placed in hotels, motels, gasoline stations and phone booths) are used
4 to disseminate to any transient population within the plume exposure pathway EPZ appropriate
5 information that would be helpful if an emergency or accident occurs. Such notices refer the
6 transient to the telephone directory or other source of local emergency information and guide
7 the visitor to appropriate radio and television frequencies.

8
9 **Technical Information in the Plan: [G.3.a.]** Section G.3, "Media Accommodations," of the
10 VCSNS Units 2 and 3 Emergency Plan lists the EPI Organization and the Joint information
11 Center (JIC) as the two organizations in charge of media and public relations. The SCANA
12 Public Affairs Group is notified when an Unusual Event or higher emergency condition exists
13 and will handle media responsibilities until the JIC is activated. However, the emergency plan
14 does not explain who or what SCANA is. In **RAI 13.03-21** the staff requested additional
15 information on SCANA. In a response letter dated May 8, 2009 (pg 39), the applicant provided
16 a description of SCANA and their role in the ERO.

17 The EPI is comprised of senior managers from SCANA who will function as company
18 spokespersons. Organization of the EPI is discussed in detail in Section B.5.c, "EPI
19 Organization." The EPI provides information from the Emergency Response Organization
20 (ERO) to the public, via the news media, after it is approved by the Emergency Director (ED).
21 The JIC is where approved news releases will be provided to the media for dissemination to the
22 public. The JIC, located with the Emergency Operations Facility (EOF), is equipped with
23 appropriate seating, lighting, and visual aids to allow for public announcements and briefings to
24 be given to the news media. The JIC is activated at the declaration of an Alert or higher
25 classification.

26 **Technical Evaluation:** The staff finds the additional information submitted in response to **RAI**
27 **13.03-21** to be acceptable and therefore resolved

28
29 **Technical Information in the Plan: [G.3.b.]** Section G.3.a.2, "Joint Information Center," of the
30 VCSNS Units 2 and 3 Emergency Plan states the JIC, located in the EOF, is where approved
31 news releases will be provided to the media for dissemination to the public. The JIC is equipped
32 with appropriate seating, lighting, and visual aids to allow for public announcements and
33 briefings to be given to the news media.

34 **VCSNS Units 2 and 3 ITAAC 4.1** has been proposed to ensure that the licensee has provided
35 space which may be used for a limited number of the news media. (See Table 3.8-1,
36 "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined
37 License Conditions and ITAAC)," of the V. C. Summer Nuclear Station, Units 2 and 3, COL
38 Application

39
40 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan also describes space which
41 may be used for a limited number of the news media at the Emergency Operations Facility.

42
43 **Technical Information in the Plan: [G.4.a.]** Section G.3, "Media Accommodations," of
44 VCSNS Units 2 and 3 Emergency Plan states the Company Spokesperson will function as the
45 single point of contact to interface with Federal, State, and local authorities responsible for
46 disseminating information to the public.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan identifies a spokesperson that should have access to all necessary information.

Technical Information in the Plan: [G.4.b.] Section G.4.b, "Coordination of public Information," (pages G-3) of the VCSNS Units 2 and 3 Emergency Plan states that the JIC is staffed by Federal, State, county, and VCSNS personnel to assure timely, periodic exchange and coordination of information. The exchange of information is described in Section G.3, "Media Accommodations."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes established arrangements for timely exchange of information among designated spokespersons.

Technical Information in the Plan: [G.4.c.] Section G.4.c, "Coordination of Public Information," (pages G-3) of the VCSNS Units 2 and 3 Emergency Plan states rumors or misinformation is identified by the media/rumor control monitors. This group will be responsible for responding to telephone calls and monitoring media reports.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes coordinated arrangements for dealing with rumors.

Technical Information in the Plan: [G.5.] Section G.5, "Media Orientation," (pages G-3) of the VCSNS Units 2 and 3 Emergency Plan states programs to acquaint new media with the emergency plan, information concerning radiation, and points of contacts, are offered annually through the Emergency Preparedness Program in conjunction with SCANA Public Affairs Group.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes coordinated programs that will be conducted at least annually to acquaint news media with the emergency plans, information concerning radiation, and points of contact for release of public information in an emergency.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Public education and Information," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50.

13.3.1C.G.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.D.2. requires that provisions be described for yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information during an emergency be developed. In addition, signs or other measures shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs.

Technical Information in the Plan: Section G, "Public Education and Information," of the VCSNS Units 2 and 3 Emergency Plan states the Emergency Public Information (EPI) publication is distributed annually to all residents and transients within the 10-mile plume exposure pathway Emergency Planning Zone (EPZ). Section G.2, "Public Education Materials," states these publications instruct the public to go indoors and turn on their radios when they

1 hear the Alert and Notification System (ANS) sirens. Information intended for transients is
2 placed at local business establishments and at the entrances to recreational areas around the
3 VCSNS site. Information provided includes instructions to be followed in the event of an
4 emergency, a list of radio stations, and telephone numbers for additional information.
5 Information on the contents of the EPI publication is provided on page G-1.

6 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes provisions for
7 yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency
8 planning information, including the methods and times required for public notification and the
9 protective actions planned if an accident occurs, general information as to the nature and effects
10 of radiation, and provides a listing of local broadcast stations that will be used for dissemination
11 of information during an emergency be developed. In addition, signs will be used to
12 disseminate to any transient population within the plume exposure pathway EPZ appropriate
13 information that would be helpful if an accident occurs.

14 15 **13.3.1C.G.3 Conclusion for Public Education and Information**

16 On the basis of its review of the VCSNS Units 2 and 3 Emergency Plan and response to **RAI**
17 **13.03-21** as described above for Planning Standard G/ Public Education and Information, the
18 staff concludes that the information provided in the VCSNS Units 2 and 3 Emergency Plan is
19 consistent with Planning Standard G/ Public Education and Information, of
20 NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the
21 requirements of 10 CFR 50.47(b)(7) and Section IV.D.2. of Appendix E to 10 CFR Part 50.

22
23 The applicant has committed to meet the following license conditions and ITAAC, with the
24 associated dates, for the emergency preparedness program:

25 **VCSNS Units 2 and 3 ITAAC 4.1** was proposed to ensure that the licensee has provided space
26 which may be used for a limited number of the news media.

13.3.1C.H Emergency Facilities and Equipment

13.3.1C.H.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(8); Planning Standard H, requires that adequate emergency facilities and equipment to support the emergency response be provided and maintained.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(8), the NRC staff evaluated it against the detailed evaluation criteria¹⁰ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [H.1.] Section H.1, "Control Room, Technical Support Center [TSC], and Operations Support Center [OSC]," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states that VCSNS has established a single TSC and an OSC for each unit. Section H.1.b, "Technical Support Center," states the TSC is located outside and between the Protected Areas for Unit 1 and Units 2/3. A layout of the site with the location of the TSC is provided in each unit annex (Figures A1-1, B1-1, and C1-1). Part 7, "Departures and Exemptions," (page 6) of the VCSNS COL Application, Departure Number: VCS DEP 18.8-1 identifies the change for the location of the TSC and OSC from that stated in the Design Control Document (DCD). This section states the TSC directly meets most of the requirements of NUREG-0696 and Regulatory Guide 1.206, but the TSC does not lend itself to face-to-face communications with the affected Control Room. In **RAI 13.03-22(D)(1)** the staff requested an explanation for how the requirements in 0696 were satisfied. In a response letter dated May 8, 2009 (pg 45), the applicant stated that the facilities will meet all requirements of NUREG-0696 with the exception of face to face communication between the TSC and the Control room personnel. The applicant also identified the various ITAAC (1.1, 3.1, 5.1.1) that were proposed to ensure that 0696 requirements are met.

In **RAI 13.03-22(D)(3)** staff requested verification that the TSC will be constructed in accordance with the Uniform Building Code. In a response letter dated May 8, 2009 (pg 45), the applicant the applicant stated that the TSC and the EOF will be built in accordance with State and local uniform building codes.

An explanation of the functions of the TSC is provided on page H-2. Among these functions is providing support to the control room and providing voice communications to the Control Room, OSC, Emergency Operations Facility (EOF), and the Nuclear Regulatory Commission (NRC). Section 4.1.A, "Operations Support Center," of each unit annex, states implementing procedures establish the process for relocating if the OSC becomes uninhabitable. The Emergency Plan does not address transfer of TSC functions in the event that the TSC becomes uninhabitable. In **RAI 13.03-22(F)** the staff requested additional information regarding the relocation of staff and transfer of function for the TSC and OSC in the event that they should become uninhabitable. In a response letter dated May 8, 2009, the applicant stated that Implementing Procedures will provide the direction for relocating in the event that the OSC or the TSC is uninhabitable.

Section H.1.c, "Operations Support Center," states each unit has an OSC where the affected unit's support personnel report and will be dispatched during an emergency. The affected unit's OSC will be activated whenever the TSC is activated, but can be deactivated at the Emergency Plant Managers (EPMs) discretion. Otherwise, the affected unit OSC or an alternate OSC shall

¹⁰ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

1 be activated at all times. Personnel that will staff the OSC are listed on page H-3 and also in
2 Figure B-1b, "Onsite Emergency Response Organization [ERO]" (page B-14). Each OSC is
3 equipped with communication links to the Control Room and the TSC and carries a limited
4 number of respirators, protective clothing, flashlights, and portable survey instruments.

5
6 **VCSNS Units 2 and 3 ITAAC 5.1** has been proposed to verify that a TSC and OSC are
7 established and there capabilities are tested. The facilities will meet the criteria of NUREG-
8 0696 with exceptions. (See Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance
9 Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC," of the VCSNS Units
10 2 and 3, COL Application).

11
12 **Technical Evaluation:** The staff finds the clarification and additional information submitted in
13 response to **RAIs 13.03-22(D)(1), 13.03-22(D)(3), 13.03-22(F)** to be acceptable and therefore
14 resolved.

15 **Technical Information in the Emergency Plan: [H.2.]** Section H.2, "Emergency Operations
16 Facility," of the VCSNS Units 2 and 3 Emergency Plan states the company will coordinate
17 activities during an emergency under direction of the Emergency Director (ED) from the EOF.
18 The EOF is located outside the 10-mile plume exposure pathway Emergency Planning Zone
19 (EPZ) and greater than 10-miles from the TSC. Function of the EOF is provided on pages H-
20 3/4. Considerations for design of the EOF are listed on page H-4. Section H.2 states the EOF
21 meets the criteria of NUREG-0696 regarding location, structure, habitability, size,
22 communications, instrumentation, data system equipment, power supplies, technical data,
23 records availability, and management. In **RAI 13.03-22(G)** the staff requested additional
24 information related to location of the new EOF and use of existing EOF. In a response letter
25 dated May 8, 2009, the applicant stated that the EOF currently under construction is located
26 outside the 10 Mile Emergency Planning Zone and greater than 10 miles from the TSC. This
27 facility is expected to be utilized to support a Unit 1 FEMA/NRC evaluated exercise by the end
28 of calendar year 2009. The following statement will be added to Section H.1.b on Page H-3 at
29 the end of the first complete paragraph: "The EOF is located in Richland County at the corner of
30 Bickley Road and SC Hwy 176 and is outside the 10 Mile Emergency Planning Zone and
31 greater than 10 miles from the TSC."

32
33 Section H.3, "Joint Information Center," of the VCSNS Units 2 and 3 Emergency Plan states the
34 Company Spokesperson will coordinate the release of information during an emergency from
35 the Joint Information Center (JIC) in the EOF. The JIC will also provide provides facilities and
36 equipment for VCSNS staff, Federal, State, and county agencies to interface and where
37 information regarding the event is released to the media and general public. In **RAI 13.03-22(E)**
38 the staff requested additional information to explain whether security is available at the EOF to
39 exclude unauthorized personnel and maintain readiness when idle. In a response letter dated
40 May 8, 2009, the applicant committed to revise Section H.2 to include the following text: "The
41 EOF is provided with access limiting devices when not in use and a posted assigned security
42 personnel during activation to ensure that only authorized personnel are permitted to enter the
43 facility."

44
45 Section 18.1, "Overview," of the AP1000 Design control Document states layout and
46 environmental design of the main control room and the remote shutdown room, and the
47 supplementary support areas (TSC), are sites of application of the traditional disciplines of
48 human factors engineering.

VCSNS Units 2 and 3 ITAAC 5.2 has been proposed to verify the EOF is established outside of the 10-mile plume exposure pathway EPZ and its capabilities are tested. (See Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC," of the V. C. Summer Nuclear Station, Units 2 and 3, COL Application).

Technical Evaluation: The staff finds the additional information and textual revision submitted in response to **RAI 13.03-22(E)** to be acceptable. **Confirmatory Action NRC Item 13.03-09** was created to track this proposed revision.

Technical Information in the Emergency Plan: [H.4.] Section H.5, "Activation," of the VCSNS Units 2 and 3 Emergency Plan contains a note on page H-5 which states that the unaffected unit on-shift personnel will be used to augment the affected unit on-shift personnel upon declaration of an Alert or higher classification. Augmentation will fulfill the NUREG-0654 Criterion II.B.5 for 30-minute responders and provides additional support to the On-shift ERO to permit a 75 minute response for on-call ERO personnel. Upon reaching minimum staffing the Emergency Response Facility (ERF) should be activated 15 minutes. Criteria for activation are listed on page H-5. Response and activation criteria do not apply to the JIC. The senior manager in charge may activate their facility without meeting minimum staffing if sufficient personnel are available to fully respond to the event.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan provides for timely activation and staffing of the facilities and centers described in the plan.

Technical Information in the Emergency Plan: [H.5.] Section H.6, "Monitoring Equipment Onsite," of the VCSNS Units 2 and 3 Emergency Plan states instrumentation for the detection or analysis of emergency conditions is maintained in accordance with Technical Specifications or commitments made to the NRC. Instrumentation is available for: seismic monitoring, radiation monitoring, fire protection, and meteorological monitoring. Because instrumentation varies from unit to unit, additional details of the equipment can be found in each unit's annex. Descriptions of monitoring system related to Geophysical, Radiological and Sampling, and Process monitoring are provided. Monitoring systems and instrumentation specific to each unit are discussed in detail in Section 4.2, "Assessment Resources," of each unit annex. Additional information related to monitoring systems can be found in the final Safety Analysis Report (FSAR) Section 11.5, "Radiation Monitoring." Additional information on the Fire protection can be found in FSAR Section 9.5.1.8, "Fire Protection Program."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes an onsite monitoring systems that is used to initiate emergency measures, as well as those to be used for conducting assessment. The equipment includes:

- a. geophysical phenomena monitors (e.g., meteorological, hydrologic, seismic);
- b. radiological monitors (e.g., process, area, emergency, effluent, wound and portable monitors and sampling equipment);
- c. process monitors (e.g., reactor coolant system pressure and temperature, liquid levels, flow rates, status or lineup of equipment components); and
- d. fire and combustion products detectors.

Technical Information in the Emergency Plan: [H.6.] Section H.7, "Monitoring Equipment Offsite," of the VCSNS Units 2 and 3 Emergency Plan states that provisions have been made to

1 acquire data from and have access to the monitoring and analysis equipment. Meteorological
2 data can be obtained from the National Weather Service (NWS) or the internet if both
3 metrological towers are down. Seismic information can be obtained from a South Carolina
4 State Network (SCSN) seismometer located about 3.2 miles east-southeast of Unit 1. Data for
5 radiation and radioactive materials in the environs will be provided by South Carolina
6 Department of Health and Environmental Control (DHEC) environmental monitoring program
7 consistent with the Branch Technical Position Paper. Alternative lab facilities for counting and
8 analyzing samples can be provided by other nuclear stations within a few hours. Analytical
9 assistance can be requested from State and Federal agencies, or through contracted vendors.
10 The State maintains a radiological laboratory that provides independent analysis. The NRC
11 mobile laboratory may be made available for Site Area Emergencies and General Emergencies.
12 The Department of Energy (DOE), through the Interagency Radiological Assistance Program
13 has access to any national laboratory with DOE contract. Lab capabilities are discussed in
14 Section C.3, Radiological Laboratories.”

15
16 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes provisions to
17 acquire data from or for emergency access to offsite monitoring and analysis equipment
18 including:

- 19 a. geophysical phenomena monitors (e.g., meteorological, hydrologic, seismic);
- 20 b. radiological monitors including rate meters and sampling devices. Dosimetry meets, as
21 a minimum, the NRC Radiological Assessment Branch Technical Position for the
22 Environmental Radiological Monitoring Program; and,
- 23 c. laboratory facilities, fixed or mobile.

24
25
26 **Technical Information in the Emergency Plan: [H.7.]** Section H.8, “Offsite Monitoring
27 Equipment Storage,” states VCSNS maintains a sufficient supply of emergency equipment for
28 environmental monitoring that meet the initial requirements of two environmental Field
29 Monitoring Teams. Additional equipment is available from other VCSNS Field Monitoring
30 Teams, Institute of Nuclear Power Operations (INPO) mutual aid, and offsite response
31 organizations.

32
33 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes offsite
34 radiological monitoring equipment in the vicinity of the nuclear facility.

35
36 **Technical Information in the Emergency Plan: [H.8.]** Section H.9, “Meteorological
37 Monitoring, of the VCSNS Units 2 and 3 Emergency Plan states the site maintains two
38 meteorological towers equipped with instrumentation for continuous reading of the wind speed,
39 wind direction, air temperature, and vertical temperature difference. Representative
40 meteorological information can also be obtained from the NWS. Section 4, “Emergency
41 Facilities and Equipment,” of each unit annex provides additional information on the
42 meteorological capabilities of the site.

43
44 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes meteorological
45 instrumentation and procedures and provisions to obtain representative current meteorological
46 information from other sources.

47
48 **Technical Information in the Emergency Plan: [H.9.]** Section H.10, “OSC Capabilities,” of
49 the VCSNS Units 2 and 3 Emergency Plan states areas for coordinating, planning, and for

staging personnel are available in each OSC. Additional personnel can be accommodated in adjacent offices and locker rooms. Parts and equipment for plant maintenance are available in onsite storerooms. Radiation protection equipment is also available near the OSC. Equipment used by the damage control team is located in the maintenance shop near the OSC. The OSCs also maintains a stock of medical supplies and equipment. Voice communication systems are capable of communication with the Control Room, TSC, and EOF. Additional supplies can be requested from unaffected units and corporate resources. Communications systems are described in detail in Section F, "Emergency Communications."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan also describes the capacity, and supplies, including: respiratory protection, protective clothing, portable lighting, portable radiation monitoring equipment, cameras and communications equipment for personnel present in the OSC.

Technical Information in the Emergency Plan: [H.10.] Section H.11, "Facility and Equipment Readiness," of the VCSNS Units 2 and 3 Emergency Plan states inventory of all emergency equipment and supplies is performed on a quarterly basis and after each use. Radiation monitoring equipment is checked to verify that required calibration period and location are in accordance with the inventory lists. Surveillances include an operational check of instruments and equipment. Equipment, supplies, and parts which have a shelf-life are identified, checked, and replaced as necessary. Reserves are maintained for instruments and equipment that is removed for calibration or repair. Emergency facilities and equipment are inspected and inventoried in accordance with emergency preparedness procedures. Procedure is identified in Appendix 3, "Procedure Cross Reference to the Emergency Plan." These procedures provide information on location and availability of emergency equipment and supplies.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes provisions to inspect, inventory and operationally check emergency equipment/instruments at least once each calendar quarter and after each use. Sufficient reserves of instruments/equipment to replace those which are removed from emergency kits for calibration or repair are provided. Calibration of equipment is described to be at intervals recommended by the supplier of the equipment.

Technical Information in the Emergency Plan: [H.11.] Section H.12, "Emergency Equipment and Supplies," of the VCSNS Units 2 and 3 Emergency Plan provides a list of general equipment and supplies for emergency use by location. Facilities include the control room, TSC, EOF, and JIC. A specific list of supplies by facility can be found in the Emergency Equipment Checklist Procedure. Section H.13, "General Use Emergency Equipment," states equipment that is stored in emergency kits in each facility is listed in inventory procedures.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that emergency kits are identified by general category: protective equipment, communications equipment, radiological monitoring equipment and emergency supplies.

Technical Information in the Emergency Plan: [H.12.] Section H.14, "Collection Point for Field Samples," of the VCSNS Units 2 and 3 Emergency Plan states the central point for the receipt and analysis of filed samples is the environmental lab in the EOF. The equipment in the

lab can be used to determine activity of samples. Instruments are routinely calibrated to ensure availability. Filed monitoring equipment is maintained at the station.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes a central point, EOF Environmental Lab, for the receipt and analysis of all field monitoring data and coordination of sample media.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Emergency Facilities and Equipment," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50, 10 CFR 52.79(a), 10 CFR 50.34(f) and 10 CFR 52.73.

13.3.1C.H.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.E.1. requires that there be equipment at the site for personnel monitoring.

Technical Information in the Emergency Plan: Section K.3, "Personnel Monitoring," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states emergency workers will receive Thermoluminescent Dosimeter (TLD) badges and personal self-reading dosimeters capable of measuring expected exposures on a real time basis (24 hours per day). Workers are instructed to read their dosimeters frequently and dose records are maintained.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that there is equipment at the site for personnel monitoring.

13.3.1C.H.3 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.E.2. requires equipment for determining the magnitude of and for continuously assessing the impact of the release of radioactive materials to the environment.

Technical Information in the Emergency Plan: Section H.6, "Monitoring Equipment Onsite," of the VCSNS Units 2 and 3 Emergency Plan states instrumentation for the detection or analysis of emergency conditions is maintained in accordance with Technical Specifications or commitments made to the Nuclear Regulatory Commission (NRC). Instrumentation is available for radiation and meteorological monitoring. Additional information on monitoring equipment is provided in Section 4.2, "Assessment Resources," of each unit annex. Emergency equipment for environmental monitoring off-site is discussed in Section H.8, "Offsite Monitoring Equipment Storage."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes equipment for determining the magnitude of and for continuously assessing the impact of the release of radioactive materials to the environment.

13.3.1C.H.4 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.E.3. requires facilities and supplies at the site for decontamination of onsite individuals.

Technical Information in the Emergency Plan: Section k.6.b, "Contamination Control Measures," of the VCSNS Units 2 and 3 Emergency Plan states decontamination of personnel will be performed at decontamination areas located onsite. Temporary decontamination areas

can also be set up inside at various locations. Showers and supplies to be used are provided onsite. Section H.12, "Emergency Equipment and Supplies," provides a general list of supplies kept in each facility. The emergency plan does not provide the location of decontamination facilities onsite or provide a list of supplies that are available for decontamination of personnel. Section 1.2.5, "Annex Building," (page 23) identifies decontamination facilities in the Annex building hot shop but it is not clear if this is the facility mentioned in the emergency plan. In **RAI 13.03-22(B)** the staff requested additional information on the location of decontamination facilities and supplies that will be available for decontamination of personnel. In a response letter dated May 8, 2009 (pg 42), the applicant stated that decontamination facilities and their location will be described in the Emergency Plan Implementing Procedures to be submitted within the required timeframe as required by the EP ITAAC. The procedures will also address decontamination materials. In **Supplemental RAI 13.03-39** the staff requested the applicant revise the VCSNS Emergency Plan to address the location(s) of onsite decontamination facilities and describe the decontamination supplies associated with these facilities as required by 10 CFR 50, Appendix E.IV.E.3. In a response letter dated August 27, 2009, the applicant committed to revise Section K.5.b of the VCSNS Emergency plan to include decontamination facility locations as discussed in the AP1000 DCD and a list of decontamination supplies that will be available.

Technical Evaluation: The staff finds the additional information and textual revisions provided in response to **Supplemental RAI 13.03-39** to be acceptable. In response to **Supplemental RAI 13.03-39** the applicant provided revised text for Section K.5.b of the VCSNS Emergency. **Confirmatory Action NRC Item 13.03-18** was created to track this proposed revision.

13.3.1C.H.5 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.E.4. requires facilities and medical supplies at the site for appropriate emergency first aid treatment.

Technical Information in the Emergency Plan: Section B.1, "On-shift Emergency Response Organization Assignments," of the VCSNS Units 2 and 3 Emergency Plan states individuals trained in first aid will be designated as a first aid team for each protected area. Section H.10, "OSC Capabilities," states the Operations Support Centers (OSCs) are stocked with and first aid and medical treatment equipment and supplies. The first aid at the site is discussed in detail in Section L.2, "Onsite First Aid Capability." This section states emergency treatment areas, with equipment and supplies are located in each unit and described in each unit annex. The annexes do not include information on emergency treatment areas. In **RAI 13.03-22(C)** the staff requested additional information on the location and operation of medical treatment areas located in each unit. In a response letter dated May 8, 2009 (pg 45), the applicant proposed to include the following text in Annex 1, Section 4.1:

Emergency treatment areas are located onsite for the treatment of those individuals requiring first aid. These areas are located at the Radiation Control Area Control Point at the 412' elevation of the Control Building and at the 436' elevation of the Service Building. Medical equipment and supplies are available at these locations.

The applicant has also proposed to add the following text to Section 4.1 of Annexes 2 and 3:

The health physics area near the work exits contains the personnel contamination monitoring equipment, decontamination shower facilities, and first-aid equipment.

1 **Technical Evaluation:** The staff finds the additional information and textual revision submitted
2 in response to **RAI 13.03-22(C)** to be acceptable. **Confirmatory Action NRC Items 13.03-10**
3 **through 13.03-12** were created to track the proposed revisions.

4
5 **13.3.1C.H.6 Regulatory Basis:** 10 CFR 50, Appendix E.IV., "Content of Emergency Plans."
6 10 CFR 50, Appendix E.IV.E.8. requires an onsite technical support center and an emergency
7 operations facility from which effective direction can be given and effective control can be
8 exercised during an emergency.

9 **Technical Information in the Emergency Plan:** The Technical Support Center (TSC) and
10 Emergency Operations Facility (EOF) is discussed in Section H, "Emergency Equipment and
11 Facilities," of the VCSNS Units 2 and 3 Emergency Plan. Evaluation of these facilities is
12 described in Evaluation Criterion H.1 and H.2 above.

13
14 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan adequately describes an
15 onsite technical support center and an emergency operations facility from which effective
16 direction can be given and effective control can be exercised during an emergency.

17
18 **13.3.1C.H.7 Regulatory Basis:** 10 CFR 50, Appendix E.IV., "Content of Emergency Plans."
19 10 CFR 50, Appendix E.IV.G. requires a description of the provisions to be employed to ensure
20 that the emergency plan, and its implementing procedures, and emergency equipment and
21 supplies are maintained up-to-date.

22 **Technical Information in the Emergency Plan:** Section H.11, "Facility and Equipment
23 Readiness," of the VCSNS Units 2 and 3 Emergency Plan states inventory of all emergency
24 equipment and supplies is performed on a quarterly basis and after each use. Radiation
25 monitoring equipment is checked to verify that required calibration period and location are in
26 accordance with the inventory lists. Equipment, supplies, and parts which have a shelf-life are
27 identified, checked, and replaced as necessary. Reserves are maintained for instruments and
28 equipment that is removed for calibration or repair. Emergency facilities and equipment are
29 inspected and inventoried in accordance with emergency preparedness procedures. Section
30 P.4, "Emergency Plan and Agreement Revisions," provides information on the annual review of
31 the emergency plan. Procedures are discussed in Section P.7, "Implementing and Supporting
32 Procedures." Procedures are identified in Appendix 3, "Procedure Cross Reference to the
33 Emergency Plan." These procedures provide information on location and availability of
34 emergency equipment and supplies.

35
36 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes in sufficient
37 detail the provisions to be employed to ensure that the emergency plan, and its implementing
38 procedures, and emergency equipment and supplies are maintained up-to-date.

39
40 **13.3.1C.H.8 Regulatory Basis:** 10 CFR 50, Appendix E.VI., "Emergency Response Data
41 System," requires Emergency Response Data System (ERDS), which is a direct near real-time
42 electronic data link between the licensee's onsite computer system and the NRC Operations
43 Center that provides for the automated transmission of a limited data set of selected
44 parameters. The ERDS supplements the existing voice transmission over the Emergency
45 Notification System (ENS) by providing the NRC Operations Center with timely and accurate
46 updates of a limited set of parameters from the licensee's installed onsite computer system in

1 the event of an emergency. The licensee shall test the ERDS periodically to verify system
2 availability and operability. The frequency of ERDS testing will be quarterly unless otherwise set
3 by NRC based on demonstrated system performance.

4 10 CFR 50, Appendix E.VI., "Emergency Response Data System," also requires onsite
5 hardware at each unit by the licensee to interface with the NRC receiving system. Software,
6 which will be made available by the NRC, will assemble the data to be transmitted and transmit
7 data from each unit via an output port on the appropriate data system. The hardware and
8 software must have the following characteristics:

9 a. Data points, if resident in the in-plant computer systems, must be transmitted for four
10 selected types of plant conditions: Reactor core and coolant system conditions; reactor
11 containment conditions; radioactivity release rates; and plant meteorological tower data. A
12 separate data feed is required for each reactor unit. While it is recognized that ERDS is not
13 a safety system, it is conceivable that a licensee's ERDS interface could communicate with
14 a safety system. In this case, appropriate isolation devices would be required at these
15 interfaces. The data points, identified in the following parameters will be transmitted:

16
17 (i) The selected plant parameters are: (1) Primary coolant system: pressure,
18 temperatures (hot leg, cold leg, and core exit thermocouples), subcooling margin,
19 pressurizer level, reactor coolant charging/makeup flow, reactor vessel level, reactor
20 coolant flow, and reactor power; (2) Secondary coolant system: Steam generator levels
21 and pressures, main feedwater flows, and auxiliary and emergency feedwater flows; (3)
22 Safety injection: High- and low-pressure safety injection flows, safety injection flows
23 (Westinghouse), and borated water storage tank level; (4) Containment: pressure,
24 temperatures, hydrogen concentration, and sump levels; (5) Radiation monitoring
25 system: Reactor coolant radioactivity, containment radiation level, condenser air removal
26 radiation level, effluent radiation monitors, and process radiation monitor levels; and (6)
27 Meteorological data: wind speed, wind direction, and atmospheric stability.

28
29 b. The system must be capable of transmitting all available ERDS parameters at time
30 intervals of not less than 15 seconds or more than 60 seconds. Exceptions to this
31 requirement will be considered on a case by case basis.

32 c. All link control and data transmission must be established in a format compatible with the
33 NRC receiving system as configured at the time of licensee implementation.
34

35 **Technical Information in the Emergency Plan: [10 CFR 50, Appendix E.VI, "Emergency**
36 **Response Data System"]** Section F.3, "Communication testing," of the VCSNS Units 2 and 3
37 Emergency Plan states that testing of communication system is performed in accordance with
38 Section N.2, "Drills." Section N.2 states primary communication methods are tested monthly.
39 Capability to notify NRC and Federal EROs is tested quarterly. Section F.5, "ERDS," of the
40 VCSNS Units 2 and 3 Emergency Plan states as prescribed by 10 CFR 50 Appendix E.VI,
41 ERDS will supply the NRC with selected plant data points on a near real time basis. The
42 selected data points are transmitted via modem to the NRC at approximately 1-minute intervals.
43 The ERO has backup methods available to provide required information to the NRC in the event
44 that ERDS is inoperable during the declared emergency.
45

46 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes the Emergency
47 Response Data System (ERDS), as a direct near real-time electronic data link between the
48 licensee's onsite computer system and the NRC Operations Center that provides for the

1 automated transmission of a limited data set of selected parameters. The ERDS supplements
2 the existing voice transmission over the Emergency Notification System (ENS) by providing the
3 NRC Operations Center with timely and accurate updates of a limited set of parameters from
4 the licensee's installed onsite computer system in the event of an emergency. The VCSNS
5 Units 2 and 3 Emergency Plan states that the licensee will test the ERDS periodically to verify
6 system availability and operability. The frequency of ERDS testing will be quarterly unless
7 otherwise set by NRC based on demonstrated system performance.

8 Also, the VCSNS Units 2 and 3 Emergency Plan states that onsite hardware will be provided at
9 each unit by the licensee to interface with the NRC receiving system. Software, which will be
10 made available by the NRC, will assemble the data to be transmitted and transmit data from
11 each unit via an output port on the appropriate data system. The hardware and software has
12 the following characteristics:

13 a. Data points will be transmitted for four selected types of plant conditions: Reactor core
14 and coolant system conditions; reactor containment conditions; radioactivity release rates;
15 and plant meteorological tower data. A separate data feed is provided for each reactor unit.
16 The VCSNS Units 2 and 3 Emergency Plan states that appropriate isolation devices are
17 provided at interfaces with safety systems. In addition, the VCSNS Units 2 and 3
18 Emergency Plan states that the data points, identified in the following parameters will be
19 transmitted:

20
21 (i) Selected plant parameters are: (1) Primary coolant system: pressure, temperatures
22 (hot leg, cold leg, and core exit thermocouples), subcooling margin, pressurizer level,
23 reactor coolant charging/makeup flow, reactor vessel level, reactor coolant flow, and
24 reactor power; (2) Secondary coolant system: Steam generator levels and pressures,
25 main feedwater flows, and auxiliary and emergency feedwater flows; (3) Safety injection:
26 High- and low-pressure safety injection flows, safety injection flows (Westinghouse), and
27 borated water storage tank level; (4) Containment: pressure, temperatures, hydrogen
28 concentration, and sump levels; (5) Radiation monitoring system: Reactor coolant
29 radioactivity, containment radiation level, condenser air removal radiation level, effluent
30 radiation monitors, and process radiation monitor levels; and (6) Meteorological data:
31 wind speed, wind direction, and atmospheric stability.

32
33 b. The system is capable of transmitting all available ERDS parameters at time intervals of
34 not less than 15 seconds or more than 60 seconds.

35 c. All link control and data transmission are established in a format compatible with the
36 NRC receiving system as configured at the time of licensee implementation.
37

38 **13.3.1C.H.9 Regulatory Basis:** 10 CFR 52.79(a)(17) and 10 CFR 50.34(f)(2)(iv) require that
39 the application contain information with respect to compliance with the technically relevant
40 positions of the Three Mile Island requirements in 10 CFR 50.34(f). 10 CFR 50.34(f)(2)(iv)
41 specifically requires a plant safety parameter display console that will display to operators a
42 minimum set of parameters defining the safety status of the plant. The console must be
43 capable of displaying a full range of important plant parameters [list them if provided] and data
44 trends on demand and capable of indicating when process limits are being approached or
45 exceeded. 10 CFR 50.34(f)(2)(viii) requires that the application describe the capability to
46 promptly obtain and analyze from the reactor coolant system and containment that may contain
47 accident source term radioactive materials without radiation exposures to the individual
48 exceeding 5 rems to the whole body or 50 rems to the extremities. Materials to be analyzed
49 and quantified include certain radionuclides that are indicators of the degree of core damage

(e.g., noble gases, radioiodines, and cesiums, and nonvolatile isotopes), hydrogen in containment atmosphere, dissolved gases, chloride, and boron concentrations. 10 CFR 50.34(f)(2)(xvii) requires that the application describe instruments to measure, record and readout in the control room for: (1) containment pressure, (2) containment water level, (3) containment hydrogen concentration, (4) containment radiation intensity (high level), and (5) noble gas effluents at all potential, accident release points. In addition, the application must describe a continuous sampling capability for radioactive iodines and particulates in gaseous effluents from all potential accidents release points, and for onsite capability to analyze and measure these samples. 10 CFR 50.34(f)(2)(xxv) requires a description of the onsite Technical Support Center (TSC) and the onsite Operational Support Center (OSC).

Technical Information in the Emergency Plan: Section H.6.c.2, "Safety Parameter Display System (SPDS)," of the VCSNS Units 2 and 3 Emergency Plan states that the SPDS provides a display of plant parameters from which the safety status of operation may be assessed in the Control Room, TSC, and EOF for the station. The SPDS and/or other display systems in the TSC and EOF promote the exchange of information between these facilities and the Control Room and assists the emergency organization in the decision making process. Additional information related to the SPDS and measured parameters can be found in the AP1000 Design Control Document (DCD) Section 18.8.2, "Safety Parameter Display System (SPDS)." Chapter 1.9.3, "Three Mile Island Issues," of the AP1000 DCD discusses compliance with Three Mile Island issues addressed in 10 CFR 50.34(f) that relate to AP1000 design features or program plans. Chapter 12.4.1.8, "Post-Accident Actions," discusses prevention of individuals exceeding 5 rem to the whole body or 50 rem to the extremities. The TSC and OSC are discussed in under Evaluatino Criterion H.1 above.

Technical Evaluation: Section 18.8.2, "Safety Parameter Display System (SPDS)," of the Tier 2 Material in AP1000 DCD, Revision 16, states the SPDS is designed following the human system interface design implementation plan described in subsection 18.8.1, "Implementation Plan for the Human System Interface Design". The SPDS is integrated into the design of the AP1000 human system interface resources. Section 18.8.2.1 states, "The AP1000 human system interface data display (alarms and visual display unit displays) is organized around the SPDS requirement of plant process functions." The display of system parameters is discussed in section 18.2.2.2. In Section 1.9 of the DCD sub-section (2) (iv) Safety Parameter Display System, states the purpose of the plant safety parameter display console (SPDS) is to display important plant variables in the main control room in order to assist in rapidly and reliably determining the safety status of the plant. The requirements for the safety parameter display system are specified during the main control room design process, and are met by the main control room design, specifically as part of the alarms, displays, and controls. The requirements for a SPDS are met by grouping the alarms by plant process or purpose, as directly related to the critical safety functions. The process data presented on the graphic displays is similarly grouped, facilitating an easy transition for the operators. The SPDS requirement for presentation of plant data in an analog fashion prior to reactor trip is met by the design of the graphic CRT displays. Displays are available at the operator workstations, the remote shutdown workstation, and at the TSC.

13.3.1C.H.10 Regulatory Basis: Supplement 1 to NUREG-0737, "Clarification of TMI Action Plan Requirements," issued January 1983, provides guidance emergency response facilities in section 8, "Emergency Response Facilities."

The application contained information with respect to compliance with the technically relevant positions of the Three Mile Island requirements in 10 CFR 50.34(f). The VCSNS Units 2 and 3

Emergency Plan addressed the plant safety parameter display console that will display to operators a minimum set of parameters defining the safety status of the plant. The console is capable of displaying a full range of important plant parameters and data trends on demand and capable of indicating when process limits are being approached or exceeded.

The application describes instruments to measure, record and readout in the control room for: (1) containment pressure, (2) containment water level, (3) containment hydrogen concentration, (4) containment radiation intensity (high level), and (5) noble gas effluents at all potential, accident release points. The VCSNS Units 2 and 3 Emergency Plan also describes a continuous sampling capability for radioactive iodines and particulates in gaseous effluents from all potential accidents release points, and for onsite capability to analyze and measure these samples.

Technical Information in the Emergency Plan: Section H.6.c.2, "Safety Parameter Display System (SPDS), of the VCSNS Units 2 and 3 Emergency Plan states the site employs a SPDS to display plant parameters used to make a quick assessment of the safety status of the plant, exchange information between facilities and the Control Room, and assists in the decision making process. The SPDS is available in the Control Room, TSC, and EOF for the station. The use of the SPDS system is also discussed in Section I, Accident Assessment." Additional information regarding display systems can be found in Final Safety Analysis Report (FSAR) Section 7.5, "Safety-Related Display Information." In **RAI 13.03-22(A)(1)**, the staff requested additional information regarding the capability of the SPDS system to provide data trends. In a response letter dated May 8, 2009 (pg 44), the applicant the applicant committed to revise Section H.6.c.2 to read include the following sentence with regards to SPDS: "It also provides data trending information regarding current and past status of the affected Unit(s)."

In **RAI 13.03-22(A)(2)** staff requested additional information regarding the reliability of the indicators and circuitry of the SPDS. In a response letter dated May 8, 2009 (pg 42), the applicant the applicant stated that the reliability of the SPDS indicators and circuitry is specifically discussed in DCD Subsection 18.8.2.3, "Reliability." The first sentence of Section H.6.c.2 will be revised to read: "SPDS provides a reliable display of plant parameters from which the safety status of operation may be assessed in the Control Room, TSC, and EOF for the station."

The TSC and OSC is discussed in Section H, "Emergency Equipment and Facilities," of the VCSNS Emergency Plan. For information regarding the evaluation of these facilities refer to the analysis for Evaluation Criterion H.1 and H.9.

Technical Evaluation: The staff finds the additional information and textual revision submitted in response to **RAI 13.03-22(A)(1) and (2)** to be acceptable. **Confirmatory Action NRC Items 13.03-13 and 13.03-14** were created to track the proposed revisions.

13.3.1C.H.11 Regulatory Basis: 10 CFR 52.73, "Relationship to other Subparts," states that an applicant for a combined license may reference a standard design certification, standard design approval, or manufacturing license.

Technical Information in the Emergency Plan: The applicant referenced a standard design certification

13.3.1C.H.12 Conclusion for Emergency Facilities and Equipment

1 The staff has reviewed the onsite emergency plan and the applicant's responses to **RAI 13.03-**
2 **RAIs 13.03-22 (A)(1)(2), (B), (D)(1)(3), (E), (F), (G), and Supplemental RAI 13.03-39** in
3 regards to Planning Standard H of NUREG-0654/FEMA-REP-1 and the requirements of 10 CFR
4 50.47(b)(8) and Section IV.E.1., E.2., E.3, E.4., E.8., G., and VI. of Appendix E to 10 CFR Part
5 50. Final determination regarding this planning standard will be based on verification of
6 **Confirmatory Action NRC Items 13.03-09 through 13.03-14 and 13.03-18.**

7
8 The applicant has committed to meet the following license conditions and ITAAC, with the
9 associated dates, for the emergency preparedness program:

10
11 **VCSNS Units 2 and 3 ITAAC 5.1 [H.1] [H.9]** has been proposed to verify that a TSC and OSC
12 are established and their capabilities are tested. The facilities will meet the criteria of NUREG-
13 0696 with exceptions.

14
15 **VCSNS Units 2 and 3 ITAAC 5.2 [H.2]** has been proposed to verify the EOF is established
16 outside of the 10-mile plume exposure pathway EPZ and its capabilities are tested.

13.3.1C.I Accident Assessment

13.3.1C.I.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(9); Planning Standard I. requires that adequate methods, systems and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition be in use.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(9), the NRC staff evaluated it against the detailed evaluation criteria ¹¹ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [I.1.] Discussion of efforts made in response to emergency conditions can be found in Section I, "Accident Assessment," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan. Section I.1, "Plant Parameters and Corresponding Emergency Classification," states plant system and effluent parameter values along with environmental and meteorological conditions are used to determine the severity of an accident leading to its emergency classification. The specific symptoms, parameter values or events for each level of emergency classification will be contained in the implementing procedures. Implementing Procedures were identified in Appendix 3, "Procedure Cross-Reference to Emergency Plan," (page 3-2) for Emergency Classification, Dose Assessment, Core Damage, and Offsite Monitoring. Administrative procedures have also been identified for facilities and equipment discussed in Annex 1 and Annex 2.

Events are characterized by system and effluent parameters according to Emergency Action Levels (EALs) that are presented in each Unit Annex. The EALs can be found in Section 3, "Classification of Emergencies," of each unit Annex. The EALs were developed using NEI 07-01, Methodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors. They are discussed in more detail in Section D, "Emergency Classification system."

Necessary equipment and instrumentation will be installed in each facility to allow for continuous availability of plant information. Instrumentation and equipment capabilities are described in Section H, "Emergency Facilities and Equipment." A list of equipment available for each facility can be found in Section 4.2.b, "Onsite Radiation Monitoring Equipment," Table 4-1, "Radiation Monitoring System Description," (page Annex 1-28/29, 2-22/23, and 3-22/3). Conditions of the plant are evaluated through monitoring of plant parameters from the Control Room and within the plant. The Safety Parameter Display System (SPDS) is assembled in the control room to monitor reactor coolant system pressure, reactor or pressurizer water level, containment pressure, reactor power, safety system status, containment radiation level and effluent monitor readings in one display

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan identifies plant system and effluent parameter values characteristic of a spectrum of off-normal conditions and accidents, and identifies the plant parameter values or other information which correspond to the initiating conditions. Such parameter values and the corresponding emergency class are included in the appropriate facility emergency procedures. Facility emergency procedures specify the kinds of instruments being used and their capabilities.

¹¹ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

1 **Technical Information in the Emergency Plan: [I.2.]** Section I.2, "Onsite Accident
2 Assessment Capabilities," (page I-1) of the VCSNS Units 2 and 3 Emergency Plan states the
3 station employs a plant parameter display systems, liquid and gaseous sampling system, Area
4 and process Radiation Monitors (RMs), and accident RMs to acquire initial and continuous
5 information for accident assessment. These systems are described in Section H.6.b,
6 "Monitoring Equipment Onsite," (page H-6/7), and in Section 4.2, "Assessment Resources," of
7 each unit annex.
8

9 **[Post-accident sampling capability]** Section 1.9.5.2.9, "Post-Accident Sampling System NRC
10 Position," of the AP1000 Design control Document (DCD) states the post-accident sampling
11 system is a subsystem of the primary sampling system, described in subsection 9.3.3. The
12 primary sampling system is designed to conform to the guidelines of the model Safety
13 Evaluation Report on eliminating post-accident sampling system requirements from technical
14 specifications for operating plants. The primary sampling system conforms to the most recent
15 NRC position. Section 9.3.3.1.2.2, "Post-Accident Sampling," (page 9.3-11) of the AP1000 DCD
16 states there are contingency plans for obtaining and analyzing highly radioactive samples.
17 These plans include the procedures to analyze reactor coolant for boron, containment
18 atmosphere for hydrogen and fission products, and containment sump water for pH, during later
19 stages of accident response.
20

21 Section I.3, "Source Term Determination," (page I-1/3) states core damage considerations are
22 used as the bases for several of the EAL Initiating Conditions (ICs) and as the threshold for the
23 declaration of a General Emergency. Assessment methodologies used to estimate core
24 damage and determine core damage type are discussed. Assessment of core damage will be
25 performed by a core damage assessment team trained in accordance with Section O.4.b.2,
26 "Core Damage Assessment Personnel" (page O-3). Discussion on classification levels can be
27 found in Section D, "Emergency Classification System," and Section 3, "Classification of
28 Emergencies," of each unit annex.
29

30 Section I.9, "Iodine Monitoring," (page I-5) states field monitoring equipment has the capability
31 to detect and measure airborne radioiodine concentrations as low as 1×10^{-7} $\mu\text{Ci/cc}$ in the field.
32 Hand held survey meters are used to measure elemental iodine concentrations in air samples to
33 check offsite release projections made based on plant data. Section I.4, "Effluent Monitor Data
34 and Dose Projection," (page I-3) outlines the process for making dose projections for offsite
35 areas.
36

37 **[NUREG-0737, Section 6.1.b.1. - Control Room]** Measurement and display of Type A-E
38 variables is discussed in detail in Section 7.5, "Safety Related Display Information," of the Final
39 Safety Analysis Report (FSAR). Section 7.5.1, "Introduction states the measured variables are
40 based on guidance provided in Regulatory Guide 1.97.
41

42 **[Supplement 1 to NUREG-0737, Section 6.1.b.2. - Control Room]** Section I.4,
43 "Meteorological Information," (page I-3/4) of the VCSNS Units 2 and 3 Emergency Plan states
44 that meteorological data, which includes wind speed, wind direction, temperature, and vertical
45 temperature difference, are available in the Control Room, Technical Support Center (TSC), and
46 Emergency Operations Facility (EOF). A short description of meteorological capability is
47 provided in Section H.9, "Meteorological Monitoring," (page H-9). A more detailed description of
48 meteorological capabilities is provided in Section 4.2.A, "Onsite Meteorological Monitoring
49 Instrumentation," in each unit Annex. Section 4.2.A.c also states that meteorological data will
50 be available in the Control Room, TSC, and EOF.
51

1 **[Supplement 1 to NUREG-0737, Section 6.1.b.3. - Control Room]** Section H.9,
2 “Meteorological Monitoring,” (page H-9) of the VCSNS Units 2 and 3 Emergency Plan states the
3 capability exist to obtain “representative” data from other sources such as the National Weather
4 Service (NWS). Section 4.2.A.c, “Onsite Meteorological Monitoring Instrumentation,” of each
5 unit annex, states that meteorological data will be obtained from the NWS in Columbia South
6 Carolina if both onsite towers are not available.

7
8 **VCSNS Units 2 and 3 ITAAC 6.1** has been proposed to demonstrate that the means exists to
9 provide initial and continuing radiological assessment throughout the course of an accident
10 through the plant computer or communications with the Control Room. (See Table 3.8-1,
11 “Inspections, Tests, Analyses, and Acceptance Criteria,” in Part 10, “Proposed Combined
12 License Conditions and ITAAC,” of the VCSNS Units 2 and 3, COL Application).

13 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes the onsite
14 capability and resources to provide initial values and continuing assessment throughout the
15 course of an accident. The capabilities include post-accident sampling capability, radiation and
16 effluent monitors, in-plant iodine instrumentation, and containment radiation monitoring.

17 **[Include a description of the PASS capability.] [Supplement 1 to NUREG-0737, Section**
18 **6.1.b. - Control Room]** The VCSNS Units 2 and 3 Emergency Plan describes measurements
19 and indication of Type A, B, C, D, E variables listed in Regulatory Guide 1.97 (Rev. 2),
20 “Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess Plant and Environs
21 Conditions during And Following an Accident.” **[Supplement 1 to NUREG-0737, Section**
22 **6.1.b. - Control Room]** The VCSNS Units 2 and 3 Emergency Plan describes reliable
23 indication of the meteorological variables (wind direction, wind speed, and atmospheric stability)
24 specified in Regulatory Guide 1.97 (Rev. 2) for site meteorology. **[Supplement 1 to NUREG-**
25 **0737, Section 6.1.b. - Control Room]** Information on meteorological conditions for the region
26 in which the site is located are available via communication with the National Weather Service.

27
28 **Technical Information in the Emergency Plan: [I.3.]** Section I.3, “Source Term
29 Determination,” (page I-1/3) of the VCSNS Units 2 and 3 Emergency Plan states core damage
30 considerations are used as the bases for several of the EAL ICs and as the threshold for the
31 declaration of a General Emergency. Assessment methodologies used to estimate core damage
32 and determine core damage type are discussed in this section. Estimates of core damage can
33 be used to determine the potential type and/or quantity of source term available for release to
34 support offsite dose projections and determine protective action measures. The dose estimate
35 methods used to make source term estimations are discussed in Section I.4, “Effluent Monitor
36 Data and Dose Projection,” (page I-3).

37
38 **VCSNS Units 2 and 3 ITAAC 6.2** has been proposed to demonstrate that the means exist to
39 determine the source term of releases of radioactive material within plant systems, and the
40 magnitude of the release of radioactive materials based on plant system parameters and
41 effluent monitors. (See Table 3.8-1, “Inspections, Tests, Analyses, and Acceptance Criteria,” in
42 Part 10, “Proposed Combined License Conditions and ITAAC,” of the VCSNS Units 2 and 3,
43 COL Application).

44
45 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan establishes methods and
46 techniques to be used for determining:

- 47 a. the source term of releases of radioactive material within plant systems.

- b. the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors.

Technical Information in the Emergency Plan: [I.4.] Section I.4, "Effluent Monitor Data and Dose Projection," (page I-3) outlines the process for making dose assessment or projections. The Plant Parameter Display System and personal computers will provide the Emergency Response Organization (ERO) with information required to make decisions. Instrumentation readings will be used to determine dose rates and dose at various distances from the site. Methods include measurements and samples at release points, containment leakage rates, and field data. Dose assessments will be performed by personnel using simplified computer dose models, effluent monitors, and site meteorological data. One hour post accident, more complex models will be used to analyze the offsite consequences. The computer applications are evaluated against the EPA-400 plume exposure Protective Action Guidelines (PAGs) for the early phase of an accident to determine the necessity for offsite PARs.

Section 4.2.A.1.c, "Onsite Meteorological Instrumentation," of each unit annex states the meteorological data necessary for making offsite dose projections is available to personnel in the Control Room, TSC, and EOF. The dose projection model is discussed in more depth in Section 4.2.F, "Dose Projection Model," of each unit annex. Section 4.2.f, describes the MIDAS System that is used for dose assessments.

VCSNS Units 2 and 3 ITAAC 6.3 has been proposed to demonstrate that the impact of a radiological release to the environment is able to be assessed by utilizing the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions. (See Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC," of the VCSNS Units 2 and 3, COL Application).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes the relationship between effluent monitor readings and onsite and offsite exposures and contamination for various meteorological conditions.

Technical Information in the Emergency Plan: [I.5.] Section H.9, "Meteorological Monitoring," (page H-9) of the VCSNS Units 2 and 3 Emergency Plan states the VCSNS site has two meteorological towers equipped with instrumentation for continuous reading of the wind speed, wind direction, air temperature, and vertical temperature difference. Section I.5, "Meteorological Information," (page I-3/4) states this data is used by VCSNS personnel, the state, and NRC to provide near real-time predictions of the atmospheric effluent transport and diffusion. This data is available in the Control Room, TSC, and EOF. Section F.1.b.5, "ERDS," (page F-2) states the Emergency Response Data System (ERDS) will be used to transmit data to the Nuclear Regulatory Commission (NRC) on a real time basis according to 10 CFR 50 Appendix E.IV. Backup systems are available if the ERDS fails. Section 4.2.A, "Onsite Meteorological Monitoring Instrumentation," (page 1-27, 2-21, and 3-21) of each unit annex, provides a description of the onsite equipment used to measure atmospheric conditions. This section also states meteorological data from the NWS in Columbia, South Carolina, will be acquired and used when both onsite meteorological towers are not available.

VCSNS Units 2 and 3 ITAAC 6.4 has been proposed to test the capability to acquire and evaluate meteorological data/information. (See Table 3.8-1, "Inspections, Tests, Analyses, and

Acceptance Criteria,” in Part 10, “Proposed Combined License Conditions and ITAAC,” of the VCSNS Units 2 and 3, COL Application).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the capability of acquiring and evaluating meteorological information. There are provisions for access to meteorological information by EOF, the TSC, the Control Room and an offsite NRC Center. The applicant made available to the State of South Carolina suitable meteorological data processing interconnections which will permit independent analysis by the State(s), of facility generated data.

Technical Information in the Emergency Plan: [I.6.] Section I.6, “Unmonitored Release,” (page I-4) of the VCSNS Units 2 and 3 Emergency Plan states dose projections can be made by using sample data if effluent monitors are off-scale, inoperable, or the release occurs in an unmonitored path. In these cases, a dose projection can be performed by specifying the accident category as a default. The accident category will define the mix, total curies, and the release pathway, providing an upper bound for release concentrations, dose rate, and dose. Section O.4.c.3, “Dose Assessment,” (page O-4) states that dose assessment personnel will receive initial and periodic computerized dose assessment training.

VCSNS Units 2 and 3 ITAAC 6.5 has been proposed to ensure a test will be performed of the capabilities to make rapid assessments of actual or potential magnitude and locations of radiological hazards through liquid or gaseous release pathways, including activation, notification means, field team composition, transportation, communication, monitoring equipment, and estimated deployment times. (See Table 3.8-1, “Inspections, Tests, Analyses, and Acceptance Criteria,” in Part 10, “Proposed Combined License Conditions and ITAAC,” of the VCSNS Units 2 and 3, COL Application).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes the methodology for determining the release rate/projected doses if the instrumentation used for assessment are off-scale or inoperable.

Technical Information in the Emergency Plan: [I.7.] Section I.7, “Field Monitoring,” (page I-4) of the VCSNS Units 2 and 3 Emergency Plan states VCSNS maintains the ability to take offsite air samples and to directly measure gamma dose rates in the event of an airborne or liquid release. Environmental measurements are used as an aid in the determination and assessment of protective and recovery actions for the general public. Offsite soil, water, and vegetation samples will be provided by either the Field Monitoring Teams or South Carolina Department of Health and Environmental Control (SCDHEC) teams. Resources to support field teams are also discussed. Section H.7.b, “Radiological Environmental Monitors and Sampling,” (page H-9) states an offsite environmental monitoring program will be conducted by the SCDHEC that includes fixed continuous air samplers; sampling of water, milk and fish; and fixed thermoluminescent dosimeters. Placement and numbers of equipment are described.

Section H.8, “Offsite monitoring Equipment Storage,” (page H-9) states supply equipment sufficient for two environmental Field Monitoring Teams is maintained at the site. Additional equipment is available from other VCSNS Field Monitoring Teams, Institute of Nuclear Power Operations (INPO) mutual aid, and offsite response organizations. Appendix 2, Letters of Agreement,” (page 2-1) contains a list of organizations for which the VCSNS has letters of agreement and/or memorandums of understating.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the capability and resources for field monitoring within the plume exposure Emergency Planning Zone which are an intrinsic part of the concept of operations for the facility.

Technical Information in the Emergency Plan: [I.8.] Section I.8, "Field Monitoring Teams," (page I-4/5) of the VCSNS Units 2 and 3 Emergency Plan states VCSNS has the expertise necessary to conduct limited offsite environmental survey and sampling 24 hours a day. Two teams composed of two individuals, are notified and activated at an Alert or higher classification. Teams will assemble in the EOF and then are dispatched in company vehicles into the surrounding areas. Initial surveys involve simple measurements to quickly confirm or modify the dose projections. Subsequent measurements will be made to further define offsite consequences. Data collected by the field monitoring team will be transmitted to the emergency facilities. The data is used to define affected area boundaries, verify or modify dose projections and PARs, and assess the actual magnitude, extent, and significance of a liquid or gaseous release. The SCDHEC support can be used to perform collection, shipment, and analysis of environmental sample media.

VCSNS Units 2 and 3 ITAAC 6.5 has been proposed to ensure a test will be performed of the capabilities to make rapid assessments of actual or potential magnitude and locations of radiological hazards through liquid or gaseous release pathways, including activation, notification means, field team composition, transportation, communication, monitoring equipment, and estimated deployment times. (See Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC," of the VCSNS Units 2 and 3, COL Application).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes methods, equipment and expertise to make rapid assessments of the actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways. The methods include activation, notification means, field team composition, transportation, communication, monitoring equipment and estimated deployment times.

Technical Information in the Emergency Plan: [I.9.] Section I.9, "Iodine Monitoring," (page I-5) states field monitoring equipment has the capability to detect and measure airborne radioiodine concentrations as low as 1×10^{-7} $\mu\text{Ci/cc}$ (microcuries per cubic centimeter) in the field. Hand held survey meters are used to measure air samples to check projections of elemental iodine releases based on plant data. Noble gas and background radiation interference will be minimized by ensuring that monitoring teams move to areas of low background before analyzing the sample cartridge.

VCSNS Units 2 and 3 ITAAC 6.6 has been proposed to ensure a test will be performed of the capabilities to detect and measure radioiodine concentrations in air in the plume exposure EPZ, as low as 10^{-7} $\mu\text{Ci/cc}$ under field conditions. (See Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC," of the VCSNS Units 2 and 3, COL Application).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes a capability to detect and measure radioiodine concentrations in air in the plume exposure EPZ as low as 10^{-7}

uCi/cc under field conditions. Interference from the presence of noble gas and background radiation does not decrease the stated minimum detectable activity.

Technical Information in the Emergency Plan: [I.10.] Section I.10, "Dose Estimates," (page I-5) states procedures exist for the correlation of air activity levels to dose rate for key isotopes. These procedures also provide a method to estimate the integrated dose from the projected and actual dose rates and for the comparison of these estimates with the PAGs. Appendix 3, "Procedure Cross-Reference to the Emergency Plan," (page 3-2) identifies a procedures for making dose assessments.

VCSNS Units 2 and 3 ITAAC 6.7 has been proposed to ensure a test will be performed of the capabilities to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with the EPA PAGs. (See Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC," of the VCSNS Units 2 and 3, COL Application).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes means for relating the various measured parameters (e.g., contamination levels, water and air activity levels) to dose rates for key isotopes and gross radioactivity measurements. The VCSNS Units 2 and 3 Emergency Plan describes provisions for estimating integrated dose from the projected and actual dose rates and for comparing these estimates with the protective action guides. The detailed provisions are described in separate procedures.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Accident Assessment," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50 and guidance in Supplement 1 to NUREG-0737 and Regulatory Guide 1.97.

13.3.1C.I.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.B. requires that the means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials be described. The description must include emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Nuclear Regulatory Commission (NRC), and other Federal agencies, and the Emergency Action Levels (EALs) that are to be used for determining protective measures. The EALs are to be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. These initial EALs are to be discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC.

Technical Information in the Emergency Plan: Section I, "Accident Assessment," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan contains a discussion of efforts made in response to emergency conditions. Section I.1, "Plant Parameters and Corresponding Emergency Classification," (page I-1) states Plant system and effluent parameter values are used to determine the severity of an accident leading to its emergency classification. Events are characterized by system and effluent parameters according to EALs that are presented in each unit annex. Additional information related to EALs is discussed in Section D, "Emergency Classification System."

On-site monitoring capabilities are described in Section I.2, "Onsite Accident Assessment Capabilities," (page I-1) and Section H.6.b, "Monitoring Equipment Onsite," (page H-6/8).

Methodologies used to estimate core damage and determine core damage type, used for offsite dose projections and determine protective action measures, are described in Section I.3, "Source Term Determination," (page I-1/3). Methods used for these estimations are discussed in Section I.4, "Effluent Monitor Data and Dose Projection," (page I-3). Methods for making dose projections when primary systems are down are discussed in Section I.6, "Unmonitored Release," (page I-4).

Information on meteorological instruments used to gather atmospheric data for making dose projections is described in Section H.9, "Meteorological Monitoring," (page H-9) and Section 4.2.A, "Onsite Meteorological Monitoring Instrumentation," (page 1-27, 2-21, and 3-21) of Annexes 1-3. Section I.5, "Meteorological Information," (page I-3/4) states this data is available in the Control Room, Technical Support Center (TSC), and Emergency Operations Facility (EOF) and used by the State, and the NRC to provide near real-time predictions of the atmospheric effluent transport and diffusion.

Information on environmental sampling capability can be found in Section I.7, "Field monitoring," (page I-4). Resources and capabilities supplied by the State in support of offsite sampling is discussed in Section H.7.b, "Radiological Environmental Monitors and Sampling," (page H-9). Equipment is discussed in Section H.8, "Offsite monitoring Equipment Storage," (page H-9). Offsite monitoring procedure can be found in Section I.8, "Field Monitoring Teams," (page I-4/5). Data collected by the filed monitoring teams will be transmitted to the emergency facilities. The data is used to define affected area boundaries, verify or modify dose projections and Protective Action Recommendations (PARs), and assess the actual magnitude, extent, and significance of a liquid or gaseous release.

Procedures for correlating air activity levels to dose rate for key isotopes estimating the integrated dose from the projected and actual dose rates and for the comparison of these estimates with the PAGs, is discussed in Section I.10, "Dose Estimates," (page I-5).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials be described. The description includes emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the NRC, and other Federal agencies, and the EALs that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The EALs are based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. These initial EALs are discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC.

13.3.1C.I.3 Regulatory Basis: Supplement 1 to NUREG-0737, Section 6.1.b., "Control Room," provides guidance related to control room instrumentation to assess plant and environs conditions during and following an accident, including the reliable indication of the meteorological variables (wind direction, wind speed, and atmospheric stability) for site meteorology.

Technical information in the Emergency Plan: [10 CFR 52.79(a)(17), Three Mile Island Requirements] Section 1.9.5.2.9, "Post-Accident Sampling System NRC Position," of the of the AP1000 Design Control Document (DCD), Rev 16, states the post-accident sampling system is a subsystem of the primary sampling system, described in subsection 9.3.3. The primary sampling system is designed to conform to the guidelines of the model Safety

1 Evaluation Report on eliminating post-accident sampling system requirements from technical
2 specifications for operating plants. The primary sampling system conforms with the most recent
3 NRC position.

4 Site meteorological variable are discussed in Section 4.2, "Onsite Meteorological Monitoring
5 Instrumentation." This section also discusses the capability to acquire meteorological data from
6 the NWS in Columbia, South Carolina.
7

8 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes measurements
9 and indication of Type A, B, C, D, E variables listed in Regulatory Guide 1.97 (Rev. 2),
10 "Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess Plant and Environs
11 Conditions during And Following an Accident." The VCSNS Units 2 and 3 Emergency Plan
12 describes reliable indication of the meteorological variables (wind direction, wind speed, and
13 atmospheric stability) specified in Regulatory Guide 1.97 (Rev. 2) for site meteorology.
14 Information on meteorological conditions for the region in which the site is located is available
15 via communication with the National Weather Service.
16

17 **13.3.1C.I.4 Regulatory Basis:** Regulatory Guide 1.97 (Rev. 2), "Instrumentation for Light-
18 Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions during And
19 Following an Accident."

20 **Technical information in the Emergency Plan: [10 CFR 50.34(f)(2)(xviii)]** Section 1.9.3,
21 "Three Mile Island Issues," of the AP1000 Design Control Document (DCD), Rev 16, states that
22 the NRC recently published a model Safety Evaluation Report on eliminating post-accident
23 sampling system requirements from technical specifications for operating plants. The AP1000
24 sampling design is consistent with the approach in the Model safety evaluation report and not
25 the guidance outlined in NUREG-0737 and Regulatory Guide 1.97. The primary sampling
26 system design is consistent with contingency plans to obtain and analyze highly radioactive
27 post-accident samples from the reactor coolant system, the containment sump, and the
28 containment atmosphere. Additional information related to sampling can be found in Section
29 9.3.3, "Primary Sampling System," of the AP1000 DCD.
30

31 Section I.2, "Onsite Accident Assessment Capabilities," (page I-1) of the VCSNS Units 2 and 3
32 Emergency Plan states the station employs a plant parameter display systems, liquid and
33 gaseous sampling system, area and process RMSs, and Accident RMSs to acquire initial and
34 continuous information for accident assessment. Additional information on these instruments
35 and equipment can be found in Section H.6.b, "Monitoring Equipment Onsite," (page H-6/8).
36 The SPDS is assembled in the control room to monitor reactor coolant system pressure; reactor
37 or pressurizer water level; containment pressure; reactor power; safety system status;
38 containment radiation level and effluent monitor readings in one display. Table 4-1, "Radiation
39 Monitoring Detectors," (page 1-28/29, 2-22/23, and 3-22/23) of each unit annex, provides a list
40 of onsite monitoring equipment. Additional information on display system can be found in
41 Section 7.5, "Safety Related Display Information," of the AP1000 DCD. Chapter 12.4.1.8, "Post-
42 Accident Actions," discusses prevention of individuals exceeding 5 rem to the whole body or 50
43 rem to the extremities.

44 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes the capability to
45 promptly obtain and analyze the reactor coolant system and containment that may contain
46 accident source term radioactive materials without radiation exposures to the individual
47 exceeding 5 rems to the whole body or 50 rems to the extremities. Materials to be analyzed

1 and quantified include certain radionuclides that are indicators of the degree of core damage
2 (e.g., noble gases, radioiodines, cesiums, and nonvolatile isotopes), hydrogen in containment
3 atmosphere, dissolved gases, chloride, and boron concentrations.

5 **13.3.1C.I.5 Conclusion for Accident Assessment**

6 On the basis of its review of the onsite emergency plan as described above for accident
7 assessment, the NRC staff concludes that the information provided in the VCSNS Units 2 and 3
8 Emergency Plan is acceptable and meets the requirements of 10 CFR 50.47(b)(9) and Section
9 IV.B. of Appendix E to 10 CFR Part 50.

11 The applicant has committed to meet the following license conditions and ITAAC, with the
12 associated dates, for the emergency preparedness program:

13 **VCSNS Units 2 and 3 ITAAC 6.1** has been proposed to ensure a test will be performed to
14 demonstrate that the means exists to provide initial and continuing radiological assessment
15 throughout the course of an accident through the plant computer or communications with the
16 Control Room.

17 **VCSNS Units 2 and 3 ITAAC 6.2** has been proposed to ensure a test will be performed to
18 demonstrate that the means exist to determine the source term of releases of radioactive
19 material within plant systems, and the magnitude of the release of radioactive materials based
20 on plant system parameters and effluent monitors.

22 **VCSNS Units 2 and 3 ITAAC 6.3** has been proposed to ensure a test will be performed to
23 demonstrate that the impact of a radiological release to the environment is able to be assessed
24 by utilizing the relationship between effluent monitor readings, and onsite and offsite exposures
25 and contamination for various meteorological conditions.

27 **VCSNS Units 2 and 3 ITAAC 6.4** has been proposed to ensure a test will be performed to test
28 the capability to acquire and evaluate meteorological data/information.

30 **VCSNS Units 2 and 3 ITAAC 6.5** has been proposed to ensure a test will be performed of the
31 capabilities to make rapid assessments of actual or potential magnitude and locations of
32 radiological hazards through liquid or gaseous release pathways, including activation,
33 notification means, field team composition, transportation, communication, monitoring
34 equipment, and estimated deployment times.

36 **VCSNS Units 2 and 3 ITAAC 6.6** has been proposed to ensure a test will be performed of the
37 capabilities to detect and measure radioiodine concentrations in air in the plume exposure EPZ,
38 as low as 10^{-7} $\mu\text{Ci/cc}$ under field conditions.

40 **VCSNS Units 2 and 3 ITAAC 6.7** has been proposed to ensure a test will be performed of the
41 capabilities to estimate integrated dose from the projected and actual dose rates, and for
42 comparing these estimates with the EPA PAGs.

13.3.1C.J Protective Response

13.3.1C.J.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(10); Planning Standard J. requires that a range of protective actions be developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are to be developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale must be developed.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(10), the NRC staff evaluated it against the detailed evaluation criteria¹² in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [J.1.] Section J, "Protective Response," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states protective actions have been developed for workers and the general public in the plume exposure pathway Emergency Planning Zone (EPZ). Guidelines have also been established to aid in choosing protective actions that are consistent with Federal guidance. Section J.1, "Notification of Onsite Personnel," states all personnel within the Owner Controlled Area (OCA) are notified of the initial classification or escalation of an emergency by alarms and verbal announcements over the plant PA system. Announcements include the emergency classification and response actions. These actions pertain to Emergency Response Organization (ERO), non-ERO, contractor personnel, and visitors. Provisions are made to alert personnel in high noise areas and outbuildings within the Protected Areas.

VCSNS Units 2 and 3 ITAAC 7.1 has been proposed to ensure a test will be performed of the capabilities to warn and advise onsite individuals of an emergency, including those in areas controlled by the operator. (See Table 3.8-1, "Inspections, Tests, Analyses, and Acceptance Criteria," in Part 10, "Proposed Combined License Conditions and ITAAC," of the VCSNS Units 2 and 3, COL Application).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes the means and time required to warn or advise onsite individuals and individuals who may be in areas controlled by the operator, including:

- a. Employees not having emergency assignments;
- b. Visitors;
- c. Contractor and construction personnel; and
- d. Other persons who may be in the public access areas on or passing through the site or within the owner controlled area.

Technical Information in the Emergency Plan: [J.2.] Section J.2, "Evacuation Locations," of the VCSNS Units 2 and 3 Emergency Plan states that during a site evacuation, nonessential personnel are directed to either assemble within designated assembly areas or to immediately evacuate the site. These areas are described in Section 5.2, "Unit Assembly Areas," of each unit

¹² The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

annex. Personnel will be directed to either proceed to their homes or to reassemble at designated offsite locations. Visitors are to assemble with and follow the instructions of their escorts. Nonessential personnel within the Protected Areas will normally exit through the normal access point. Personal transportation will be used but personnel without transportation will be identified and provided transportation. In **RAI 13.03-23**, the staff requested additional information related to available to those without personal vehicles. In a response letter dated May 8, 2009, the applicant stated that personnel that don't have transportation will typically carpool with others. If personal vehicles are not available, the Interim Emergency Director (IED) or the Emergency Director (ED) will request assistance from the offsite authorities to transport personnel from the Station.

Established evacuation routes are discussed in Section 5.3, "Unit Evacuation Routes," of each unit annex. Evacuation routes and areas are determined based on wind direction and other radiological conditions inclement weather and high traffic density are discussed in Section J.4, "Protective Actions for Onsite Personnel."

Technical Evaluation: The staff finds the applicant response to **RAI 13.03-23** to be acceptable and therefore resolved.

Technical Information in the Emergency Plan: [J.3.] Section J.3, "Radiological Monitoring of Evacuees," of the VCSNS Units 2 and 3 Emergency Plan states that personnel will be monitored for contamination by the portal monitors as they exit the Protected Areas, with portable friskers in assembly areas, or sent to offsite monitoring locations. In cases where there is no release of radioactive materials limited monitoring will be used to speed the evacuation process. Additional information on decontamination can be found in Section K, "Radiological Exposure Control."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan provides for radiological monitoring of people evacuated from the site.

Technical Information in the Emergency Plan: [J.4.] Section J.4, "Protective Actions for Onsite Personnel," onsite personnel not having immediate emergency response assignments are expected to evacuate. Assembly areas and offsite locations are described in Section 5.2, "Unit Assembly Areas," in each unit annex. Monitoring equipment used in these areas is described in Section J.3, "Radiological Monitoring of Evacuees." Decontamination is discussed in Sections K.5, Contamination and Decontamination" and Section K.7, "Decontamination of Relocated Personnel."

Technical Evaluation: In addition, the VCSNS Units 2 and 3 Emergency Plan provides for the evacuation of onsite non-essential personnel in the event of a Site or General Emergency and provides a decontamination capability.

Technical Information in the Emergency Plan: [J.5.] Section J.5, "Accountability," of the VCSNS Units 2 and 3 Emergency Plan states Accountability activities are initiated by the IED or the Emergency Plant Manager (EPM). Accountability is required to be initiated whenever a Site Area Emergency or higher classification is declared. All personnel shall be accounted for and the names of missing individuals are determined within 30 minutes of initiation. Accountability within the Protected Areas is maintained throughout the course of the event, unless terminated by the EPM. The specific procedure to be followed is identified in Appendix 3, "Procedure Cross-Reference to the Emergency Plan."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan provides for a capability to account for all individual onsite at the time of the emergency and ascertain the names of missing individuals within 30 minutes of the start of an emergency and account for all onsite individuals continuously thereafter.

Technical Information in the Emergency Plan: [J.6.] Section J.6, "Provisions for Onsite Personnel," of the VCSNS Units 2 and 3 Emergency Plan states the site maintains an inventory of respiratory protection equipment, anti-contamination clothing, and KI that is available to emergency workers remaining onsite. Protective actions considered during the course of an emergency, are described in this section for the use of the provided equipment.

Technical Evaluation: For individuals remaining or arriving onsite during the emergency, the VCSNS Units 2 and 3 Emergency Plan describes provisions for:

- a. Individual respiratory protection;
- b. Use of protective clothing; and
- c. Use of radioprotective drugs (e.g., individual thyroid protection).

Technical Information in the Emergency Plan: [J.7.] Section J.7, "mechanism for Implementing Protective action Recommendations," (pages J-3) of the VCSNS Emergency Plan, states plant conditions, projected dose and dose rates, and/or field monitoring data are evaluated to develop Protective Action Recommendations (PARs) for the purpose of preventing or minimizing exposure to the general public. The PARs are provided by the ED to the offsite agencies responsible for implementing protective actions for the general public within the 10-mile plume exposure pathway EPZ. A flowchart of decision making for issuing PARs is provided in Figure J-2, "PAR Flowchart," (page J-7). In an emergency that requires immediate protective actions be taken before activation of the offsite emergency facilities, PARs are provided directly to the State and county 24 hour warning points by the IED. Section J.10, "Implementation of Protective Action Recommendation," states EPA 400-R-92-001, NRC Technical Manual RTM 96, NUREG-0654 (supplement 3) were used as the basis for the general public PARs.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes a mechanism for recommending protective actions to the appropriate State and local authorities. The mechanism includes Emergency Action Levels corresponding to projected dose to the population-at-risk and with the recommendations set forth in the Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (EPA-520/1-75-001). Prompt notification is made directly to the offsite authorities responsible for implementing protective measures within the plume exposure pathway EPZ.

Technical Information in the Emergency Plan: [J.8.] Section J.8, "Evacuation Time Estimates," (pages J-3) of the VCSNS Units 2 and 3 Emergency Plan, states an independent Evacuation Time Estimate Study has been performed to provide estimates of the time required to evacuate resident and transient populations surrounding the site for various times of the year under favorable and adverse conditions. The Evacuation Time Estimate Report is included in South Carolina Electric & Gas (SCE&G) Application for a COL as Appendix 4 to the Emergency Plan.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan contains time estimates for evacuation within the plume exposure EPZ.

Technical Information in the Emergency Plan: [J.10.a.] Section J.10.a, "Implementation of Protective Recommendations," (pages J-4/5) of the VCSNS Units 2 and 3 Emergency Plan states the State and county plans contain official maps and information on the locations of reception centers and shelters.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan contains maps that show evacuation routes, evacuation areas, pre-selected radiological sampling and monitoring points, relocation centers in host areas, and shelter areas;

Technical Information in the Emergency Plan: [J.10.b.] Section J.10.b, "Implementation of Protective Recommendations," (pages J-4/5) of the VCSNS Units 2 and 3 Emergency Plan, states the population distribution around the station for the 10-mile radius is illustrated in Figure J-1, "Sector Population Distribution" (J-6).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan contains maps that show population distribution around the nuclear facility by evacuation areas.

Technical Information in the Emergency Plan: [J.10.c.] Section J.10.c, "Implementation of Protective Recommendations," (pages J-4/5) of the VCSNS Units 2 and 3 Emergency Plan, states that Section E, "Notification Methods and Procedures," contains information on the capabilities to notify on-site personnel of an existing or potential emergency. Notification of the public is described in Section E.6, "Notification of the Public." State and county agencies have the responsibility and capability to notify members of the transient and resident population within the plume exposure pathway EPZ.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes means for notifying all segments of the transient and resident population.

Technical Information in the Emergency Plan: [J.10.m.] Section J.10, "Implementation of Protective Recommendations," (pages J-4/5) of the VCSNS Units 2 and 3 Emergency Plan, states at a General Emergency classification, the site will provide the State and counties with PARs for the public. For incidents involving actual, potential, or imminent releases of radioactive material to the atmosphere, EPA 400-R-92-001, the Nuclear Regulatory Commission (NRC) Response Technical Manual (RTM-96) and NUREG-0654, Supp. 3 are used as the basis for the general public PARs.

[RIS 2003-12, Clarification of NRC Guidance for Modifying Protective Actions] Criteria used to determine if an issued PAR should be relaxed are discussed in Section M, "Recovery and Reentry." Section J.10.m.2, "Dose-Related PARs," states Field monitoring teams will be dispatched to downwind areas to verify calculations before issuing as hoc PAR outside the plume exposure pathway EPZ.

[RIS 2004-13, Consideration of Sheltering in Licensee's Range of Protective Action Recommendations] Section J.10, "Implementation of Protective Recommendations," (pages J-4/5) of the VCSNS Emergency Plan states shelter is recommended if projected doses reach the minimum EPA PAGs (1 Rem EPA TEDE or 5 Rem CDE Thyroid) and a puff release is in progress.

1 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan includes the choice of
2 recommended protective actions for the plume exposure pathway during emergency conditions.
3 The choices include expected local protection afforded in residential units or other shelter for
4 direct and inhalation exposure, as well as evacuation time estimates.

5
6 In determining whether the proposed emergency plan met the applicable regulatory
7 requirements related to the area of "Protective Response," the NRC staff also evaluated it
8 against the following requirements in Appendix E to 10 CFR Part 50.

9 **13.3.1C.J.2 Regulatory Basis:** 10 CFR 50, Appendix E.IV., "Content of Emergency Plans,"
10 requires that the nuclear power reactor operating license applicant provide an analysis of the
11 time required to evacuate and for taking other protective actions for various sectors and
12 distances within the plume exposure pathway EPZ for transient and permanent populations.

13
14 **Technical Information in the Emergency Plan:** Section J.8, "Evacuation Time Estimates,"
15 (pages J-3) of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan,
16 states an independent Evacuation Time Estimate (ETE) Study has been performed to provide
17 estimates of the time required to evacuate resident and transient populations surrounding the
18 VCSNS site for various times of the year under favorable and adverse conditions.

19
20 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan includes an analysis of the
21 time required to evacuate and for taking other protective actions for various sectors and
22 distances within the plume exposure pathway EPZ for transient and permanent populations.

23 24 **13.3.1C.J.3 Conclusion for Protective Response**

25 On the basis of its review of the onsite emergency plan and the applicant's responses to **RAI**
26 **13.03-23** as described above for Planning Standard J, "Protective Response," the staff
27 concludes that the information provided in the VCSNS Units 2 and 3 Emergency Plan is
28 consistent with Planning Standard J of NUREG-0654/FEMA-REP-1. Therefore, the information
29 is acceptable and meets the requirements of 10 CFR 50.47(b)(10) and Section IV. of Appendix
30 E to 10 CFR Part 50.

31
32 The applicant has committed to meet the following license conditions and ITAAC, with the
33 associated dates, for the emergency preparedness program:

34 **VCSNS Units 2 and 3 ITAAC 7.1** has been proposed to ensure a test will be performed of the
35 capabilities to warn and advise onsite individuals of an emergency, including those in areas
36 controlled by the operator.

13.3.1C.K Radiological Exposure Control

13.3.1C.K.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(11) requires that means for controlling radiological exposures, in an emergency, be established for emergency workers. The means for controlling radiological exposures must include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(11), the NRC staff evaluated it against the detailed evaluation criteria¹³ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [K.1.a-g.] Section K.1, "Emergency Exposure Guidelines," (pages K-1) of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states the site uses Emergency Worker and Lifesaving Activity Protective Action Guidelines set forth in EPA 400-R-92-001(EPA 400). In emergency situations, exposures will be justified if the maximum risks or costs to others that are avoided by their actions outweigh the risks to which the workers are subjected. The Emergency Worker Dose Limits are 5 Rem Total Effective Dose Equivalent (TEDE) for all activities; 10 Rem TEDE for protecting valuable property; 25 Rem TEDE for lifesaving or protection of large populations; and above 25 Rem TEDE only on a voluntary basis to persons fully aware of the risks involved. Section K.2, "Emergency Radiation Protection Program," (page K-1) states normal occupational doses received under emergency conditions should be maintained as low as reasonably achievable.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes onsite exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Actions Guides (EPA 520/1-75/001) for:

- a. removal of injured persons;
- b. undertaking corrective actions;
- c. performing assessment actions;
- d. providing first aid;
- e. performing personnel decontamination;
- f. providing ambulance service; and
- g. providing medical treatment services.

Technical Information in the Emergency Plan: [K.2.] Section K.1, "Emergency Exposure Guidelines," (pages K-1) of the VCSNS Units 2 and 3 Emergency Plan states the site uses Emergency Worker and Lifesaving Activity Protective Action Guidelines set forth in EPA 400-R-92-001(EPA 400). These guidelines are implemented under the Emergency Radiation Protection Program by the Onsite Radiological Manager (ORM) in accordance with 10 CFR 20. Emergency Worker Dose Limits are 5 Rem TEDE for all activities; 10 Rem TEDE for protecting valuable property; 25 Rem TEDE for lifesaving or protection of large populations; and above 25 Rem TEDE only on a voluntary basis to persons fully aware of the risks involved. In emergency situations, exposures will be justified if the maximum risks or costs to others that are avoided by their actions outweigh the risks to which the workers are subjected. Guidelines for the Radiation Protection Program are summarized in Section K.2, "Emergency Radiation Protection Program."

¹³ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

Technical Evaluation: [K.2.] The VCSNS Units 2 and 3 Emergency Plan provides an onsite radiation protection program to be implemented during emergencies, including methods to implement exposure guidelines. The VCSNS Units 2 and 3 Emergency Plan identifies individual(s), by position who can authorize emergency workers to receive doses in excess of 10 CFR Part 20 limits. A procedure is established for permitting onsite volunteers to receive radiation exposures in the course of carrying out lifesaving and other emergency activities. These procedures include expeditious decision making and a reasonable consideration of relative risks

Technical Information in the Emergency Plan: [K.3.a.] Section K.3, "Personal Monitoring," (pages K-2) of the VCSNS Units 2 and 3 Emergency Plan states that emergency workers will receive Thermoluminescent Dosimeter (TLD) badges and personal self-reading dosimeters capable of measuring expected exposures on a real time basis. The capability exists for the emergency processing of TLDs on a 24-hour per day basis. Dosimeters are listed as being kept the Operation Support Center (OSC) where activities are staged

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes provisions for 24-hour-per-day capability to determine the doses received by emergency personnel involved in any nuclear accident, including volunteers. Provisions are also described for the distribution of dosimeters, both self-reading and permanent record devices.

Technical Information in the Emergency Plan: [K.3.b.] Section K.3, "Personal Monitoring," (pages K-2) of the VCSNS Units 2 and 3 Emergency Plan states that emergency worker dose records are maintained by the ORM in accordance with the emergency and radiological protection procedures.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan ensures that dosimeters are read at appropriate frequencies and provide for maintaining dose records for emergency workers involved in any nuclear accident.

Technical Information in the Emergency Plan: [K.5.a.] Section K.5, "Contamination and Decontamination," (pages K-2/3) of the VCSNS Units 2 and 3 Emergency Plan states that during emergency conditions, normal plant contamination control criteria will be adhered to as much as possible. Action levels are not specified for determining the need for decontamination. In **RAI 13.03-33(A)** the staff requested information on action levels for determination the need for decontamination. In a response letter dated May 8, 2009 (pg. 137), the applicant stated action levels will be dependant on the emergency event conditions and the need to control contamination. Emergency response personnel will be required to utilize personnel protective equipment in accordance with Implementing Procedures to be developed according to Emergency Planning ITAAC Section 9.0. During the recovery phase, the Recovery Director will provide direction based on recommendations from Radiological Management personnel.

Technical Evaluation: The staff finds the additional information submitted in response to **RAI 13.03-33(A)** to be acceptable and therefore resolved.

Technical Information in the Emergency Plan: [K.5.b.] Section K.5.b, "Contamination and Decontamination," (page K-3) of the VCSNS Units 2 and 3 Emergency Plan states contaminated personnel will be attended to at decontamination areas located onsite. Temporary decontamination areas can also be established. Decontamination showers and

1 supplies are provided onsite with additional personnel decontamination equipment and
2 capabilities. In **RAI 13.03-33(B)**, the staff requested additional information regarding the
3 decontamination supplies. In a response letter dated May 8, 2009 (pg. 137), the applicant
4 stated that the inventory of specific types and numbers of decontamination supplies and
5 equipment will be maintained in accordance with procedures to be developed according to
6 Emergency Planning ITAAC Section 9.0. Decontamination equipment will be available at
7 various locations throughout the VCSNS site. Decontamination supplies such as various
8 decontamination solutions, brushes, and clothes are available at these locations. Due to its
9 location, the EOF will maintain a supply of decontamination supplies.

10 Emergency vehicles will be surveyed for contamination before they are allowed to leave the
11 plant or offsite assembly area. Alternate locations for vehicle surveys are available. The
12 decontamination and or disposal of contaminated equipment and facilities is discussed in
13 Section K.6, Contamination control Measures.” This section states that contaminated personnel,
14 equipment, and materials, will be decontaminated in accordance with procedures to “acceptable
15 levels”. In **RAI 13.03-33(C)(1)(2)**, the staff requested the definition of acceptable limits. Staff
16 also requested a summary of decontamination procedures or a reference to their location. In a
17 response letter dated May 8, 2009 (pg. 137), the applicant stated that decontamination
18 procedures will be included in Implementing Procedures that will be developed according to
19 Emergency Planning ITAAC Section 9.0. Action levels for decontamination personnel and
20 equipment are specified in plant procedures

21 **Technical Evaluation:** The staff finds the additional information submitted in response to **RAIs**
22 **13.03-33 (B) and (C)(1)(2)** to be acceptable and therefore resolved.

23
24 **Technical Information in the Emergency Plan: [K.6.a]** Section K.6.a, “Contamination Control
25 Measures,” of the VCSNS Units 2 and 3 Emergency Plan states contaminated areas are
26 isolated as restricted areas with appropriate radiological protection and access control.
27 Personnel are monitored for contamination prior to leaving the area. Decontaminated in
28 accordance with plant procedures will be performed if necessary. Supplies, instruments, and
29 equipment that are in contaminated areas will be monitored before removal. Contaminated
30 materials will be disposed of as radwaste. Contaminated vehicles will be decontaminated
31 before being released including responding ambulance.

32
33 **[K.6.b]** Section K.6.b, “Contamination Control Measures,” of the VCSNS Units 2 and 3
34 Emergency Plan states measures will be taken to control onsite access to potentially
35 contaminated potable water and food supplies. Under emergency conditions, eating, drinking,
36 and chewing are prohibited in all VCSNS ERFs until such time as habitability surveys indicate
37 that such activities are permissible.

38
39 **[K.6.c]** Section K.6.c, “Contamination Control Measures,” of the VCSNS Units 2 and 3
40 Emergency Plan states restricted areas and contaminated items will be returned to normal use
41 when contamination levels have been returned to acceptable levels. Contamination control
42 criteria for returning areas and items to normal use are contained in the plant procedures. In
43 **RAI 13.03-33 (D)** the staff requested the applicant provide additional information on the
44 contamination control criteria for returning areas and items to normal use. In a response letter
45 dated May 8, 2009 (pg. 137), the applicant stated that contamination control criteria for returning
46 areas and items to normal use are identified in SCE&G VCSNS Procedures HPP-0158,
47 Contamination Control for Equipment and Materials; and HPP-0160, Control and Posting of
48 Radiation Control Zones.

1 **Technical Evaluation:** The staff finds the additional information submitted in response to **RAI**
2 **13.03-33(D)** to be acceptable and therefore resolved.

3
4
5 **Technical Information in the Emergency Plan: [K.7.]** Section K.7, “Decontamination of
6 Relocated Personal,” (pages K-3/4) of the VCSNS Units 2 and 3 Emergency Plan states efforts
7 will be made to prevent contaminated vehicles operated by nonessential personnel to depart the
8 VCSNS site. Alternate forms of transportation will be made available to reduce the possibilities
9 of transporting contamination offsite with suspected contaminated vehicles. Section K.7 also
10 states existing and temporary facilities to limit contamination and exposure will be used and
11 established at the site as necessary during an emergency situation. In the event that
12 decontamination of site evacuees locally is not possible, personnel will be sent to designated
13 locations for monitoring and decontamination. Provisions for extra clothes and decontaminates
14 for skin contamination are available.

15 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes the capability for
16 decontaminating relocated onsite personnel, including provisions for extra clothing and
17 decontaminants suitable for the type of contamination expected, with particular attention given
18 to radioiodine contamination of the skin.

19
20 **13.3.1C.K.2 Conclusion for Radiological Exposure Control.**

21 On the basis of its review of the onsite emergency plan and the applicants response to **RAIs**
22 **13.03-33(A), (B), (C)(1)(2), and (D)** as described above for Planning Standard K, “Radiological
23 Exposure Control,” the staff concludes that the information provided in the VCSNS Units 2 and
24 3 Emergency Plan is consistent with Planning Standard K of NUREG-0654/FEMA-REP-1.
25 Therefore, the information is acceptable and meets the requirements of 10 CFR 50.47(b)(11).

13.3.1C.L Medical and Public Health Support

13.3.1B.L.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(12); Planning Standard L. requires that arrangements be made for medical services for contaminated injured individuals.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(12), the NRC staff evaluated it against the detailed evaluation criteria ¹⁴ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [L.1.] Section L.1, "Offsite Hospital and Medical Services," (pages L-1) of V.C. summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states that there are arrangements by letter of agreement with Palmetto Richland Hospital for receiving and treating contaminated or exposed persons requiring immediate medical care. Palmetto Richland Hospital is identified in the list of letters of agreement in Appendix 2 "Letters of agreement," (page Appendix 2-1). Section L.3, "Medical Service Facilities," discusses backup response for contamination and exposure injuries from the Radiation Emergency Assistance Center/Training Site (REAC/TS) in Oak Ridge Tennessee. In **RAI 13.03-24(B)** staff requested information to explain if there are arrangements for backup hospital or physician that can be used to treating contaminated or exposed persons requiring immediate medical care. In a response letter dated May 8, 2009 (pg. 49), the applicant stated that the back-up medical facility for contamination and exposure injuries is the REAC/TS. Personnel requiring treatment beyond that provided by the primary facility will be transported to REAC/TS with transportation provided by the county, State, or Federal Agencies. In **Supplemental RAI 13.03-40** the staff requested the applicant clarify whether REAC/TS as discussed in the VCSNS Emergency Plan or Newberry County Memorial Hospital as discussed in the South Carolina State Plan, will act as a backup for the treatment of contaminated injured individuals. In a response letter dated August 27, 2009, the applicant stated that an agreement exists between the State of South Carolina and Newberry Memorial Hospital to serve as a back-up for radiological-medical emergencies. The agreement is not with VCSNS; therefore the VCSNS Emergency Plan identifies REAC/TS in Oak Ridge, Tennessee as the back-up to Palmetto Richland Hospital.

Technical Evaluation: The staff finds the clarification provided in response to **Supplemental RAI 13.03-40** to be acceptable and therefore resolved.

Technical Information in the Emergency Plan: [L.2.] Section L.2, "Onsite First Aid Capability," (pages L-1) of the VCSNS Units 2 and 3 Emergency Plan states physicians and nurses are not staffed at the VCSNS site. Treatment given to injured persons by the Medical Emergency Response Team (MERT) is of a "first response" nature. The VCSNS site maintains an agreement with a local physician that serves as the company physician and is available to respond to the site to augment medical treatment. Section H.12, "Emergency Equipment and Supplies," provides a list of kits and equipment. Specific equipment is identified in the Emergency Equipment Checklist Procedure. In **RAI 13.03-24(C)** the staff requested the location of Emergency Treatment Areas. The applicant responded to **RAI 13.03-24(C)** in the response to **RAI 13.03-22(C)**.

¹⁴ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

Technical Evaluation: The staff found the additional information and textual revisions submitted in response to **RAI 13.03-22(C)** to be acceptable. **Confirmatory Action NRC Item 13.03-12** was created to track the proposed revision with regard to **RAI 13.03-24(C)**.

Technical Information in the Emergency Plan: [L.4.] Transportation of contaminated or injured people is discussed in Section L.4, "Medical Transportation," of the VCSNS Units 2 and 3 Emergency Plan. Arrangements are made by the station for ambulance transport to Palmetto Richland Hospital 24 hours a day by the Fairfield County Emergency Medical Services (FCEMS). The FCEMS is staffed with emergency medical technicians, paramedics, and personnel capable of handling medical emergency situations. Helicopter landing areas are also available onsite. Lexington County Emergency Medical Services (LCEMS) will provide additional services. A qualified radiation protection person will accompany the ambulance to the hospital if they are contaminated. Monitoring services will be provided by VCSNS personnel for the transportation of contaminated persons. Additional radiation protection personnel may be dispatched to Palmetto Richland Hospital if needed.

Technical Evaluation: In addition, the VCSNS Units 2 and 3 Emergency Plan provides for onsite first aid capability.

13.3.1B.L.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.E.5. requires that arrangements be made for the services of physicians and other medical personnel qualified to handle radiation emergencies on-site.

Technical Information in the Emergency Plan: Section L.2, "Onsite First Aid Capability," (pages L-1) of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states physicians or nurses are not staffed at VCSNS and medical treatment given to injured persons by the MERT is of a "first response" nature. The VCSNS site maintains an agreement with a local physician that serves as the company physician and is available to respond to the site to augment medical treatment. In **RAI 13.03-24(A)** the staff requested the applicant provide the letter of agreement with physicians available for onsite medical emergencies. In a response letter dated May 8, 2009 (pg. 48), the applicant stated that the Letter of Agreement with Pinner Clinic and staff to support the emergency response effort is included with the response to **RAI 13.03-17**.

Technical Evaluation: The staff finds the additional information provided in response to **RAI 13.03-24(A)** to be acceptable and therefore resolved. The VCSNS Units 2 and 3 Emergency Plan and the applicant response to **RAI 13.03-24(A)** describes arrangements made for the services of physicians and other medical personnel qualified to handle radiation emergencies on-site.

13.3.1B.L.3 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.E.6. requires that arrangements be made for transportation of contaminated injured individuals from the site to specifically identified treatment facilities outside the site boundary.

Technical Information in the Emergency Plan: Transportation of contaminated or injured people is discussed in Section L.4, "Medical Transportation," of the VCSNS Units 2 and 3 Emergency Plan. Arrangements are made by the station for prompt ambulance transport to Palmetto Richland Hospital on a 24-hour from the FCEMS. Helicopter landing areas are available onsite. The LCEMS will also provide additional services.

1 **Technical Evaluation:** In addition, the VCSNS Units 2 and 3 Emergency Plan describes the
2 arrangements made for transportation of contaminated injured individuals from the site to
3 specifically identified treatment facilities outside the site boundary.

4
5 **13.3.1B.L.4 Regulatory Basis:** 10 CFR 50, Appendix E.IV., "Content of Emergency Plans."
6 10 CFR 50, Appendix E.IV.E.7. requires that arrangements be made for treatment of individuals
7 injured in support of licensed activities on the site at treatment facilities outside the site
8 boundary.

9 **Technical Information in the Emergency Plan:** Section L.1, "Offsite Hospital and Medical
10 Services," (pages L-1) of VCSNS Units 2 and 3 Emergency Plan, states there are arrangements
11 by letter of agreement with Palmetto Richland Hospital for receiving and treating contaminated
12 or exposed persons requiring immediate medical care.

13 **Technical Evaluation:** Also, the VCSNS Units 2 and 3 Emergency Plan describes
14 arrangements made for treatment of individuals injured in support of licensed activities on the
15 site at treatment facilities outside the site boundary.

16
17 **13.3.1C.L.5 Conclusion for Medical and Public Health Support**

18 The staff has reviewed the onsite emergency plan and the applicant's response to **RAI 13.03-**
19 **24(A), (B), and (C)**, and **Supplemental RAI 13.03-40** in regards to Planning Standard L of
20 NUREG-0654/FEMA-REP-1 and the requirements of 10 CFR 50.47(b)(12) and Section IV.E.5.,
21 E.6., and E.7 of Appendix E to 10 CFR Part 50. Final determination regarding this planning
22 standard will be based on verification of **Confirmatory Action NRC Item 13.03-12.**

13.3.1C.M Recovery and Reentry Planning and Post-accident Operations

13.3.1C.M.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(13); Planning Standard M. requires that general plans for recovery and reentry be developed.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(13), the NRC staff evaluated it against the detailed evaluation criteria¹⁵ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [M.1.] Section M, "Reentry and Recovery Planning" of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan describes measures taken for reentry into the Station following an accident and the concept of operation of the VCSNS Recovery Organization. Initial action is aimed at limiting consequences and protecting personnel and the general public. Reentry is divided into two categories: Reentry during the emergency phase; and Reentry during the recovery phase. All reentry activities are authorized by the Emergency Plant Manager (EPM) and coordinated by the Operation Support Center (OSC) Manager and the Onsite Radiation Manager (ORM). Reentry activities during the recovery phase are authorized by the Recovery Director and coordinated by the recovery organization managers in charge of personnel making the reentry. The specific areas of consideration that are used in reentry planning are discussed in Section M.1.a, "Reentry and Recovery" (page M-1/2). Once the plant has been stabilized the Recovery Phase may be entered.

The Emergency Director (ED) will declare the emergency phase terminated and entry into Recovery. During a Site Area Emergency or General Emergency, the ED must get concurrence from the EPM and offsite authorities. Government agencies may be notified or consulted with before declaring Recovery or event termination during an unusual event or alert. During a Site Area Emergency or a General Emergency, the appropriate government agencies must be contacted prior to declaring Recovery or event termination. Section M.1.b, "Evaluating Entry into Recovery," (page M-2) states considerations for Termination/Recovery are contained in the implementing procedures. These considerations should be included or summarized in the emergency plan.

The purpose of Recovery is to provide the necessary personnel to affect the long-term activities and to return the plant to an acceptable condition. A short list of Conditions to be used as guidelines for the determination of establishing Recovery can be found in Section M.1.b, "Evaluating Entry into Recovery" (page M-3/4). All conditions listed do not have to be met but must be considered before entering the recovery phase.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes general plans and procedures for reentry and recovery and describes the means by which decisions to relax protective measures (e.g., allow reentry into an evacuated area) are reached. This process considers both existing and potential conditions.

¹⁵ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

Technical Information in the Emergency Plan: [M.2.] Following discussions with NRC, The ED, with assistance from management, may form a Recovery Organization once plant conditions have been stabilized and the Recovery Phase has been initiated. For Unusual Event classifications, the normal on shift organization will perform necessary recovery actions. For Alert classifications, the Station Emergency Response Organization (ERO) will perform the recovery actions. The recovery organization is selected based on events that preceded the recovery activities and the requirements of the recovery phase. The ED is initially designated as the Recovery Director and is responsible for directing the activities of the recovery organization. A list of responsibilities for this position is provided in Section M.2.a (page M-5). The General Manager, Nuclear Plant Operations for the affected unit will become the Recovery Plant Manager. The responsibilities for this position can be found in Section M.2.b (page M-5). A senior member of Nuclear Support Services is the Recovery Offsite Manager. A list of responsibilities for this position is provided in Section M.2.c (page M-5). A senior SCANA Public Relations Group individual is designated as the Company Spokesperson. The responsibilities for this position can be found in Section M.2.d (page M-6). All the above positions report directly to the Recovery Director. Lists of additional supervisors that may be appointed in specific areas are listed on Page M-6.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan contains the position/title, authority and responsibilities of individuals who will fill key positions in the facility recovery organization. The organization includes technical personnel with responsibilities to develop, evaluate and direct recovery and reentry operations.

Technical Information in the Emergency Plan: [M.3.] Section M.3, "Recovery Phase Notifications," of the VCSNS Units 2 and 3 Emergency Plan states that all members of the ERO are informed when the decision is made to enter the Recovery Phase. Personnel receive instructions organization and responsibilities during the recovery effort. The offsite authorities are notified of the shift and the basic structure and management of the Recovery Organization.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan specifies the means for informing members of the response organizations that a recovery operation is to be initiated, and of any changes in the organizational structure that may occur.

Technical Information in the Emergency Plan: [M.4.] Section M.4., "Total Population Exposure," (page M-7) of the VCSNS Units 2 and 3 Emergency Plan states that a total population exposure calculation are performed periodically and updated during recovery. A procedure has been developed for estimating total population exposure in cooperation with State and Federal agencies. Sources of data include: environment monitoring Thermo Luminescent Dosimeters (TLDs); Bioassay; release rates and meteorology; monitoring of food, water, and ambient dose rates. Environmental sampling will be coordinated with state efforts and shared with the other agencies. Appendix 3, "Procedure Cross-Reference to the Emergency Plan," (page 3-2) shows implementing procedures for Section M, "Recovery," will be written. The information that will be provided in the procedure for estimating total population exposure should be included in Section M.4.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes a method for periodically estimating total population exposure.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Recovery and Reentry Planning and Post-accident

Operations," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50.

13.3.1C.M.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.H. requires that the criteria to be used to determine when, following an accident, reentry of the facility would be appropriate or when operation could be resumed be described.

Technical Information in the Emergency Plan: Section M.1.b, "Evaluating Entry into Recovery," (page M-3) of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan contains a conditions used in determining if recovery should be established. This section notes that additional criteria may apply depending on the specific event.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the criteria to be used to determine when, following an accident, reentry of the facility would be appropriate or when operation could be resumed.

13.3.1C.M.3 Conclusion for Recovery and Reentry Planning and Post-accident Operations.

On the basis of its review of the onsite emergency plan as described above for recovery and reentry planning and post-accident operations, the NRC staff concludes that the information provided in the VCSNS Units 2 and 3 Emergency Plan is acceptable and meets the requirements of 10 CFR 50.47(b)(13) and Section IV.H. of Appendix E to 10 CFR Part 50.

13.3.1C.N Exercises and Drills

13.3.1C.N.1 Regulatory Basis:

10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(14); Planning Standard N. requires that periodic exercises be conducted to evaluate major portions of emergency response capabilities, periodic drills be conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills be corrected.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(14), the NRC staff evaluated it against the detailed evaluation criteria¹⁶ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [N.1.a.] Section N, "Drill and Exercise Program," (page N-1) of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states that VCSNS has implemented a Drill and Exercise Program that will: verify the adequacy of their Emergency Preparedness Program; Develop, maintain, and evaluate response capabilities; Identify and correct deficiencies in the Emergency Plan, Security Plan, associated procedures, and training. The program will also ensure the continued adequacy of emergency facilities, supplies, and equipment, including communications networks. Section N.1, "Exercises," states that exercises are conducted to ensure that all major elements of the emergency plan and preparedness program are demonstrated at least once in each six-year period. Personnel from VCSNS, other commercial nuclear facilities, and Federal, State, or local governments will be present to observe and critique each exercise.

Section N.1.a, "Biennial Exercises," (page N-1/2) states that VCSNS participates in federally prescribed exercises on a rotating basis with the other fixed nuclear facilities in the State of South Carolina. Exercises required by Sections F.2.b., F.2.c., & F.2.d. to 10 CFR 50 Appendix E, involving offsite agency participation, are conducted based on Federal Emergency Management Agency (FEMA) guidance and State/county emergency response plans. Exercises include simulation of off-site release that will require the mobilization of State, local and VCSNS personnel to test observable portions of both on and off-site plans. Ingestion pathway exercises are conducted on a six-year cycle usually in conjunction with a full participation exercise. In the event of an inadequate demonstration of the offsite response, VCSNS will participate and support activities to address the deficiencies.

Section N.1.b, "Off-Year Exercises," (page N-2) states off-year exercises, which involve little to no participation by offsite agencies, are conducted during the calendar year when an NRC Evaluated Exercise is not scheduled. Section N.1.c, "Pre-Exercises," (page N-2) states pre-exercise drills may be conducted before a Biennial Exercise where FEMA evaluation of State and local performance is expected. These drills are used as a training and experience tool for the participants to sharpen awareness and practice skills necessary to accomplish specific Emergency Plan duties and responsibilities.

VCSNS Units 2 and 3 ITAAC 8.1 has been proposed to ensure a full participation exercise (test) will be conducted within the specified time periods of Appendix E to 10 CFR Part 50.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that the exercises will test the integrated capability and a major portion of the basic elements existing within emergency preparedness plans and organizations. In addition, the emergency preparedness

¹⁶ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

exercise will simulate an emergency that results in offsite radiological releases which would require response by offsite authorities. The VCSNS Units 2 and 3 Emergency Plan also states that exercises will be conducted as set forth in the Nuclear Regulatory Commission (NRC) and FEMA rules.

Technical Information in the Emergency Plan: [N.1.b.] Section N.1, "Exercises," VCSNS Units 2 and 3 Emergency Plan states that exercises are conducted to ensure that all major elements of the emergency plan and preparedness program are demonstrated at least once in each six-year period. At least one off-hours exercise, between 6:00 p.m. and 4:00 a.m. every cycle (6 years), will be conducted. Personnel from VCSNS, other commercial nuclear facilities, and Federal, State, or local governments will be present to observe and critique each exercise. Section N.1.a, "Biennial Exercises," (page N-1) states that exercises will include mobilization of State/local and VCSNS personnel to test observable portions of on- and off-site plans. These exercises are to be scheduled in an attempt to provide or simulate various weather conditions. Section N.2.f, "Augmentation Drills," (page N-3) states an unannounced off-hours Emergency Response Organization (ERO) augmentation drill is performed semiannually. At least once every 6 years an unannounced activation of the ERO Notification System with response to other facilities is also conducted.

Technical Evaluation: [N.1.b.] The VCSNS Units 2 and 3 Emergency Plan states that exercises will include mobilization of State and local personnel and resources adequate to verify the capability to respond to an accident scenario requiring response. In addition, the VCSNS Units 2 and 3 Emergency Plan describes provisions for a critique of the annual exercise by Federal and State observers/evaluators. Scenarios will be varied from year to year such that all major elements of the plans and preparedness organizations are tested within a five-year period. Provisions to start an exercise between 6:00 p.m. and midnight, and another between midnight and 6:00 a.m. once every six years is described. Exercises will be conducted under various weather conditions and some exercises will be unannounced.

Technical Information in the Emergency Plan: [N.2.a.] Section N.2.a, "Communication Drills," (page N-2/3) of the VCSNS Units 2 and 3 Emergency Plan states that communication drills are performed monthly to test the primary and alternate methods of notifying State and local government warning points and Emergency Operations Centers (EOCs) within the plume exposure pathway Emergency Planning Zone (EPZ). The capability to notify NRC using the Emergency Notification System (ENS) is also tested monthly. The capability to notify the NRC Region and Federal EROs from the Emergency Operations Facility (EOF) is tested quarterly along with the functionality of computer and communication equipment. All communication systems discussed in Section F, "Emergency Communications," are tested annually. The drills include provisions to ensure that all participants are able to understand the content of the messages.

[N.2.b.] Section N.2.b, "Fire Drills," (page N-3) of the VCSNS Units 2 and 3 Emergency Plan states that fire drills will be conducted in accordance with the station Technical Specifications, Fire Protection Plan, and/or station procedures. The Fire Protection Program is discussed in the VCSNS Final Safety Analysis Report (FSAR) Section 9.5.1.8, "Fire Protection Program." The FSAR Section 9.5.1.8.2.2.4, "Drills," (pages 9.5-7/8) states that fire brigade drills are conducted at least once per calendar quarter for each shift. Each member of the fire brigade participates in at least two drills annually, one will be unannounced. At least one drill is performed annually on a "back shift" for each shift's fire brigade. The drills provide for off-site fire department

1 participation at least annually. Triennially, a randomly selected, unannounced drill shall be
2 conducted and critiqued by qualified individuals independent of the plant staff. Training
3 objectives are established prior to each drill and reviewed by plant management. Criteria to be
4 critiqued during the drills are also listed on page 9.5-8. Unsatisfactory drill performance is
5 followed by a repeat drill within 30 days.

6
7 **[N.2.c.]** Section N.2.c, "Medical Emergency Drills," (page N-3) of the VCSNS Units 2 and 3
8 Emergency Plan states a medical emergency drill, involving a simulated contaminated
9 individual, is conducted annually. The drill will contain provisions for participation by local
10 support services organizations such as ambulance and hospital support. The offsite portions of
11 the medical drill may be performed as part of the required biennial exercise.

12
13 **[N.2.d.]** Section N.2.d, "Radiological Monitoring Drills," (page N-3) of the VCSNS Units 2 and 3
14 Emergency Plan states that radiological monitoring drills, both on and off-site are conducted
15 annually. These drills include collection and analysis of all sample media and provisions for
16 communications and record keeping. Collection of milk is demonstrated in accordance with the
17 ingestion pathway exercises. NUREG 0654 Section N.1.d, "Radiological Monitoring Drills,"
18 states that where appropriate, local organizations shall participate. No information is provided to
19 determine if there is any participation by local organizations. In **RAI 13.03-25** the staff requested
20 additional information to clarify whether local organizations will be participating in radiological
21 monitoring drills. In a response letter dated May 8, 2009 (pg. 49), the applicant stated that The
22 South Carolina Department of Health and Environmental Control (SCDHEC) is responsible for
23 the State's independent assessment of radiological monitoring drills for each of the commercial
24 nuclear facilities in South Carolina. They do not participate in a drill annually at each of the
25 facilities. The SCDHEC will conduct all environmental radiological monitoring during a declared
26 emergency at VCSNS making it unnecessary for local counties to participate in drills.

27
28 **[N.2.e.1.]** Section N.2.e, "Health Physics Drills," (page N-3) of the VCSNS Units 2 and 3
29 Emergency Plan states that health physics drills are conducted semiannually in each Protected
30 Area. These drills involve a response to, and analysis of, simulated elevated airborne and liquid
31 samples and direct radiation measurements within the plant.

32
33 **[N.2.e.2.]** Section N.2.e, "Health Physics Drills," (page N-3) of the VCSNS Units 2 and 3
34 Emergency Plan states that health physics drills involve a response to, and analysis of,
35 simulated elevated liquid samples and direct radiation measurements within the plant. It is not
36 specifically stated that use of the post-accident sampling system shall be included only that that
37 direct radiation measurements will be analyzed.

38 **Technical Evaluation:** The staff finds the additional information provided in response to **RAI**
39 **13.03-25** to be acceptable and therefore resolved.

40
41 **Technical Information in the Emergency Plan: [N.3.a-e.]** Section N.3, "Conduct of Drills and
42 Exercises," (page N-3/4) of the VCSNS Units 2 and 3 Emergency Plan states that advance
43 knowledge of the scenario will be kept to a minimum to allow "free-play" decision making and
44 ensure realistic participation. A package will be distributed to the controllers and evaluators
45 before the drill or exercise that includes the scenario, a list of performance objectives, and a
46 description of the expected responses. Each member of the ERO will have an opportunity to
47 participate in a drill in their assigned facility at least once in a two-year period. Drills will be
48 rotated among the units and their Emergency Response Facilities (ERFs). The minimum
49 contents for a scenario package are listed on page N-4. The Station Management will provide

1 prior approval for all drills and exercises conducted in support of the Emergency Preparedness
2 Program.

3
4 **[N.3.f.]** Section N.3, "Conduct of Drills and Exercises," (page N-4) of the VCSNS Units 2 and 3
5 Emergency Plan states that a package will be distributed to the controllers and evaluators that
6 will include the scenario, a list of performance objectives, and a description of the expected
7 responses.

8 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes how exercises
9 and drills will be carried out to allow free play for decision-making and to meet the following
10 objectives. The VCSNS Units 2 and 3 Emergency Plan states that the scenarios for use in
11 exercises and drills will include, but are not limited to, the following:

- 12 a. The basic objective(s) of each drill and exercise and appropriate evaluation criteria;
- 13 b. The date(s), time period, place(s) and participating organizations;
- 14 c. The simulated events;
- 15 d. A time schedule of real and simulated initiating events;
- 16 e. A narrative summary describing the conduct of the exercises or drills to include such
17 things as simulated casualties, offsite fire department assistance, rescue of personnel, use
18 of protective clothing, deployment of radiological monitoring teams, and public information
19 activities; and
- 20 f. A description of the arrangements for and advance materials to be provided to official
21 observers.

22
23 **Technical Information in the Emergency Plan: [N.4.]** Section N.4, "Critique and Evaluation,"
24 (page N-4/5) of the VCSNS Units 2 and 3 Emergency Plan states that a representatives from
25 the NRC will observe and evaluate the licensee's ability to conduct an adequate self-critical
26 critique biennially. For full offsite participation exercises, both the NRC and FEMA will observe,
27 evaluate, and critique. A critique is conducted as soon as possible following the conclusion of
28 each drill or exercise. The Manager, Emergency Services will prepare a formal written critique
29 following a drill or exercise. The report will evaluate the ability of the ERO to respond to a
30 simulated emergency situation or sequence of events. The report will also contain corrective
31 actions and recommendations for improvement. Comments identified by participants during a
32 training drill where objectives are not formally being evaluated will be reviewed but are not
33 required to be included in a formal report.

34 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes provisions for
35 official observers from Federal, State or local governments to observe, evaluate, and critique
36 the required exercises. A critique will be scheduled at the conclusion of the exercise to evaluate
37 the ability to respond as described in the VCSNS Emergency Plan. The critique will be
38 conducted as soon as practicable after the exercise, and a formal evaluation will result from the
39 critique.

40
41 **Technical Information in the Emergency Plan: [N.5.]** Section N.5, "Resolution of Drill and
42 Exercise Findings," (page N-5) of the VCSNS Units 2 and 3 Emergency Plan states that any
43 deficiencies identified in the emergency plan or implementing procedures through the critique
44 process will be revised as necessary. The Manager, Emergency Services is responsible for
45 evaluating recommendations and comments to determine which items will be incorporated into
46 the program or require corrective actions, and for the scheduling, tracking, and evaluation of the
47 resolution to the items.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes means for evaluating observer and participant comments on areas needing improvement, including emergency plan procedural changes, and for assigning responsibility for implementing corrective actions. The VCSNS Units 2 and 3 Emergency Plan also establishes management control used to ensure that corrective actions are implemented.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Exercises and Drills," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50.

13.3.1C.N.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.F.2. requires that the emergency plan describe provisions for the conduct of emergency preparedness exercises and that exercises test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, test the public notification system, and ensure that emergency organization personnel are familiar with their duties. Use of a site-specific simulator is used for some exercises.

Technical Information in the Emergency Plan: [10 CFR 50, Appendix E.IV.F.2.] Section N.1.a, "Biennial Exercises," (page N-1/2) states that VCSNS participates in federally prescribed exercises on a rotating basis with the other fixed nuclear facilities in the State of South Carolina. Federally prescribed exercises are conducted at the station in order to test the adequacy of timing and content of implementing procedures and methods; to test emergency equipment and communication networks; and to ensure that emergency personnel are familiar with their duties.

[10 CFR 50, Appendix E.IV.F.2.a.] Section N.1.a, "Biennial Exercises," (page N-1) states that VCSNS participates in federally prescribed exercises on a rotating basis with the other fixed nuclear facilities in the State of South Carolina that include full participation of offsite and local and State authorities. During these exercises, offsite local and State authorities and VCSNS personnel physically and actively take part in testing the integrated capability to adequately assess and respond to a declared emergency at the station. Full participation exercises will also test the major observable portions of the onsite and offsite emergency plans and mobilization of State, local, and VCSNS personnel and other resources to verify the capability to respond to the accident scenario. **VCSNS Units 2 and 3 ITAAC 8.1** was submitted to ensure a full participation exercise (test) will be conducted within the specified time periods of Appendix E to 10 CFR Part 50.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes provisions for the conduct of emergency preparedness exercises and specifies that exercises test the adequacy of timing and content of implementing procedures and methods, test emergency equipment and communications networks, test the public notification system, and ensure that emergency organization personnel are familiar with their duties. The VCSNS Units 2 and 3 Emergency Plan also describes the use of a site-specific simulator for some exercises.

13.3.1C.N.3 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.F.2.b. requires that each licensee at each site conduct an exercise of its onsite emergency plan every 2 years. The exercise may be included in the full participation biennial exercise. In addition, the licensee shall take actions necessary to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises

by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities. The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, protective action decision-making, and plant system repair and corrective actions. During these drills, activation of all of the licensee's emergency response facilities [Technical Support Center (TSC), Operations Support Center (OSC), and the Emergency Operations Facility (EOF)] would not be necessary, licensees would have the opportunity to consider accident management strategies, supervised instruction would be permitted, operating staff would have the opportunity to resolve problems (success paths) rather than have controllers intervene, and the drills could focus on onsite training objectives.

Technical Information in the Emergency Plan: Section N.1.a, "Biennial Exercises," of the VCSNS Units 2 and 3 Emergency Plan discusses the conduct of exercises at the VCSNS site every two years. Section N.1.b, "Off-Year Exercises," discusses the conduct of exercises in years where a Nuclear Regulatory Commission (NRC) exercise is not scheduled. The VCSNS site also conducts exercises prior to the biennial exercise as discussed in Section N.1.c, "Pre-exercises."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that an exercise of its onsite emergency plan will be conducted every 2 years. In addition, the VCSNS Units 2 and 3 Emergency Plan describes actions that will be taken to ensure that adequate emergency response capabilities are maintained during the interval between biennial exercises by conducting drills, including at least one drill involving a combination of some of the principal functional areas of the licensee's onsite emergency response capabilities. The principal functional areas of emergency response include activities such as management and coordination of emergency response, accident assessment, protective action decision-making, and plant system repair and corrective actions. During these drills, activation of all of the licensee's emergency response facilities (TSC, OSC, and EOF) would not be necessary. However, emergency response personnel would have the opportunity to consider accident management strategies, supervised instruction would be permitted, operating staff would have the opportunity to resolve problems (success paths), and the drills will focus on onsite training objectives.

13.3.1C.N.4 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.F.2.c. requires that offsite plans for each site shall be exercised biennially with full participation by each offsite authority having a role under the plan. Where the offsite authority has a role under a radiological response plan for more than one site, it shall fully participate in one exercise every 2 years and shall, at least, partially participate in other offsite plan exercises in this period. If two different licensees whose licensed facilities are located either on the same site or on adjacent, contiguous sites, and that share most of the elements defining co-located licensees, each licensee shall:

- a. Conduct an exercise biennially of its onsite emergency plan; and
- b. Participate quadrennially in an offsite biennial full or partial participation exercise; and
- c. Conduct emergency preparedness activities and interactions in the years between its participation in the offsite full or partial participation exercise with offsite authorities, to test and maintain interface among the affected State and local authorities and the licensee. Co-located licensees shall also participate in emergency preparedness activities and interaction with offsite authorities for the period between exercises.

Technical Information in the Emergency Plan: Section N.1.a, "Biennial Exercises," (page N-1/2) states that VCSNS participates in federally prescribed exercises on a rotating basis with the other fixed nuclear facilities in the state of South Carolina. Exercises are conducted based on FEMA guidance and State/county emergency response plans. Exercises will test all observable portions of both on and off-site plans. Ingestion pathway exercises are conducted on a six-year cycle usually in conjunction with a full participation exercise. Section N.1.b, "Off-Year Exercises," (page N-2) states off-year exercises, which involve little to no participation by offsite agencies, is conducted during the calendar year when an NRC evaluated exercise is not scheduled. Section N.1.c, "Pre-Exercises," (page N-2) states pre-exercise drills may be conducted before a Biennial Exercise where Federal Emergency Management Agency (FEMA) evaluation of State and local performance is expected.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that offsite plans for each site will be exercised biennially with full participation by each offsite authority having a role under the Plan. In addition, the VCSNS Units 2 and 3 Emergency Plan states that since the State of South Carolina has a role under a radiological response plan for more than one site, the State will fully participate in one exercise every 2 years and will, at least, partially participate in other offsite plan exercises in this period.

13.3.1C.N.5 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.F.2.e. requires that licensees enable any State or local Government located within the plume exposure pathway EPZ to participate in the licensee's drills when requested by such State or local Government.

Technical Information in the Emergency Plan: Section N.1.b, "Off-Year Exercise," (page N-2) of the VCSNS Units 2 and 3 Emergency Plan states that Off-Year Exercises involve no or limited participation by offsite agencies, although a routine offer is made to determine the extent of participation by the offsite authorities.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that the licensee will enable any State or local Government located within the plume exposure pathway EPZ to participate in the licensee's drills when requested by such State or local Government.

13.3.1C.N.6 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.F.2.f. states that remedial exercises will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency. The extent of State and local participation in remedial exercises must be sufficient to show that appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.

Technical Information in the Emergency Plan: Section N.1.a, "Biennial Exercises," (page N-1) of the VCSNS Units 2 and 3 Emergency Plan states VCSNS will participate and support the conduct of activities that are designed to address the deficient or weak demonstrations.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that remedial exercises will be conducted if the emergency plan is not satisfactorily tested during the biennial exercise, such that NRC, in consultation with FEMA, cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency. The extent of State and local participation in remedial exercises will be sufficient to show that

appropriate corrective measures have been taken regarding the elements of the plan not properly tested in the previous exercises.

13.3.1C.N.7 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.F.2.g. requires that all training, including exercises, provide for formal critiques in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies must be identified and corrected.

Technical Information in the Emergency Plan: Section N.4, "Critique and Evaluation," (page N-4/5) of the VCSNS Units 2 and 3 Emergency Plan states that NRC representatives will observe and evaluate the licensee's ability to conduct an adequate self-critical critique biennially. The NRC and FEMA will observe, evaluate, and critique full offsite participation exercises. Section N, "Drill and Exercise Program," (page N-1) states that the purpose of the Drill and Exercise Program is to identify deficiencies and ensure they are promptly corrected. Section O.2, "Functional Training of the ERO [Emergency Response Organization]," states performance based training is provided that includes on-the-spot correction of erroneous performance.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that the exercises have provisions for formal critiques in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies will be identified and corrected.

13.3.1C.N.9 Conclusion for Exercises and Drills

On the basis of its review of the onsite emergency plan and the applicants response to **RAI 13.03-25** as described above for exercises and drills, the NRC staff concludes that the information provided in the VCSNS Units 2 and 3 Emergency Plan is acceptable and meets the requirements of 10 CFR 50.47(b)(14) and Sections IV.F.2., F.2.b, F.2.c., F.2.e., F.2.g. with respect to exercise and drill training.

The applicant has committed to meet the following license conditions and ITAAC, with the associated dates, for the emergency preparedness program:

VCSNS Units 2 and 3 ITAAC 8.1 has been proposed to ensure a full participation exercise (test) will be conducted within the specified time periods of Appendix E to 10 CFR Part 50.

13.3.1C.O Radiological Emergency Training

13.3.1C.O.1 Regulatory Basis: 10 CFR 50.47, "Emergency Plans." 10 CFR 50.47(b)(15); Planning Standard O. requires that radiological emergency response training be provided to those who may be called on to assist in an emergency.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(15), the NRC staff evaluated it against the detailed evaluation criteria¹⁷ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [O.1.a.] Emergency response training, provided to VCSNS and offsite support personnel, is described in Section O, "Emergency Response Training," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan. Section O.1, "Assurance of Training," (page O-1) states task specific training for each position in the emergency plan is described in lesson plans and guides as part of the Emergency Response Organization (ERO) training Program. Implementation of the training program is covered in implementing procedures and course content in the Nuclear Training Manual. Section O.1.a (page O-1) states that training for offsite support organizations is designed to acquaint the participants with problems encountered during an emergency, notification procedures, and their expected roles. Those organizations also receive site-specific emergency response training and will be instructed, by position and title, to the identity of those persons in the onsite organization who will control their support activities.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the site-specific emergency response training to be provided for the following offsite emergency organizations who may be called upon to provide assistance in the event of an emergency.

Technical Information in the Emergency Plan: [O.2.] Section O.2, "Functional Training of the ERO," (page O-1/2) of the VCSNS Units 2 and 3 Emergency Plan states members of the ERO receive periodic performance-based emergency response training in addition to classroom training. Performance-based training includes discussion of predetermined objectives, facility walk-throughs, and supervised instruction periods or drills. On-the-spot correction of errors made during drills and a demonstration of the proper performance may be offered by the Controller. Section O.4, "Emergency Response Organization Training Program," states personnel responsible for implementing the emergency plan will receive specialized training. The program is based on the requirements of 10 CFR 50, Appendix E and position specific responsibilities as defined in the emergency plan. On-shift emergency response personnel are trained annually. New personnel receive an initial overview course to familiarize them with the emergency plan.

Technical Evaluation: Section O.2 of the VCSNS Units 2 and 3 Emergency Plan refers to the training program for members of the onsite emergency organization. The training program includes classroom training and practical drills in which each individual demonstrates ability to perform his/her assigned emergency function. During the practical drills, on-the-spot correction of erroneous performance will be made and a demonstration of the proper performance offered by the instructor.

¹⁷ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

Technical Information in the Emergency Plan: [O.3.] Section O.3, "First Aid Response," (page O-2) of the VCSNS Units 2 and 3 Emergency Plan states that selected site personnel are trained in accordance with the VCSNS approved First Aid Program and medical triage.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes training for individuals assigned to first aid teams that includes courses equivalent to Red Cross Multi-Media.

Technical Information in the Emergency Plan: [O.4.a through j.] [O.4.a.] Section O.4.a, "Directors, Managers, and Coordinators within the Station ERO," of the VCSNS Units 2 and 3 Emergency Plan states personnel identified in the Emergency Planning Telephone Directory as Directors, Managers, and Coordinators for the Station ERO receive position specific training in accordance with the approved ERO training program. Contents of the training program are discussed in this section. All personnel receive knowledge and/or performance based training initially and retraining thereafter on an annual basis.

[O.4.b.] Section O.4.b, "Personnel Responsible for Accident Assessment," (page O-3) of the VCSNS Units 2 and 3 Emergency Plan states skills and knowledge necessary to perform accident assessment duties are specific to operational positions. Personnel in these positions use normal operating procedures to perform power changes and shutdowns of the reactor. Stabilization and mitigation of the plant are normal functions performed by these personnel. Operators receive routine classroom and simulator training to ensure proficiency. Section O.4.b.1, "Active Senior Licensed Control Room Personnel," (page O-3) describes the contents of the training program for control room personnel. Section O.4.b.2, "Core Damage Assessment Personnel," (page O-3) discusses the training program for personnel responsible for performing core damage assessment during an emergency.

[O.4.c.] Training of Field Monitoring Teams and Radiological Analysis Personnel is discussed in Section O.4.c, "Field Monitoring Teams and Radiological Analysis Personnel," (page O-3/4). Section O.4.c.1, "Field Radiological Monitoring," (page O-3/4) of the VCSNS Units 2 and 3 Emergency Plan states Field Monitoring Teams receive training in accordance with the approved training program. Content of the training program is also included. The program used to train personnel monitoring teams is discussed in Section O.4.c.2, "Field Radiological Monitoring," (page O-4). The program used to train dose assessment personnel is discussed in Section O.4.c.3, "Dose Assessment," (page O-4).

[O.4.d.] Section O.4.d.1, "Local Police and Firefighting Personnel," (page O-4) states local police and fire departments are invited to receive training as outlined in Section O.4.d.1.a, "Assurance of Training." Training for Station security personnel, covered in Section O.4.d.2, "Security Personnel," (page O-4) is performed in accordance with training defined by the SOT and VCSNS Security Program. Section 13.6, "Security," of the Final Safety Analysis Report states the Security Plan is submitted to the NRC as a separate document to fulfill the requirements for 10 CFR 50.34. Training for Station fire brigade members, covered in Section O.4.d.3, "Fire Brigade Teams," (page O-4) is performed in accordance with training defined by the VCSNS Fire Protection Program.

[O.4.e.] Training of Repair and Damage Control Teams is discussed in Section O.4.e, "Repair and Damage Control Teams," (page O-4/5) of the VCSNS Emergency Plan. These teams are

made up of personnel from operations, maintenance, chemistry, and radiation protection. Personnel are trained to perform damage control and repair duties as part of their job specific training. Specific areas of training for each position are identified in this section. Fifty percent of personnel from these teams are required to be qualified in the use of respiratory protection equipment.

[O.4.f] Section O.4.f, "Medical Emergency Response Team and Rescue Personnel," (page O-5) of the VCSNS Units 2 and 3 Emergency Plan references section O.3,"First Aid Response," (page O-2) which states personnel are trained in accordance with the VCSNS approved First Aid Program and medical triage. This training is also available to fire brigade members and personnel providing rescue assistance.

[O.4.g.] Section O.4.g, "Local Support Service Personnel," (page O-5) of the VCSNS Units 2 and 3 Emergency Plan states local support service personnel are invited to receive training described in Section O.1.a and O.1.b, "Assurance of Training." Training is designed to familiarize them with potential problems encountered in an emergency, notification procedures, and their expected roles. They will also receive site-specific emergency response training and be instructed as to the identity of those persons in the onsite organization who will control their support activities.

[O.4.h.] Section O.4.h, "Medical Support Personnel," (page O-5) of the VCSNS Units 2 and 3 Emergency Plan states onsite medical personnel are trained to handle contaminated victims and hospital interface. Offsite ambulance and hospital personnel are also offered annual training.

[O.4.i.] Section O.4.i, "EPI Personnel," (page O-5) of the VCSNS Units 2 and 3 Emergency Plan states corporate and station personnel responsible for disseminating Emergency Public Information (EPI), responding to media, and public information requests receive public information training.

[O.4.j.] Section O.4.j, "Communications Personnel," (page O-5) of the VCSNS Units 2 and 3 Emergency Plan states ERO personnel are trained in communications protocol during an initial Emergency Response Overview Course. Personnel using specialized communications equipment and those responsible for notification of offsite agencies receive initial and requalification training.

...

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan establishes a training program for instructing and qualifying personnel who will implement radiological emergency response plans. Specialized initial training and periodic retraining programs (including the scope, nature and frequency) were described for the following categories:

- a. Directors and/or coordinators of the plant emergency organization;
- b. Personnel responsible for accident assessment, including control room shift personnel;
- c. Radiological monitoring teams;
- d. Fire control teams (fire brigades);
- e. Repair and damage control teams;
- f. First aid and rescue teams;
- g. Medical support personnel;
- h. Licensee's headquarters support personnel;

i. Security personnel.

Technical Information in the Emergency Plan: [O.5.] Section O.5, "General, Initial, and Annual Training Program Maintenance," (page O-5/7) of the VCSNS Units 2 and 3 Emergency Plan states the responsibility for training and retraining personnel belongs to the station departments and Emergency Preparedness. Section O.5.a, "Station Responsibilities for Station ERO personnel," (page O-5/6) provides an outline of the stations responsibilities for training of personnel that will be providing emergency support. The station will ensure all personnel will be present for training and the training and retraining they receive will use approved lesson plans. An annual review of assembly areas, Emergency Response Facility (ERF) assignment, potential hazards, and anticipated actions are performed as part of a continued training program.

Section O.5.b, "Initial and Requalification ERO Training," (page O-6) provides the process used to ensure that personnel remain proficient in their duties. This includes initial assignment of emergency duties; training on emergency plans and implementing procedures; retraining when necessary or once per year; and participation in drills and exercises. Personnel will receive training on changes to the emergency plan within 120 days of its implementation. Those assigned responsibility in the ERO will be listed in the Emergency Planning Telephone Directory.

Section O.5.c, "Station Orientation Training (SOT)," (page O-6/7) states all unescorted personnel receive training on notification and instruction methods used during an emergency. Badged personnel will receive orientation in basic principles of radiological safety. All personnel will receive requalification training on the basic elements of the Emergency Plan that includes: alarms and their meanings; assembly areas evacuation procedures; special precautions; and the purpose of the VCSNS Emergency Plan.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes provisions for the initial and annual retraining of personnel with emergency response responsibilities.

In determining whether the proposed emergency plan met the applicable regulatory requirements related to the area of "Radiological Emergency Response Training," the NRC staff also evaluated it against the following requirements in Appendix E to 10 CFR Part 50.

13.3.1C.O.2 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV. F.1. requires that the emergency plan describe a program to provide for: (a) The training of employees and exercising, by periodic drills, of radiation emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (b) The participation in the training and drills by other persons whose assistance may be needed in the event of a radiation emergency. The description is to include specialized initial training and periodic retraining programs that is to be provided to each of the following categories of emergency personnel:

- a. Directors and/or coordinators of the plant emergency organization;
- b. Personnel responsible for accident assessment, including control room shift personnel;
- c. Radiological monitoring teams;
- d. Fire control teams (fire brigades);
- e. Repair and damage control teams;
- f. First aid and rescue teams;
- g. Medical support personnel;

- h. Licensee's headquarters support personnel;
- i. Security personnel.

In addition, a radiological orientation training program is to be made available to local services personnel; e.g., local emergency services/Civil Defense, local law enforcement personnel, local news media persons.

Technical Information in the Emergency Plan: [10 CFR 50, Appendix E.IV. F.1.i.] Section O.4.a, "Directors, Managers, and Coordinators within the Station ERO," of the V.C. Summer Nuclear Station (VCSNS) Units 2 and 3 Emergency Plan states personnel identified in the Emergency Planning Telephone Directory as Directors, Managers, and Coordinators for the Station ERO receive position specific training in accordance with the approved ERO training program. Contents of the training program are also discussed in Section O.4.a. All personnel receive knowledge and/or performance based training initially and retraining thereafter on an annual basis. More specific detail on the training program is provided in Section O.5, "General, Initial, and Annual Training Program Maintenance."

[10 CFR 50, Appendix E.IV. F.1.ii.] Section O.4.b, "Personnel Responsible for Accident Assessment," (page O-3) of the VCSNS Units 2 and 3 Emergency Plan states skills and knowledge necessary to perform accident assessment duties are specific to operational positions. Personnel in these positions use normal operating procedures to perform power changes and shutdowns of the reactor. Stabilization and mitigation of the plant are normal functions performed by these personnel. Operators receive routine classroom and simulator training to ensure proficiency. Section O.4.b.1, "Active Senior Licensed Control Room Personnel," (page O-3) states that training of control room personnel includes: Event Classification, Protective Action Recommendations, Radioactive Release Rate Determination, Notification form completion and use of ESSX, Federal, State and county notification procedures, and Site-specific procedures for activating the onsite and offsite ERO. These topics are covered on an annual basis. Section O.4.b.2, "Core Damage Assessment Personnel," (page O-3) states personnel responsible for performing core damage assessment during an accident receive classroom and hands-on training in Available Instrumentation and Equipment, Isotopic Assessment and Interpretation, and Core Damage Assessment Methodology and/or proceduralized assessment methods.

[10 CFR 50, Appendix E.IV. F.1.iii.] Training of Field Monitoring Teams and Radiological Analysis Personnel is discussed in Section O.4.c, "Field Monitoring Teams and Radiological Analysis Personnel," (page O-3/4). Section O.4.c.1, "Field Radiological Monitoring," (page O-3/4) states Field Monitoring Teams receive training in accordance with the approved training program. Training includes classroom and hands-on training in equipment and equipment checks, communications, and plume tracking techniques. Training for the Personnel Monitoring team, covered in Section O.4.c.2, "Field Radiological Monitoring," (page O-4) includes: the use of personnel monitoring equipment, personnel decontamination techniques, and vehicle decontamination techniques. Training for the Dose assessment Personnel, covered in Section O.4.c.3, "Dose Assessment," (page O-4) includes: computerized Dose Assessment, protective action recommendations, field monitoring team interface, PAGs associated with offsite plume exposure doses, and basic meteorology. All personnel receive knowledge and/or performance based training initially and retraining thereafter on an annual basis. More specific detail on the training program is provided in Section O.5, "General, Initial, and Annual Training Program Maintenance," (page O-5/7) of the VCSNS Emergency Plan.

1 **[10 CFR 50, Appendix E.IV. F.1.iv.]** Training for Station fire brigade members, covered in
2 Section O.4.d.3, "Fire Brigade Teams," (page O-4) is performed in accordance with training
3 defined by the VCSNS Fire Protection Program. All personnel receive knowledge and/or
4 performance based training initially and retraining thereafter on an annual basis. Additional
5 information on training is provided in Section O.5, "General, Initial, and Annual Training Program
6 Maintenance," (page O-5/7) of the VCSNS Emergency Plan.
7

8 **[10 CFR 50, Appendix E.IV. F.1.v.]** Training of Repair and Damage Control Teams is
9 discussed in Section O.4.e, "Repair and Damage Control Teams," (page O-4/5). These teams
10 are made up of personnel from operations, maintenance, chemistry, and radiation protection.
11 Personnel are trained to perform damage control and repair duties as part of their job specific
12 training. The content of their training program is outlined in this section. All personnel receive
13 knowledge and/or performance based training initially and retraining thereafter on an annual
14 basis. Fifty percent of personnel from Operations, Radiation Protection, Chemistry, and/or
15 Maintenance, who may respond to the Operations support Center (OSC) as damage control
16 team members, are required to be qualified in the use of respiratory protection equipment.
17

18 **[10 CFR 50, Appendix E.IV. F.1.vi.]** Section O.3, "First Aid Response," (page O-2) of the
19 VCSNS Units 2 and 3 Emergency Plan states that personnel are trained in accordance with the
20 VCSNS approved First Aid Program and medical triage. Fire brigade members and other
21 personnel that will provide rescue assistance may also receive this training.
22

23 **[10 CFR 50, Appendix E.IV. F.1.vii.]** Section O.4.h, "Medical Support Personnel," (page O-5)
24 of the VCSNS Units 2 and 3 Emergency Plan states onsite medical personnel are trained to
25 handle contaminated victims and hospital interface. Offsite ambulance and hospital personnel
26 are offered annual training in accordance with a program provided by Emergency
27 Preparedness.
28

29 **[10 CFR 50, Appendix E.IV. F.1.viii.]** Section O.4.i, "EPI Personnel," (page O-5) of the
30 VCSNS Units 2 and 3 Emergency Plan corporate and station personnel responsible for
31 disseminating EPI and responding to media and public information requests receive public
32 information training.
33

34 **[10 CFR 50, Appendix E.IV. F.1.ix.1.]** Section O.4.d.2, "Security Personnel," (page O-4) of the
35 VCSNS Units 2 and 3 Emergency Plan states that training is performed as defined by the
36 Station Orientation Training and VCSNS Security Program. All personnel receive knowledge
37 and/or performance based training initially and retraining thereafter on an annual basis. More
38 specific detail on the training program is provided in Section O.5, "General, Initial, and Annual
39 Training Program Maintenance." Section 13.6, "Security," of the Final Safety Analysis Report
40 (FSAR) states the Security Plan is submitted to the Nuclear Regulatory Commission (NRC) as a
41 separate document to fulfill the requirements for 10 CFR 50.34.
42

43 **[10 CFR 50, Appendix E.IV. F.1.ix.2.]** Section O.4.g, "Local Support Service Personnel," (page
44 O-5) of the VCSNS Units 2 and 3 Emergency Plan states local support service personnel that
45 will assistance in an emergency are invited to receive training described in Section O.1.a and
46 O.1.b, "Assurance of Training." Training for local support services is designed to familiarize
47 them with potential problems encountered in an emergency, notification procedures, and their
48 expected roles. They will also receive site-specific emergency response training and be
49 instructed as to the identity of those persons in the onsite organization who will control their
50 support activities. Training for off-site personnel will also be conducted in accordance with their
51 off-site ERO radiological emergency plans.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes a program to provide for: (a) The training of employees and exercising, by periodic drills, of radiation emergency plans to ensure that employees of the licensee are familiar with their specific emergency response duties, and (b) The participation in the training and drills by other persons whose assistance may be needed in the event of a radiation emergency. The description includes specialized initial training and periodic retraining programs that will be provided to each of the following categories of emergency personnel:

- a. Directors and/or coordinators of the plant emergency organization;
- b. Personnel responsible for accident assessment, including control room shift personnel;
- c. Radiological monitoring teams;
- d. Fire control teams (fire brigades);
- e. Repair and damage control teams;
- f. First aid and rescue teams;
- g. Medical support personnel;
- h. Licensee's headquarters support personnel;
- i. Security personnel.

In addition, a radiological orientation training program is to be made available to local services personnel; e.g., local emergency services/Civil Defense, local law enforcement personnel, local news media persons.

13.3.1C.O.3 Regulatory Basis: 10 CFR 50, Appendix E.IV., "Content of Emergency Plans." 10 CFR 50, Appendix E.IV.F.2.g. requires that all training, including exercises, provide for formal critiques in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies that are identified are to be corrected.

Technical Information in the Emergency Plan: Section O.5.b, "Initial and Requalification ERO Training," (page O-6) of the VCSNS Units 2 and 3 Emergency Plan states personnel not demonstrating the required level of knowledge in initial or retraining classes receive additional training on the areas requiring improvement. Section N.4, "Critique and Evaluation," (page N-4) states biennially a representative from the NRC will observe and evaluate the licensee's ability to conduct a self-critical critique. The NRC and Federal Emergency Management Association (FEMA) will observe, evaluate, and critique full offsite participation exercises. Section N, "Drill and Exercise Program," (page N-1) states any deficiencies identified through the drill and exercise program will be promptly corrected.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan provides for formal critiques of exercises in order to identify weak or deficient areas that need correction. Any weaknesses or deficiencies that are identified will be corrected.

13.3.1C.O.4 Conclusion for Radiological Emergency Training

On the basis of its review of the onsite emergency plan as described above for radiological emergency response training, the staff concludes that the information provided in the HNP Emergency Plan is consistent with Planning Standard O of NUREG-0654/FEMA-REP-1.

1 Therefore, the information is acceptable and meets the requirements of 10 CFR 50.47(b)(15)
2 and Sections IV.F.1 and applicable portions of F.2.g. of Appendix E to 10 CFR Part 50.

3

4

13.3.1C.P Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans

13.3.1C.P.1 Regulatory Basis: 10 CFR 50.47, "Emergency plans." 10 CFR 50.47(b)(16); Planning Standard P. requires that the emergency plan describe the responsibilities for emergency plan development and review and for distribution of the emergency plans. In addition, planners must be properly trained.

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(16), the NRC staff evaluated it against the detailed evaluation criteria¹⁸ in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [P.1.] Section P.1, "Emergency Preparedness Staff Training," (page P-1) of the V.C. Summer Nuclear Station (VCSNS) Emergency Plan states that once a year, all emergency preparedness staff are involved in training courses, drills, exercises, seminars, workshops, or industry review and evaluation programs, in order to maintain knowledge of planning techniques and equipment.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes the training that will be provided for individuals responsible for the planning effort

Technical Information in the Emergency Plan: [P.2] Section P.2, "Authority for the Emergency Preparedness Effort," (page P-1) of the VCSNS Units 2 and 3 Emergency Plan states the Vice President, Nuclear Operations is responsible for issuance, control, and implementation of the emergency plan and all activities associated with the plan and is annexes. The Vice President, Nuclear Operations is also responsible for safe and reliable operation of the VCSNS site.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan identifies the individual by title with the overall authority and responsibility for radiological emergency response planning.

Technical Information in the Emergency Plan: [P.3.] Section P.3, "Responsibility for Development and Maintenance of the Plan," (page P-1/4) of the VCSNS Units 2 and 3 Emergency Plan states the Manager, Emergency Services is in charge of the emergency preparedness program and its administration. The Manager, Emergency Services works with emergency preparedness staff to ensure proper administration of the emergency plan (page P-1/2), coordination of drills and exercises (page P-2/3), maintenance of facilities and equipment (page P-3), and Emergency Response Organization (ERO) Qualification and administration (page P-4). The Vice President, Nuclear Operations will oversee the work of the Manager, Emergency Services and their staff to ensure that the ERO is staffed adequately; drills and exercises are scheduled; communication system are operational; equipment and supplies are available; and implementing procedures are maintained.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan designates an Emergency Planning Coordinator with responsibility for the development and updating of emergency plans and coordination of these plans with other response organizations.

¹⁸ The bracketed, alphanumeric designations used throughout this SER section identify the corresponding NUREG-0654/FEMA-REP-1 evaluation criteria used by the staff to determine compliance with 10 CFR 50.47(b).

Technical Information in the Emergency Plan: [P.4.] Section P.4, "Emergency Plan and Agreement Revisions," (page P-4/5) of the VCSNS Units 2 and 3 Emergency Plan provides a process for making revisions to the Emergency Plan, Annexes, and supporting Agreements. Areas needing revision are identified by the Manager, Emergency Services during audits, assessments, training, drills, and exercises and changes are incorporated into the revisions. Changes are approved by the General Manager, Nuclear Plant Operations. The emergency plan and its annexes are revised as needed or on an annual basis. Minor changes are implemented within 30 days and significant programmatic changes within 90 days of approval. Letters of Agreement are also reviewed on an annual basis to ensure availability of resources. Implementing Procedures are revised with the emergency plan and reviewed every two years. If a need for revision is not discovered, a letter or memorandum will be written to document that no change was made.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes provisions for updating the emergency plan and agreements as needed, and reviewing and certifying it to be current on an annual basis. In addition, the updating provisions described take into account changes identified by drills and exercises.

Technical Information in the Emergency Plan: [P.5.] Section P.5, "Emergency Plan Distribution," (page P-5) of the VCSNS Units 2 and 3 Emergency Plan states emergency plans, unit annexes, and implementing procedures will be distributed to Emergency Response Facilities (ERFs), selected Federal, State, and local agencies, and other appropriate locations, on a controlled basis. Electronic copies are also available on the company's computer network. Document revisions are issued to appropriate parties following approval through the procedure discussed in Section P.4, "Emergency Plan and Agreement Revisions" (page P-4/5).

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan states that the emergency response plans and approved changes to the plan will be forwarded to all organizations and appropriate individuals with responsibility for implementation of the plan. The VCSNS Units 2 and 3 Emergency Plan also states that revised pages will be dated and marked to show where changes have been made.

Technical Information in the Emergency Plan: [P.6.] Section P.6, "Supporting Emergency Response Plans," (page P-5) of the VCSNS Units 2 and 3 Emergency Plan provides a list of plans that support the VCSNS Units 2 and 3 Emergency Plan and their sources.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan contains a detailed listing of supporting plans and their source.

Technical Information in the Emergency Plan: [P.7.] Section P.7, "Implementing and Supporting Procedures," (page P-5) of the VCSNS Units 2 and 3 Emergency Plan states a listing of procedures used to implement the emergency plan and administrative procedures can be found in Appendix 3, "Procedure Cross-References to the Emergency Plan."

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan contains as an appendix, a listing of the procedures by title that are required to implement the plan. The listing includes the section(s) of the plan to be implemented by each procedure.

Technical Information in the Emergency Plan: [P.8.] Section P.8, "Cross-Reference to Planning Criteria," (page P-6) of the VCSNS Units 2 and 3 Emergency Plan states format of the emergency Plan is the same as NUREG-0654. In **RAI 13.03-26(A)(1)**, the staff requested a Reference to Appendix 6," NUREG-0654 Cross-Reference Document," be added in Section P.8, "Cross-Reference to Planning Criteria." In **RAI 13.03-26(A)(2)** the staff requested that a cross reference to Appendix E to 10 CFR 50 be provided in the Emergency Plan as specified in RG 1.206, "Combined License Applications for Nuclear Power Plants." In a response letter dated May 8, 2009 (pg. 54), the applicant committed to revise Section P.8 to include the following statement: "Appendix 6 provides the cross reference for this EP to the criteria in NUREG-0654." The applicant also committed to add a cross reference to Appendix E to 10 CFR Part 50 to Appendix 6. The new Table 1 was included as an attachment to this response.

Technical Evaluation: The staff finds the additional information and textual revisions submitted in response to **RAIs 13.03-26(A)(1) and (2) to be acceptable. Confirmatory Action NRC Items 13.03-15 and 13.03-16** were created to track the proposed revisions.

Technical Information in the Emergency Plan: [P.9.] Section P.9, "Audit/Assessment of the Emergency Preparedness Program," (page P-6) of the VCSNS Units 2 and 3 Emergency Plan states the Nuclear Safety Review Committee will ensure that an audit of the VCSNS Emergency Planning Program is performed at least once every 12 months. The Manager, Emergency Services is responsible for coordinating the independent review. Results are submitted for review to the Vice President, Nuclear Operations. The Manager, Emergency Services ensures necessary findings are reviewed with the offsite agencies. The State and counties receive written notification of audit results on the adequacy of interfaces and the availability of the audit records. The audit will examine the emergency plan and implementing procedures; the Emergency Preparedness Training Program; drills and exercises; the Station ERO readiness; documents and programs associated with the administrative portion of the Emergency Preparedness Program; readiness of facilities and equipment; interfaces between VCSNS, the state, and county governmental agencies.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan describes arrangements for and conduct of independent reviews of the emergency preparedness program at least every 12 months. The review will include the emergency plan, its implementing procedures and practices, training, readiness testing, equipment, and interfaces with State and local governments. Management controls are described for evaluation and correction of review findings. The result of the review, along with recommendations for improvements, will be documented, reported to appropriate licensee corporate and plant management, and involved Federal, State and local organizations, and retained for a period of five years.

Technical Information in the Emergency Plan: [P.10.] Section P.10, "Maintenance of Emergency Telephone Numbers," (page P-6) of the VCSNS Units 2 and 3 Emergency Plan states names and phone numbers will be reviewed and updated at least quarterly. This includes the ERO, support agencies, and ERFs in the implementing procedures and the Emergency Planning Telephone Directory.

Technical Evaluation: The VCSNS Units 2 and 3 Emergency Plan provides for updating telephone numbers in emergency procedures at least quarterly.

1 In determining whether the proposed emergency plan met the applicable regulatory
2 requirements related to the area of "Responsibility for the Planning Effort: Development,
3 Periodic Review and Distribution of Emergency Plans," the NRC staff also evaluated it against
4 the following requirements in Appendix E to 10 CFR Part 50.

5 **13.3.1C.P.2 Regulatory Basis:** 10 CFR 50, Appendix E.IV., "Content of Emergency Plans."
6 10 CFR 50, Appendix E.IV.G. requires the description of provisions to be employed to ensure
7 that the emergency plan, its implementing procedures, and emergency equipment and supplies
8 are maintained up-to-date.

9 **Technical Information in the Emergency Plan:** Maintenance of the Emergency Plan is
10 discussed in Section P.3, "Responsibility for Development and Maintenance of the Plan."
11 Updating of the Emergency Plan is discussed in Section P.4, "Emergency Plan and Agreement
12 Revisions." Maintenance of equipment and supplies is discussed in Section H.11, "Facility and
13 Equipment Readiness."

14
15 **Technical Evaluation:** The VCSNS Units 2 and 3 Emergency Plan describes provisions to be
16 employed to ensure that the emergency plan, its implementing procedures, and emergency
17 equipment and supplies are maintained up-to-date.

18
19 **13.3.1C.P.3 Conclusion for Responsibility for the Planning Effort: Development,**
20 **Periodic Review and Distribution of Emergency Plans**

21 The staff has reviewed the onsite emergency plan and the applicant's responses to **RAIs 13.03-**
22 **26(A)(1) and (2)** with regards to Planning Standard P of NUREG-0654/FEMA-REP-1 and the
23 requirements of 10 CFR 50.47(b)(16) and Section IV.G. of Appendix E to 10 CFR Part 50. Final
24 determination regarding this planning standard will be based on verification of **Confirmatory**
25 **Action NRC Items 13.03-15 and 13.03-16.**

13.3.1C.Q Hostile Action-Based Considerations

13.3.1C.Q.1 Regulatory Basis: 10 CFR 52.79(a)(41) requires that the final safety evaluation report include an evaluation of the facility against the Standard Review Plan (SRP) in effect 6 months before the docket date of the application. Where a difference exists, the evaluation shall discuss how the proposed alternative provides an acceptable method of complying with the Commission's regulations, or portions thereof, that underlie the corresponding SRP acceptance criteria.

Section 13.3, "Emergency Planning," to NUREG-0800, "Standard Review Plan" states the following:

a. The reviewer should verify that the required NRC reporting requirements associated with discovery of an actual or imminent safeguards threat against the facility, or other safeguards event, are reflected in the site emergency plan and/or procedures.

b. The reviewer should verify that the applicant has determined the potential effect on the plant, onsite staffing and augmentation, and on site evacuation strategies from damage to nearby hazardous facilities, dams, and other nearby sites, with consideration of a security event, and has reflected this, as appropriate, in the plans and preparedness measures.

c. If available, the reviewer should verify that onsite staffing, facilities, and procedures are adequate to accomplish actions necessary in response to a security event, and the emergency plan and/or procedures reflect the specific site needs.

d. The reviewer should verify that the application contains EALs to ensure that a site-specific, security event results in an emergency classification declaration of at least a notification of unusual event. The classification scheme should also reflect the strategy for escalation to a higher-level event classification.

~~e. The reviewer should review SRP Section 13.6, as it relates to consultation with DHS concerning the potential vulnerabilities of the location of the proposed facility to terrorist attack, as required by Section 657 of the Energy Policy Act of 2005.~~

[Reviewer's note: Ask Bob M. to discuss for reason for deleting this item.]

Compensatory Measures (ICMs) B.5.c, B.5.d, and B.5.e of Commission Orders of February 25, 2002, to all operating commercial nuclear power plants, relates to security-based emergency plans and preparedness.

The staff's primary focus was on its evaluation of the emergency plan against the guidance provided in Section 13.3 of NUREG-0800. Section 13.3 of NUREG-0800 provides the detailed acceptance criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirement in 10 CFR 52.79(a)(41).

Technical Information in the Emergency Plan: Section ----- in the ----- Plan [states/describes/identifies/lists/contains/etc.] that [summarize the key content of the information from the emergency plan that addresses the evaluation criterion (don't copy the information verbatim)].

Technical Evaluation: Chapter ---- of the FSAR includes an evaluation of the facility against the Standard Review Plan (SRP) in effect 6 months before the docket date of the application. **[If applicable:** Where differences existed, the evaluation discusses how the proposed alternative

provides an acceptable method of complying with the Commission's regulations, or portions thereof, that underlie the corresponding SRP acceptance criteria.

In addition:

a. The required NRC reporting requirements associated with discovery of an actual or imminent safeguards threat against the facility, or other safeguards event, are reflected in section ---- of the ---- Plan [**and/or**] procedures ----.

b. The applicant has determined the potential effect on the plant, onsite staffing and augmentation, and on site evacuation strategies from damage to nearby hazardous facilities, dams, and other nearby sites, with consideration of a security event, and has reflected this, as appropriate, in the plans and preparedness measures.

c. Onsite staffing, facilities, and procedures are adequate to accomplish actions necessary in response to a security event, and section ---- of the ---- Plan [**and/or**] procedures ---- reflect the specific site needs.

d. Section ---- of the application contains EALs to ensure that a site-specific, security event results in an emergency classification declaration of at least a notification of unusual event. The classification scheme reflects the strategy for escalation to a higher-level event classification.

~~e. FSAR Section 13.6 addresses Section 657 of the Energy Policy Act of 2005, as it relates to consultation with DHS concerning the potential vulnerabilities of the location of the proposed facility to terrorist attack.~~

Compensatory Measures (ICMs) B.5.c, B.5.d, and B.5.e of Commission Orders of February 25, 2002, relating to security-based emergency plans and preparedness are addressed in section -- of the ---- Plan.

13.3.1C.Q.2 Conclusion for Hostile Action-Based Considerations.

[Placeholder: On the basis of its review of the onsite emergency plan as described above, the NRC staff concludes that the information provided in the ---- Plan is consistent with those portions of Section 13.3 of NUREG-0800 related to hostile action based considerations. Therefore, the information is acceptable and meets the requirements of 10 CFR 52.79(a)(41) as it relates to preparedness for responding to hostile actions.]

[If applicable: As discussed above, the applicant needs to provide the bases for why ITAAC ---- will demonstrate the sufficiency ----. The NRC will determine whether the requirements of 10 CFR 52.79(a)(41) have been met and document its determination in the Final Safety Evaluation Report (FSER), based on information the applicant has provided to date and its response to Open Item ----.]

[If applicable: As discussed above, the applicant needs to provide ----, and provide ----. The NRC will determine whether this requirements is met and document its determination in the Final Safety Evaluation Report (FSER), based on information the applicant has provided to date and its response to Open Items ---- and ----.

The applicant has committed to meet the following license conditions and ITAAC, with the associated dates, for the emergency preparedness program:

- 1 **[If applicable] License Conditions**
- 2 **[Note:** Refer to the Licensee Conditions here and in overall summary.]
- 3

13.3.1C.R Evacuation Time Estimate (ETE) Analysis

13.3.1C.R.1 Regulatory Basis: Section IV. "Content of Emergency Plans," of Appendix E to 10 CFR 50 requires that the nuclear power reactor operating license applicant provide an analysis of the time required to evacuate and for taking other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations.

The NRC staff's primary focus was its evaluation of the ETE analysis against Appendix 4, "Evacuation Time Estimates within the Plume Exposure Pathway Emergency Planning Zone," to NUREG-0654/FEMA-REP-1. Appendix 4 includes detailed guidance that the staff should consider in determining whether the ETE analysis meets the applicable regulatory requirements in Appendix E to 10 CFR 50.

Technical Information in the Emergency Plan: The ----- Plan includes an analysis of the time required to evacuate the plume exposure emergency planning zone and for taking other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations. [Note: The ETE is also addressed in Evaluation Criteria J.8 and J.10.I.]

Section ----- of the ETE [Report/Analysis] [states/describes/identifies/lists/contains/etc.] that [summarize the key content of the information from the ETE analysis that addresses the guidance in Appendix 4 (don't copy the information from the ETE analysis verbatim). Include any ITAAC.]

Technical Evaluation: [Placeholder: Adequacy of RAI Response] The Evacuation Time Estimate [Report/Analysis] was provided as a separate document in the COL application, but it is considered to be part of the Plan and subject to the requirements of 10 CFR 50.54(q).

[Also, provide additional information related to confirming calculations, contacts, etc. that were performed to verify information in the application. Address the adequacy of each ITAAC in the appropriate section.]

[If applicable:] In RAIs ---- through ----, the staff requested information regarding the ETE for --- as part of its review of physical characteristics unique to the site that could pose significant impediments to the development of emergency plans. The staff identified the need for this information as Open Item ----. In its submission to the NRC dated -----, the applicant responded to RAIs ---- through ----. The information related to the ETE for ----- provided by the applicant in response to RAIs ---- through ---- is consistent with the regulation in Appendix E to 10 CFR 50 and is, therefore, acceptable. The staff considers Open Item ---- to be resolved.

[If applicable:] The staff notes that the COL application site is adjacent to (insert plant/unit name). Integrated onsite and offsite radiological emergency plans currently exist for ----, that is an operating nuclear power plant. Because ---- is an operating nuclear power plant, with integrated onsite and offsite emergency plans, no significant impediments exist to the development of an emergency plan for the site.

[If applicable:] In addition, the applicant adequately identified physical characteristics unique to the proposed site by performing a preliminary analysis of the time required to evacuate various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations and did not note any major impediments for an evacuation or other protective actions.

1 The ETE **[Report/Analysis]** analysis includes a map showing the proposed site and plume
2 exposure pathway EPZ, as well as transportation networks, topographical features, and political
3 boundaries. The boundaries of the EPZ, in addition to the evacuation subareas within the EPZ,
4 are based on factors such as current and projected demography, topography, land
5 characteristics, access routes, and jurisdictional boundaries. **[If applicable:** The applicant's ----
6 ETE **[Report/Analysis]** does not require updating, since the guidance in NUREG/CR-4831,
7 "State of the Art in Evacuation Time Estimate Studies for Nuclear Power Plants," states that, as
8 a general rule, a 10-percent increase in the population indicates a need to check evacuation
9 times.]

10
11 The ETE **[Report/Analysis]** describes the method of analyzing the evacuation times. A general
12 description of the ---- model was provided. **(insert a brief description of the model)**

13
14 The ETE **[Report/Analysis]** submitted with the COL application includes an estimate of the
15 number of people to be evacuated, using the latest population census numbers and the most
16 recent local conditions. The population estimate also considers permanent residents,
17 transients, and persons in special facilities, including those confined to institutions such as
18 hospitals, nursing homes, and prisons. Estimates for special populations considered the means
19 of mobilization of equipment and manpower to aid in evacuation. The applicant also evaluated
20 the school population in the special facility segment of the analysis.

21
22 The sub-areas **[sectors and zones]**, for which evacuation time estimates were determined,
23 encompass the entire area within the plume exposure EPZ. Additionally, evacuation time
24 estimates for simultaneous evacuation of the entire plume exposure pathway EPZ were
25 determined.

26
27 The ETE **[Report/Analysis]** also described the locations, types, and capacities of the facilities
28 to be used in evacuation.

29
30 The ETE **[Report/Analysis]** submitted with the COL application included a complete review and
31 description of the road network in the proposed site area. The applicant included the
32 assumptions for determining the number of vehicles that should be provided, as well as the
33 methodology for determining the transport-dependent population. The applicant also analyzed
34 travel times and potential locations for serious congestion along the evacuation routes. The
35 ETE **[Report/Analysis]** considered normal and adverse weather conditions, such as flooding,
36 snow, ice, fog, or rain, as well.

37 The ETE **[Report/Analysis]** describes the methods to be used and estimates of the time to
38 confirm evacuation.

39
40 The ETE **[Report/Analysis]** included specific recommendations for actions that could be taken
41 to significantly improve evacuation times. **[If applicable:** Where significant costs were
42 involved, estimates of the cost of implementing those recommendations were given.

43
44 The review of the ETE **[Report/Analysis]** by ----- (the principal state and local organizations)
45 who are involved in emergency response for the site was solicited. Comments resulting from
46 the review were provided.

47
48 **[If applicable:]** The applicant did not identify any other physical characteristics that could pose
49 a significant impediment to the development of an emergency plan, such as new home or
50 shopping center construction, an industrial park, a major increase in the number of new
51 employers, or new roads or highways.

1
2 **Interface Coordination:**
3

4 **13.3.1C.R.2 Conclusion for the Evacuation Time Estimate Analysis**

5 **[Placeholder:** On the basis of its review of the onsite emergency plan as described above, the
6 NRC staff concludes that the information provided in the ---- Plan is consistent with those
7 portions of Section 13.3 of NUREG-0800 related to the evacuation time estimate analysis.
8 Therefore, the information is acceptable and meets the applicable requirements of 10 CFR 50,
9 Appendix E.IV.]

10 **[If applicable:** As discussed above, the applicant needs to provide the bases for why ITAAC ----
11 will demonstrate the sufficiency ----. The NRC will determine whether the requirements of 10
12 CFR 52.79(a)(41) have been met and document its determination in the Final Safety Evaluation
13 Report (FSER), based on information the applicant has provided to date and its response to
14 Open Item ----.]

15 **[If applicable:** As discussed above, the applicant needs to provide ----, and provide ----. The
16 NRC will determine whether this requirements is met and document its determination in the
17 Final Safety Evaluation Report (FSER), based on information the applicant has provided to date
18 and its response to Open Items ---- and ----.

19 **[If applicable:]** The applicant has committed to meet the following license conditions and
20 ITAAC, with the associated dates, for the emergency preparedness program:

21 **[If applicable] License Conditions**

22 **[Note:** Refer to the Licensee Conditions here and in overall summary.]
23

13.3.1C.S Emergency Plan ITAAC

13.3.1C.S.1 Regulatory Basis: 10 CFR 52.80, "Contents of applications; additional technical information." 10 CFR 52.80(a) requires that the application contain proposed inspections, tests, and analyses.

Technical Information in the Emergency Plan: [10 CFR 52.80(a) – ITAAC required] Section ---- of the ---- Plan ...

[If applicable: 10 CFR 50.80(a)(1) and (3) – when ESP with ITAAC is referenced] Section --- - of the ---- Plan ...

[If applicable: 10 CFR 50.80(a)(2) and (3) – when ITAAC from design certification are referenced] Section ---- of the ---- Plan ...

Technical Evaluation: [If applicable: add sentences to address acceptability of RAI responses.] **[10 CFR 52.80(a)]** The onsite emergency plan with ITAAC was submitted as required by 10 CFR 52.80(a). The NRC staff used the generic ITAAC table¹⁹ in Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," issued June 2007, to review of the applicant's proposed ITAAC. The staff found

[If applicable: 10 CFR 50.80(a)(1)] The NRC staff reviewed the inspections, tests, analyses, and acceptance criteria (ITAAC) in the Early Site Permit (ESP) issued for the site on ----- that were included by reference by the applicant.

As stated in -----, the applicant developed a set of ITAAC, and included it in the Plan to address some elements of the emergency plan that cannot be completed during the COL application stage (i.e., before construction of the proposed Units 3 and 4). SER Sections ----- and ----- include the proposed ITAAC for ----- Units 3 and 4, and the applicable SER sections discuss the use of the ITAAC.

13.3.1C.S.2 Conclusion for the Emergency Plan ITAAC

[Placeholder: On the basis of its review of the onsite emergency plan as described above, the NRC staff concludes that the information provided in the ---- Plan is consistent with those portions of Section 13.3 of NUREG-0800 related to emergency plan ITAAC. Therefore, the information is acceptable and meets the applicable requirements of 10 CFR 50.80(a) and [if applicable: (a)(1)].

[If applicable: As discussed above, the applicant needs to provide the bases for why ITAAC ---- will demonstrate the sufficiency ----. The NRC will determine whether the requirements of 10 CFR 52.79(a)(41) have been met and document its determination in the Final Safety Evaluation Report (FSER), based on information the applicant has provided to date and its response to Open Item ----.]

[If applicable: As discussed above, the applicant needs to provide ----, and provide ----. The NRC will determine whether this requirements is met and document its determination in the Final Safety Evaluation Report (FSER), based on information the applicant has provided to date and its response to Open Items ---- and ----.

¹⁹ The generic emergency planning ITAAC Table C.II.1-B1 in RG 1.206 appears as Table 14.3.10-1 in Section 14.3.10 of the "Standard Review Plan" (SRP) (NUREG-0800) (issued March 2007).

1 **[If applicable:]** The applicant has committed to meet the following license conditions and
2 ITAAC, with the associated dates, for the emergency preparedness program:

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[Placeholder]

Table 13.3-1, "Emergency Planning ITAAC for **[Insert Plant Name]**"

[Reviewer's note: It may be prudent for the applicant to develop separate ITAAC tables for each unit, since many items are common to both units and be completed before loading fuel on the first unit. Then all that is needed is a smaller list for the second unit.]

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Appendix D - Offsite Emergency Plans

[Reviewer's note: The reviewer should insert the review of the offsite emergency plans by FEMA in this appendix. SER sections 13.3.4 and 13.3.1A. refer to this Appendix when addressing the applicant's submittal of state and local emergency plans as part of the COL application.)