13.3 Emergency Planning

13.3.1 Introduction

This section addresses the plans, design features, facilities, functions, and equipment necessary for radiological emergency planning (EP) that must be considered in a combined license (COL) application. This includes both the applicant's onsite emergency plan and State and local offsite emergency plans, which the Nuclear Regulatory Commission (NRC) and the Federal Emergency Management Agency (FEMA) evaluated to determine whether the plans are adequate, and that there is a reasonable assurance that they can be implemented. The plans shall be an expression of the overall concept of operation, describe the essential elements of advanced planning that have been considered, and the provisions that have been made to cope with radiological emergency situations.

13.3.2 Summary of Application

Section 13.3 of the V.C. Summer Nuclear Station (VCSNS) COL Final Safety Analysis Report (FSAR), Revision 2, incorporates by reference Section 13.3 of the AP1000 Design Control Document (DCD), Revision 17.

In addition, in VCSNS COL FSAR Section 13.3, the applicant provided the following:

Tier 2 Departure

- VCS DEP 18.8-1

The applicant proposed this departure from the AP1000 DCD to address new locations of the technical support center (TSC) and the operational support center (OSC) for each unit. Part 7, ~~D~~departures and Exemptions," provides additional information regarding the departures.

AP1000 COL Information Items

- STD COL 13.3-1

The applicant provided additional information in Standard (STD) COL 13.3-1 to address COL Information Item 13.3-1 (COL Action Item 13.3-1) of the AP1000 DCD, which states:

> Combined License applicants referencing the AP1000 certified design will address emergency planning including post-72 hour actions and its communication interface.

- STD COL 13.3-2

The applicant provided additional information in STD COL 13.3-2 to address COL Information Item 13.3-2 (COL Action Item 13.3.3.3.5-1) of the AP1000 DCD, which states:

> Combined License applicants referencing the AP1000 certified design will address the activation of the emergency operations facility consistent with current

operating practice and NUREG-0654/FEMA-REP-1 [~~–~~Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" Revision 1].

Supplemental Information

- STD SUP 13.3-1

The applicant provided additional information in STD SUP 13.3-1 that provides milestones for EP implementation.

Part 5, ~~–~~Emergency Plan," Revision 2, of the VCSNS COL application includes the following:

Onsite Emergency Plans

Part 5, ~~–~~Emergency Planning," of the VCSNS COL application includes the Emergency Plan (the VCSNS Emergency Plan). The VCSNS Emergency Plan consists of a basic plan, three annexes and six appendices. The three annexes address the one operating reactor unit and the two proposed units. The staff's evaluation in this SER is limited to Units 2 and 3. The six appendices provide additional detailed information regarding various aspects of the VCSNS Emergency Plan.

Offsite Emergency Plans

Part 5, ~~–~~Emergency Planning," of the VCSNS COL application includes current State and local emergency plans. In addition, Part 5 includes the detailed evacuation time estimate (ETE) report.

ITAAC

Part 10, ~~–~~Proposed License Conditions and ITAAC," Revision 2, of the VCSNS COL application provides information regarding emergency planning – inspections, tests, analyses and acceptance criteria (EP ITAAC). The ITAAC is evaluated in Section 13.3C.19 of this safety evaluation report (SER).

License Conditions

- Part 10, License Condition 1

The applicant proposed a license condition to incorporate the ITAAC identified in the tables in Appendix B to Part 10 of the VCSNS COL application.

- Part 10, License Condition 6

The applicant proposed a license condition to provide a schedule to support the NRC's inspection of operational programs including the EP.

- Part 10, License Condition 11

The applicant proposed the following license condition:

> The licensee shall submit a fully developed set of plant-specific Emergency Action Levels (EALs) for VCSNS Units 2 and 3 to the NRC in accordance with NEI 07-01, Revision 0. These fully developed EALs shall be submitted to the NRC for confirmation at least 180 days prior to initial fuel load. The submitted EALs will be written with no deviations.

13.3.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed in NUREG-1793, ~~"F~~inal Safety Evaluation Report [FSER] Related to Certification of the AP1000 Standard Design," and its supplements.

The applicable regulatory requirements and guidance for EP are as follows:

- Title 10 of the *Code of Federal Regulations* (10 CFR) 52.79(a)(21), ~~"C~~ontents of Applications; Technical Information in Final Safety Analysis Report" and 10 CFR 52.79(a)(22)(i) require that the FSAR include emergency plans that comply with the requirements of 10 CFR 50.47 and Appendix E to 10 CFR Part 50, and certifications from State and local governmental agencies with EP responsibilities. Under 10 CFR 50.47(a)(1)(ii), no initial COL under 10 CFR Part 52, ~~"L~~icenses, Certifications, and Approvals for Nuclear Power Plants" 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.

- The staff considered the applicable requirements in 10 CFR 52.77, 10 CFR 52.80, 10 CFR 50.33(g), and 10 CFR 100.21, ~~"N~~on-seismic Siting Criteria."

- NUREG-0800, ~~"S~~tandard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants" identifies NUREG-0654/FEMA-REP-1, Revision 1 and other related guidance that the staff considered during its review. The related acceptance criteria are identified in NUREG-0800, Section 13.3.II and the applicable regulatory guidance for reviewing emergency preparedness as an operational program is established in NUREG-0800 Section 13.4.

- In addition, Appendix A to 44 CFR 353, ~~"M~~emorandum of Understanding (MOU) Between Federal Emergency Management Agency and Nuclear Regulatory Commission Relating to Radiological Emergency Planning and Preparedness," September 14, 1993, states that FEMA is responsible for making findings and determinations as to whether offsite emergency plans are adequate and can be implemented. FEMA radiological

emergency preparedness (REP) guidance documents provide guidance on various topics for use by State and local organizations responsible for radiological emergency preparedness and response. NUREG-0654/FEMA-REP-1, Revision 1, provides guidance to provide a basis for State and local governments to develop radiological emergency plans.

13.3.4 Technical Evaluation

The NRC staff reviewed Section 13.3 of the VCSNS COL FSAR and checked the referenced DCD to ensure that the combination of the DCD and the COL application represents the complete scope of information relating to this review topic.[1] The NRC staff's review confirmed that the information in the application and incorporated by reference addresses the required information relating to EP. The results of the NRC staff's evaluation of the information incorporated by reference in the VCSNS COL application are documented in NUREG-1793 and its supplements.

The staff reviewed the information in the VCSNS COL FSAR:

Tier 2 Departure

- VCS DEP 18.8-1

The NRC staff's evaluation related to VCS Departure (DEP) 18.8-1 is addressed in Attachment 13.3A of this SER.

AP1000 COL Information Items

- STD COL 13.3-1
- STD COL 13.3-2

The NRC staff's evaluation related to STD COL 13.3-1 and 13.3-2 is addressed in Attachment 13.3A of this SER.

Supplemental Information

- STD SUP 13.3-1

The NRC staff's review of STD SUP 13.3-1 is addressed in Attachment 13.3A of this SER.

The NRC staff's review of the information provided in the application that is not part of the VCSNS Emergency Plan is addressed in Attachment 13.3B, "Emergency Planning Information in the Application," of the SER. The NRC staff's review of the VCSNS Emergency Plan is addressed in Attachment 13.3C, "Onsite Emergency Plan," of the SER.

[1] See Section 1.2.2 for a discussion of the staff's review related to verification of the scope of information to be included in a COL application that references a design certification (DC).

In addition, the staff conducted site area visits on January 27-28, 2009 and March 28, 2009, to the VCSNS site, consisting of reviews of the proposed plant location and various areas within the 10-mile emergency planning zone (EPZ).

The NRC staff also reviewed the application against the generic EP ITAAC provided in Table 14.3.10-1, ~~–~~Emergency Planning-Generic Inspections, Tests, Analyses, & Acceptance Criteria (EP ITAAC)," pursuant to Section 14.3.10 of NUREG-0800.

FEMA has reviewed the emergency plans for the State of South Carolina and the local government plans for Lexington, Newberry, Richland, and Fairfield counties in accordance with 44 CFR 350 and provided its Interim Findings Report (IFR) for Reasonable Assurance, dated June 30, 2010. FEMA has determined that the plans are adequate, and there is reasonable assurance that the plans can be implemented with no corrections needed. The NRC staff has reviewed the FEMA report and based its overall reasonable assurance finding on the FEMA findings and determinations regarding offsite emergency planning.

Based on the staff's evaluation of the applicant's emergency plan found in Attachment 13.3C, the staff finds that, pending acceptable resolution of the confirmatory items detailed in Attachment 13.3C, the applicant's onsite emergency plan meets the standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50.

Based on the IFR and the staff's evaluations detailed in Attachments 13.3A, 13.3B, and 13.3C of this SER, the staff finds that, pending acceptable resolution of the confirmatory items detailed in these attachments, there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. Therefore, the staff finds that the VCSNS emergency plan meets the requirements in 10 CFR 50.33(g), 10 CFR 50.34(b)(6)(v), 10 CFR 50.34(f)(2), 10 CFR 50.47, Appendix E to 10 CFR Part 50, 10 CFR 52.77.

License Conditions

- Part 10, License Condition 1

The applicant provided a license condition in Part 10 of the VCSNS COL application, which will incorporate the ITAAC identified in the tables in Appendix B. Appendix B includes the EP ITAAC. License Condition 1's proposed text is evaluated in Chapter 1 of this SER. The NRC staff's evaluation of the EP ITAAC identified in Table 3.8-1 of Appendix B to Part 10 of the VCSNS COL application is documented in Section 13.3C.19 of the SER. Table 13.3-1 of this SER provides the EP ITAAC identified in Table 3.8-1 of Appendix B to Part 10 of the VCSNS COL application, as modified by the applicant's letter dated May 18, 2010. Therefore, the staff will include the ITAAC in SER Table 13.3-1 for EP in the license.

- Part 10, License Condition 6

The applicant proposed a license condition to provide a schedule to support the NRC's inspection of operational programs including the EP. Specifically, the applicant proposed the following:

> The licensee shall submit to the appropriate Director of the NRC, a schedule, no later than 12 months after issuance of the COL, that supports planning for and conduct of NRC inspections of operational programs listed in the operational program FSAR Table 13.4-201. The schedule shall be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until either the operational programs in the FSAR table have been fully implemented or the plant has been placed in commercial service, whichever comes first.

The staff reviewed the above proposed license condition against the recommendations in SECY-05-0197 as endorsed by the related Staff Requirements Memorandum (SRM) dated February 22, 2006. The staff concludes that this proposed license condition conforms to the guidance in SECY-05-0197 and is, therefore, acceptable. For additional details on the staff's evaluation of proposed License Condition 6, see Section 13.4.4 of this SER.

- Part 10, License Condition 11

The applicant proposed a license condition related to the plant-specific EALs. Specifically, the applicant proposed the following:

> The licensee shall submit a fully developed set of plant-specific Emergency Action Levels (EALs) for VCSNS Units 2 and 3 in accordance with NEI-07-01 Revision 0. These fully developed EALs shall be submitted to the NRC for confirmation at least 180 days prior to initial fuel load. The submitted EALs will be written with no deviations.

The NRC staff's evaluation of the EALs is documented in Section 13.3C.4 of the SER.

The staff has revised the proposed license condition as follows:

> The licensee shall submit a fully developed set of plant-specific Emergency Action Levels (EALs) for VCSNS Units 2 and 3 in accordance with NEI-07-01 Revision 0. <u>The EALs shall have been discussed and agreed upon with State and local officials.</u> These fully developed EALs shall be submitted to the NRC for confirmation at least 180 days prior to initial fuel load. The submitted EALs will be written with no deviations.

With this modification, the staff finds this license condition to be acceptable.

In EP ITAAC 8.1.3 the applicant proposed that if offsite exercise deficiencies were not corrected prior to the 10 CFR 52.103(g) finding, then a license condition that requires offsite full participation exercise deficiencies to be corrected prior to operation above 5 percent of rated power will be requested. A reference to this license condition is not required in EP ITAAC 8.1.3 because this license condition is now provided in 10 CFR 50.54(gg).

The applicant has proposed a license condition to the EP ITAAC 8.1.3 that requires offsite exercise deficiencies to be corrected prior to operation above 5 percent of rated power as described in 10 CFR 50.54(gg). This will be tracked as **Confirmatory Item 13.3-1.**

The NRC staff's evaluation of the ITAAC identified in Table 3.8-1 of Appendix B to Part 10 of the VCSNS COL application is documented in Section 13.3C.19 of the SER. Table 13.3-1 of this SER provides the EP ITAAC identified in Table 3.8-1 of Appendix B to Part 10 of the VCSNS COL application, as modified by the applicant's letter dated August 24, 2010. The staff finds that a specific license condition is not required because this requirement is now specifically addressed in 10 CFR 50.54(gg).

13.3.5 Post Combined License Activities

For the reasons discussed in the technical evaluation section above, the staff finds the following ITAAC and license conditions acceptable:

- The licensee shall perform and satisfy the ITAAC defined in SER Table 13.3-1, ~~"E~~mergency Plan ITAAC."

- License Condition (13-3) – The licensee shall develop a schedule that supports planning for and conduct of NRC inspections of the operational programs listed in VCSNS COL FSAR Table 13.4-201, ~~"O~~perational Programs Required by NRC Regulations." This schedule must be available to the NRC staff no later than 12 months after issuance of the COL. The schedule shall be updated every 6 months until 12 months before scheduled fuel load, and every month thereafter until either the operational programs listed in VCSNS COL FSAR Table 13.4-201 have been fully implemented or the plant has been placed in commercial service, whichever comes first. This schedule shall address the emergency planning program implementation.

- License Condition (13-4) – The licensee shall submit a fully developed set of plant-specific EALs for VCSNS Units 2 and 3 in accordance with Nuclear Energy Institute (NEI) 07-01, ~~"M~~ethodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors," Revision 0. <u>The EALs shall have been discussed and agreed upon with State and local officials.</u> These fully developed EALs shall be submitted to the NRC for confirmation at least 180 days prior to initial fuel load. The submitted EALs will be written with no deviations.

13.3.6 Conclusion

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the required information relating to EP, and there is no outstanding information expected to be addressed in the VCSNS COL FSAR related to this section. The results of the NRC staff's technical evaluation of the information incorporated by reference in the VCSNS COL application are documented in NUREG-1793 and its supplements. The staff's conclusions for Chapter 13.3, ~~"E~~mergency Planning," are subject to successful closure of the confirmatory items identified in the attachments listed below.

The ITAAC that are applicable to EP for VCSNS are included in SER Table 13.3-1 and are addressed in Section 13.3C.19. Pursuant to 10 CFR 52.80(a), the VCSNS 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.

FEMA has reviewed the emergency plans for the State of South Carolina and the local government plans for Lexington, Newberry, Richland, and Fairfield counties in accordance with 44 CFR 350 and provided its IFR for Reasonable Assurance, dated June 30, 2010. FEMA has determined that the plans are adequate, and there is reasonable assurance that the plans can be implemented with no corrections needed. The NRC staff has reviewed the FEMA report and based its overall reasonable assurance finding on the FEMA findings and determinations regarding offsite emergency planning.

Based on the staff's evaluation of the applicant's emergency plan for proposed Units 2 and 3 found in Attachment 13.3C, the staff finds that, pending acceptable resolution of the confirmatory items detailed in Attachment 13.3C, the applicant's onsite emergency plan meets the standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50.

Based on the IFR and the staff's evaluations detailed in Attachments 13.3A, 13.3B, and 13.3C of this SER, the staff finds that, pending acceptable resolution of the confirmatory items detailed in these attachments, there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. Therefore, the staff finds that the VCSNS emergency plan meets the requirements in 10 CFR 50.33(g), 10 CFR 50.34(b)(6)(v), 10 CFR 50.34(f)(2), 10 CFR 50.47, Appendix E to 10 CFR Part 50, 10 CFR 52.77, 10 CFR 52.79(a)(21), 10 CFR 52.79(a)(22)(i), 10 CFR 52.80, 10 CFR 52.81, and 10 CFR 52.83.

Attachment 13.3A – COL Information Items, Supplemental Information Items and Departures

Introduction

This section addresses the COL information items, supplemental information items and departures associated with EP.

13.3A.1 Regulatory Basis

The applicable regulatory requirements related to VCS DEP 18.8-1, dealing with the locations of the OSC and TSC, are established in 10 CFR 50.34(f)(2)(xxv) and the guidance provided in NUREG-0654/FEMA-REP-1.

The applicable regulatory requirements for STD COL 13.3-1 and STD COL 13.3-2, dealing with EP, are in 10 CFR 50.33(g), 10 CFR 52.79(a)(21), 10 CFR 50.47(b)(2) and (6) and the guidance provided in NUREG-0654/FEMA-REP-1.

With respect to STD SUP 13.3-1, the guidance related to implementation milestones for the EP program is provided in Sample FSAR Table 13.4-X, ~~O~~operational Programs Required by NRC Regulation and Program Implementation," in NUREG-0800.

13.3A.2 COL Information Items

Technical Information in the Application:

- STD COL 13.3-1

In a letter dated August 11, 2010, the applicant submitted a proposed revision to VCSNS COL FSAR Section 13.3, ~~E~~mergency Planning," that included supplemental information to incorporate by reference the emergency planning information into the FSAR, as required by 10 CFR 52.79(a)(21). The revised STD COL 13.3-1 states:

> The emergency planning information is submitted to the Nuclear Regulatory Commission as a separate licensing document and is incorporated by reference. (See Table 1.6-201.)
>
> Post-72 hour support actions, as discussed in DCD Sections 1.9.5.4 and 6.3.4, are addressed in DCD Sections 6.2.2, 8.3, and 9.1.3. Provisions for establishing post-72 hour action ventilation for the main control room, instrumentation and controls rooms, and direct current (dc) equipment rooms are established in operating procedures.

The applicant's commitment to incorporate the change to FSAR Section 13.3 in a future revision of the COL application is **Confirmatory Item 13.3-2**.

- STD COL 13.3-2

In Section 13.3 of the VCSNS COL FSAR, STD COL 13.3-2 states:

> The emergency plan describes the plans for coping with emergency situations, including communication interfaces and staffing of the emergency operations facility.

In request for additional information (RAI) 13.3-29(A), the staff asked the applicant to explain why communication interfaces were not addressed. The applicant responded that a stand-alone TSC is provided for the VCSNS site and will serve Units 1, 2, and 3. Therefore, the communications interfaces will not be dependent on the AP1000 DCD design of the TSC.

In addition, the applicant responded that Section 13.3 states:

> The emergency plan describes the plans for coping with emergency situations, including communication interfaces and staffing of the emergency operations facility.

In RAI 13.3-29(B), the staff asked the applicant to discuss why the staffing of the emergency operations facility (EOF) was not addressed. The applicant responded that in Section 2.H.2, ~~-~~Activation and Staffing of Emergency Response Facilities," of the VCSNS Emergency Plan, activation of the EOF is mandatory upon the declaration of an ~~-~~alert" or higher emergency classification. The EOF must establish communications with the affected unit's control room prior to activating and assuming the duties of emergency classification, notification of offsite authorities, issuing protective action recommendations for the general public, and approval of press releases. Figures B-1a and B-1c of the VCSNS Emergency Plan provide graphically the minimum staffing for the EOF to be activated. Section 2.B.3 requires "a formal turnover between the Interim Emergency Director (IED) relinquishing Command and Control and the Emergency Director (ED) assuming Command and Control has been made." Therefore, a minimum staffing level is required in the EOF prior to activation of the facility. In addition, communications must be established with the affected unit's control room prior to assuming the command and control for the emergency response effort. The applicant's response to RAI 13.3-29(B) refers to Section 2.H.2, of the VCSNS Emergency Plan, which states that the emergency response facilities (ERFs) are staffed and activated in accordance with the emergency plan implementing procedures (EPIPs). In RAI 13.3-42, the staff requested additional information to address specific timeliness goals associated with activating and staffing the ERFs. In its response, the applicant provided additional information that is addressed in Section 2.H.5 of the VCSNS Emergency Plan, which adequately addressed the RAI.

Technical Evaluation:

- STD COL 13.3-1

The applicant responses to RAIs 13.3-29(A) and (B) and 13.3-42 are acceptable because they meet the guidance in NUREG-0654/FEMA-REP-1. The applicant has proposed operating procedures to address post-72 hour support actions through reference to the AP1000 DCD that specifically address an extended loss of nonsafety-related systems or both offsite or onsite

alternating current (ac) power sources for more than 72 hours. The NRC staff evaluates these procedures in SER Section 13.5. Therefore, the staff finds, pending resolution of **Confirmatory Item 13.3-2**, STD COL 13.3-1, addressing emergency planning including post-72 hour actions and its communication interface, acceptable because the applicant provided an emergency plan in accordance with 10 CFR 52.79(a)(21).

- STD COL 13.3-2

The staff finds STD COL 13.3-2, addressing the activation of the emergency operations facility consistent with current operating practices and NUREG-0654/FEMA-REP-1 acceptable because the applicant provided this information, which meets the requirements of the applicable portions of 10 CFR 50.47(b)(2) and (6). The acceptability of this information is evaluated in Sections 13.3C.6 and 13.3C.8 of this SER.

13.3A.3 Supplemental Information Items

Technical Information in the Application:

- STD SUP 13.3-1

The applicant provided the following text to VCSNS COL FSAR Section 13.3 to address STD SUP 13.3-1:

> Table 13.4-201 provides milestones for emergency planning implementation.

Technical Evaluation:

- STD SUP 13.3-1

As part of STD SUP 13.3-1, the applicant provided milestones for the EP program implementation in Table 13.4-201, ~~"O~~Operational Programs Required by NRC Regulations," of the VCSNS COL FSAR. The staff finds the milestones to be acceptable as they are consistent with NUREG-0800. The staff's evaluation of emergency planning milestones to support issuance of 10 CFR Parts 30, 40, and 70 licenses is in Section 1.5 of this SER.

13.3A.4 Departures

Technical Information in the Application: Tier 2 Departure

In Part 2 of the VCSNS COL FSAR, the applicant incorporated by reference Section 18.8, ~~"H~~Human System Interface Design," of Revision 17 of the AP1000 DCD. However, the applicant identified the following departure:

- VCS DEP 18.8-1 relates to the locations of the TSC and the OSC for each unit.

In a letter dated August 11, 2010, the applicant submitted a revision to Part 7, ~~"D~~Departures and Exemptions," of the COL application to address changes made to the DCD resulting from resolution of OI-TR107-NSIR-07. In its January 27, 2010, response to OI-TR107-NSIR-07,

Westinghouse changed the TSC location designation in DCD Section 18.8.3.5 from Tier 2* to Tier 2. In its revised Part 7, the applicant stated that the TSC at VCSNS will not be located in the control support area (CSA) as identified in AP1000 DCD, Section 18.8.3.5. The TSC location is to be in a central location such that a single TSC can serve all three VCSNS units. Additionally, the VCSNS OSC is being moved from the location identified in AP1000 DCD Sections 18.8.3.6 and 12.5.2.2 and as described in AP1000 DCD Figure 1.2-18. The OSC is being moved to the CSA vacated by the move of the TSC. The technical evaluation of this departure is in Section 13.3C.8 of this SER. The commitment to update the application with the revision to Part 7 of the application is tracked as **Confirmatory Item 13.3-3**.

Technical Evaluation:

- VCS DEP 18.8-1

In its letter dated August 11, 2010, the applicant's evaluation, in accordance with 10 CFR Part 52, Appendix D, Section VIII, Item B.5, determined that this departure did not require prior NRC approval. As discussed in SER Section 13.3C8, the staff finds the proposed locations of the TSC and OSC meet the applicable regulatory requirements and are, therefore, acceptable. Because the proposed location of the TSC and OSC are acceptable, the staff finds, pending resolution of **Confirmatory Item 13.3-3**, VCS DEP 18.8-1 acceptable.

13.3A.5 Post Combined License Activities

There are no post-COL activities related to this section.

13.3A.6 Conclusions

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the required information relating to EP, and there is no outstanding information expected to be addressed in the VCSNS COL application FSAR related to this section. The results of the NRC staff's technical evaluation of the information incorporated by reference in the VCSNS COL application are documented in NUREG-1793 and its supplements.

The NRC staff has compared the COL information items and supplemental information items in the VCSNS COL application to the applicable NRC regulations and other NRC regulatory guides and concludes, pending resolution of **Confirmatory Items 13.3-2 and 13.3-3**, that the applicant is in compliance with the applicable regulatory requirements in 10 CFR 50.33(g), 10 CFR 52.79(a)(17), 10 CFR 52.79(a)(21), 10 CFR 50.34(f)(2)(xxv), 10 CFR 50.47(b)(2) and (6), and the applicable guidance provided in NUREG-0654/FEMA-REP-1, and in NUREG-0800.

Attachment 13.3B – Emergency Planning Information in the Application

Introduction

This section of the SER includes the NRC staff's evaluation of EP information that is required to be provided in the COL application, but does not address the applicant's plans for responding to a radiological emergency, which are evaluated in Attachment 13.3C in this SER.

13.3B.1 Regulatory Basis[2]

The applicable regulatory requirements for EP information are as follows:

- 10 CFR Part 50, Appendix E, Section I, "Introduction," describes the EPZ.

- 10 CFR Part 50, Appendix E, Section E.III, "The Final Safety Analysis Report," requires that the FSAR include plans for coping with emergencies.

- 10 CFR 52.79(a)(21), "Contents of Applications; Technical Information in the Final Safety Analysis Report," and 10 CFR 50.34(b)(6)(v), "Contents of Applications; Technical Information," also require that the FSAR include an onsite emergency plan that meets the requirements in 10 CFR 50.47 and 10 CFR Part 50, Appendix E.

- 10 CFR 50.33, "Content of Application: General Information" and 10 CFR 52.77, "Contents of Applications; General Information," require in part, the submittal of State and local emergency plans.

- 10 CFR 50.33(g) requires, in part, a description of the plume exposure pathway and the ingestion pathway EPZs. In addition, 10 CFR 50.47(c)(2), "Emergency Plans," states generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 kilometers [km]) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries. The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway.

- 10 CFR 50.34(b)(6)(v) requires plans for coping with emergencies, which shall include the items specified in Appendix E. 10 CFR 50.34(h)(1)(i) and 10 CFR 52.79(a)(41) require that the COL application include an evaluation of the facility against NUREG-0800. Section 13.3 of NUREG-0800 provides guidance for the review of onsite emergency plans for nuclear power plants. 10 CFR 50.34(h)(2) and (3) require that the evaluation identify and describe all differences from the NUREG-0800 acceptance

[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).
Braces { } identify requirements in Appendix E to 10 CFR Part 50.
Parentheses ( ) identify other applicable regulatory requirements

criteria in Section 13.3 and evaluate how the proposed alternatives to the NUREG-0800 criteria provide an acceptable method of complying with the Commission‘s regulations. Where differences exist, the evaluation should discuss how the proposed alternative provides an acceptable method of complying with the Commission‘s regulations or portions thereof that underlie the corresponding NUREG-0800 acceptance criteria.

- 10 CFR 52.73, ―Relationship to Other Subparts,” states that the application for a COL may reference a standard design.

- 10 CFR 52.79(a)(22)(i), ―Contents of Applications: Technical Information in the Final Safety Analysis Report,” requires certifications from State and local governmental agencies with EP 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.

- 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 Part 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), ―Reactor Site Criteria, Purpose,” requires the identification of physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans. In addition, 10 CFR 100.21(g) also requires that applications for site approval identify physical characteristics unique to the proposed site.

- 10 CFR 100.1(c) states siting factors and criteria are important in assuring that radiological doses from normal operation and postulated accidents will be acceptably low, that natural phenomena and potential man-made hazards will be appropriately accounted for in the design of the plant, that site characteristics are such that adequate security measures to protect the plant can be developed, and that physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans are identified.

- 10 CFR 100.21(g) states physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans must be identified.

13.3B.2 FSAR and Onsite Emergency Plan

Technical Information in the Application: {Appendix E, Section III} (10 CFR 52.79(a)(21)) (10 CFR 50.34(b)(6)(v)) Section 13.3 of the VCSNS COL FSAR states in STD COL 13.3-1 that EP information is submitted to the NRC as a separate licensing document. The document is Part 5, ―Emergency Plan,” (VCSNS Emergency Plan) of the COL application. Section I.B, Scope, states the plan applies to planning for and responding to any radiological condition at the VCSNS. Section I.C.1, Planning Basis, of the VCSNS Emergency Plan states that consistent with the requirements of both 10 CFR Part 50 and 10 CFR Part 52, this plan is based on the

requirements of 10 CFR 50.47, "Emergency Plans," and 10 CFR Part 50, Appendix E. The VCSNS Emergency Plan also includes three annexes and six appendices that provide additional detailed information on various aspects of the onsite emergency plan.

Technical Evaluation: {Appendix E, Section III} (10 CFR 52.79(a)(21)) (10 CFR 50.34(b)(6)(v)) The staff finds that the VCSNS COL FSAR includes an emergency plan for coping with emergencies at the VCSNS site, which meets the applicable requirements in Section III of Appendix E to 10 CFR Part 50, 10 CFR 52.79(a)(21), and 10 CFR 50.34(b)(6)(v).

13.3B.3 Submittal of State and Local Emergency Plans

Technical Information in the Application: (10 CFR 50.33(g)) The "Explanatory Notes Regarding the Emergency Plan and Supplemental Information," of the VCSNS Emergency Plan states that current State and local EP documents are included as supplemental information. The list of State and local EP documents includes:

- South Carolina Emergency Operations Plan
- South Carolina Operational Radiological Emergency Response Plan
- South Carolina Technical Radiological Emergency Response Plan
- South Carolina Proposed Emergency Operations Plan
- South Carolina Proposed Operational Radiological Emergency Response Plan
- South Carolina Proposed Technical Radiological Emergency Response Plan
- Fairfield County, South Carolina Radiological Emergency Plan
- Newberry County, South Carolina Radiological Emergency Plan
- Lexington County, South Carolina Radiological Emergency Plan
- Richland County, South Carolina Radiological Emergency Plan

In RAI 13.3-32, the staff requested that SCE&G discuss measures, or show documentation that the VCSNS Emergency Plan has been coordinated with the Catawba Indian Nation. The Catawba Indian Nation Office of Tribal Government is located in Rock Hill, South Carolina (within the 50 mile Ingestion Pathway Emergency Planning Zone (IPZ). The applicant responded with a letter of certification that the York County Emergency Management Agency coordinates all emergency management issues for the Catawba Indian Nation.

Technical Evaluation: (10 CFR 50.33(g)) The staff finds the applicant's response to RAI 13.3-32 acceptable because the Catawba Indian Nation is covered, by agreement, with a county level Emergency Management Agency. 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: South Carolina and Fairfield, Lexington, Newberry, and Richland Counties in South Carolina. The offsite emergency plans for the State governments wholly or partially within the ingestion pathway EPZ were also submitted for South Carolina. This is acceptable because it meets the requirements in 10 CFR 50.33(g).

13.3B.4 Description of the Emergency Planning Zones

Technical Information in the Application: {Appendix E, Section I} (10 CFR 50.47(c)(2))
Section B, ~~–~~Background-Emergency Planning Zones, in Part 5," "Emergency Plan," of the COL application describes plume exposure pathway and ingestion pathway EPZs. The plume exposure pathway EPZ consists of an area about 10 miles in radius around the site. Figure 1-3, "10 mile Emergency Planning Zone," provides an illustration of the plume exposure pathway EPZ. The plume exposure pathway EPZ is also described to be the area where the principal sources of incident-related radiation exposures are likely to be whole body gamma radiation exposures and inhalation exposures form the passing radioactive plume.

In RAI 13.3-27, the staff asked why the plume exposure pathway description did not include whole body external exposure to gamma radiation from deposited material as specified in NUREG-0396/EPA 520/1-78-016, "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Reactors." The applicant responded and identified the definition section as the location in the plan that accurately described the correct citation that the EPZ included whole body external exposure to gamma radiation from deposited material.

Section B also includes a description of the ingestion pathway EPZ. The ingestion pathway EPZ consists of an area about 50 miles in radius around the site. Figure I-4, "50 Mile Emergency Planning Zone," of the VCSNS Emergency Plan provides an illustration of the ingestion exposure pathway EPZ.

Technical Evaluation: {Appendix E, Section I} (10 CFR 50.47(c)(2))

FEMA, as part of the development of the IFR for Reasonable Assurance (SER Section 13.3.4), requested that the applicant clarify the EPZ size since Units 2 and 3 were proposed to be built approximately 1 mile southwest of the existing Unit 1. In its response, the applicant stated that it considers the property containing the existing operating unit and the proposed Units 2 and 3 to be one homogeneous site. Consistent with the guidance in NUREG-0654/FEMA-REP-1, the EPZ boundaries currently in place were based on demography, topography, land characteristics, access routes, and jurisdictional boundaries and these EPZ boundaries are considered to be the appropriate size and shape for emergency planning purposes. When considering all the different attributes, the established EPZ did not reach out to include an entire 10-mile radius in all cases even for Unit 1. However this boundary has been appropriate for the emergency planning needs of the surrounding areas. Facilities, equipment and emergency planning procedures currently exist to support this EPZ. Based on FEMA's RAI, the applicant conducted subsequent discussions regarding the existing EPZ boundary with the affected counties (Fairfield, Newberry, Richland and Lexington). As a result, each of the counties passed resolutions to maintain the existing Unit 1 EPZ for the additional Units 2 and 3.

The FEMA staff found the response to its RAI adequate. The IFR stated there were no deficiencies, nor any areas needing corrective actions.

The staff finds the applicant's response to RAI 13.3-27 acceptable because the applicant conforms to the guidance in NUREG-0396 and the acceptance criteria in NUREG-0800. In addition, the onsite emergency plan describes the plume exposure pathway EPZ as consisting

of an area about 10 miles in radius and the ingestion pathway EPZ consisting of an area about 50 miles in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor were determined in relation to the local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries.

Based on FEMA's findings, the VCSNS Emergency Plan, and the applicant's response to RAI 13.3-27, the NRC staff finds that the EPZ size is acceptable and meets the requirements in 10 CFR 50.33(g), 10 CFR 50.47(c)(2), and Section 1 of Appendix E to 10 CFR Part 50.

13.3B.5 Certifications from State and Local Governments

Technical Information in the Application: (10 CFR 52.79(a)(22)(i)) The VCSNS Emergency Plan did not provide any Letters of Certification in the COL application. In the Acceptance Review of the VC Summer COL, the staff requested the applicant provide additional Letters of Certification from the offsite response agencies that address the revised Emergency Plan for the proposed Units 2 and 3. In RAI 13.3-17(A), the staff requested additional information on the existing Letters of Agreement with the various offsite response agencies listed in the VCSNS Emergency Plan. The applicant provided certifications from the State and local governmental agencies with EP responsibilities to supplement the COL application dated June 26, 2008. Certifications were received from the State of South Carolina Emergency Management, and Fairfield, Lexington, Newberry, and Richland Counties in South Carolina which stated 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. Appendix 2, ~~-~~Letters of Agreement," of the VCSNS Emergency Plan lists the current Letters of Agreements with VCSNS. Letters of Agreement and/or Memorandums of Understanding are reviewed annually and updated as required.

Technical Evaluation: (10 CFR 52.79(a)(22)(i)) The staff finds the response to RAI 13.3-17(A) adequate. The staff finds the certifications acceptable because they meet the requirements of 10 CFR 52.79(a)(22)(i).

13.3B.6 Evaluation Against the Standard Review Plan

Technical Information in the Application: (10 CFR 52.79(a)(41)) (10 CFR 50.34(h)(1)(i)) (10 CFR 50.34(h)(2 and 3)) The VCSNS COL FSAR Table 1.9-202, ~~-~~Conformance with SRP Acceptance Criteria," in STD SUP 1.9-1 indicates conformance with the acceptance criteria in NUREG-0800 is acceptable for Section 13.3. However, acceptance criteria related to EP in Section 13.3 of the NUREG-0800 was not evaluated against Part 5 of the COL application. In RAI 13.3-28, the staff requested an evaluation of the VCSNS Emergency Plan against NUREG-0800 and that the applicant identify all differences between the VCSNS Emergency Plan and NUREG-0800 Section 13.3, "Emergency Planning." In its response, the applicant provided a conformance table to confirm the evaluation of the VCSNS Emergency Plan against NUREG-0800 and also confirmed there were no differences.

Technical Evaluation: (10 CFR 52.79(a)(41)) (10 CFR 50.34(h)(1)(i)) (10 CFR 50.34(h)(2 and 3)) The staff finds the applicant's response to RAI 13.3-28 acceptable because it conforms

to the guidance of NUREG-0800. The staff reviewed the applicant's evaluation of the VCSNS Emergency Plan against the applicable portions of Section 13.3 of NUREG-0800. The staff's evaluation confirmed that there were no differences from the NUREG-0800 acceptance criteria in Section 13.3 of NUREG-0800. This is acceptable because it meets the requirements of 10 CFR 52.79(a)(41), 10 CFR 50.34(h)(1)(i) and 10 CFR 50.34(h)(2 and 3).

13.3B.7 Reference to a Standard Design

Technical Information in the Application: (10 CFR 52.73) Section 13.3 of the VCSNS COL FSAR states that the AP1000 DCD is incorporated by reference with departures and supplements.

Technical Evaluation: (10 CFR 52.73) The staff finds that the AP1000 DCD was incorporated by reference in the VCSNS COL FSAR and the evaluation of the departures and supplements is addressed in Attachment 13.3A of this SER. This is acceptable because it meets the requirements of 10 CFR 52.73.

13.3B.8 Impediments to the Development of Emergency Plans

Technical Information in the Application: (10 CFR 52.81) (10 CFR 100.1(c)) (10 CFR 100.21(g)) Appendix 5, "Evacuation Time Estimates," to Part 5, "Emergency Plan," of the COL application states that the ETE report, "Virgil C. Summer, Development of Evacuation Time Estimates," dated August 2007, describes the analyses undertaken, and the results obtained by a study, to develop ETEs for the proposed VCSNS site. Also in Appendix 4, "Evacuation Time Estimates," to Part 5 of the VCSNS Emergency Plan, the applicant concluded that there are no physical characteristics unique to the VCSNS site that poses a significant impediment to the development of the proposed emergency plans. 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. This conclusion is based on the information in the ETE Report for the plume exposure pathway EPZ. The ETE Report provided an estimate of the time to evacuate the plume exposure pathway EPZ. In addition, the ETE Report examined the population distribution and transportation routes to determine whether there are any characteristics that pose a significant impediment to taking protective actions to protect the public in the event of an emergency. Populations that have special needs during an emergency are identified. In addition, no significant impediments to taking protective measures, such as egress limitations from the area surrounding the site were identified.

Technical Evaluation: (10 CFR 52.81) (10 CFR 100.1(c)) (10 CFR 100.21(g)) The applicant has demonstrated, through the use of the ETE Report that no physical characteristics unique to the proposed site could pose a significant impediment to the development of emergency plans. Therefore, the staff finds that the information is acceptable because it meets the requirements of 10 CFR 100.1(c), 10 CFR 100.21(g) and 10 CFR 52.81. The staff's review of the ETE Report is in Section 13.3C.18, "Evacuation Time Estimates (ETE) Analysis," of this SER.

13.3B.9 Post Combined License Activities

There are no post-COL activities related to this section.

13.3B.10 Conclusions

The NRC staff reviewed the EP information required by regulations to be in the application, but not required to be part of the VCSNS Emergency Plan provided in Part 5, "Emergency Plan," of the VCSNS COL application. The staff concludes that the information provided is acceptable and meets the applicable requirements and guidance in 10 CFR 50.33, 10 CFR 50.34(b)(6)(v), 10 CFR 50.34(f)(1), (2), and (3), 10 CFR 50.47(c)(2), 10 CFR 52.73, 10 CFR 52.77, 10 CFR 52.79, 10 CFR 52.81, 10 CFR 100.1(c), 10 CFR 100.21(g), and the applicable portions of Appendix E to 10 CFR Part 50 as discussed above.

Attachment 13.3C - Onsite Emergency Plan

Introduction

The NRC evaluates emergency plans for nuclear power reactors to determine whether the plans are adequate and there is reasonable assurance that the plans can be implemented. This attachment to the SER provides the results of the review of the onsite emergency plan for the proposed reactors at the VCSNS site.

VCSNS COL FSAR states in Section 13.3, "Emergency Planning," that the VCSNS Emergency Plan is included in Part 5 of the COL application. Also included as part of the onsite emergency plan are three annexes and six appendices, which provide additional detailed information on various aspects of the VCSNS Emergency Plan. In addition, Part 10 of the COL application includes a set of ITAAC related to the VCSNS Emergency Plan. Note: Although the applicant provided the Emergency Plan for Units 1, 2, and 3, this review only addresses the proposed Units 2 and 3.

The following section describes 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. Compliance with the guidance in NUREG-0654/FEMA-REP-1 for each planning standard meets the requirements of 10 CFR 50.47(b).

13.3C.1 Assignment of Responsibility (Organizational Control)

13.3C.1.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(1) for assignment of responsibility, the staff evaluated it against the detailed evaluation criteria[3] in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Assignment of Responsibility (Organization Control)," in Appendix E to 10 CFR Part 50.[4]

13.3C.1.2 Overall Response Organization

Technical Information in the Emergency Plan: [A.1.a] Section 2.A.1, "Assignment of Responsibilities-Concept of Operations," of the VCSNS Emergency Plan provides a general discussion of the assignment of responsibility. Participating organizations include: South Carolina Electric and Gas (SCE&G), the South Carolina Departments of Emergency Management, Health and Environmental Control, Law Enforcement, and Natural Resources and the South Carolina Counties of Fairfield, Newberry, Lexington, and Richland. Federal agencies include the NRC, Department of Homeland Security (DHS), Department of Energy (DOE), Environmental Protection Agency (EPA), Federal Bureau of Investigation (FBI), FEMA, and the National Weather Service (NWS).

[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).
[4] Braces identify requirements in Appendix E to 10 CFR Part 50.

{Appendix E, Section IV.A.8} Section 1.A, ―Purpose," of the VCSNS Emergency Plan states that the emergency plan establishes protective actions that are necessary in order to limit and mitigate the consequences of emergencies. The South Carolina Emergency Management Division (SCEMD) is responsible for proposing protective action recommendations (PARs) to the Governor of South Carolina. The SCEMD will also coordinate the implementation of the Governor's protective action decisions (PADs). Final recommendations for protective actions will be made by the governor. Protective actions are discussed in detail in Section J, ―Protective Response." Section 5, ―Emergency Measures," of each unit annex provides a description of unit-specific personnel protective actions, assembly areas, and evacuation routes.

Technical Evaluation: [A.1.a] The staff finds that the VCSNS Emergency Plan adequately provides a general discussion of the assignment of responsibilities and addresses protective actions. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR Part 50, Appendix E.

{Appendix E, Section IV.A.8} The staff finds that the VCSNS Emergency Plan adequately identifies State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.1.3 Concept of the Operations

Technical Information in the Emergency Plan: [A.1.b] Section 2.A.1, ―Concept of Operations," of the VCSNS Emergency Plan provides the concept of operations for SCE&G and its relationship to the total response effort. SCE&G will assess plant conditions, classify the emergency, activate the Emergency Response Organization (ERO) and ERFs, support offsite assessment, make PARs, monitor, control, and mitigate plant conditions, communicate to offsite agencies and terminate emergency conditions. The involvement of State, county, and Federal governments, as well as the participation of supporting agencies in the private sector are also briefly covered in this section.

{Appendix E, Section III} Chapter 13, ―Conduct of Operations," of the VCSNS COL FSAR describes the organization of the VCSNS site and outlines individual responsibilities. A list of staffing is provided in Table 13.1-201, ―Generic Position/Site Specific Position Cross Reference." Minimum on-duty staffing for the VCSNS site is provided in Table 13.1-202, ―Minimum On-Duty Operations Shift Organization for Two-Unit Plant." Section 13.3.2 of the VCSNS COL FSAR states that the emergency plan describes the plans for coping with emergency situations, including communications interfaces and staffing of the EOF. Section A, ―Assignment of Responsibility," of the VCSNS Emergency Plan describes the primary responsibilities and organizational control of SCE&G, Federal, State, county, and other support organizations. A block diagram outlining the interrelationships of supporting organizations is provided in Figure A-1, ―Agency Response Organization Interrelationships." A list of Letters of Agreement (LOA) is provided in Appendix 2, ―Letters of Agreement." These LOAs formalize the coordination of the response.

Technical Evaluation: [A.1.b] {Appendix E, Section III} The staff finds that the VCSNS Emergency Plan adequately describes the applicant's operational role, its concept of

operations, and its relationship to the total effort. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and the requirements in Appendix E to 10 CFR Part 50.

13.3C.1.4 Organizational Interrelationships

Technical Information in the Emergency Plan: [A.1.c.] Figure A-1, ~~"A~~gency Response Organization Interrelationships" of the VCSNS Emergency Plan includes a block diagram illustrating the interrelationships of participating organizations. In RAI 13.3-17(B), the staff requested a revision to Figure A-1 that would identify interaction between DOE, the VCSNS site, and State agencies. In its response, the applicant revised 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 contact the US NRC Headquarters and the affected state(s) will make contact through DHS.

Figure A-2, ~~"V~~CSNS Augmented Emergency Response Organization Interrelationships," includes a block diagram of the interrelationships of the emergency response organizations following the activation of the EOF.

Technical Evaluation: [A.1.c.] The staff finds the additional information and textual revisions submitted in response to RAI 13.3-17(B) acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1 and the staff confirmed that Revision 1 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-17(B). The staff finds that the VCSNS Emergency Plan adequately illustrates the interrelationships of the participating organizations in emergency response in a block diagram and in text. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.1.5 Individual in Charge of Emergency Response

Technical Information in the Emergency Plan: [A.1.d] Section 2.A.1.c of the VCSNS Emergency Plan states the ED is responsible for coordinating emergency response action of the station, and the Emergency Public Information (EPI) Organization with affected State and county agencies. This position is held by a senior VCSNS employee. The Shift Supervisor for the affected unit who is the senior operations person on shift will serve as the IED until relieved by the ED.

Technical Evaluation: [A.1.d] The staff finds that the VCSNS Emergency Plan adequately identifies a specific individual by title that shall be in charge of the emergency response. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.1.6 24-Hour Response Capability

Technical Information in the Emergency Plan: [A.1.e.] Section 2.A.4, ~~"C~~ontinuous Coverage," of the VCSNS Emergency Plan describes provisions for 24-hour per day emergency response, including 24-hour per day staffing of communications links. Section 2.A.1.d, of the

VCSNS Emergency Plan states that procedures for training and maintenance of the emergency organization are in place to ensure 24-hour-per-day staffing for emergency response. Appendix 3, "Procedure Cross-Reference to the Emergency Plan," provides a list of implementing procedures for the VCSNS Emergency Plan that will be provided prior to fuel loading.

Technical Evaluation: [A.1.e.] The staff finds that the VCSNS Emergency Plan describes provisions for 24-hour per day emergency response, including 24-hour per day manning of communications links. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.1.7 Written Agreements

Technical Information in the Emergency Plan: [A.3] Section 2.A.3, "Agreements in Planning Effort," of the VCSNS Emergency Plan states written agreements between VCSNS and other support organizations have been developed. Agreements identify the emergency measures to be provided, the mutually accepted criteria for implementation, and the arrangements for exchange of information. A list of LOAs is provided in Appendix 2, "Letters of Agreement." In RAI 13.3-17(C), the staff requested that the applicant provide the LOAs to verify that the agreements have been made. In its response, the applicant provided copies of the Letters of Agreement or Memorandum of Understanding for the organizations listed in Appendix 2.

Technical Evaluation: [A.3] The staff finds the additional information and textual revisions submitted in response to RAI 13.3-17(C) acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1 and the staff confirmed that Revision 1 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-17(C). This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.1.8 Operations for a Protracted Period

Technical Information in the Emergency Plan: [A.4] Section 2.A.4, "Continuous Coverage," of the VCSNS Emergency Plan states that VCSNS maintains 24-hour emergency response capability. The normal on-shift complement is trained to handle emergency situations and will provide the initial response until relieved/augmented by the ERO. Personnel from the unaffected unit(s) will also be available. The ED has the authority and responsibility for assuring continuity of resources in the event of the activation of the ERO. In RAI 13.3-17(D), the staff requested additional information to identify a 24-hour point of contact. In its response, the applicant stated that the control room is the location of the 24-hour communication point of contact. The lED or the ED, whichever is in command, can be contacted through the use of the Electric Switch System Exchange (ESSX) line provided in the control room, TSC, and the EOF.

Technical Evaluation: [A.4] The staff finds the additional information submitted in response to RAI 13.3-17(D) acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1. The VCSNS Emergency Plan describes provisions for 24-hour per day emergency response, including 24-hour per day manning of communications links. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.1.9 Conclusions

On the basis of its review of the onsite emergency plan as described above for assignment of responsibility, the staff concludes that the information provided in the VCSNS Emergency Plan is acceptable and meets the requirements of 10 CFR 50.47(b)(1) because it complies with the guidance in Planning Standard A of NUREG-0654/FEMA-REP-1 and the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.2 Onsite Emergency Organization

13.3C.2.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(2) for onsite emergency organization, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Onsite Emergency Organization," in Appendix E to 10 CFR Part 50.

13.3C.2.2 Normal Plant Operating Organization

Technical Information in the Emergency Plan: {Appendix E, Section IV.A.1} VCSNS COL FSAR Section 13.1 describes staffing. Table 2-1, ~~"~~V.C. Summer ERO On-shift Staffing," of each unit annex and Table B-1a, ~~"~~Shift Emergency Response Organization," of the VCSNS Emergency Plan outlines the unit on-shift emergency organization and its relation to the normal staff complement.

Technical Evaluation: {Appendix E, Section IV.A.1} The staff finds that the VCSNS Emergency Plan adequately describes the normal plant operating organization. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.2.3 Onsite Emergency Organization

Technical Information in the Emergency Plan: [B.1] {Appendix E, Section IV.A.2.b} Section 2.B, ~~"~~On Shift Emergency Response Organization Assignments," of the VCSNS Emergency Plan describes the minimum staffing requirements and responsibilities necessary to ensure initial emergency response operations are maintained at the station consistent with 10 CFR Part 50, Appendix E. A description of responsibilities of the normal staff complement is provided in Section 2.B.1, ~~"~~On-Shift Emergency Response Organization (ERO) Assignments." The initial response to an emergency event will be provided by personnel on-shift who 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 2.B.5.a, ~~"~~Onsite ERO," will be activated at an ~~"~~alert," ~~"~~site area emergency," or ~~"~~general emergency."

Technical Evaluation: [B.1] {Appendix E, Section IV.A.2.b} The staff finds that the VCSNS Emergency Plan provides an adequate description of the onsite emergency organization of plant staff personnel for all shifts and its relation to the responsibilities and duties of the normal

staff complement. This is acceptable because it meets the requirements of Appendix E to 10 CFR Part 50 and conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.2.4 Designation of an Emergency Coordinator

Technical Information in the Emergency Plan: [B.2] Section 2.B.2, "Authority over the Emergency Response Organization," of the VCSNS Emergency Plan states the IED (Shift Supervisor from affected unit) or ED has overall authority and responsibility for coordinating all emergency response activities at the VCSNS. The Unit 1 Shift Supervisor will be designated as the IED if multiple units simultaneously enter an emergency or an emergency that affects the entire site occurs. The IED assumes control until relieved by on-call ERO members in the 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: [B.2] The staff finds that the VCSNS Emergency Plan adequately identifies a designated 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.2.5 Line of Succession for the Emergency Coordinator

Technical Information in the Emergency Plan: [B.3] Section 2.B.3, "Criteria for Assuming Command and Control (Succession)," of the VCSNS Emergency Plan states the IED has the authority and responsibility for emergency response until relieved by the ED. The 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: [B.3] The staff finds that the VCSNS Emergency Plan adequately identifies a line of succession for the emergency coordinator position, and identifies the specific conditions for higher level utility officials assuming this function. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.2.6 Responsibilities of the Emergency Coordinator

Technical Information in the Emergency Plan: [B.4] {Appendix E, Section IV.A.2.c} Section 2.B.4, "Non-Delegable Duties," of the VCSNS Emergency Plan lists those duties that may not be delegated to other elements of the emergency organization. These duties include event classification; making 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.

{Appendix E, Section IV.A.2.a} Section 2.B.1, "On-Shift Emergency Response Organization Assignments," of the VCSNS Emergency Plan discusses the normal plant personnel complement. 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 2.B.5.a, "Onsite ERO," discusses the responsibilities of each position during an emergency.

Technical Evaluation: [B.4] {Appendix E, Section IV.A.2.c} The staff finds that the VCSNS Emergency Plan adequately 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and it meets the requirements in Appendix E to 10 CFR Part 50.

{Appendix E, Section IV.A.2.a} The staff finds that the VCSNS Emergency Plan adequately describes the onsite ERO with a detailed discussion of the authorities, responsibilities, and duties of the individual(s) who will take charge during an emergency. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.2.7 On-shift and Augmentation Emergency Response Staff

Technical Information in the Emergency Plan: [B.5] Interrelationships of the overall ERO are diagramed in Figure B-1a, "Overall ERO Command Structure." Activities performed by the onsite ERO are listed. The onsite ERO functions under the direction of the EPM. On-call ERO personnel are immediately available during normal working hours within 75 minutes because they are working onsite performing regular duties and functions. Responsibilities of individual position within the onsite ERO are described in Section 2.B.5.a, "Onsite ERO." Organization of the onsite ERO is diagramed in Figure B-1b, "On-site Emergency Response Organization." 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." The offsite ERO, headed by the Emergency Offsite Manager (EOM), is responsible for offsite activities that include supporting onsite activities and coordinating public information. Responsibilities of individual positions within the offsite ERO are described in Section 2.B.5.b, "Offsite ERO." Organization of the offsite ERO is diagramed in Figure B-1c, "Off-site Emergency Response Organization." The EPI, operating under the company spokesperson, is responsible for providing information to the public. The Emergency Public Information Office (EPIO) consists of corporate and station personnel involved with emergency response that will coordinate with offsite agencies. Responsibilities of individual positions within the EPI are described in Section 2.B.5.c, "EPI Organization." Organization of the EPI is diagramed in Figure B-1d, "Emergency Public Information Organization."

Technical Evaluation: [B.5] The staff finds that the VCSNS Emergency Plan specifies the positions or titles 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.2.8 Interfaces Between Functional Areas

Technical Information in the Emergency Plan: [B.6] Section 2.B.6, ~~–E~~mergency Response Organization Block Diagram," of the VCSNS Emergency Plan states that Table B-1a, ~~–S~~hift Emergency Response Organization," of each unit annex and Table B-1b, ~~–S~~taffing Requirements for the VCSNS ERO," lists the key positions of the ERO and the supporting positions assigned to interface with Federal, State, and county/local authorities. Figure B-1a, ~~–O~~verall ERO Command Structure," illustrates the interrelationships of the overall ERO organization. Figure B-1b, ~~–O~~n-site Emergency Response Organization," through Figure B-1d, ~~–E~~mergency Public Information Organization" illustrates the interrelationships within the individual organizations. Figure B-1b includes the TSC, OSC, and EOF. Specific responsibilities and the interrelationships are discussed in detail in Section 2.B.5, ~~–E~~mergency Response Organization Positional Responsibilities."

Technical Evaluation: [B.6] The staff finds that the VCSNS Emergency Plan adequately specifies 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 EOF. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.2.9 Corporate Support

Technical Information in the Emergency Plan: [B.7] {Appendix E, Section IV.A.3} Sections 2.B.5.a, ~~–O~~nsite ERO," Section 2.B.5.b, ~~–O~~ffsite ERO," and Section 2.B.5.c, ~~–E~~PI Organization," of the VCSNS Emergency Plan describe who in corporate management, administrative, and technical support will augment the plant staff during emergency incidents 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 re-entry/recovery operations

c) management level interface with governmental authorities

d) release of information to news media during an emergency (coordinated with governmental authorities)

Technical Evaluation: {B.7} {Appendix E, Section IV.A.3} The staff finds that the VCSNS Emergency Plan adequately describes who in the corporate management, administrative, and technical support personnel will augment the plant staff during emergency events. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and the requirements of Appendix E to 10 CFR Part 50.

13.3C.2.10 Contractor and Private Organizations Support

Technical Information in the Emergency Plan: [B.8] {Appendix E, Section IV.A.5}
Section 2.B.7, ~~I~~ndustry/Private Support Organizations," of the VCSNS Emergency Plan states VCSNS retains contractors to provide supporting services. Services are currently provided by Institute of Nuclear Power Operations (INPO), American Nuclear Insurers (ANI), DOE Radiation Emergency Assistance Center/Training Site (REAC/TS), and Manufacturer Design and Engineering Support.

Sections 2.B.5.a, ~~O~~nsite ERO," Section 2.B.5.b, ~~O~~ffsite ERO," and Section 2.B.5.c, ~~E~~PI Organization," of the VCSNS Emergency Plan details licensee employees with special qualifications for coping with emergency conditions. Section 2.B.7, ~~I~~ndustry/Private Support Organizations" discusses contractors that will be providing assistance during emergencies. Section 2.B.8, ~~S~~upplemental Emergency Assistance to the ERO" addresses outside organizations that provide support services and the special qualifications of those persons were described.

Technical Evaluation: [B.8] {Appendix E, Section IV.A.5} The staff finds that the VCSNS Emergency Plan adequately specifies the contractor and private organizations that may be requested to provide technical assistance to, and augmentation of, the emergency organization. The staff also finds that the VCSNS Emergency Plan adequately identifies, by position and function to be performed, other employees of the licensee with special qualifications for coping with emergency conditions that may arise or 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.2.11 Local Emergency Response Support

Technical Information in the Emergency Plan: [B.9] {Appendix E, Section IV.A.6}
Section 2.B.8, ~~S~~upplemental Emergency Assistance to the ERO," of the VCSNS Emergency Plan states that 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, ~~L~~etters of Agreement." Services to be provided include: law enforcement; fire protection; ambulance services; medical and hospital support; transportation and treatment of injured station personnel. 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. Additional information on transportation and treatment of injured station personnel is described in Section 2.L, ~~M~~edical and Public Health Support."

Technical Evaluation: [B.9] {Appendix E, Section IV.A.6} The staff finds that the VCSNS Emergency Plan adequately identified the services to be provided by local agencies for handling

emergencies (e.g., police, ambulance, medical, hospital, and fire-fighting organizations). The staff also finds that the VCSNS Emergency Plan adequately incorporates information about the emergency response roles of supporting organizations and offsite agencies. The information in the onsite emergency plan is sufficient to provide assurance of coordination among the supporting groups and with the licensee. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.2.12 Conclusions

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 Emergency Plan is acceptable and meets the requirements of 10 CFR 50.47(b)(2) because it complies with the guidance in Planning Standard B of NUREG-0654/FEMA-REP-1 and the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.3 Emergency Response Support and Resources

13.3C.3.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(3), the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Emergency Response Support and Resources," in Appendix E to 10 CFR Part 50.

13.3C.3.2 Person Authorized to Request Federal Support

Technical Information in the Emergency Plan: [C.1.a] Section 2.B.5.a, ~~"E~~mergency Response Organization Positional Responsibilities," states that the shift supervisor will become the ED and is responsible for notifying offsite support government agencies. The ED is responsible for requesting assistance from non-VCSNS EROs.

Technical Evaluation: [C.1.a] The staff finds that the VCSNS Emergency Plan adequately addresses the person authorized to request federal support. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.3.3 Expected Assistance from State, Local, and Federal Agencies

Technical Information in the Emergency Plan: [C.1.b] {Appendix E, Section IV.A.7} Section 2.A, ~~"A~~ssignment of Responsibility," of the VCSNS Emergency Plan details the interactions with Federal, State, and local organizations that will be providing assistance in an emergency and their responsibilities. Resources from Federal agencies will be made available in an expeditious and timely manner. Section 2.C, ~~"E~~mergency Response Support and Resources," and Section 2.C.1, ~~"F~~ederal Response Support and Resources," of the VCSNS Emergency Plan states assistance from Federal agencies is provided through the National Response Framework (NRF) with the NRC as the lead agency.

Technical Evaluation: [C.1.b] {Appendix E, Section IV.A.7} The staff finds that the VCSNS Emergency Plan adequately identifies the assistance expected from appropriate State, local, and Federal agencies with responsibilities for coping with emergencies. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50 and it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.3.4 Resources to Support the Federal Response

Technical Information in the Emergency Plan: [C.1.c] Section 2.C.1.c, ~~"~~Federal Response Support and Resources," of the VCSNS 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, are based on the NRC Response Coordination Manual 1996 (RCM-96) or NUREG-0728. In RAI 13.3-18(B), the staff requested additional information regarding specific resources made available to Federal response teams. In its response, the applicant committed to revise Section 2.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 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: [C.1.c] The staff finds the additional information and textual revisions submitted in response to RAI 13.3-18(B) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1 and confirmed that Revision 1 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-18(B). The staff finds that the VCSNS Emergency Plan adequately describes provisions for incorporating the Federal response capability into its operation plan; including specific licensee, State and local resources available to support the Federal response. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.3.5 Representatives to Offsite Governments

Technical Information in the Emergency Plan: [C.2.b] Section 2.C.2.b, ~~"~~Liaisons," of the VCSNS 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 EALs, explaining accident conditions, and providing technical information regarding the affected unit's actions by the station's ERO.

Technical Evaluation: [C.2.b] The staff finds that the VCSNS Emergency Plan adequately addresses the dispatch of a representative to principal offsite governmental EOCs. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.3.6 Radiological Laboratory Support

Technical Information in the Emergency Plan: [C.3] Section 2.C.3, ~~–~~Radiological Laboratories," of the VCSNS 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: **[C.3]** The staff finds that the VCSNS Emergency Plan adequately identifies radiological laboratories and their general capabilities and expected availability to provide radiological monitoring and analyses services which can be used in an emergency. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.3.7 Other Sources of Assistance

Technical Information in the Emergency Plan: [C.4] Section 2.C.4, ~~–~~Other Assistance," of the VCSNS Emergency Plan states other companies' operating nuclear facilities are available to provide assistance and support through the INPO. Facilities, organizations, and individuals, to provide support are listed in the Emergency Planning Telephone Directory. A general description of services is provided.

{Appendix E, Section III} Chapter 13, ~~–~~Conduct of Operations," of the VCSNS FSAR describes the organization of the VCSNS site and outlines individual responsibilities. Section 2.A, ~~–~~Assignment of Responsibility," of the VCSNS Emergency Plan describes the primary responsibilities and organizational control of SCE&G, Federal, State, county, and other support organizations. A block diagram outlining the interrelationships of supporting organizations is provided in Figure A-1, ~~–~~Agency Response Organization Interrelationships." A list of Letters of Agreement is provided in Appendix 2, ~~–~~Letters of Agreement." These LOAs formalize the coordination of the response.

Technical Evaluation: [C.4] The staff finds that the VCSNS Emergency Plan adequately identifies the other sources of assistance expected to support any emergency response. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

{Appendix E, Section III} The staff finds that the VCSNS Emergency Plan adequately describes the applicant's operational role, its concept of operations, and its relationship to the total effort. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.3.8 Conclusions

On the basis of its review of the onsite emergency plan as described above for the emergency response support and resources, the NRC staff concludes that the information provided in the VCSNS Emergency Plan is acceptable and meets the requirements of 10 CFR 50.47(b)(3) because it complies with the guidance in Planning Standard C of NUREG-0654/FEMA-REP-1 and the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.4 Emergency Classification System

13.3C.4.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(4) for the emergency classification system, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Emergency Classification System," in Appendix E to 10 CFR Part 50.

13.3C.4.2 Emergency Classification System

Technical Information in the Emergency Plan: [D.1 and D.2] {Appendix E, Section IV.B} {Appendix E, Section IV.C} Section 2.D, "Emergency Classification System," of the VCSNS Emergency Plan states that for the VCSNS Emergency Plan, the initiating conditions (ICs) include the conditions provided in Nuclear Energy Institute (NEI) 07-01, "Methodology for Development of Emergency Action Levels, Advanced Passive Light Water Reactors," as it applies to AP1000 facilities and postulated accidents identified in the FSAR. Section 3, "Classification of Emergencies," of each annex for Unit's 2 and 3 of the VCSNS Emergency Plan provides the parameter values and equipment status that are indicative of each emergency class. The applicant also proposed EP ITAAC 1.1, which states that the specific parameters identified in Section 3 of each units annex have been retrieved and displayed in the control room, TSC, and EOF. The proposed EP ITAAC 1.1 states that the ranges available in the control room, TSC, and EOF encompassed the values for the specific parameters identified in the EALs in Section 3 of each unit's appendix of the VCSNS Emergency Plan. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

In RAIs 13.3-31 and 13.3-41, the staff requested that the applicant address its plans to finalize the required EAL scheme. In its response, the applicant provided a revised Section 2.D, and proposed a license condition to submit a fully developed set of site-specific EALs in accordance with the NRC-endorsed version of NEI 07-01 with no deviations. The applicant has proposed License Condition 11 in Part 10, "Proposed License Conditions and ITAAC," related to the emergency classification scheme. Specifically, the applicant proposed the following:

> The licensee shall submit a fully developed set of plant-specific Emergency Action Levels (EALs) for VCSNS Units 2 and 3 in accordance with NEI-07-01 Revision 0. These fully developed EALs shall be submitted to the NRC for confirmation at least 180 days prior to initial fuel load. The submitted EALs will be written with no deviations.

Technical Evaluation: [D.1 and D.2] {Appendix E, Section IV.B} {Appendix E, Section IV.C} The staff finds Section 2.D of the VCSNS Emergency Plan, as revised by RAI 13.3-31 adequate because the applicant's proposed overview of its EAL scheme and its general list of licensee actions at each emergency classification level and its commitment to control the EALs by 10 CFR 50.54(q) meets the requirements of Appendix E to 10 CFR Part 50 and because it conforms to the guidance in NUREG-0654/FEMA-REP-1. In a letter dated August 12, 2009, the NRC found the NEI 07-01 EAL scheme acceptable for development of the EAL scheme.

The staff has reviewed proposed License Condition 11 and finds that it does not include the review of the EALs to be discussed and agreed upon with the State and local officials as required by Appendix E, Section IV.B. Therefore, the staff has revised the proposed license condition as follows:

> The licensee shall submit a fully developed set of plant-specific Emergency Action Levels (EALs) for VCSNS Units 2 and 3 in accordance with NEI-07-01 Revision 0. The EALs shall have been discussed and agreed upon with State and local officials. These fully developed EALs shall be submitted to the NRC for confirmation at least 180 days prior to initial fuel load. The submitted EALs will be written with no deviations.

The proposed EAL scheme and license condition as modified by the staff are acceptable because they meet the requirements of Appendix E to 10 CFR Part 50 and conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.4.3 Emergency Action Levels Review by State and Local Authorities

Technical Information in the Emergency Plan: {Appendix E, Section IV.B} Letters of Certification with State and local governments are included in Appendix 2, "Letters of Agreement," of the VCSNS Emergency Plan. These letters state that the signature on the letter indicates that the parties concurred with the emergency classification system for VCSNS. The VCSNS Emergency Plan states that the EALs will be reviewed on an annual basis. The State and counties are informed regarding any EAL changes that significantly impact the ICs or Technical Basis.

Technical Evaluation: {Appendix E, Section IV.B} The staff finds that the VCSNS Emergency Plan provides for the annual review of EALs by State and local officials. This is acceptable because it meets the requirements of Appendix E, Section IV.B to 10 CFR Part 50 and conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.4.4 Conclusions

On the basis of its review of the VCSNS Emergency Plan as described above for the emergency classification system, the NRC staff concludes that the information provided in the VCSNS Emergency Plan is acceptable and meets the requirements of 10 CFR 50.47(b)(4) because it complies with the guidance in Planning Standard D of NUREG-0654/FEMA-REP-1 and the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.5 Notification Methods and Procedures

13.3C.5.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(5) for notification methods and procedures, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to

the area of "Notification Methods and Procedures," in Appendix E to 10 CFR Part 50 and 10 CFR 50.72[5].

13.3C.5.2 Notification Procedures, Capabilities, and Agreements

Technical Information in the Emergency Plan: [E.1] {Appendix E, Section IV.D.1 and D.3} Section 2.E.1, ~~"~~Bases for Emergency Response Organization Notification," of the VCSNS Emergency Plan states that 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 that will address methods and procedures for notifying offsite emergency response organizations. The applicant has proposed EP ITAAC 2.1 to test the capabilities of the system used to notify State and local authorities. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [E.1] {Appendix E, Section IV.D.1 and D.3} The staff finds that the VCSNS Emergency Plan adequately refers to procedures which describe mutually agreeable bases for notification of response organizations and conforms to the emergency classifications as set forth in Appendix 1, ~~"~~US Nuclear Regulatory Commission Emergency Action Level Guidelines for Nuclear Power Plants," to NUREG-0654/FEMA-REP-1. These procedures include the means for verification of messages. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.5.3 Notification and Activation of the Emergency Response Organization

Technical Information in the Emergency Plan: **[E.2] {Appendix E, Section IV.C}** Section 2.E.2, ~~"~~Notification and Mobilization of Emergency Response Personnel," provides a summary of the methods used to notify the ERO. Section 2.E.2 also 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 that will address methods and procedures for notifying and activating the onsite ERO. The applicant has proposed EP ITAAC 2.2 to test the capabilities of the system used to notify licensee response organizations and their mobilization procedures. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [E.2] {Appendix E, Section IV.C} The staff finds that the VCSNS Emergency Plan adequately addresses procedures for alerting, notifying, and mobilizing emergency response personnel. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements in Appendix E to 10 CFR Part 50.

[5] Parentheses identify other applicable regulatory requirements

13.3C.5.4 Initial Message Content to Offsite Response Organizations

Technical Information in the Emergency Plan: [E.3] {Appendix E, Section IV.A.4 and IV.C} Section 2.E.3, ~~I~~initial Notification Messages," of the VCSNS Emergency Plan states that the VCSNS and the State and local authorities have established the contents of the initial message form that includes as a part of the message form content: event classification; whether a release is taking place; potentially affected subareas when a ~~g~~general emergency" is declared; and whether offsite protective measures may be necessary. The applicant has proposed EP ITAAC 2.3 to test the capabilities to inform the public in the plume exposure pathway EPZ. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [E.3] {Appendix E, Section IV.A.4 and IV.C} The staff finds that the VCSNS Emergency Plan, in conjunction with State and local organizations, adequately establishes the contents of the initial emergency messages to be sent from the plant. These messages include information about the class of emergency, whether a release is taking place, potentially affected population and areas, and whether protective measures may be necessary. This is acceptable because it meets the requirements of Appendix E, to 10 CFR Part 50 and conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.5.5 Follow-up Messages to Offsite Response Organizations

Technical Information in the Emergency Plan: [E.4] Section 2.E.4, ~~F~~ollow-Up Messages," of the VCSNS Emergency Plan states that updates are provided on a prearranged frequency and include prearranged information plus information requested at the time of notification. Follow-up messages are provided to the NRC Operations Center as soon as possible, but not later than one hour after significant new information is available. The information provided may include any or all of the information specified in NUREG-0654/FEMA-REP-1, Evaluation Criterion E.4.a-n, based upon the type of incident, needs of the affected agencies, and information requested. Implementing Procedures will be developed to address specific follow-up message format.

Technical Evaluation: [E.4] The staff finds that the VCSNS Emergency Plan adequately provides for follow-up messages from the facility to offsite authorities. The staff verified that the nature of the information provided is consistent with the State and local emergency plans. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.5.6 Notification of the Public

Technical Information in the Emergency Plan: [E.6] Section 2.E.6, ~~N~~otification of the Public," of the VCSNS Emergency Plan states that prompt notification to the general public within the 10-mile plume exposure pathway 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. The applicant proposed EP ITAAC Acceptance Criteria 2.3 to confirm the means to notify and provide instructions to the populace in the plume exposure pathway EPZ. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [E.6] The staff finds that the VCSNS Emergency Plan adequately establishes administrative and physical means, and the time required for notifying and providing prompt instructions to the public in the plume exposure pathway EPZ. This is acceptable because it conforms to the guidance of NUREG-0654/FEMA-REP-1.

13.3C.5.7 Written Messages to the Public

Technical Information in the Emergency Plan: [E.7] Section 2.E.7, ~~–~~Messages to the Public," of the VCSNS 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," of the South Carolina Operational Radiological Emergency Response Plan includes sample EAS messages with content for sheltering and evacuation and refers to information in the safety information brochure/calendar. The messages included the appropriate aspects of sheltering, and ad hoc respiratory protection.

Technical Evaluation: [E.7] The staff finds the VCSNS Emergency Plan adequately discusses written messages intended for the public developed by the State of South Carolina. 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.5.8 Notification of the NRC

Technical Information in the Emergency Plan: {Appendix E, Section IV.A.4} (10 CFR 50.72(a)(3)) and (10 CFR 50.72(c)(3)) Section 2.E.2.b.2, ~~–~~NRC," of the VCSNS 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 2.E.2.b.2 also states that VCSNS will use a Nuclear Power Plant Emergency Notification Form (NPPENF) as a guide to provide the initial information and a communications log will be maintained if continuous communications is requested and established.

Technical Evaluation: {Appendix E, Section IV.A.4} (10 CFR 50.72(a)(3)) The staff finds that the VCSNS 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 licensee declares one of the emergency classes. This is acceptable because it meets the requirements in 10 CFR 50.72(a)(3) and Appendix E to 10 CFR Part 50.

(10 CFR 50.72(c)(3)) The staff finds that the VCSNS 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, adequate provisions have been made that upon request of the NRC an open and continuous communication channel with the NRC will be maintained. This is acceptable because it meets the requirements in 10 CFR 50.72(c)(3).

13.3C.5.9 Conclusions

The NRC staff concludes that the information provided in the VCSNS Emergency Plan regarding notification methods and procedures is acceptable and meets the requirements of 10 CFR 50.47(b)(5) because it complies with the guidance in Planning Standard E of NUREG-0654/FEMA-REP-1, the applicable portions of Appendix E to 10 CFR Part 50, and the requirements of 10 CFR 50.72(a)(3) and (c)(3) as described above.

13.3C.6 Emergency Communications

13.3C.6.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(6) for emergency communications, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Emergency Communications," in Appendix E to 10 CFR Part 50 and Generic Letter (GL) 91-14.

13.3C.6.2 Content of the Emergency Communications Plan

Technical Information in the Plan: [F.1.a] Section 2.F.1, ~~–~~Communications/Notifications," of the VCSNS Emergency Plan states that VCSNS has an offsite notification system, the ESSX that 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 links.

Technical Evaluation: [F.1.a] The staff finds that the VCSNS Emergency Plan adequately addresses communication plans for emergencies, provides 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. These actions are acceptable because they conform to the guidance described in NUREG-0654/FEMA-REP-1. Additional information on Emergency Communications is located in SER Section 9.5.2, ~~–~~Communications Systems."

Technical Information in the Plan [F.1.b] Section 2.F.1, ~~–~~Communications/Notifications," of the VCSNS 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 13.3-20(A), the staff requested that the applicant clarify whether the ESSX is available in the TSC. In its response, the applicant committed to revise Section 2.F.1.d.1 of the VCSNS Emergency Plan to correctly identify the ESSX line as being available in the TSC.

Technical Evaluation: [F.1.b] The staff finds the additional information and textual revision submitted in response to RAI 13.3-20(A) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 1 of the VCSNS Emergency Plan included the additional information and textual revisions provided in the response to RAI 13.3-20(A). Therefore, the staff finds that the VCSNS Emergency Plan adequately addresses provisions for communications with State and local governments within the EPZs. This is acceptable because it meets the guidance in NUREG-0654/FEMA-REP-1.

Technical Information in the Plan: [F.1.c] Section 2.F.1.f, ~~"~~NRC Communications (ENS and HPN)," of the VCSNS 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 NRC. Section 2.F.1, ~~"~~Communications/Notifications," states that Figure F-1, ~~"~~Notification Scheme (After Full Augmentation)," depicts initial notification paths and organizational titles from VCSNS to Federal, State, and county EROs and supporting industry agencies.

Technical Evaluation: [F.1.c] The staff finds that the VCSNS Emergency Plan adequately addresses provisions for communications as needed with Federal emergency response organizations. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1.

Technical Information in the Plan: [F.1.d] Section 2.F.1, ~~"~~Communications/Notifications," of the VCSNS 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, EOF and mobile units. The applicant proposed EP ITAAC Program Element 3.1 to test the capabilities to verify that the means exist for communications among the control room, TSC, EOF, principal State and local EOCs and radiological field assessment teams. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [F.1.d] The staff finds the VCSNS Emergency Plan adequately describes the communication plans that included provisions for emergency communications between the nuclear facility and the EOF, State and local EOCs, and radiological monitoring teams. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1.

Technical Information in the Plan [F.1.e] Section 2.F.1.e, ~~"~~ERO Notification System," of the VCSNS 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. Appendix 3 identifies procedures that will be implemented should the notification system fail.

Technical Evaluation: [F.1.e] The staff finds that the VCSNS Emergency Plan adequately describes the emergency communication plans that include provision for alerting or activating emergency personnel in each response organization. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

Technical Information in the Plan: [F.1.f] Figure F-1, ~~"~~Notification Scheme (After Full Augmentation)," of the VCSNS Emergency Plan identifies the ENS/HPN Communicator and the TSC Manager within the TSC, as having responsibility for communications to the NRC Headquarters Duty Officer and the EOF HPN Communicator. Section 2.F, ~~"~~Emergency Communications," identifies communications between control room/TSC/EOF to the NRC

Operations Center via the ENS or private telephone and to the regional office via the normal private capability. Communication between the TSC/EOF and offsite monitoring teams is by radio. The applicant has proposed EP ITAAC Program Element 3.2 to test the communications capabilities of the ERFs to NRC headquarters and regional offices. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [F.1.f] The staff finds that the VCSNS Emergency Plan adequately describes the communication plans for emergencies and addresses provisions for communication by the licensee with NRC headquarters and NRC Regional Office EOCs and the EOF and radiological monitoring team assembly area. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

Technical Information in the Plan: {Appendix E, Section IV.E.9} Section 2.F.1, ~~"C~~ommunications/Notifications," of the VCSNS 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 local commercial telephone system vendor provides primary and secondary power at its location. The ERO notification system is used for rapid notification of VCSNS ERO members and is designed with redundant power. Backup power is also available for the ENS and the HPN. Additional information concerning communications systems and backup power can be found in AP1000 DCD Section 9.5.2, "Communication System."

Technical Information in the Plan: {Appendix E, Section IV.E.9(a)} Figure F-1, ~~"N~~otification Scheme (After Full Augmentation)," of the VCSNS Emergency Plan identifies the ENS/HPN Communicator and the TSC Manager, as having responsibility for communications to the NRC Headquarters Duty Officer and the EOF HPN Communicator. In addition, the affected unit control room Shift Supervisor or EPOS is responsible for initial notification to State and county warning points/EOC Dispatcher/Communicator. After activation of the VCSNS EOF, the State/County Communicator provides updates to the State and county warning points. Section 2.F.3, ~~"C~~ommunications Testing," and Section 2.N.2.a, ~~"C~~ommunications Drills," states that monthly drills are conducted with State and local government warning points and EOCs.

Technical Information in the Plan: {Appendix E, Section IV.E.9(b)} Section 2.F.1, ~~"C~~ommunications/Notifications," of the VCSNS Emergency Plan, states that Figure F-1, ~~"N~~otification Scheme (After Full Augmentation)," depicts initial notification paths and organizational titles from VCSNS to Federal, State, and county EROs, and supporting industry agencies. Section 2.F.3, ~~"C~~ommunications Testing," and Section 2.N.2.a, ~~"C~~ommunications Drills," states that annual drills are conducted to fully test the emergency communications systems outlined in Section 2.F.

Technical Information in the Plan: {Appendix E, Section IV.E.9(c)} Section 2.F.3, ~~"C~~ommunications Testing," and Section 2.N.2.a, ~~"C~~ommunications Drills," of the VCSNS Emergency Plan states that annual drills are conducted to fully test the emergency communications systems outlined in Section F. Section 2.N.2.a also states that communication among the control room, TSC, State and local EOCs, field monitoring teams, OSC, EOF, and the joint information center (JIC) are included in the annual drill.

Technical Information in the Plan: {Appendix E, Section IV.E.9(d)} Section 2.F.3, ―Communications Testing," and Section N.2.a, ―Communications Drills," of the VCSNS 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," shows communication flow between the affected unit control room, TSC, and EOF to the NRC Headquarters and NRC Region.

Technical Evaluation: {Appendix E, Section IV.E.9} The staff finds that the VCSNS Emergency Plan adequately states that at least one onsite and one offsite communications systems exists, and that each system has a backup power source. This is acceptable because it meets the requirements described in Appendix E to 10 CFR Part 50.

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. 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 EROs. Such communications systems shall be tested annually.

c. Provisions for communications among the nuclear power reactor control room, the onsite TSC, and the EOF; and among the nuclear facility, the principal State and local EOCs, 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 TSC, and the EOF. Such communications shall be tested monthly.

These provisions for onsite and offsite communications are acceptable because they meet the requirements in Appendix E to 10 CFR Part 50.

Technical Information in the Plan (GL 91-14) Appendix 1, ―References," of the VCSNS Emergency Plan lists NRC Bulletin 80-15 and GL 91-14, which address RSCL, PMCL, MCL, communication paths. However, RSCL, PMCL, MCL, and the LAN were not specifically discussed in the VCSNS Emergency Plan. In RAI 13.3-20(B), the staff requested additional information on how VCSNS addressed RSCL, PMCL, MCL, and LAN communications paths. In its response, the applicant stated that these communication lines are reserved for use by the NRC Site Response Team, and VCSNS does not include utilization of these communication links in the Emergency Plan. In RAI 13.3-38, the staff requested that the applicant provide a statement with regard to use of RSCL, PMCL, MCL, and LAN communications paths in the VCSNS Emergency Plan or provide justification for why the statement is not needed. In its response, the applicant revised the text on pages C-1 and Section 2.C.1.d to include the following statement:

> Communication pathways provided in each of these facilities include access to dedicated landline telephones, wireless telephones and [Federal Telecommunications System] 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 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.

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

Technical Evaluation: (GL 91-14) The staff finds the additional information and textual revision submitted in response to RAIs 13.3-20(B) and 13.3-38 to be acceptable because they conform to the guidance in GL 91-14. The staff confirmed that Revision 2 of the VCSNS Emergency Plan included the additional information and textual revisions provided in the response to RAI 13.3-38. Therefore, the staff finds that the VCSNS Emergency Plan adequately includes provisions for communications with the NRC. This is acceptable because it meets the guidance in GL 91-14.

13.3C.6.3 Communications with Medical Facilities

Technical Information in the Plan: [F.2] Section 2.F.2, ~~-~~Medical Communications," of the VCSNS Emergency Plan states that commercial telephones are used to communicate with primary and backup medical hospitals and transportation services. In RAI 13.3-20(C), the staff requested an explanation of backup communication systems should the commercial telephone system not be available. In its response, the applicant stated that satellite telephones will be used for back-up communication as discussed in Section 2.F.1.d.7.

Technical Evaluation: [F.2] The staff finds the clarification submitted in response to RAI 13.3-20(C) to be acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 1 of the VCSNS Emergency Plan included the additional information and textual revisions provided in the response to RAI 13.3-20(C). The staff finds that the VCSNS Emergency Plan adequately ensures that a coordinated communication link exists for fixed medical support facilities and ambulance service(s). This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1.

13.3C.6.4 Periodic Testing of the Emergency Communications System

Technical Information in the Plan: [F.3] Section 2.F.3, ~~-~~Communications Testing," of the VCSNS Emergency Plan Communications equipment is checked in accordance with Section N.2. Communication drills between VCSNS and state and county government facilities are conducted in accordance with Section 2.N.2.a. In addition, minimum siren testing is performed as follows: silent tests of the ANS (sirens) are conducted at least biweekly, growl (or

equipment) tests are conducted quarterly and following preventive maintenance and full volume tests are conducted annually.

Technical Evaluation: [F.3] The staff finds that the VCSNS Emergency Plan adequately describes the conduct of periodic testing of the entire emergency communications system. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1.

13.3C.6.5 Conclusions

The NRC staff concludes that the information provided in the VCSNS Emergency Plan regarding emergency communications is acceptable and meets the requirements of 10 CFR 50.47(b)(6) because it complies with the guidance in Planning Standard F of NUREG-0654/FEMA-REP-1, the applicable portions of Appendix E to 10 CFR Part 50, and the guidance in GL 91-14 as described above.

13.3C.7 Public Education and Information

13.3C.7.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(7) for public education and information, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Public Education and Information," in Appendix E to 10 CFR Part 50.

13.3C.7.2 Content of Public Information

Technical Information in the Plan: [G.1] Section 2.G, –Public Education and Information," of the VCSNS Emergency Plan provides a description of the site's public education information program. The VCSNS site coordinates with State and county agencies to update the EPI publication annually. This information includes educational information on radiation, contact for additional information, protective measures (e.g., evacuation routes and relocation centers, sheltering, respiratory protection, radioprotective drugs, and special needs of the handicapped). The publication is distributed annually to all residents and transient locations, specified in Section 2.G.2, –Public Education Materials," within the 10-mile plume exposure pathway EPZ.

Technical Evaluation: [G.1] The staff finds that the VCSNS Emergency Plan adequately 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. Means for accomplishing this dissemination are also adequately described. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.7.3 Dissemination and Maintenance of Public Information

Technical Information in the Plan: [G.2] {Appendix E, Section IV.D.2} Section 2.G, –Public Education and Information," of the VCSNS 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 2.G.2, "Public Education Materials," of the VCSNS Emergency Plan states that information intended for transients is placed at local business establishments and at the entrances to recreational areas around the VCSNS site. Signs or other measures (e.g., decals, posted notices or other means, placed in hotels, motels, gasoline stations and phone booths) are used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an emergency or accident occurs. Such notices refer the transient to the telephone directory or other source of local emergency information and guide the visitor to appropriate radio and television frequencies.

Technical Evaluation: [G.2] {Appendix E, Section IV.D.2} The staff finds that the VCSNS Emergency Plan adequately describes a public information program that provides the permanent and transient population within the plume exposure EPZ an opportunity to become aware of the information annually. The program includes provision for written material that is available in a residence during an emergency. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1 and it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.7.4 Points of Contact for the News Media

Technical Information in the Plan: [G.3.a] Section 2.G.3, "Media Accommodations," of the VCSNS Emergency Plan lists the EPI Organization and the JIC as the two organizations in charge of media and public relations. The SCANA Public Affairs Group is notified when an "unusual event" or higher emergency condition exists and will handle media responsibilities until the JIC is activated. The EPI is comprised of senior managers from SCANA who will function as company spokespersons. (Note: SCANA Corporation is an energy-based holding company that has SCE&G as one of its subsidiary companies.) Organization of the EPI is discussed in detail in Section 2.B.5.c, "EPI Organization." The EPI provides information from the ERO to the public, via the news media, after it is approved by the ED. The JIC is where approved news releases will be provided to the media for dissemination to the public. The JIC, located with the EOF, is equipped with appropriate seating, lighting, and visual aids to allow for public announcements and briefings to be given to the news media. The JIC is activated at the declaration of an "Alert" or higher classification.

Technical Evaluation: [G.3.a] The staff finds that the VCSNS Emergency Plan adequately designates the points of contact and physical locations for use by news media during an emergency and that the VCSNS Emergency Plan also describes space, which may be used for a limited number of the news media at the EOF. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.7.5 Space for News Media

Technical Information in the Plan: [G.3.b] Section 2.G.3.a.2, "Joint Information Center," of the VCSNS Emergency Plan states the JIC, co-located with the EOF, is where approved news releases will be provided to the media for dissemination to the public. The JIC is equipped with appropriate seating, lighting, and visual aids to allow for public announcements and briefings to be given to the news media. Section 2.H.3, "Joint Information Center," of the VCSNS Emergency Plan states the JIC also provides facilities and equipment for VCSNS staff, Federal,

State, and county agencies to interface and where information regarding the event is released to the media and general public. The applicant has proposed EP ITAAC 4.1 to ensure that the licensee has provided space which may be used for a limited number of the news media. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [G.3.b] The staff finds that the VCSNS Emergency Plan adequately describes space which may be used for the news media at the emergency operations facility and is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.7.6 Designated Spokesperson

Technical Information in the Plan: [G.4.a] Section 2.G.3, ~~–~~Media Accommodations," of the VCSNS Emergency Plan states that the Company Spokesperson will function as the single point of contact to interface with Federal, State, and local authorities responsible for disseminating information to the public. Section 2.H.3, ~~–~~Joint Information Center," of the VCSNS Emergency Plan states the Company Spokesperson will coordinate the release of information during an emergency from the JIC in the EOF.

Technical Evaluation: [G.4.a] The staff finds that the VCSNS Emergency Plan adequately identifies a spokesperson that has access to all necessary information. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.7.7 Timely Exchange of Information

Technical Information in the Plan: [G.4.b] Section 2.G.4.b, ~~–~~Coordination of Public Information," of the VCSNS 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 2.G.3, ~~–~~Media Accommodations."

Technical Evaluation: [G.4.b] The staff finds the VCSNS Emergency Plan adequately describes established arrangements for timely exchange of information among designated spokespersons. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.7.8 Rumor Control

Technical Information in the Plan: [G.4.c] Section 2.G.4.c, ~~–~~Coordination of Public Information," of the VCSNS 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: [G.4.c] The staff finds that the VCSNS Emergency Plan adequately describes coordinated arrangements for dealing with rumors. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.7.9 Annual Media Orientation

Technical Information in the Plan: [G.5] Section 2.G.5, ~~"M~~edia Orientation," of the VCSNS Emergency Plan states programs to acquaint news 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: [G.5] The staff finds that the VCSNS Emergency Plan adequately 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.7.10 Conclusions

The NRC staff concludes that the information provided in the VCSNS Emergency Plan regarding public education and information is acceptable and meets the requirements of 10 CFR 50.47(b)(7) because it complies with the guidance in Planning Standard G of NUREG-0654/FEMA-REP-1, and the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.8 Emergency Facilities and Equipment

13.3C.8.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(8) for emergency facilities and euqipment, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Emergency Facilities and Equipment," in Appendix E to 10 CFR Part 50, 10 CFR 50.34, and 10 CFR 50.72. In addition, the staff evaluated the proposed emergency plan against the guidance in Supplement 1 to NUREG-0737, "Clarification of TMI Action Plan Requirements."

Technical Support Center

13.3C.8.2 Technical Support Center Functions

Technical Information in the Emergency Plan: [H.1] {Appendix E, Section IV.E.8} (8.2.1.a) Section 2.H.1, ~~"C~~ontrol Room, Technical Support Center (TSC), and Operations Support Center (OSC)," of the VCSNS Emergency Plan states that VCSNS has established a single TSC for the site and details the functions of the TSC in Section 2.H, ~~"E~~mergency Equipment and Facilities." When activated, the TSC functions include:

a. Support for the affected control room's emergency response efforts
b. Continued evaluation of event classification
c. Assessment of the plant status and potential offsite impact
d. Coordination of emergency response actions within the protected area (PA)

e. Communication with the NRC via ENS
f. Activation of the emergency response data system (ERDS) or ensuring that it is activated

Technical Evaluation: [H.1] {Appendix E, Section IV.E.8} (8.2.1.a) The staff finds that the VCSNS Emergency Plan adequately describes the TSC functions. This is acceptable because it meets the applicable regulatory guidance in NUREG-0654/FEMA-REP-1 and Supplement 1 to NUREG-0737, and meets the applicable requirements of Appendix E to 10 CFR Part 50.

13.3C.8.3 TSC Location

Technical Information in the Emergency Plan: (8.2.1.b) (50.34(f)(2)(xxv)) Section 2.H.1.b, ~~–~~Technical Support Center," states the TSC is located outside of and between the Protected Areas for Unit 1 and Units 2 and 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). In Part 7, ~~–~~Departures and Exemptions," of the VCSNS COL application, VCS DEP 18.8-1 identifies the change for the location of the TSC and OSC from that stated in the DCD. This SER only addresses the TSC as it relates to the proposed Units 2 and 3. The applicant proposed EP ITAACs 1.1, 3.1, and 5.1.1 to test the capabilities of the ERO facilities. In addition, NUREG-0737, Supplement 1, ~~–~~Requirements for Emergency Response Capability," Section 8.2.1(b), ~~–~~Technical Support Center (TSC) Requirements," states that the TSC is to be located within the site protected area so as to facilitate necessary interaction with control room, OSC, EOF, and other personnel involved with the emergency. In Section 2.H.1.b, ~~–~~Technical Support Center," of the VCSNS Emergency Plan and VCS DEP 18.8-1,it states that the proposed TSC is located outside the protected areas for Unit 1 and Units 2 and 3. The TSC will be located between the two protected areas. Section 1.B, ~~–~~Facility Description," of the VCSNS Emergency Plan states Units 2 and 3 are approximately 1 mile south-southwest of Unit 1. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

In RAI 13.3-44, the staff requested that the applicant provide additional information to address the siting of the TSC outside of the protected area of Units 2/3 and approximately 2500 feet (ft) from the control rooms of Units 2/3 in relation to the Supplement 1, NUREG-0737 guidance. In its response, the applicant stated that the TSC will be located in the basement of the new Nuclear Operations Building outside the protected area and within the owner controlled area (OCA). This building will also house site personnel in Operations Support, Engineering, Site Management, and other plant organizations typically assigned to the ERO to augment the shift staffing in an emergency. This is expected to facilitate the activation time of the TSC, thus improving the timeliness of taking critical tasks from the Control Room Staff and allowing for better command and control of the event(s). The separation of the TSC from any of the three control rooms will be approximately 2500 ft. The transit time between the TSC and the affected main control room (MCR) will be approximately 10 to 15 minutes and includes processing time through the Exclusion Area and Protected Area Security control points. In addition, the applicant stated that while the proposed location of the TSC does not allow for direct face-to-face communications between MCR personnel and the ED in the TSC, the TSC will have dedicated and diverse communications capabilities between the affected MCR, TSC, OSC, and the EOF. Use of current technologies such as updated computer equipment, teleconferencing, real time system monitoring of plant data, and telephone and radio systems for primary and emergency communications will bridge the physical separation. The facility will

have access to plant drawings, procedures, and computer applications needed to support the evaluation and decision making processes of the ERO. Designated communicator positions will be identified to ensure continued and effective communications with the affected MCR. The data display and processing system will be used to support continuous evaluation and mitigation communications in addition to the communicators, adequate communication lines and site networked computer systems are provided.

VCS DEP 18.8-1 from the AP1000 DCD, Tier 2 material, that addresses a new location for the TSC, is discussed in Attachment 13.3A in this section of the SER. The VCSNS Emergency Plan describes dedicated and diverse communications capabilities between the control rooms, TSC, OSC, and the EOF. These communications links include:

a. Dedicated phone link for the Affected Unit to dispatch OSC teams between the OSC, TSC,and Control Room.

b. Dedicated phone link for use by the ED, EPM, and Shift Supervisor/EPOS between the Affected Unit Control Room, the TSC, and the EOF.

c. Dedicated phone link for transmission of technical data between the TSC, Affected Unit Control Room, and the EOF.

d. Dedicated phone link to discuss mitigating activities and priorities between the TSC and EOF.

e. Dedicated phone link to discuss changes in station or affected plant conditions and EPIO needs between the EOF and the JIC.

f. Station telephone line that is a communication link between activated facilities.

In addition, the communications systems in the station have diverse and back-up power supplies. (See SER Section 13.3C.9, –Emergency Communications.) The applicant proposed EP ITAAC Program Element 3.1 to test the communications between the control room and TSC. Section 13.3C.8.9 of this SER addresses plant data that is available in the TSC via the safety parameter display system (SPDS). Section 1.9, "Compliance with Regulatory Criteria," in the AP1000 DCD states that the purpose of the plant SPDS is to display important plant variables in the control room in order to assist in rapidly and reliably determining the safety status of the plant. In addition, displays are available at the operator workstations, the remote shutdown workstation, and at the TSC. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

In RAI 13.3-22(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 its response, the applicant stated that implementing procedures will provide the direction for relocating in the event that the OSC or the TSC is uninhabitable.

Technical Evaluation: (8.2.1.b) (50.34(f)(2)(xxv)) The staff finds that the clarification and additional information submitted in response to RAIs 13.3-22(F) and 13.3-44 to be acceptable because they meet the applicable requirements in 10 CFR 50.34. The VCSNS Emergency Plan

describes extensive communications capabilities between the TSC and the respective unit control rooms, OSCs, EOF, and offsite EROs. These communications capabilities provide a variety of methods to ensure reliable communications and compensate for the TSC being located outside of the protected area. NUREG-0800 includes a statement that advanced communication capabilities may be used to satisfy the 2-minute travel time. In addition, having a common TSC that supports multiple reactor units and is located a moderate distance (i.e., more than 2 minutes) from the control room presents distinct advantages. These include the increased efficiency of a centralized point of support for the entire site, the elimination of confusion regarding which TSC on a multiple-unit site would be staffed in an emergency, not having to staff multiple TSCs if an incident involved more than one unit, and consideration of security-related events. From a support and functional standpoint, the staff finds that the applicant's proposed TSC location is acceptable subject to a demonstration of adequacy during the full participation exercise (EP ITAAC Acceptance Criteria 8.1.2.1 and 8.1.2.2). This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737, and 10 CFR 50.34.

13.3C.8.4 TSC Staffing Requirements, Size, and Equipment

Technical Information in the Emergency Plan: (8.2.1.c and j) Section 2.H.1.b, ~~–~~Technical Support Center," of the VCSNS Emergency Plan describes the TSC which is designed to provide a location for plant management and technical support staff to assemble and provide support to the control room. Responsibilities of the TSC are covered in Section 2.A, "Assignment of Responsibility (Organization Control)." Figure B-1b, ~~–~~Onsite Emergency Response Organization," illustrates the staffing and organization of the TSC. Due to the configuration of the site and the presence of two separate and different technologies, there are selected positions in the ERO that have expertise in a specific technology. Those personnel will staff the specific ERO positions when that unit is the affected unit. The TSC staff has key positions staffed for each PA; Unit 1 and Units 2/3. The TSC is sized to accommodate at least 40 personnel and has supporting equipment necessary to communicate and assess emergency conditions.

Technical Evaluation: (8.2.1.c and j) The staff finds that the VCSNS Emergency Plan adequately describes the TSC staffing, size, and equipment. This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737.

13.3C.8.5 TSC Structure

Technical Information in the Emergency Plan: (8.2.1.d) Section 2.H.1.b of the VCSNS Emergency Plan also states that the TSC is designed in accordance with the Uniform Building Code (UBC) to withstand earthquakes and high winds. Support facilities are located in the TSC to support long term operation of the TSC. The TSC is environmentally controlled to provide room air temperature, humidity, and cleanliness appropriate for personnel and equipment. In RAI 13.3-22(D)(3), the staff requested verification that the TSC will be constructed in accordance with the UBC. In its response, the applicant stated that the TSC and the EOF will be built in accordance with State and local UBCs.

Technical Evaluation: (8.2.1.d) The staff finds the clarification and additional information submitted in response to RAI 13.3-22(D)(3) to be acceptable because they meet the guidance

of Supplement 1 to NUREG -0737. The staff finds that the VCSNS Emergency Plan adequately describes the TSC structure. This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737.

13.3C.8.6 TSC Environmental Controls

Technical Information in the Emergency Plan: (8.2.1.e) Section 2.H.1.b of the VCSNS Emergency Plan states that the TSC is provided with reliable power and backup power supplies. Lighting is powered by the normal and backup electrical supply system. An emergency battery operated lighting system is installed. Power for vital information systems is provided by reliable power supplies including a battery backed uninterruptible power supply (UPS) system. EP ITAAC Acceptance Criterion 5.1.3 was proposed to confirm back-up electrical supply is available for the TSC. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: (8.2.1.e) The staff finds that the VCSNS Emergency Plan adequately describes the TSC environmental controls. This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737.

13.3C.8.7 TSC Radiological Protection

Technical Information in the Emergency Plan: (8.2.1.f) Section 2.H.1.b of the VCSNS Emergency Plan states that the TSC structure, shielding, and ventilation system are designed to protect the TSC personnel from radiological hazards. The ventilation system is operated in accordance with procedures and is manually controlled from the TSC. The VCSNS Emergency Plan also states that portable radiation monitors are available to personnel in the TSC. In addition, EP ITAAC Acceptance Criterion 5.1.3 will confirm that the TSC includes radiation monitors and a ventilation system with a high efficiency particulate air (HEPA) and charcoal filter. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

In RAI 13.3-44, the staff requested that the applicant provide additional information concerning the radiological consequence analysis for the TSC against design based accidents. In its response, the applicant stated that the DCD provides the loss-of-coolant accident (LOCA) dose at the low population zone (LPZ), along with the associated atmospheric dispersion factors (X/Qs) and breathing rates. Multiplying the time-dependent LPZ doses, as provided by Westinghouse, by the TSC/LPZ ratios of X/Qs and breathing rates and conservatively assuming a 100 percent occupancy rate for the duration of the accident, the resulting TSC dose is 2.4 roentgen equivalent man (rem) total effective dose equivalent (TEDE), which is less than the 5 rem TEDE acceptance criterion of NUREG-0800. This simplified approach is conservative, as it does not take credit for structural shielding, ventilation, or filtration

Technical Evaluation: (8.2.1.f) In its response to RAI 13.3-44, as supplemented by letter dated March 3, 2010, the applicant provided a discussion of the radiological habitability analysis for the TSC to be located outside the protected area in the basement of the Nuclear Operations Building. In its response to RAI 13. 3-22, the applicant stated that the design of the TSC will incorporate the guidance in NUREG-0696 for habitability, which will be verified to be met through ITAAC related to the TSC. The TSC-related ITAAC in Section 5.1 will include

verification of the configuration, cooling, habitability upon detection of radiation, and HVAC controls and displays.

Although the applicant's RAI response indicated that the detailed design phase of the TSC HVAC system is not complete at this time, the discussion provided information on the design concept sufficient to perform design basis accident radiological consequence analyses for TSC habitability. The design concept for the TSC includes a ventilation envelope that is designed to be resistant to leakage, and an HVAC system that would isolate the TSC upon detection of high radiation in the TSC ventilation system intake and provide filtered pressurization and filtered recirculation for the duration of the event. The type of HVAC system described in the RAI response is similar in concept (i.e., system includes a HEPA and charcoal filter, and radiation monitors) to the nonsafety nuclear island nonradioactive ventilation system (VBS) described in AP1000 DCD Section 9.4, which serves the TSC in the Communications Support Area in the AP1000 design. The applicant has proposed EP ITAAC 5.1.3 in table 3.8-1 of Part 10 of its application to test this system. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

The applicant evaluated the radiological consequences in the TSC of a LOCA at VCSNS Unit 2 or 3 to show compliance with the TSC radiological habitability requirements. The LOCA is the bounding design basis accident (DBA) for TSC habitability. The applicant stated that the HVAC system flow rates, unfiltered inleakage, outleakage, and filtration efficiencies provided in the January 7, 2010, letter are bounding values, and that the final TSC design is anticipated to result in a reduced amount of radioactivity in the TSC in an accident condition. The applicant provided atmospheric dispersion factors (χ/Q values) for a release from the containment to the TSC air intake as used in the LOCA TSC radiological habitability analysis. The staff performed an independent verification of the applicant's TSC values based on information given in the VCSNS Units 2 and 3 FSAR and Emergency Plan, and determined that the TSC χ/Q values are reasonable.

The staff reviewed the description of the TSC radiological habitability design inputs and assumptions and found them to be reasonable and consistent with the guidance in RG 1.183 on performing DBA radiological consequences analyses. The staff performed an independent calculation using the design values given in the January 10, 2010, RAI response and was able to confirm that the applicant's reported dose results are conservative for the proposed TSC design and meet the dose criterion.

The staff finds that the clarification and additional information in response to RAI 13.3-44 acceptable because it meets the guidance in Supplement 1 to NUREG-0737. The staff finds that the VCSNS Emergency Plan adequately describes the TSC radiological protection. This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737 and meets the applicable requirements of Appendix E to 10 CFR Part 50.

13.3C.8.8 TSC Communications

Technical Information in the Emergency Plan: (8.2.1.g) Section 2.H.b, ~~–~~Technical Support Center," of the VCSNS Emergency Plan states the TSC has reliable voice communications to the control room, the OSC, the EOF, and the NRC as described in Section 13.3C.8.3 above.

Provisions for communications with State and local operations centers are also provided in the TSC. The communications facilities include the means for reliable primary and backup communication. The TSC serves as the primary onsite communications center when activated during an emergency. Additional technical information on the TSC communications is located in Section 13.3C.6.2, ~~"C~~ontent of the Emergency Communications Plan," of this SER.

Technical Evaluation: (8.2.1.g) The staff finds that the VCSNS Emergency Plan adequately describes the TSC communications. This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737.

13.3C.8.9 TSC Data Collection, Storage, and Analysis

Technical Information in the Emergency Plan: (8.2.1.h) Section 13.3C.8.9 of this SER addresses plant data that is available in the TSC via the SPDS. Section 1.9.3, "Three Mile Island Issues," in Section 1.9, "Compliance with Regulatory Criteria," of the AP1000 DCD states the purpose of the plant SPDS is to display important plant variables in the control room in order to assist in rapidly and reliably determining the safety status of the plant. In addition, displays are available at the operator workstations, the remote shutdown workstation, and at the TSC. Section 2.H.1.b of the VCSNS Emergency Plan describes the technical and operational data and information that is available in the TSC for each VCSNS unit. The TSC is equipped with a computer system, which provides source term and meteorological data and technical data displays to allow TSC personnel to perform detailed analysis and diagnosis of abnormal plant conditions, including assessment of any significant release of radioactivity to the environment. Emergency planning ITAAC Acceptance Criterion 6.4 has been proposed to ensure the meteorological data is available in the TSC. Additional information on meteorological instrumentation is located in SER Section 2.3.3, ~~"O~~nsite Meteorological Measurement Program," and Section 7.5, ~~"S~~afety Related Data Systems." The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: (8.2.1.h) The staff finds that the VCSNS Emergency Plan adequately describes the TSC functions of Data Collection, Storage, and Analysis. This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737.

13.3C.8.10 TSC Human Factors Engineering

Technical Information in the Emergency Plan: (8.2.1.h and k) With respect to the TSC human factors engineering (HFE) design, Section 18.2.1, "Human Factors Engineering Program Goals, Scope, Assumptions, and Constraints," of this SER, discusses the acceptability of the implementation and verification of applicable TSC displays in accordance with the AP1000 HFE program. Tier 2, Section 18.1, ~~"O~~verview," of the AP1000 DCD states layout and environmental design of the main control room and the remote shutdown room, and the supplementary support areas such as the TSC, are designed using the traditional disciplines of human factors engineering. In a letter dated November 16, 2010, the applicant proposed an additional HFE ITAAC Acceptance Criteria 8.1.1.D.2 to demonstrate the capability of the TSC and EOF equipment and data displays to clearly identify the affected unit. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: (8.2.1.h and k) The staff finds that the VCSNS Emergency Plan adequately describes the TSC HFE design. This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737.

13.3C.8.11 TSC Plant Records

Technical Information in the Emergency Plan: (8.2.1.i) Section 2.H.1.b of the VCSNS Emergency Plan states that the TSC has ready access to plant records and provides a list of specific documents, procedures, reports, and drawings that will be maintained in the TSC.

Technical Evaluation: (8.2.1.i) The staff finds that the VCSNS Emergency Plan adequately describes the TSC Plant Records availability. This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737.

13.3C.8.12 TSC Activation

Technical Information in the Emergency Plan: [H.4] Section 2.H.5, ―Activation," of the VCSNS Emergency Plan 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. Additional responders provide support to the on-shift ERO to permit a 75-minute response goal for on-call ERO personnel. Upon reaching minimum staffing all ERFs, including the TSC, should be activated within 15 minutes. Criteria for activation are listed in Section 2.H.5, ―Activation," of the VCSNS Emergency Plan. 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: [H.4] The staff finds that the VCSNS Emergency Plan adequately provides for timely activation and staffing of the facilities and centers described in the plan. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1, and Supplement 1 to NUREG-0737.

Operations Support Center

13.3C.8.13 Operations Support Center Functions

Technical Information in the Emergency Plan: [H.1] (8.3.1.a) Section 2.H.1.c, ―Operations Support Center," states that each unit has an OSC where the affected unit's support personnel report and will be dispatched during an emergency. Each OSC is equipped with communication links to the control room and the TSC and carries a limited number of respirators, protective clothing, flashlights, and portable survey instruments. VCSNS disciplines reporting to the OSC include, but are not limited to:

a. Operating personnel not assigned to the control room
b. Radiation protection personnel
c. Chemistry personnel
d. Maintenance personnel (mechanical, electrical and instrumentation and control [I&C])

Technical Evaluation: [H.1] (8.3.1.a) The staff finds that the VCSNS Emergency Plan adequately describes the OSC functions. This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737 and conforms to the guidance described in NUREG-0654/FEMA-REP-1.

13.3C.8.14 OSC Location

Technical Information in the Emergency Plan: (8.3.1.b) (10 CFR 50.34(f)(2)(xxv)) Section 2.H.1.c, ~~O~~perations Support Center," states each unit has established an OSC. Additional information regarding each OSC is provided in the specific unit annexes which state that the OSC is located in the Control Support Area in the Annex Building on the 117'-6" elevation and is separate from the Control Room. In Part 7, ~~D~~epartures and Exemptions," of the VCSNS COL application, the applicant states in VCS DEP 18.8-1 that the OSC location will be as described in the Emergency Plan. The VCSNS OSC is being moved from the location identified in AP1000 DCD Sections 18.8.3.6 and 12.5.2.2 and as described in DCD Figure 1.2-18, ~~A~~nnex Building General Arrangement Plan at Elevation 100′-0″ and 107′-2″" (Note: DCD Figure 1.2-18 is security-related information, withheld under 10 CFR 2.390d). The discussion further states that the OSC is being moved to the CSA vacated by the move of the TSC.

Technical Evaluation: (8.3.1.b) (10 CFR 50.34(f)(2)(xxv)) The staff finds that the relocation of the Units 2 and 3 respective OSCs to the CSA is acceptable because the CSA provides an area that exceeds applicable regulatory requirements for an OSC; and as such, will allow the OSC to adequately support its intended emergency response functions. Therefore, the staff concludes that VCS DEP 18.8-1 is acceptable. The staff finds that the VCSNS Emergency Plan adequately describes the location of the OSC. This is acceptable because it conforms to the guidance described in Supplement 1 to NUREG-0737 and meets the applicable requirements of 10 CFR 50.34.

13.3C.8.15 OSC Coordination Activities

Technical Information in the Emergency Plan: (8.3.1.a) Section 2.H.1.c, ~~O~~perations Support Center," of the VCSNS Emergency Plan provides an overview of coordination between the control room, TSC and OSC. Section 2.8.10, ~~O~~SC Capabilities," of the VCSNS Emergency Plan states areas for coordinating, planning, and for staging personnel are available in each OSC. Additional information regarding the location, OSC Managers responsibilities, activation, tools, supplies, and equipment, radiation exposure control, and habitability of each OSC is addressed in specific unit annexes.

Technical Evaluation: (8.3.1.a) The staff finds that the VCSNS Emergency Plan adequately describes the OSC Coordination Activities functions. This is acceptable because it conforms to the regulatory guidance in Supplement 1 to NUREG-0737.

13.3C.8.16 OSC Communications

Technical Information in the Emergency Plan: (8.3.1.c) Section 2.H.1.c, ~~O~~perations Support Center," of the VCSNS Emergency Plan states that the OSC provides the resources for communicating with the control room and the TSC. Voice communication systems are capable

of communication with the control room, TSC, and EOF. Communications systems are described in detail in Section 2.F, "Emergency Communications."

Technical Evaluation: (8.3.1.c) The staff finds that the VCSNS Emergency Plan adequately describes the OSC communications. This is acceptable because it meets the applicable regulatory guidance in Supplement 1 to NUREG-0737.

13.3C.8.17 OSC Activation and Staffing

Technical Information in the Emergency Plan: [H.4] Section 2.H.1.c, "Operations Support Center," of the VCSNS Emergency Plan states that the affected unit's OSC will be activated whenever the TSC is activated, but can be deactivated at the Emergency Plant Manager's (EPM's) discretion. At the "site area emergency" and "general emergency" levels, the affected unit OSC or an alternate OSC shall be activated at all times. Activation for other events is optional. See also SER Section 13.3C.8.12, "TSC Activation." Personnel who will staff the OSC are identified in Figure B-1b, "Onsite Emergency Response Organization [ERO]," of the VCSNS Emergency Plan.

Technical Evaluation: [H.4] The staff finds that the VCSNS Emergency Plan adequately provides for timely activation and staffing of the OSC. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1.

13.3C.8.18 OSC Capacity and Supplies

Technical Information in the Emergency Plan: [H.9] Section 2.H.10, "OSC Capabilities," of the VCSNS 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. Additional supplies can be requested from unaffected units and corporate resources. The VCSNS 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 Evaluation: [H.9] The staff finds the VCSNS Emergency Plan adequately describes the OSC capacity and supplies. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

Emergency Operations Facility

13.3C.8.19 Emergency Operations Facility Functions

Technical Information in the Emergency Plan: [H.2] {Appendix E, Section IV.E.8} (8.4.1.a) Section 2.H.2, "Emergency Operations Facility," of the VCSNS Emergency Plan states the company will coordinate activities during an emergency under direction of the ED from the EOF. The function of the EOF is described in Section 2.H.2 as providing for; management of

overall emergency response, performance of the non-delegable functions when in command and control, notification of appropriate corporate and station management, coordination of radiological and environmental assessments, determination of recommended public protective actions, management of recovery operations from an "alert" or higher classification, and coordination of emergency response activities with federal, state, and county agencies.

Technical Evaluation: [H.2] {Appendix E, Section IV.E.8} (8.4.1.a) The staff finds the VCSNS Emergency Plan adequately describes the EOF functions. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1, Supplement 1 to NUREG-0737, and the requirements of Appendix E to 10 CFR Part 50.

13.3C.8.20 EOF Location

Technical Information in the Emergency Plan: (8.4.1.b) (50.34(f)(2)(xxv)) Section 2.H.2, "Emergency Operations Facility," states that the EOF is located outside the 10-mile plume exposure pathway EPZ and greater than 10-miles from the TSC. In RAI 13.3-22(G), the staff requested additional information related to location of the new EOF and use of the existing EOF. In its response, the applicant stated that the EOF is located in a larger, multi-purpose facility. This facility is newly constructed in 2009 and was demonstrated in a FEMA offsite evaluated exercise and has been utilized to support a Unit 1 NRC evaluated exercise in 2010. The EOF is located in Richland County at the corner of Bickley Road and South Carolina Highway 176. The applicant has proposed EP ITAAC 5.2 to verify the EOF capabilities are tested with Units 2 and 3. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: (8.4.1.b) (50.34(f)(2)(xxv)) The staff finds the additional information and textual revisions submitted in response to RAI 13.3-22(G) to be acceptable because they conform to the guidance in Supplement 1 to NUREG-0737, and the staff confirmed that Revision 1 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-22(G). The staff finds the VCSNS Emergency Plan adequately describes the EOF location. This is acceptable because it conforms to the guidance in Supplement 1 to NUREG-0737 and regulations in 10 CFR 50.34(f)(2)(xxv).

13.3C.8.21 EOF Size

Technical Information in the Emergency Plan: (8.4.1.c) Section 2.H.2, of the VCSNS Emergency Plan, states that the EOF has the size capacity to accommodate 50 persons to include representatives from the local government and the NRC.

Technical Evaluation: (8.4.1.c) The staff finds the VCSNS Emergency Plan adequately describes the EOF size. This is acceptable because it conforms to the guidance in Supplement 1 to NUREG-0737.

13.3C.8.22 EOF Structural Capabilities

Technical Information in the Emergency Plan: (8.4.1.d) In the response to RAI 13.3-22 the applicant stated that the EOF facility was constructed in 2009 and inspected against the UBC standards and evaluated in an exercise as part of its support to Unit 1.

Technical Evaluation: (8.4.1.d) The staff finds the VCSNS Emergency Plan adequately describes the EOF structural capabilities. This is acceptable because it conforms to the guidance in Supplement 1 to NUREG-0737.

13.3C.8.23 EOF Environmental Requirements

Technical Information in the Emergency Plan: (8.4.1.e) Section 2.H.2 states the EOF meets the guidance in NUREG-0696, "Functional Criteria for Emergency Response Facilities," as it relates to habitability and environmental requirements. The EOF was built in 2009 and has up-to-date environmental and habitability systems.

Technical Evaluation: (8.4.1.e) The staff finds the VCSNS Emergency Plan adequately describes the EOF environmental habitability. This is acceptable because it conforms to the guidance in Supplement 1 to NUREG-0737.

13.3C.8.24 EOF Voice and Data Communications and Information Collection

Technical Information in the Emergency Plan: (8.4.1.f) Section 2.H.2 of the VCSNS Emergency Plan states that the EOF is equipped with reliable voice communications capabilities to the TSC, the control room, NRC, and State and county EOCs. In addition, the EOF has facsimile, computer transmission, and electronic transfer capabilities. The emergency communications systems at the EOF are designed to provide a reliable, timely flow of information between the parties having an emergency response role.

Technical Evaluation: (8.4.1.f) The staff finds the VCSNS Emergency Plan adequately describes the EOF voice and data communications and information collection capabilities. The EOF voice and data communications and information collection capabilities have been demonstrated in evaluated exercises supporting the existing Unit 1. This is acceptable because it conforms to the guidance in Supplement 1 to NUREG-0737.

13.3C.8.25 EOF Information Storage and Analysis

Technical Information in the Emergency Plan: (8.4.1.g) Section 2.H.2, of the VCSNS Emergency Plan states that equipment is provided to gather, store, and display data needed in the EOF to analyze and exchange information on plant conditions with the station. The EOF technical data system receives, stores, processes, and displays information sufficient to perform assessments of the actual and potential onsite and offsite environmental consequences of an emergency condition. Data available at the EOF provides a snapshot of data from each unit's integrated set of plant data as described in Chapter 18.8, "Human System Interface Design," of the AP1000 DCD. Plant data can be displayed at the EOF. These data are sufficient to perform accident assessment and evaluate the potential onsite and offsite environmental consequences of an emergency at the VCSNS site.

Technical Evaluation: (8.4.1.g) The staff finds the VCSNS Emergency Plan adequately describes the EOF information storage and analysis. This is acceptable because it conforms to the guidance in Supplement 1 to NUREG-0737.

13.3C.8.26 EOF Plant Records

Technical Information in the Emergency Plan: (8.4.1.h) Section 2.H.2 of the VCSNS Emergency Plan states that the EOF has ready access (either through hard copies or electronic media) to plant records, procedures, and emergency plans needed for effective overall management of VCSNS emergency response resources.

Technical Evaluation: (8.4.1.h) The staff finds the VCSNS Emergency Plan adequately describes the EOF plant records. This is acceptable because it conforms to the guidance in Supplement 1 to NUREG-0737.

13.3C.8.27 EOF Industrial Security

Technical Information in the Emergency Plan: (8.4.1.j) In RAI 13.3-22(E), the staff requested additional information to explain whether security is available at the EOF to exclude unauthorized personnel and maintain readiness when not in use. In its response, the applicant revised Section 2.H.2 to include the following text:

> The EOF is provided with access limiting devices when not in use and a posted assigned security personnel during activation to ensure that only authorized personnel are permitted to enter the facility.

Technical Evaluation: (8.4.1.j) The staff finds the additional information and textual revisions submitted in response to RAI 13.3-22(E) to be acceptable because they conform to the guidance in Supplement 1 to NUREG-0737, and the staff confirmed that Revision 1 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-22(E). Therefore, the staff finds the VCSNS Emergency Plan adequately describes EOF industrial security. This is acceptable because it conforms to the guidance in Supplement 1 to NUREG-0737.

13.3C.8.28 EOF Human Factors

Technical Information in the Emergency Plan: (8.4.1.k) SER Section 18.2.1 discusses the implementation and verification of applicable EOF displays in accordance with the AP1000 HFE program. In a letter dated November 16, 2010, the applicant proposed an additional HFE ITAAC Acceptance Criteria 8.1.1.D.2 to demonstrate the capability of the TSC and EOF equipment and data displays to clearly identify the affected unit. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: (8.4.1.k) The staff‘s evaluation of the EOF human factors analysis is located in Section 18.2, ―Human Factors Engineering,” of this SER.

13.3C.8.29 EOF Activation and Staffing

Technical Information in the Emergency Plan: [H.4] (8.4.1.i) Section 2.H.5, ―Activation,” states that the ERO augmentation process identifies individuals who are capable of fulfilling the specific response functions that are listed in Table B-1b. This table was developed based on the functions listed in Table B-1 of NUREG-0654/FEMA-REP-1. VCSNS will use unaffected unit on-shift personnel to augment the affected unit on-shift personnel upon declaration of an alert or

higher classification. This staffing augmentation will fulfill the NUREG-0654/FEMA-REP-1, 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. Although the response time will vary due to factors such as weather and traffic conditions, a goal of 75 minutes for minimum staffing, following the notification of an —Alert" or higher emergency classification, has been established for the ERO personnel responding to the station emergency facilities and the EOF. In RAI 13.3-47, the staff requested additional information on where the specific staff augmentation would be provided to compensate for the lack of 30 minute responders. In response, the applicant stated:

> VCSNS Units 1, 2, and 3 are physically located on the same property site. Each plant has identical minimum staffing, including Operations, Health Physics, Chemistry, Mechanical Maintenance, Electrical Maintenance, and I&C Maintenance personnel. The personnel from these disciplines on the unaffected unit(s) will be used to augment the affected unit(s) staffing to perform actions they are trained and qualified to perform, such as radiological accident assessment, repair and corrective actions, search and rescue, chemistry/radiochemistry, etc. This staffing 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. The time frames for rapid augmentation of nuclear power plant staff in the event of an emergency are not rigid inviolate requirements but rather goals. It is VCSNS's intent to expend its best efforts to meet the augmentation criteria goals regarding staffing Emergency Response Facilities with sufficiently skilled individuals capable of handling an emergency. While Unit 3 is under construction, Units 1 and 2 will maintain the capability to augment affected unit shift personnel.

Technical Evaluation: [H.4] (8.4.1.i) The staff finds the additional information submitted in response to RAI 13.3-47 to be acceptable because it conforms to the guidance in Supplement 1 to NUREG-0737 and NUREG-0654/FEMA-REP-1. The staff also finds that the VCSNS Emergency Plan adequately addresses the EOF activation and staffing for Units 2 and 3. The use of on-shift personnel from the other units will provide timely staffing of the ERO. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1, and Supplement 1 to NUREG-0737.

Other Emergency Facilities and Equipment

13.3C.8.30 Onsite Monitoring System

Technical Information in the Emergency Plan: [H.5] Section 2.H.6, —Monitoring Equipment Onsite," of the VCSNS Emergency Plan states that 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 systems related to geophysical, radiological 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 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." Emergency equipment for environmental monitoring off-site is discussed in Section 2.H.8, ―Offsite Monitoring Equipment Storage."

Technical Evaluation: [H.5] The staff finds that the VCSNS Emergency Plan adequately describes onsite monitoring systems. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.8.31 Provisions to Acquire Data from Offsite Sources

Technical Information in the Emergency Plan: [H.6] Section 2.H.7, ―Monitoring Equipment Offsite," of the VCSNS Emergency Plan states that provisions have been made to acquire data from, and have access to, the monitoring and analysis equipment from offsite sources. This capability is a back-up to onsite monitoring equipment. Meteorological data can be obtained from the NWS or the internet, if both meteorological towers are down. Seismic information can be obtained from a South Carolina State Network (SCSN) seismometer located about 3.2 miles east-southeast of Unit 1. Data for radiation and radioactive materials in the environs will be provided by South Carolina DHEC environmental monitoring program. The program is described in the applicant's Offsite Dose Calculation Manual (ODCM) and includes:

a. Fixed continuous air samplers
b. Routine sampling of river water, milk and fish
c. A fixed thermoluminescent dosimeter (TLD) monitoring network consisting of the following elements:
   (1) A near-site ring of dosimeters covering the 16 meteorological sectors.
   (2) A 16-sector ring of dosimeters placed in a zone within about 5 miles from the plant.
   (3) TLDs placed at each of the normal fixed air sampler locations (typically about 8-15 air samplers).

Alternative lab facilities for counting and analyzing samples can be provided by other nuclear stations within a few hours. Analytical assistance can be requested from State and Federal agencies, or through contracted vendors. The State maintains a radiological laboratory that provides independent analysis. The DOE, through the Interagency Radiological Assistance Program has access to any national laboratory with a DOE contract. Lab capabilities are discussed in Section 2.C.3, ―Radiological Laboratories."

Technical Evaluation: [H.6] The staff finds that the VCSNS Emergency Plan adequately describes provisions to acquire data from, or for emergency access to, offsite monitoring and analysis equipment. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.8.32 Offsite Radiological Monitoring Equipment

Technical Information in the Emergency Plan: [H.7] Section 2.H.8, ―Offsite Monitoring Equipment Storage," states VCSNS maintains a sufficient supply of emergency equipment for environmental monitoring that meet the initial requirements of two environmental Field

Monitoring Teams. Additional equipment is available for other VCSNS Field Monitoring Teams through INPO mutual aid agreements, and other offsite response organizations.

Technical Evaluation: **[H.7]** The staff finds that the VCSNS Emergency Plan adequately describes the offsite radiological monitoring equipment in the vicinity of the nuclear facility. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.8.33 Meteorological Instrumentation

Technical Information in the Emergency Plan: [H.8] Section 2.H.9, ~~"M~~eteorological Monitoring," of the VCSNS Emergency Plan states that the site maintains two meteorological towers equipped with instrumentation for continuous reading of the wind speed, wind direction, air temperature, and vertical temperature difference. Representative meteorological information can also be obtained from the NWS. Section 4, ~~"E~~mergency Facilities and Equipment," of each unit annex provides additional information on the meteorological capabilities of the site.

Technical Evaluation: [H.8] The staff finds that the VCSNS Emergency Plan adequately describes the meteorological instrumentation and procedures and provisions to obtain representative current meteorological information from other sources. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.8.34 Inspection and Inventory of Emergency Equipment

Technical Information in the Emergency Plan: [H.10] Section 2.H.11, ~~"F~~acility and Equipment Readiness," of the VCSNS 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. Calibration of equipment is described to be at intervals recommended by the supplier of the equipment. Implementing Procedures are identified in Appendix 3, ~~"P~~rocedure Cross Reference to the Emergency Plan." These procedures provide information on location and availability of emergency equipment and supplies.

Technical Evaluation: [H.10] The staff finds that the VCSNS Emergency Plan adequately describes the provisions to inspect, inventory and operationally check emergency equipment and instruments at least once each calendar quarter and after each use. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.8.35 Emergency Kits

Technical Information in the Emergency Plan: [H.11] Section 2.H.12, ~~"E~~mergency Equipment and Supplies," of the VCSNS 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 general list of equipment and supplies is provided. A specific list of equipment and

supplies by facility will be provided in the Emergency Equipment Checklist Procedure. Section 2.H.13, "General Use Emergency Equipment," states equipment that is stored in emergency kits in each facility is listed in inventory procedures.

Technical Evaluation: [H.11] The staff finds that the VCSNS Emergency Plan adequately describes the emergency kits. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.8.36 Location to Coordinate Field Monitoring Data

Technical Information in the Emergency Plan: [H.12] Section 2.H.14, "Collection Point for Field Samples," of the VCSNS Emergency Plan states the central point for the receipt and analysis of field samples is the environmental lab in the EOF. The equipment in the lab can be used to determine the activity of the samples. Instruments are routinely calibrated to ensure availability. Field monitoring equipment is maintained at the station.

Technical Evaluation: [H.12] The staff finds that the VCSNS Emergency Plan adequately establishes a central point, the EOF Environmental Lab, for the receipt and analysis of all field monitoring data and coordination of sample media. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.8.37 Facilities and Supplies for Emergency Medical Treatment

Technical Information in the Emergency Plan: {Appendix E, Section IV.E.4} Section 2.B.1, "Onshift Emergency Response Organization Assignments," of the VCSNS Emergency Plan states that individuals trained in first aid will be designated as a first aid team for each protected area. Section 2.H.10, "OSC Capabilities," states that the OSCs are stocked with first aid and medical treatment equipment and supplies. The first aid at the site is discussed in detail in Section 2.L.2, "Onsite First Aid Capability." This section also states that emergency treatment areas, with equipment and supplies are located in each unit and described in each unit annex. Because the annexes did not include information on emergency treatment areas, in RAI 13.3-22(C), the staff requested additional information on the location and operation of medical treatment areas located in each unit. In its response, the applicant proposed to include the following text in Annex 1, Section 4.1, "Unit-Specific Emergency Facilities:"

> 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, "Unit-Specific Emergency Facilities" 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.

Technical Evaluation: **{Appendix E, Section IV.E.4}** The staff finds the additional information and textual revision submitted in response to RAI 13.3-22(C) to be acceptable because they meet the requirements of Appendix E to 10 CFR Part 50. In Revision 1 of the VCSNS Emergency Plan, the staff confirmed that the revisions to the Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-22(C). The staff finds the VCSNS Emergency Plan adequately describes the facilities and medical supplies at the site for appropriate emergency first aid treatment. This is acceptable because it meets the requirements provided in Appendix E to 10 CFR Part 50.

13.3C.8.38 Maintenance of Emergency Equipment and Supplies

Technical Information in the Emergency Plan: {Appendix E, Section IV.G} Section 2.H.11, "Facility and Equipment Readiness," of the VCSNS 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. 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. Section 2.P.4, "Emergency Plan and Agreement Revisions," provides information on the annual review of the emergency plan. Procedures are discussed in Section 2.P.7, "Implementing and Supporting Procedures." Procedures are 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: {Appendix E, Section IV.G} The staff finds that the VCSNS Emergency Plan adequately describes the provisions to ensure that the emergency plan, and its implementing procedures, and emergency equipment and supplies are maintained up-to-date. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.8.39 ERDS Description, Testing, and Activation

Technical Information in the Emergency Plan: {Appendix E, Section VI} Section 2.F.3, "Communication Testing," of the VCSNS Emergency Plan states that testing of the communication system is performed in accordance with Section 2.N.2, "Drills." Section 2.N.2 states that primary communication methods are tested monthly. The capability to notify the NRC and Federal EROs is tested quarterly. Section 2.F.5, "ERDS," of the VCSNS Emergency Plan states, as prescribed by 10 CFR 50 Appendix E.VI, that ERDS will supply the NRC with selected plant data points on a near real time basis. The selected data points are transmitted via modem or a Virtual Private Network (VPN) to the NRC at approximately 1-minute intervals. The applicant has proposed adding AP1000 DCD Table 7.5.1, "Post-Accident Monitoring System," and FSAR Table 7.5-201, "Post-Accident Monitoring System," to each unit annex which identifies the specific plant parameters that are available in the Control Room, TSC, and EOF. The following statement will be added to each unit annex:

> G. Emergency Response Data System (ERDS)
> The Emergency Response Data System (ERDS) is supported via a data link to the NRC. In accordance with 10 CFR 50, Appendix E, Section VI, the appropriate

variables listed in DCD Table 7.5-1 and FSAR Table 7.5-201 including plant equipment status and parameter information for reactor core and coolant system conditions, reactor containment conditions, radioactivity release conditions, and plant meteorological conditions will be transmitted as required.

This will be tracked as **Confirmatory item 13.3-4**. The ERO has backup methods available to provide required information to the NRC in the event that ERDS is inoperable during the declared emergency. The ERDS supplements the existing voice transmission over the ENS by providing the NRC Operations Center with timely and accurate updates of a limited set of parameters from the licensee's installed onsite computer system in the event of an emergency. The VCSNS Emergency Plan states that the licensee will test the ERDS periodically to verify system availability and operability. The frequency of ERDS testing will be quarterly.

(10 CFR 50.72(a)(4)) Section 2.F.1.b.5, ~~-~~ERDS," of the VCSNS Emergency Plan states that the ERDS is activated as soon as possible, but not later than one hour after declaring an ~~-~~alert," ~~-~~site area emergency," or ~~-~~general emergency."

Technical Evaluation: {Appendix E, Section VI} (10 CFR 50.72(a)(4)) The staff finds that the VCSNS Emergency Plan adequately describes the ERDS as a direct, near real-time, electronic data link between the licensee's onsite computer system and the NRC Operations Center that provides for the automated transmission of a limited data set of selected parameters. The staff finds that the AP1000 DCD Table 7.5.1 and FSAR Table 7.5-201 contain the plant parameters required by Section VI.2.a of Appendix E to 10 CFR Part 50, including plant equipment status and parameter information for reactor core and coolant system conditions, reactor containment conditions, radioactivity release conditions, and plant meteorological conditions. The values that will be transmitted via ERDS will be derived from this list. Therefore the staff finds, pending the acceptable resolution of **Confirmatory Item 13.3-4**, that the list of plant parameters is acceptable. The staff also finds that the VCSNS Emergency Plan adequately describes the activation of ERDS and, therefore, meets the regulatory requirements in 10 CFR 50.72(a)(4).

13.3C.8.40 Conclusions

The NRC staff, pending the acceptable resolution of the confirmatory item, concludes that the information provided in the VCSNS Emergency Plan regarding emergency facilities and equipment is acceptable and meets the requirements of 10 CFR 50.47(b)(8) because it complies with the guidance in Planning Standard H of NUREG-0654/FEMA-REP-1, the applicable portions of Appendix E to 10 CFR Part 50, and Supplement 1 to NUREG-0737 as described above.

13.3C.9 Accident Assessment

13.3C.9.1 Regulatory Basis

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

proposed emergency plan against applicable regulatory requirements related to the area of "Accident Assessment" in Appendix E to 10 CFR Part 50 and 10 CFR 50.34.

13.3C.9.2 Initiating Conditions for Emergency Classes

Technical Information in the Emergency Plan: [I.1] Section 2.I, ~~"~~Accident Assessment," of the VCSNS Emergency Plan addresses the response to emergency conditions. Section 2.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 included in the implementing procedures. Implementing Procedures are identified in Appendix 3, ~~"~~Procedure Cross-Reference to Emergency Plan," for Emergency Classification. Administrative procedures are also identified for facilities and equipment discussed in unit-specific annexes.

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 2.H, ~~"~~Emergency Facilities and Equipment." A list of equipment available for each unit can be found in Section 4.2.B, ~~"~~Onsite Radiation Monitoring Equipment," Table 4-1, ~~"~~Radiation Monitoring System Description," of the Unit Annex. Conditions of the plant are evaluated through monitoring of plant parameters from the control room and within the plant. The SPDS in the control room monitors reactor coolant system pressure, reactor or pressurizer water level, containment pressure, reactor power, safety system status, containment radiation level and effluent monitor readings on one display.

Technical Evaluation: [I.1] The staff finds that the VCSNS Emergency Plan adequately 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 for each emergency class. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.9.3 Capability to Continuously Assess an Accident

Technical Information in the Emergency Plan: [I.2] (10 CFR 50.34(f)(2)(xvii)) Section 2.I.2, ~~"~~Onsite Accident Assessment Capabilities," of the VCSNS Emergency Plan states that the station employs a plant parameter display systems, liquid and gaseous sampling system, area and process radiation monitors, and accident radiation monitors to acquire initial and continuous information for accident assessment. These systems are described in Section 2.H.6.b, ~~"~~Monitoring Equipment Onsite," and in Section 4.2, ~~"~~Assessment Resources," of each unit annex. The applicant has proposed EP ITAAC 6.1 to demonstrate that the means exists to provide initial and continuing radiological assessment throughout the course of an accident through the plant computer or communications with the control room. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

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 DCD Section 18.8.2, "Safety Parameter Display System (SPDS)." Section 1.9.5.2.9, "Post-Accident Sampling System NRC Position," of the AP1000 DCD states that 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 NRC's model Safety Evaluation Report on eliminating post-accident sampling system requirements from technical specifications for operating plants. Section 9.3.3.1.2.2, "Post-Accident Sampling," of the AP1000 DCD states there are contingency plans for obtaining and analyzing highly radioactive samples. These plans include the procedures to analyze reactor coolant for boron, containment atmosphere for hydrogen and fission products, and containment sump water for pH, during later stages of accident response. Section 1.9.3 of the AP1000 DCD, addresses the instrumentation necessary to measure, record and readout in the control room. Specifically, the AP1000 post-accident monitoring provides for indication of the following parameters: containment pressure, containment water level, containment hydrogen concentration, containment radiation intensity (high level), and noble gas effluents to ascertain reactor coolant system integrity. Section 1.9.3 of the AP1000 DCD also refers to DCD Section 11.5.5. This section provides additional information on measurement of radioactive effluents and conformance with RG 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," which addresses the capability to continuously sample radioactive iodines and particulates in gaseous effluents from all potential accident release points.

Section 2.I.3, "Source Term Determination," states that core damage considerations are used as the bases for several of the EAL Initiating Conditions and as the threshold for the declaration of a "general emergency." Assessment methodologies used to estimate core damage and determine core damage type are discussed. Assessment of core damage will be performed by a core damage assessment team trained in accordance with Section 2.O.4.b.2, "Core Damage Assessment Personnel." Discussion on classification levels can be found in Section 2.D, "Emergency Classification System," and Section 3, "Classification of Emergencies," of each unit annex.

Section 2.I.9, "Iodine Monitoring," states that field monitoring equipment has the capability to detect and measure airborne radioiodine concentrations as low as $1x10^{-7}$ µCi/cc in the field. Hand held survey meters are used to measure elemental iodine concentrations in air samples to check offsite release projections made based on plant data. Section 2.I.4, "Effluent Monitor Data and Dose Projection," outlines the process for making dose projections for offsite areas.

Technical Evaluation: [I.2] (10 CFR 50.34(f)(2)(xvii)) The staff finds that the VCSNS Emergency Plan adequately describes the methods of making initial and continuing assessment of plant conditions through the course of an accident. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR 50.34(f)(2)(xvii).

13.3C.9.4 Capability to Determine Source Term

Technical Information in the Emergency Plan: [I.3a] {Appendix E, Section IV.E.2} Section 2.I.3, "Source Term Determination," of the VCSNS Emergency Plan describes assessment methodologies used to estimate core damage and determine core damage type. Estimates of core damage can be used to determine the potential type and/or quantity of source term available for release to support offsite dose projections and determine protective action measures. The applicant has proposed EP ITAAC 6.2 to demonstrate that the means exist to determine the source term of releases of radioactive material within plant systems. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [I.3.a] {Appendix E, Section IV.E.2} The staff finds that the VCSNS Emergency Plan adequately establishes methods and techniques to be used for determining the source term of releases of radioactive material within plant systems based on plant system parameters and effluent monitors. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1, and meets the requirements of Appendix E to 10 CFR Part 50.

13.3C.9.5 Capability to Determine the Magnitude of a Radiological Release

Technical Information in the Emergency Plan: [I.3b] {Appendix E, Section IV.B} Section 2.I.4, "Effluent Monitor Data and Dose Projection," of the VCSNS Emergency Plan addresses the determination of the magnitude of a radiological release. The methods include using plant effluent monitors and system flow rates, a variety of containment failures or leak rates in conjunction with available source terms estimates, sampling of the release point, and field monitoring data. The applicant has proposed EP ITAAC 6.2 to demonstrate that the means exists to determine the magnitude of the release of radiological materials based on plant system parameters and effluent monitors. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [I.3.b] {Appendix E, Section IV.B} The staff finds that the VCSNS Emergency Plan adequately establishes methods and techniques to be used for determining the magnitude of releases of radioactive material within plant systems based on plant system parameters and effluent monitors. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1, and meets the requirements of Appendix E to 10 CFR Part 50.

13.3C.9.6 Relationship Between Effluent Monitors and Exposure

Technical Information in the Emergency Plan: [I.4] {Appendix E, Section IV.A.4} {Appendix E, Section IV.B} Section 2.I.4, "Effluent Monitor Data and Dose Projection," outlines the process for making dose assessment or projections. The Plant Parameter Display System and personal computers will provide the 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. Dose assessment actions will be performed in the following sequence:

1. Onset of a release to one hour post-accident: Shift personnel will rely on a simplified computerized dose model to assist them in developing offsite dose projections using real time data from effluent monitors and site meteorology.

2. One hour post-accident to event termination: Estimates of offsite doses based on more sophisticated techniques are provided. Dedicated ERO personnel will analyze the offsite consequences of a release using more complex computerized dose modeling. These additional methods are able to analyze more offsite conditions than the simplified quick method, as well account for more specific source term considerations.

The results of the dose projections 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, ~~O~~nsite 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, ~~D~~ose Projection Model," of each unit annex. Section 4.2.F, describes the MIDAS system that is used for dose assessments. The applicant has proposed EP ITAAC 6.3 to demonstrate that the impact of a radiological release to the environment is able to be assessed by utilizing the relationship between projected effluent monitor readings, and projected onsite and offsite exposures and contamination for various meteorological conditions. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [I.4] {Appendix E, Section IV.A.4} {Appendix E, Section IV.B} The staff finds that the VCSNS Emergency Plan adequately establishes the relationship between effluent monitor readings and onsite and offsite exposures and contamination for various meteorological conditions. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and the applicable requirements in Appendix E to 10 CFR Part 50.

13.3C.9.7 Meteorological Information

Technical Information in the Emergency Plan: [I.5] Section 2.H.9, ~~M~~eteorological Monitoring," of the VCSNS 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 2.I.5, ~~M~~eteorological Information," 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 2.F.1.b.5, ~~E~~RDS," states that the ERDS will be used to transmit data to the NRC on a real time basis according to 10 CFR Part 50 Appendix E. Backup systems are available if the ERDS fails. Section 4.2.A, ~~O~~nsite Meteorological Monitoring Instrumentation," of each unit annex, provides a description of the onsite equipment used to measure atmospheric conditions. This section also states that meteorological data from the NWS in Columbia, South Carolina, will be acquired and used when both onsite meteorological towers are not available. There are provisions for access to meteorological information by the 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. The applicant has

proposed EP ITAAC 6.4 to test the capability to acquire and evaluate meteorological data/information. Additional information on meteorological measurement is located at SER Section 2.3.3, ~~–~~Onsite Meteorological Measurement Program." Additional information on meteorological instrumentation is located at SER Section 7.5, ~~–~~Safety Related Data Systems." The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [I.5] The staff finds that the VCSNS Emergency Plan adequately describes the capability of acquiring and evaluating meteorological information. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.9.8 Projecting Dose When Instrumentation Is Inoperable

Technical Information in the Emergency Plan: [I.6] Section 2.I.6, ~~–~~Unmonitored Release," of the VCSNS Emergency Plan states that dose projections can be made by using actual 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 2.O.4.c.3, ~~–~~Dose Assessment," states that dose assessment personnel will receive initial and periodic computerized dose assessment training. The applicant has proposed EP ITAAC 6.5 to ensure a test will be performed of the capabilities to make rapid assessments of actual or projected doses 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. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [I.6] The staff finds that the VCSNS Emergency Plan adequately establishes the methodology for determining the release rate/projected doses if the instrumentation used for assessment are off-scale or inoperable. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.9.9 Field Monitoring Capability

Technical Information in the Emergency Plan: [I.7] Section 2.I.7, ~~–~~Field Monitoring," of the VCSNS Emergency Plan states that 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 DHEC teams. Resources to support field teams are also discussed. Section 2.H.7.b, ~~–~~Radiological Environmental Monitors and Sampling," states that an offsite environmental monitoring program will be conducted by the South Carolina DHEC that includes fixed continuous air samplers; sampling of water, milk and fish; and fixed TLDs.

Section 2.H.8, ~~–~~Offsite Monitoring Equipment Storage," states that equipment sufficient for two environmental field monitoring teams is maintained at the site. Additional equipment is available for other VCSNS field monitoring teams, INPO mutual aid, and offsite response organizations.

Appendix 2, ~~L~~letters of Agreement," includes a list of organizations for which the VCSNS has letters of agreement and/or memorandums of understating.

Technical Evaluation: [I.7] The staff finds that the VCSNS Emergency Plan adequately describes the capability and resources for field monitoring within the plume exposure EPZ. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.9.10 Capability to Rapidly Assess Radiological Hazards

Technical Information in the Emergency Plan: [I.8] Section 2.I.8, ~~F~~ield Monitoring Teams," of the VCSNS Emergency Plan states that 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 ~~a~~lert" 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 South Carolina DHEC support can be used to perform collection, shipment, and analysis of environmental sample media. The applicant has proposed EP ITAAC 6.5 to ensure a test will be performed of the capabilities to make rapid assessments of actual or projected doses 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. In RAI 13.3-48, the staff requested clarification on the term ~~li~~mited offsite environmental survey and sampling." In its response, the applicant stated that the word "limited" is used to describe the support that can be afforded by the on-shift health physics (HPs) or by HP staff called in to support an emergency, prior to activation of the ERO. The HP staff has the responsibility to monitor radiological conditions onsite, within the PA and OCA. Upon activation of the ERF, HP staffing will be augmented by two Environmental Field Teams. These two Environmental Field Teams will be responsible for monitoring from the OCA out to the EPZ boundaries. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [I.8] The staff finds that the VCSNS Emergency Plan adequately describes methods, equipment and expertise to conduct offsite assessment of radiological hazards. This is acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.9.11 Capability to Measure Radioiodine Concentrations in Air

Technical Information in the Emergency Plan: [I.9] Section 2.I.9, ~~I~~odine Monitoring," states field monitoring equipment has the capability to detect and measure airborne radioiodine concentrations as low as $1x10^{-7}$ µCi/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. The applicant has proposed EP ITAAC 6.6 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} µCi/cc under field conditions. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [I.9] The staff finds that the VCSNS Emergency Plan adequately 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.9.12 Means to Relate Various Parameters to Dose Rates

Technical Information in the Emergency Plan: **[I.10]** Section 2.I.10, ~~"D~~Dose Estimates," 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, ~~"P~~Procedure Cross-Reference to the Emergency Plan," identifies procedures for making dose assessments. The applicant has proposed EP ITAAC 6.7 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. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: **[I.10]** The staff finds that the VCSNS Emergency Plan adequately 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 Emergency Plan also adequately 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.9.13 Conclusions

The NRC staff concludes that the information provided in the VCSNS Emergency Plan regarding accident assessment is acceptable and meets the requirements of 10 CFR 50.47(b)(9) because it complies with the guidance in Planning Standard I of NUREG-0654/FEMA-REP-1, the applicable portions of Appendix E to 10 CFR Part 50, and 10 CFR 50.34 as described above.

13.3C.10 Protective Response

13.3C.10.1 Regulatory Basis

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

13.3C.10.2 Warning Onsite Personnel

Technical Information in the Emergency Plan: [J.1.a-d] Section 2.J.1, ~~–~~Notification of Onsite Personnel," states all personnel within the OCA are notified of the initial classification or escalation of an emergency by alarms and verbal announcements over the plant public address system. Announcements include the emergency classification and response actions. These actions pertain to ERO, non-ERO, contractor personnel, and visitors. Provisions are made to alert personnel in high noise areas and outbuildings within the PA. The applicant has proposed EP ITAAC 7.1 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. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [J.1.a-d] The staff finds that the VCSNS Emergency Plan adequately establishes the means and time required to warn or advise onsite individuals and individuals who may be in areas controlled by the operator, including employees not having emergency assignments, visitors, contractor and construction personnel, and other persons who may be in the public access areas on or passing through the site or within the owner controlled area. This is acceptable because it meets the guidance in NUREG-0654/FEMA-REP-1

13.3C.10.3 Evacuation Routes for Onsite Personnel

Technical Information in the Emergency Plan: [J.2] Section 2.J.2, ~~–~~Evacuation Locations," of the VCSNS 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 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 13.3-23, the staff requested additional information related to transportation assets available to those without personal vehicles. In its response, the applicant stated that personnel who do not have transportation will typically carpool with others. If personal vehicles are not available, the lED or the 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. The evacuation routes and areas to be used are determined based on wind direction and other radiological conditions. Inclement weather and high traffic density are discussed in Section 2.J.4, ~~–~~Protective Actions for Onsite Personnel."

Technical Evaluation: [J.2] The staff finds the additional information submitted in response to RAI 13.3-23 to be acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1. The staff finds that the VCSNS Emergency Plan adequately describes the transportation for onsite individuals. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.10.4 Radiological Monitoring of Onsite Personnel

Technical Information in the Emergency Plan: [J.3] Section 2.J.3, "Radiological Monitoring of Evacuees," of the VCSNS Emergency Plan states that personnel will be monitored for contamination by the portal monitors as they exit the PA 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 2.K, "Radiological Exposure Control."

Technical Evaluation: [J.3] The staff finds that the VCSNS Emergency Plan adequately provides for radiological monitoring of people evacuated from the site. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.10.5 Evacuation of Non-essential Onsite Personnel

Technical Information in the Emergency Plan: [J.4] Section 2.J.4, "Protective Actions for Onsite Personnel," states that 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 2.J.3, "Radiological Monitoring of Evacuees." Decontamination is discussed in Sections 2.K.5, Contamination and Decontamination" and Section 2.K.7, "Decontamination of Relocated Personnel."

Technical Evaluation: [J.4] The staff finds that the VCSNS Emergency Plan adequately provides for the evacuation of onsite non-essential personnel in the event of a "site area emergency" or "general emergency" and provides a decontamination capability. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.10.6 Onsite Personnel Accountability

Technical Information in the Emergency Plan: [J.5] Section 2.J.5, "Accountability," of the VCSNS Emergency Plan states that accountability activities are initiated by the IED or the EPM. Accountability activities are 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: [J.5] The staff finds that the VCSNS Emergency Plan adequately 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.10.7 Protection for Personnel Remaining or Arriving Onsite

Technical Information in the Emergency Plan: [J.6.a-c] Section 2.J.6," Provisions for Onsite Personnel," of the VCSNS Emergency Plan states the site maintains an inventory of respiratory protection equipment, anti-contamination clothing, and potassium iodide (KI) that is available to emergency workers remaining onsite.

Technical Evaluation: [J.6.a-c] The staff finds that the VCSNS Emergency Plan adequately provides for individual respiratory protection, use of protective clothing, and use of radioprotective drugs (e.g., individual thyroid protection.) This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.10.8 Recommending of Protective Actions

Technical Information in the Emergency Plan: [J.7] Section 2.J.7, "Mechanism for Implementing Protective Action Recommendations," of the VCSNS Emergency Plan, states that plant conditions, projected dose and dose rates, and/or field monitoring data are evaluated to develop 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 2.J-2, "PAR Flowchart." 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 2.J.10, "Implementation of Protective Action Recommendation," states that EPA 400-R-92-001, the NRC Response Technical Manual (RTM 96), and NUREG-0654/FEMA-REP-1, (Supplement 3), were used as the basis for the general public PARs. Prompt notification is made directly to the offsite authorities responsible for implementing protective measures within the plume exposure pathway EPZ.

Technical Evaluation: [J.7] The staff finds that the VCSNS Emergency Plan adequately establishes a mechanism for recommending protective actions to the appropriate State and local authorities. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.10.9 Evacuation Time Estimates

Technical Information in the Emergency Plan: [J.8] Section 2.J.8, "Evacuation Time Estimates," of the VCSNS Emergency Plan states that an independent ETE 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 ETE report is included in the SCE&G application for a COL as Appendix 4 to the VCSNS Emergency Plan.

Technical Evaluation: [J.8] The staff finds that the VCSNS Emergency Plan adequately provides time estimates for evacuation within the plume exposure EPZ as shown in SER Section 13.3C.18 . This is acceptable because it meets the guidance in NUREG-0654/FEMA-REP-1.

13.3C.10.10 Plans to Implement Protective Measures

Technical Information in the Emergency Plan: [J.10.a] Section 2.J.10.a, "Implementation of Protective Action Recommendations," of the VCSNS Emergency Plan states that the State and county plans include official maps and information on the locations of reception centers and shelters. Each unit specific annex provides more detailed information on evacuation routes, evacuation areas, preselected radiological sampling and monitoring points, relocation centers in host areas, and shelter areas for onsite personnel. Additional protective measures information for emergency workers and offsite populations is described in the State and local emergency plans.

Technical Evaluation: [J.10.a] The staff finds that the VCSNS Emergency Plan adequately addresses evacuation routes, evacuation areas, preselected radiological sampling and monitoring points, relocation centers in host areas, and shelter areas. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [J.10.b] Section 2.J.10.b of the VCSNS Emergency Plan states that the population distribution around the station for the 10-mile radius is illustrated in Figure J-1, "Sector Population Distribution."

Technical Evaluation: [J.10.b] The staff finds that the VCSNS Emergency Plan includes figures that adequately show population distribution around the nuclear facility. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [J.10.c] Section 2.J.10.c of the VCSNS Emergency Plan, states that Section 2.E, "Notification Methods and Procedures," includes information on the capabilities to notify on-site personnel of an existing or potential emergency. Notification of the public is described in Section 2.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: [J.10.c] The staff finds that the VCSNS Emergency Plan adequately describes the means for notifying all segments of the transient and resident population. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [J.10.m] Section 2.J.10.m of the VCSNS Emergency Plan states that at a "general emergency" classification the applicant will provide the State and counties with PARs for the public.

Technical Evaluation: [J.10.m] The staff finds that the VCSNS Emergency Plan includes the basis for recommended protective actions for the plume exposure pathway during emergency conditions. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.10.11 Conclusions

The NRC staff concludes that the information provided in the VCSNS Emergency Plan regarding protective response is acceptable and meets the requirements of

10 CFR 50.47(b)(10) because it complies with the guidance in Planning Standard J of NUREG-0654/FEMA-REP-1, as described above.

13.3C.11 Radiological Exposure Control

13.3C.11.1 Regulatory Basis

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

13.3C.11.2 Onsite Exposure Guidelines

Technical Information in the Emergency Plan: [K.1.a-g] Section 2.K.1, ~~"E~~Emergency Exposure Guidelines," of the VCSNS Emergency Plan states that the site uses Emergency Worker and Lifesaving Activity Protective Action Guidelines set forth in EPA 400-R-92-001. 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 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 2.K.2, ~~"E~~Emergency Radiation Protection Program," states that normal occupational doses received under emergency conditions should be maintained as low as reasonably achievable.

Technical Evaluation: [K.1.a-g] The staff finds that the VCSNS Emergency Plan adequately describes onsite exposure guidelines that are consistent with the guidance in EPA-400-R-92-001 for removal of injured persons, undertaking corrective actions, performing assessment actions, providing first aid, performing personnel decontamination, providing ambulance service, and providing medical treatment services. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.11.3 Onsite Radiation Protection Program

Technical Information in the Emergency Plan: [K.2] Guidelines for the Radiation Protection Program are summarized in Section 2.K.2, ~~"E~~Emergency Radiation Protection Program." The VCSNS 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 will be established for permitting onsite volunteers to receive radiation exposures in the course of carrying out lifesaving and other emergency activities. These procedures will include expeditious decision making and a reasonable consideration of relative risks.

Technical Evaluation: [K.2] The staff finds that the VCSNS Emergency Plan adequately provides an onsite radiation protection program to be implemented during emergencies, including methods to implement exposure guidelines. This is acceptable because it conforms to the guidance of NUREG-0654/FEMA-REP-1. Additional information regarding the onsite radiological protection program is located in SER Section 12.5, "Operational Radiation Protection Program."

13.3C.11.4 Capability to Determine the Dose to Emergency Personnel

Technical Information in the Emergency Plan: [K.3.a] {Appendix E, Section IV.E.1} Section 2.K.3, ~~"P~~ersonal Monitoring," of the VCSNS Emergency Plan states that emergency workers will receive 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. Provisions are also described for the distribution of dosimeters, both self-reading and permanent record devices.

Technical Evaluation: [K.3.a] {Appendix E, Section IV.E.1} The staff finds that the VCSNS Emergency Plan adequately describes provisions for 24-hour-per-day capability to determine the doses received by emergency personnel involved in any radiological emergency. This is acceptable because it conforms to the guidance of NUREG-0654/FEMA-REP-1 and meets the requirements of Appendix E to 10 CFR Part 50.

13.3C.11.5 Dose Records for Emergency Personnel

Technical Information in the Emergency Plan: [K.3.b] Section 2.K.3, ~~"P~~ersonal Monitoring," of the VCSNS Emergency Plan states that emergency worker dose records are maintained by the Onsite Radiological Manager in accordance with the emergency and radiological protection procedures.

Technical Evaluation: [K.3.b] The staff finds that the VCSNS Emergency Plan adequately provides for maintaining dose records for emergency workers involved in any radiological emergency. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.11.6 Decontamination Action Levels

Technical Information in the Emergency Plan: [K.5.a] Section 2.K.5, ~~"C~~ontamination and Decontamination," of the VCSNS Emergency Plan states that during emergency conditions, normal plant contamination control criteria will be adhered to as much as possible. However, these limits may be modified in accordance with existing radiation protection procedures, should conditions warrant. Section 2.K.6, ~~"C~~ontamination Control Measures," states that contaminated personnel, equipment, and materials, will be decontaminated in accordance with procedures to ~~"a~~cceptable limits." In RAI 13.3-33(C)(1)(2), the staff requested the definition of ~~"a~~cceptable limits." In its response, the applicant stated that decontamination procedures will be included in implementing procedures that will be developed according to EP ITAAC 9.0 acceptance criteria. Action levels for decontamination personnel and equipment are specified in plant procedures. In RAI 13.3-49, the staff requested additional information on whether an EPIP for the decontamination action levels would be added to the EPIP list or whether VCSNS Procedure HPP-0158 and HPP-0160 would adequately address these action levels. In its response, the applicant provided a list of procedures that must be submitted to the NRC at least 180 days before fuel load to meet the EP ITAAC 9.0 acceptance criteria. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [K.5.a] The staff confirmed there is a procedure for decontamination listed in Appendix 3 of the VCSNS Emergency Plan. The staff finds the additional information

submitted in response to RAI 13.3-33(C)(1)(2) to be acceptable. The staff finds that the VCSNS Emergency Plan adequately addresses decontamination action levels. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.11.7 Decontamination Facilities and Supplies

Technical Information in the Emergency Plan: [K.5.b] {Appendix E, Section IV.E.3} Section 2.K.5.b, "Contamination and Decontamination," of the VCSNS Emergency Plan states that contaminated personnel will be attended to at decontamination areas located onsite. Temporary decontamination areas can also be established. Decontamination showers and supplies are provided onsite with additional personnel decontamination equipment and capabilities. Section 2.H.12, "Emergency Equipment and Supplies," provides a general list of supplies kept in each facility. Section 1.2.5, "Annex Building," of the AP1000 DCD identifies decontamination facilities in the Annex Building hot shop. In RAI 13.3-22(B), the staff requested additional information regarding the location of decontamination facilities and supplies that will be available for decontamination of personnel. In RAI 13.3-33(B), the staff requested additional information regarding the decontamination supplies. In its response, the applicant stated that the location of the decontamination showers will be in the HP area in each unit's Annex Building and an inventory of specific types and numbers of decontamination supplies and equipment will be maintained in accordance with procedures to be developed according to EP ITAAC Section 9.0 acceptance criteria. Decontamination equipment will be available at various locations throughout the VCSNS site. Decontamination supplies such as various decontamination solutions, brushes, and clothes are available at these locations. Due to its location, the EOF will maintain a supply of decontamination supplies. Decontamination in accordance with plant procedures will be performed if necessary. Supplies, instruments, and equipment that are in contaminated areas will be monitored before removal. Contaminated materials will be disposed of as radwaste. Contaminated vehicles will be decontaminated before being released including any responding ambulances. In RAI 13.3-39, the staff requested additional information to specifically describe the location 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 its response, the applicant provided a revision to Section 2.K.5.b that described the specific locations for the decontamination sites and the associated supplies. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: [K.5.b] {Appendix E, Section IV.E.3} The staff finds the additional information submitted in response to RAIs 13.2-22(B), 13.3-33(B) and RAI 13.3-39 to be acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and the requirements of Appendix E to 10 CFR Part 50. RAI 13.3-39 includes a commitment to update Section 2.K.5.b to describe the specific locations for the decontamination sites and the associated supplies. This item is identified as **Confirmatory Item 13.3-5**, pending NRC review and approval of the revised VCSNS COL application. The staff finds, pending resolution of this confirmatory item, that the VCSNS Emergency Plan adequately addresses decontamination of emergency personnel and equipment. Section 2.K.5.b is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1, and the requirements of Appendix E to 10 CFR Part 50.

13.3C.11.8 Onsite Contamination Control

Technical Information in the Emergency Plan: [K.6.a] Section 2.K.6.a of the VCSNS Emergency Plan states contaminated areas are isolated as restricted areas with appropriate radiological protection and access control. Personnel are monitored for contamination prior to leaving the area.

[K.6.b] Section 2.K.6.b, ~~"C~~ontamination Control Measures," of the VCSNS Emergency Plan states that measures will be taken to control onsite access to potentially contaminated potable water and food supplies. Under emergency conditions, eating, drinking, and chewing are prohibited in all VCSNS ERFs until such time as habitability surveys indicate that such activities are permissible.

[K.6.c] Section 2.K.6.c, ~~"C~~ontamination Control Measures," of the VCSNS Emergency Plan states that restricted areas and contaminated items will be returned to normal use when contamination levels have been returned to acceptable levels. Contamination control criteria for returning areas and items to normal use are included in the plant procedures. In RAI 13.3-33(D) the staff requested that the applicant provide additional information on the contamination control criteria for returning areas and items to normal use. In its response, the applicant stated that contamination control criteria for returning areas and items to normal use are identified in SCE&G VCSNS Procedures HPP-0158, ~~"C~~ontamination Control for Equipment and Materials;" and HPP-0160, ~~"C~~ontrol and Posting of Radiation Control Zones."

Technical Evaluation: [K.6.a-c] The staff finds the additional information submitted in response to RAI 13.3-33(D) to be acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1. The staff finds that the VCSNS Emergency Plan adequately addresses the contamination control. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.11.9 Capability to Decontaminate Relocated Onsite Personnel

Technical Information in the Emergency Plan: [K.7] Section 2.K.7, ~~"D~~econtamination of Relocated Personnel," of the VCSNS Emergency Plan states that efforts will be made to prevent contaminated vehicles operated by nonessential personnel to depart the VCSNS site. Alternate forms of transportation will be made available to reduce the possibilities of transporting contamination offsite with suspected contaminated vehicles. Section 2.K.7 also states that existing and temporary facilities to limit contamination and exposure will be used and established at the site as necessary during an emergency situation. In the event that decontamination of site evacuees locally is not possible, personnel will be sent to designated locations for monitoring and decontamination. Provisions for extra clothes and decontaminates for skin contamination are available.

Technical Evaluation: [K.7] The staff finds that the VCSNS Emergency Plan adequately describes the capability for decontaminating relocated onsite personnel, including provisions for extra clothing and decontaminants suitable for the type of contamination expected. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.11.10 Conclusions

The NRC staff concludes, pending resolution of **Confirmatory Item 13.3-5**, that the information provided in the VCSNS Emergency Plan regarding radiation exposure control is acceptable and meets the requirements of 10 CFR 50.47(b)(11) because it complies with the guidance in Planning Standard K of NUREG-0654/FEMA-REP-1, and the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.12 Medical and Public Health Support

13.3C.12.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(12) for medical and public health support, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Medical and Public Health Support," in Appendix E to 10 CFR Part 50.

13.3C.12.2 Onsite Medical Support

Technical Information in the Emergency Plan: [L.2] {Appendix E, Section IV.E.5}
Section 2.L.2, ~~–~~Onsite First Aid Capability," of the VCSNS 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 2.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 13.3-24(A), the staff requested the applicant provide the letter of agreement with the physician available for onsite medical emergencies. In its response, the applicant provided a Letter of Agreement with Pinner Clinic and staff to support the emergency response effort.

Technical Evaluation: [L.2] {Appendix E, Section IV.E.5} The staff finds the additional information provided in response to RAI 13.3-24(A) to be acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1. The staff finds that the VCSNS Emergency Plan adequately describes arrangements made for the services of physicians and other medical personnel qualified to handle radiation emergencies on-site. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50 and it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.12.3 Offsite Medical Services

Technical Information in the Emergency Plan: [L.1] {Appendix E, Section IV.E.7}
Section 2.L.1, ~~–~~Offsite Hospital and Medical Services," of the VCSNS 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.
Section 2.L.3, ~~–~~Medical Service Facilities," discusses backup response for contamination and exposure injuries from the REAC/TS in Oak Ridge Tennessee. In RAI 13.3-24(B), the staff

requested information to explain if there are arrangements for backup hospital or physician support that can be used to treat contaminated or exposed persons requiring immediate medical care. In its response, 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 RAI 13.3-40, 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 Radiological Emergency Plan, will act as a backup for the treatment of contaminated injured individuals. In its response, 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.

[L.4] {Appendix E, Section IV.E.6} Section 2.L.4, ~~–~~Medical Transportation," of the VCSNS Emergency plan discusses transportation of contaminated or injured people. 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 the injured personnel are contaminated. Monitoring services will be provided by VCSNS personnel for the transportation of contaminated persons if there is contamination present. Additional radiation protection personnel may be dispatched to Palmetto Richland Hospital if needed.

Technical Evaluation: [L.1] {Appendix E, Section IV.E.7} The staff finds the clarification provided in response to RAIs 13.3-24(B) and 13.3-40 to be acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and the regulatory requirements of Appendix E to 10 CFR Part 50. The staff finds that the VCSNS Emergency Plan adequately describes arrangements made for treatment of individuals injured in support of licensed activities on the site at treatment facilities outside the site boundary. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50 and it conforms to the guidance in NUREG-0654/FEMA-REP-1.

[L.4] {Appendix E, Section IV.E.6} The staff finds that the VCSNS Emergency Plan adequately describes the arrangements made for transportation of contaminated injured individuals from the site to specifically identified treatment facilities outside the site boundary. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50 and it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.12.4 Conclusions

The NRC staff concludes that the information provided in the VCSNS Emergency Plan regarding medical and public health support is acceptable and meets the requirements of 10 CFR 50.47(b)(12) because it complies with the guidance in Planning Standard L of NUREG-0654/FEMA-REP-1, the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.13 Recovery and Reentry Planning and Post-Accident Operations

13.3C.13.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(13) for recovery and reentry planning and post-accident operations, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Recovery and Reentry Planning and Post-Accident Operations," in Appendix E to 10 CFR Part 50.

13.3C.13.2 Plans and Procedures for Reentry and Recovery

Technical Information in the Emergency Plan: [M.1] {Appendix E, Section IV.H} Section 2.M, "Reentry and Recovery Planning," of the VCSNS 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: (1) reentry during the emergency phase; and (2) reentry during the recovery phase. All reentry activities are authorized by the EPM and coordinated by the 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 2.M.1.a, "Evaluating Reentry Conditions." Once the plant has been stabilized the recovery phase may be entered.

The 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 2.M.1.b, "Evaluating Entry into Recovery," states that considerations for Termination/Recovery will be included in the implementing procedures.

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 2.M.1.b. All conditions listed do not have to be met but must be considered before entering the recovery phase.

Technical Evaluation: [M.1] {Appendix E, Section IV.H} The staff finds that the VCSNS Emergency Plan adequately describes general plans and procedures for reentry and recovery and describes the means by which decisions to relax protective measures are reached. This process considers both existing and potential conditions. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1, and the applicable requirements in Appendix E to 10 CFR Part 50.

13.3C.13.3 Recovery Organization

Technical Information in the Emergency Plan: [M.2] Section 2.M, "Reentry and Recovery Planning" of the VCSNS Emergency Plan describes 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's ERO will perform the recovery actions. 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 2.M.2.a. 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 2.M.2.b. A senior member of Nuclear Support Services is the Recovery Offsite Manager. A list of responsibilities for this position in is provided in Section 2.M.2.c, "Recovery Offsite Manager." A senior SCANA Public Relations Group individual is designated as the company spokesperson. The responsibilities for this position can be found in Section 2.M.2.d, "The Company Spokesperson." All the above positions report directly to the Recovery Director. Lists of additional supervisors that may be appointed in specific areas are provided.

Technical Evaluation: [M.2] The staff finds that the VCSNS Emergency Plan adequately provides 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.13.4 Recovery Operations Initiation

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

Technical Evaluation: [M.3] The staff finds that the VCSNS Emergency Plan adequately addresses 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.13.5 Method to Estimate Total Population Exposure

Technical Information in the Emergency Plan: [M.4] Section 2.M.4, "Total Population Exposure," of the VCSNS Emergency Plan states that a total population exposure calculation is 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 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. VCSNS Emergency Plan, Appendix 3,

–Procedure Cross-Reference to the Emergency Plan," shows that implementing procedures for Section M, –Recovery," will be written.

Technical Evaluation: [M.4] The staff finds that the VCSNS Emergency Plan adequately establishes a method for periodically estimating total population exposure. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.13.6 Conclusions

The NRC staff concludes that the information provided in the VCSNS Emergency Plan regarding recovery and reentry planning and post-accident operations is acceptable and meets the requirements of 10 CFR 50.47(b)(13) because it complies with the guidance in Planning Standard M of NUREG-0654/FEMA-REP-1, and the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.14 Exercises and Drills

13.3C.14.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(14) for exercises and drills, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Exercises and Drills," in Appendix E to 10 CFR Part 50.

13.3C.14.2 Emergency Preparedness Exercise Purpose and Content

Technical Information in the Emergency Plan: [N.1.a] Section 2.N, –Drill and Exercise Program," of the VCSNS 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; and identify and correct deficiencies in the emergency plan, associated procedures, and training. The program will also ensure the continued adequacy of emergency facilities, supplies, and equipment, including communications networks. Section 2.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 as appropriate.

Technical Evaluation: [N.1.a] The staff finds that the VCSNS Emergency Plan adequately states that the exercises will test the integrated capability and the major elements of the emergency plans and preparedness program. In addition, the emergency preparedness exercise will, as appropriate, simulate an emergency that results in offsite radiological releases which would require response by offsite authorities and that exercises will be conducted as set forth in the NRC and FEMA rules. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

Technical Information in the Emergency Plan: [N.1.b] Section 2.N.1, ~~E~~xercises," VCSNS 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 2.N.2.f, ~~A~~ugmentation Drills," states that an unannounced off-hours 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 staff finds that the VCSNS Emergency Plan adequately states that exercises will include mobilization of State and local personnel and resources adequate to verify the capability to respond to an emergency event. In addition, the VCSNS Emergency Plan adequately describes provisions for a critique of the biennial exercise by Federal and State observers/evaluators. This is acceptable because it conform to the guidance described in NUREG-0654/FEMA-REP-1.

13.3C.14.3 Emergency Preparedness Exercises

Technical Information in the Emergency Plan: {Appendix E, Section IV.F.2} Section 2.N.1.a, ~~B~~iennial Exercises," states that VCSNS will participate 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.

Technical Evaluation: {Appendix E, Section IV.F.2} The staff finds that the VCSNS Emergency Plan adequately 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. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.14.4 Full Participation Exercise Before Fuel Load

Technical Information in the Emergency Plan: {Appendix E, Section IV.F.2.a} VCSNS FSAR Table 13.4-201, ~~O~~perational Programs Required by NRC Regulations," states that VCSNS will conduct a full-participation exercise within 2 years of the scheduled date for initial loading of fuel in accordance with 10 CFR Part 50, Appendix E.IV.F.2.a(ii). The applicant also proposed ITAAC 8.1 to ensure a full participation exercise (test) will be conducted within the specified time periods of Appendix E to 10 CFR Part 50. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: {Appendix E, Section IV.F.2.a} The staff finds that the VCSNS Emergency Plan adequately describes provisions for the conduct of a full-participation exercise before fuel load. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.14.5 Onsite Biennial Exercise

Technical Information in the Emergency Plan: {Appendix E, Section IV.F.2.b}
Section 2.N.1.b, –Off-Year Exercises," discusses the conduct of exercises in years where an NRC exercise is not scheduled. The VCSNS site also conducts exercises prior to the biennial exercise as discussed in Section 2.N.1.c, –Pre-exercises." 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.

Technical Evaluation: {Appendix E, Section IV.F.2.b} The staff finds that the VCSNS Emergency Plan adequately states that an exercise of its onsite emergency plan will be conducted every 2 years and adequately 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. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.14.6 Offsite Biennial Exercise

Technical Information in the Emergency Plan: {Appendix E, Section IV.F.2.c}
Section 2.N.1.a, –Biennial Exercises," 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 IV.F.2.b, IV.F.2.c, and IV.F.2.d to Appendix E of 10 CFR Part 50, involving offsite agency participation, are conducted based on FEMA guidance and State/county emergency response plans. 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 2.N.1.b, –Off-Year Exercises," 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 2.N.1.c, –Pre-Exercises," states pre-exercise drills may be conducted before a biennial exercise where FEMA evaluation of State and local performance is expected.

Technical Evaluation: {Appendix E, Section IV.F.2.c} The staff finds that the VCSNS Emergency Plan adequately states that offsite plans for each site will be exercised biennially with full participation by each offsite authority having a role under the VCSNS Emergency Plan. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.14.7 Ingestion Pathway Exercise with the State

Technical Information in the Emergency Plan: {Appendix E, Section IV.F.2.d}
Section 2.N.1a, –Biennial Exercises," of the VCSNS Emergency Plan states Ingestion Pathway

exercises are conducted on a six-year cycle. VCSNS participates on a rotating basis with the other fixed nuclear facilities in the State of South Carolina. These exercises are usually conducted in conjunction with a full participation exercise as the state chooses.

Technical Evaluation: {Appendix E, Section IV.F.2.d} The staff finds that the VCSNS Emergency Plan adequately describes how the licensee will coordinate with the State of South Carolina to integrate Ingestion Pathway exercises into the biennial exercise program. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.14.8 Enabling Local and State Participation in Drills

Technical Information in the Emergency Plan: {Appendix E, Section IV.F.2.e}
Section 2.N.1.b, "Off-Year Exercise," of the VCSNS 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: {Appendix E, Section IV.F.2.e} The staff finds that the VCSNS Emergency Plan adequately describes how 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. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.14.9 Remedial Exercises

Technical Information in the Emergency Plan: {Appendix E, Section IV.F.2.f}
Section 2.N.1.a, "Biennial Exercises," of the VCSNS Emergency Plan states that VCSNS will participate and support the conduct of activities that are designed to address any deficient or weak demonstrations. The extent of 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.

Technical Evaluation: {Appendix E, Section IV.F.2.f} The staff finds that the VCSNS Emergency Plan adequately describes how remedial exercises will be conducted if the emergency plan is not satisfactorily tested during the biennial exercise, such that the NRC and FEMA, cannot find reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. This is acceptable because it meets the requirements in Appendix E to 10 CFR Part 50.

13.3C.14.10 Drills

Technical Information in the Emergency Plan: [N.2] Section 2.N.2, "Drills," of the VCSNS Emergency Plan states that drills shall be controlled and observed by individuals qualified to conduct and evaluate the drill. Drills are used to consider accident management strategies, provide supervised instruction, allow the operating staff to resolve problems and focus on internal training objectives. One or more drills may be included as portions of an exercise. Communications tests are conducted quarterly with federal organizations and annually with State and local EOCs and field assessment teams. Section 2.A.1, "Emergency Organization," of the VCSNS Emergency Plan indentifies participating organizations. Communications drills

and tests evaluate the operability of the communications systems and the ability to understand message content.

Technical Evaluation: [N.2] The staff finds the VCSNS Emergency Plan adequately describes how a drill is a supervised instruction period aimed at testing, developing and maintaining skills in a particular operation. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.14.11 Communications Drills

Technical Information in the Emergency Plan: [N.2.a] {Appendix E, Section IV.E.9(b)} Section 2.N.2.a, ~~"C~~Communication Drills," of the VCSNS 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 EOCs within the plume exposure pathway EPZ. The capability to notify NRC using the ENS is also tested monthly. The capability to notify the NRC Region and Federal EROs from the EOF is tested quarterly along with the functionality of computer and communication equipment. All communication systems discussed in Section 2.F, ~~"E~~mergency Communications," are tested annually. The drills include provisions to ensure that all participants are able to understand the content of the messages. Communications with Federal EROs and States listed in the Emergency Telephone Directory are demonstrated from the EOF quarterly. Communications between the nuclear facility, State and local EOCs, and field assessment teams will be tested annually.

Technical Evaluation: [N.2.a] {Appendix E, Section IV.E.9(b)} The staff finds the VCSNS Emergency Plan adequately describes how communications with Federal, State and local governments in the plume exposure pathway EPZ will be tested. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and the requirements of Appendix E to 10 CFR Part 50.

13.3C.14.12 Fire Drills

Technical Information in the Emergency Plan: [N.2.b] Section 2.N.2.b, ~~"F~~ire Drills," of the VCSNS 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 FSAR Section 9.5.1.8, ~~"F~~ire Protection Program." FSAR Section 9.5.1.8.2.2.4, ~~"D~~rills," 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 ~~"b~~ack shift" for each shift's fire brigade. The drills provide for off-site fire department participation at least annually. Triennially, a randomly selected, unannounced drill shall be conducted and critiqued by qualified individuals independent of the plant staff. Training objectives are established prior to each drill and reviewed by plant management. Criteria to be critiqued during the drills are also listed. Unsatisfactory drill performance is followed by a repeat drill within 30 days.

Technical Evaluation: [N.2b] The staff finds the VCSNS Emergency Plan adequately describes how fire drills will be conducted in accordance with the VCSNS COL FSAR. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.14.13 Medical Emergency Drills

Technical Information in the Emergency Plan: [N.2.c] Section 2.N.2.c, ~~"M~~Medical Emergency Drills," of the VCSNS Emergency Plan states a medical emergency drill, involving a simulated contaminated individual, is conducted annually. The drill will include provisions for participation by local support services organizations such as ambulance and hospital support. The offsite portions of the medical drill may be performed as part of the required biennial exercise.

Technical Evaluation: [N.2.c] The staff finds the VCSNS Emergency Plan adequately describes that a medical emergency drill involving a simulated contaminated individual includes provisions for participation by the local support services agencies (i.e., ambulance and offsite medical treatment facility) will be conducted annually. In addition, the staff finds the VCSNS Emergency Plan adequately describes that the offsite portions of the medical drill may be performed as part of the required biennial exercise. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.14.14 Radiological Monitoring Drills

Technical Information in the Emergency Plan: [N.2.d] Section 2.N.2.d, ~~"R~~Radiological Monitoring Drills," of the VCSNS Emergency Plan states that radiological monitoring drills, both on and offsite, are conducted annually. These drills include collection and analysis of all sample media and provisions for communications and record keeping. Collection of milk is demonstrated in accordance with the ingestion pathway exercises. Section N.1.d, ~~"R~~Radiological Monitoring Drills," states that where appropriate, local organizations shall participate.

Technical Evaluation: [N.2.d] The staff finds the VCSNS Emergency Plan adequately describes that plant environs and radiological monitoring drills (onsite and offsite) will be conducted annually; and where appropriate, local organizations participate. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.14.15 Health Physics Drills

Technical Information in the Emergency Plan: [N.2.e] Section 2.N.2.e, ~~"H~~Health Physics Drills," of the VCSNS Emergency Plan states that health physics drills are conducted semiannually in each protected area. The VCSNS Emergency Plan also states that health physics drills involve a response to, and analysis of, simulated elevated liquid samples and direct radiation measurements within the plant.

Technical Evaluation: [N.2.e] The staff finds the VCSNS Emergency Plan adequately describes how health physics drills will be conducted semi-annually and will involve response to, and analysis of, simulated elevated airborne and liquid samples and direct radiation measurements in the environment. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.14.16 Conduct of Drills and Exercises

Technical Information in the Emergency Plan: [N.3.a-f] Section 2.N.3, ~~"C~~Conduct of Drills and Exercises," of the VCSNS Emergency Plan states that advance knowledge of the scenario

will be kept to a minimum to allow "free-play" decision making and ensure realistic participation. A package will be distributed to the controllers and evaluators before the drill or exercise that includes the scenario, a list of performance objectives, and a description of the expected responses. Each member of the ERO will have an opportunity to participate in a drill in their assigned facility at least once in a two-year period. Drills will be rotated among the units and their ERFs. The minimum contents for a scenario package are listed. The Station Management will provide prior approval for all drills and exercises conducted in support of the Emergency Preparedness Program. The VCSNS Emergency Plan states that the scenarios for use in exercises and drills will include, but are not limited to, the following:

a. the basic objective(s) of each drill and exercise and appropriate evaluation criteria

b. the date(s), time period, place(s) and participating organizations

c. the simulated events

d. a time schedule of real and simulated initiating events

e. a narrative summary describing the conduct of the exercises or drills to include such things as simulated casualties, offsite fire department assistance, rescue of personnel, use of protective clothing, deployment of radiological monitoring teams, and public information activities

f. a description of the arrangements for and advance materials to be provided to official observers

Technical Evaluation: [N.3.a-f] The staff finds that the VCSNS Emergency Plan adequately describes how exercises and drills will be carried out to allow free play for decision-making and to meet the exercise objectives. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.14.17 Observing, Evaluating, and Critiquing Drills and Exercises

Technical Information in the Emergency Plan: [N.4] {Appendix E, Section IV.F.2(g)} Section 2.N.4, ~~C~~critique and Evaluation," of the VCSNS Emergency Plan states that a representative from the NRC will observe and evaluate the licensee's ability to conduct an adequate self-critical critique biennially. For full offsite participation exercises, both the NRC and FEMA will observe, evaluate, and critique. A critique is conducted as soon as possible following the conclusion of each drill or exercise. The Manager, Emergency Services will prepare a formal written critique following a drill or exercise. The report will evaluate the ability of the ERO to respond to a simulated emergency situation or sequence of events. The report will also include corrective actions and recommendations for improvement. Comments identified by participants during a training drill where objectives are not formally being evaluated will be reviewed but are not required to be included in a formal report. Section 2.N, ~~D~~rill and Exercise Program," states that the purpose of the Drill and Exercise Program is to identify deficiencies and ensure they are promptly corrected. Section 2.O.2, ~~F~~unctional Training of the ERO," states that performance based training is provided that includes on-the-spot correction of erroneous performance. Any weaknesses or deficiencies will be identified and corrected.

Technical Evaluation: [N.4] {Appendix E, Section IV.F.2(g)} The staff finds that the VCSNS Emergency Plan adequately describes provisions for official observers from Federal, State or local governments to observe, evaluate, and critique the required exercises. This is acceptable because it conforms to the applicable requirements in Appendix E to 10 CFR Part 50 and the guidance described in NUREG-0654/FEMA-REP-1.

13.3C.14.18 Means to Correct Areas Needing Improvement

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

Technical Evaluation: [N.5] The staff finds that the VCSNS Emergency Plan adequately describes a 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 Emergency Plan also establishes management control used to ensure that corrective actions are implemented. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1.

13.3C.14.19 Conclusions

The NRC staff concludes that the information provided in the VCSNS Emergency Plan regarding exercises and drills is acceptable and meets the requirements of 10 CFR 50.47(b)(14) because it complies with the guidance in Planning Standard N of NUREG-0654/FEMA-REP-1, and the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.15 Radiological Emergency Training

13.3C.15.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(15) for radiological emergency training, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Radiological Emergency Training," in Appendix E to 10 CFR Part 50.

13.3C.15.2 Training for Offsite Emergency Organizations

Technical Information in the Emergency Plan: [O.1.a] Section 2.O, "Emergency Response Training," of the VCSNS Emergency Plan describes the emergency response training, provided to VCSNS and offsite support personnel. Section 2.O.1.a 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, of the identity of those persons in the onsite organization who will control their support activities.

Technical Evaluation: [O.1.a] The staff finds that the VCSNS Emergency Plan adequately describes the site-specific emergency response training to be provided for offsite emergency organizations that may be called upon to provide assistance in the event of an emergency. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.15.3 Onsite Emergency Response Organization Training

Technical Information in the Emergency Plan: [O.2] Section 2.O.1, "Assurance of Training," states that task specific training for each position in the emergency plan is described in lesson plans and guides as part of the ERO Training Program. Implementation of the training program is covered in implementing procedures and course content in the Nuclear Training Manual. Section 2.O.2, "Functional Training of the ERO," of the VCSNS Emergency Plan states that 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 2.O.4, "Emergency Response Organization Training Program," states that personnel responsible for implementing the emergency plan will receive specialized training. The program is based on the requirements of 10 CFR Part 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. 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.

Technical Evaluation: [O.2] The staff finds that the VCSNS Emergency Plan adequately describes the training program for members of the onsite emergency organization. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1.

13.3C.15.4 First Aid and Rescue Team Training

Technical Information in the Emergency Plan: [O.3] [O.4.f] {Appendix E, Section IV.F.1(b)(vi)} Section 2.O.4.f, "Medical Emergency Response Team and Rescue Personnel," of the VCSNS Emergency Plan references Section 2.O.3, "First Aid Response," 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.

Technical Evaluation: [O.3] [O.4.f] {Appendix E, Section IV.F.1(b)(vi)} The staff finds that the VCSNS Emergency Plan adequately describes specialized initial training for first aid and rescue teams. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1, and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.5 Training Program to Implement the Emergency Plan

Technical Information in the Emergency Plan: [O.4] {Appendix E, Section IV.F.1}
Section 2.O.4, "Emergency Response Organization Training Program," states ERO personnel who are responsible for implementing this plan receive specialized training. The training program for emergency response personnel is developed based on the requirements of 10 CFR 50, Appendix E and position specific responsibilities as defined in the VCSNS Emergency Plan. On-shift emergency response personnel perform emergency response activities as an extension of their normal duties and are trained annually as part of their duty specific training. Additional emergency preparedness information is provided as part of the station orientation training (SOT). New ERO personnel receive an initial overview course that familiarizes them with the Emergency Plan by providing basic information in the following areas as well as specific information as delineated in the sections below:

a. Planning Basis
b. Emergency Classifications
c. ERO and Responsibilities
d. Call-out of ERO
e. ERFs
f. Communications Protocol/EPI
g. Offsite Organizations

Technical Evaluation: [O.4.] {Appendix E, Section IV.F.1} The staff finds that the VCSNS Emergency Plan adequately describes the training program for instructing and qualifying personnel who will implement radiological emergency response plans. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1, and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.6 Training for Emergency Response Organization Directors

Technical Information in the Emergency Plan: [O.4.a] {Appendix E, Section IV.F.1(b)(i)}
Section 2.O.4.a, "Directors, Managers, and Coordinators within the Station ERO," of the VCSNS Emergency Plan states that personnel indentified 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 this section. All personnel receive knowledge and/or performance based training initially and retraining thereafter on an annual basis.

Technical Evaluation: [O.4.a] {Appendix E, Section IV.F.1(b)(i)} The staff finds that the VCSNS Emergency Plan adequately describes the training program for instructing and qualifying directors, managers, and coordinators who will implement radiological emergency response plans. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.7 Training for Accident Assessment Personnel

Technical Information in the Emergency Plan: [O.4.b] {Appendix E, Section IV.F.1(b)(ii)}
Section 2.O.4.b, "Personnel Responsible for Accident Assessment," of the VCSNS Emergency

Plan states that 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 2.O.4.b.1, "Active Senior Licensed Control Room Personnel," describes the contents of the training program for control room personnel. Section 2.O.4.b.2, "Core Damage Assessment Personnel," discusses the training program for personnel responsible for performing core damage assessment during an emergency. These topics are covered on an annual basis. Section 2.O.4.b.2, "Core Damage Assessment Personnel," states that 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.

Technical Evaluation: [O.4.b] {Appendix E, Section IV.F.1(b)(ii)} The staff finds that the VCSNS Emergency Plan adequately describes specialized initial training for personnel responsible for accident assessment, including control room shift personnel. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.8 Training for Radiological Monitoring and Analysis Personnel

Technical Information in the Emergency Plan: [O.4.c] {Appendix E, Section IV.F.1(b)(iii)} Section 2.O.4.c, "Field Monitoring Teams and Radiological Analysis Personnel," discusses training of Field Monitoring Teams and Radiological Analysis Personnel. Section 2.O.4.c.1, "Field Radiological Monitoring," of the VCSNS Emergency Plan, states that the field monitoring teams will receive training in accordance with the applicant-approved training program. Content of the training program is also included. The program used to train personnel monitoring teams is discussed in Section 2.O.4.c.2, "Field Radiological Monitoring." The program used to train dose assessment personnel is discussed in Section 2.O.4.c.3, "Dose Assessment." All personnel receive knowledge and/or performance-based training initially and retraining thereafter on an annual basis.

Technical Evaluation: [O.4.c] {Appendix E, Section IV.F.1(b)(iii)} The staff finds that the VCSNS Emergency Plan adequately addresses the specialized initial training describing radiological monitoring and analysis personnel. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.9 Training for Fire Fighting Teams

Technical Information in the Emergency Plan: [O.4.d] {Appendix E, Section IV.F.1(b)(iv)} Section 2.O.4.d.1, "Local Police and Firefighting Personnel," states that local fire departments are invited to receive training as outlined in Section 2.O.1.a, "Assurance of Training," of the VCSNS Emergency Plan. Training for station fire brigade members is covered in Section 2.O.4.d.3, "Fire Brigade Teams," and is performed in accordance with training defined by the VCSNS Fire Protection Program. Section 2.N.2.b, "Fire Drills," of the VCSNS Emergency Plan states that fire drills are conducted as required by Section 9.5.1 of the VCSNS

COL FSAR. VCSNS COL FSAR Section 9.5.1.8.2.2, ~~-~~Fire Brigade Training," states that training is conducted by qualified individuals and consists of classroom instruction supplemented with periodic classroom retraining, practice in fire fighting, and fire drills.

Technical Evaluation: [O.4.d] {Appendix E, Section IV.F.1(b)(iv)} The staff finds that the VCSNS Emergency Plan adequately describes the specialized initial training for firefighting personnel. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.10 Training for Repair and Damage Control Teams

Technical Information in the Emergency Plan: [O.4.e] {Appendix E, Section IV.F.1(b)(v)} Training of Repair and Damage Control Teams is discussed in Section 2.O.4.e, ~~-~~Repair and Damage Control Teams." 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. The content of their training program is outlined in this section. All personnel receive knowledge and/or performance based training initially and retraining thereafter on an annual basis. Fifty percent of personnel from Operations, Radiation Protection, Chemistry, and/or Maintenance, who may respond to the OSC as damage control team members, are required to be qualified in the use of respiratory protection equipment.

Technical Evaluation: [O.4.e] {Appendix E, Section IV.F.1(b)(v)} The staff finds that the VCSNS Emergency Plan adequately describes the initial training for repair and damage control teams. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.11 Training for Local Emergency Management Personnel

Technical Information in the Emergency Plan: [O.4.g] {Appendix E, Section IV.F.1} Section 2.O.4.g, ~~-~~Local Support Service Personnel," of the VCSNS Emergency Plan states local support service personnel are invited to receive training described in Section 2.O.1.a and 2.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.

Technical Evaluation: [O.4.g] {Appendix E, Section IV.F.1} The staff finds that the VCSNS Emergency Plan adequately describes the initial training of local support services/emergency service personnel. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.12 Training for Medical Support Personnel

Technical Information in the Emergency Plan: [O.4.h] {Appendix E, Section IV.F.1(b)(vii)} Section 2.O.4.h, ~~-~~Medical Support Personnel," of the VCSNS 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.

Technical Evaluation: [O.4.h] {Appendix E, Section IV.F.1(b)(vii)} The staff finds that the VCSNS Emergency Plan adequately describes the initial training for medical support personnel. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.13 Training for Headquarters Support Personnel

Technical Information in the Emergency Plan: [O.4.i] {Appendix E, Section IV.F.1(b)(viii)} Section 2.O.4.i, ~~–~~EPIO Personnel," of the VCSNS Emergency Plan states corporate and station personnel responsible for disseminating EPI, responding to media, and public information requests receive public information training.

Technical Evaluation: [O.4.i] {Appendix E, Section IV.F.1(b)(viii)} The staff finds that the VCSNS Emergency Plan adequately describes the initial training for corporate support personnel who disseminate EPI. This is acceptable because it conforms to the guidance described in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.14 Training Related to the Transmitting Emergency Information

Technical Information in the Emergency Plan: [O.4.j] Section 2.O.4.j, ~~–~~Communications Personnel," of the VCSNS 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 annual requalification training.

Technical Evaluation: [O.4.j] The staff finds that the VCSNS Emergency Plan adequately addresses the specialized initial training described for emergency communicators. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.15.15 Training for Security Personnel

Technical Information in the Emergency Plan: {Appendix E, Section IV.F.1(b)(ix)} Section 2.O.4.d.2, ~~–~~Security Personnel," of the VCSNS Emergency Plan, states that training is performed as defined by the Station Orientation Training and VCSNS Security Program. All personnel receive knowledge and/or performance based training initially and retraining thereafter on an annual basis.

Technical Evaluation: {Appendix E, Section IV.F.1(b)(ix)} The staff finds that the VCSNS Emergency Plan adequately addresses the training described for security personnel. This is acceptable because it meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.16 Retraining of Emergency Response Personnel

Technical Information in the Emergency Plan: [O.5] {Appendix E, Section IV.F.1} Section 2.O.5, ~~–~~General, Initial, and Annual Training Program Maintenance," of the VCSNS Emergency Plan states the responsibility for training and retraining personnel belongs to the

station departments and Emergency Preparedness. Section 2.O.5.a, ~~–~~Station Responsibilities for Station ERO personnel," states that emergency support personnel retraining will use approved lesson plans. An annual review of assembly areas, ERF assignment, potential hazards, and anticipated actions are performed as part of a continued training program.

Section 2.O.5.b, ~~–~~Initial and Requalification ERO Training," provides the process used to ensure that personnel remain proficient in their duties. This includes retraining when necessary or once per year and participation in drills and exercises.

Section 2.O.5.c, ~~–~~Station Orientation Training (SOT)," states all unescorted and badged personnel will receive annual 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: [O.5] {Appendix E, Section IV.F.1} The staff finds that the VCSNS Emergency Plan adequately describes the provisions for retraining of personnel with emergency response responsibilities. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1 and meets the requirements of 10 CFR Part 50, Appendix E.

13.3C.15.17 Conclusions

The NRC staff concludes that the information provided in the VCSNS Emergency Plan regarding radiological emergency training is acceptable and meets the requirements of 10 CFR 50.47(b)(15) because it complies with the guidance in Planning Standard O of NUREG-0654/FEMA-REP-1 and the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.16 Responsibility for the Planning Effort

13.3C.16.1 Regulatory Basis

In determining whether the proposed emergency plan met the applicable regulatory requirements in 10 CFR 50.47(b)(16) for responsibility for the planning effort, the staff evaluated it against the detailed evaluation criteria in NUREG-0654/FEMA-REP-1. The staff also evaluated the proposed emergency plan against applicable regulatory requirements related to the area of "Responsibility for the Planning Effort," in Appendix E to 10 CFR Part 50.

13.3C.16.2 Training for Personnel Responsible for Planning Effort

Technical Information in the Emergency Plan: [P.1] Section 2.P.1, ~~–~~Emergency Preparedness Staff Training," of the 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: [P.1] The staff finds that the VCSNS Emergency Plan adequately describes the training that will be provided for individuals responsible for the planning effort. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.16.3 Person Responsible for Emergency Planning

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

Technical Evaluation: [P.2] The staff finds that the VCSNS Emergency Plan adequately identifies the individual, by title, with the overall authority and responsibility for radiological emergency response planning. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.16.4 Designation of an Emergency Response Coordinator

Technical Information in the Emergency Plan: [P.3] Section 2.P.3, ~~"~~Responsibility for Development and Maintenance of the Plan," of the VCSNS Emergency Plan states that 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, coordination of drills and exercises, maintenance of facilities and equipment, and ERO qualification and administration. The Vice President, Nuclear Operations will oversee the work of the Manager, Emergency Services and his or her 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: [P.3] The staff finds that the VCSNS Emergency Plan adequately designates an Emergency Planning Coordinator with responsibility for the development and updating of emergency plans and coordination of these plans with other response organizations. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.16.5 Update and Maintenance of the Emergency Plan

Technical Information in the Emergency Plan: [P.4] {Appendix E, Section IV.G} Maintenance of the emergency plan is discussed in Section 2.P.3, ~~"~~Responsibility for Development and Maintenance of the Plan." Section 2.P.4, ~~"~~Emergency Plan and Agreement Revisions," of the VCSNS 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. LOAs 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. Maintenance of equipment and supplies is discussed in Section 2.H.11, ~~"~~Facility and Equipment Readiness."

Technical Evaluation: [P.4] {Appendix E, Section IV.G} The staff finds that the VCSNS Emergency Plan adequately 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1, and meets the applicable requirements in Appendix E to 10 CFR Part 50.

13.3C.16.6 Distribution of Emergency Plans

Technical Information in the Emergency Plan: [P.5] Section 2.P.5, "Emergency Plan Distribution," of the VCSNS Emergency Plan states that emergency plans, unit annexes, and implementing procedures will be distributed to 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 2.P.4, "Emergency Plan and Agreement Revisions." The VCSNS Emergency Plan also states that revised pages will be dated and marked to show where changes have been made.

Technical Evaluation: [P.5] The staff finds that the VCSNS Emergency Plan adequately describes 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. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.16.7 Supporting Plans

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

Technical Evaluation: [P.6] The staff finds that the VCSNS Emergency Plan adequately describes the supporting emergency response plans. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.16.8 Emergency Plan Implementing Procedures

Technical Information in the Emergency Plan: [P.7] Section 2.P.7, "Implementing and Supporting Procedures," of the VCSNS Emergency Plan states that a listing, by title, of procedures used to implement the emergency plan and administrative procedures can be found in Appendix 3 of the VCSNS Emergency Plan. The listing includes the section(s) of the plan to be implemented by each procedure.

Technical Evaluation: [P.7] The staff finds that the VCSNS Emergency Plan adequately includes a listing of the procedures, by title that are required to implement the plan. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.16.9 Table of Contents and Cross-Reference Table

Technical Information in the Emergency Plan: [P.8] Section 2.P.8, "Cross-Reference to Planning Criteria," of the VCSNS Emergency Plan states that the format of the emergency plan is the same as NUREG-0654. In RAI 13.3-26(A)(2), the staff requested that a cross-reference to Appendix E to 10 CFR Part 50 be provided in the VCSNS Emergency Plan as specified in RG 1.206, "Regulatory Guide for Combined License Applications for Nuclear Power Plants." In its response, the applicant committed to add a cross-reference to Appendix E to 10 CFR Part 50 to Appendix 6. A new Table 1, "Emergency Preparedness Cross Reference Table," was included as an attachment to this response.

Technical Evaluation: [P.8] The staff finds the additional information and textual revisions submitted in response to RAI 13.3-26(A)(2) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1, and confirmed that Revision 1 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-26(A)(2). The staff finds that the VCSNS Emergency Plan adequately provides for a table of contents and a cross reference table to facilitate the use of the VCSNS Emergency Plan. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.16.10 Annual Independent Review of the Emergency Plan

Technical Information in the Emergency Plan: [P.9] Section 2.P.9, "Audit/Assessment of the Emergency Preparedness Program," of the VCSNS Emergency Plan states that 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; and, interfaces between VCSNS, the State, and county governmental agencies. The review includes the emergency plan, 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 Evaluation: [P.9] The staff finds that the VCSNS Emergency Plan adequately describes arrangements for and the conduct of independent reviews of the emergency preparedness program at least every 12 months. This is acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

13.3C.16.11 Quarterly Update of Emergency Telephone Numbers

Technical Information in the Emergency Plan: [P.10] Section 2.P.10, "Maintenance of Emergency Telephone Numbers," of the VCSNS Emergency Plan states that 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: [P.10] The staff finds that the VCSNS Emergency Plan adequately provides for updating telephone numbers in emergency procedures at least quarterly. This is acceptable because it conforms to the guidance provided in NUREG-0654/FEMA-REP-1.

13.3C.16.12 Conclusions

The NRC staff concludes that the information provided in the VCSNS Emergency Plan regarding the responsibility for EP is acceptable and meets the requirements of 10 CFR 50.47(b)(16) because it complies with the guidance in Planning Standard P of NUREG-0654/FEMA-REP-1, and the applicable portions of Appendix E to 10 CFR Part 50 as described above.

13.3C.17 Security-Based Event Considerations

13.3C.17.1 Regulatory Basis

NUREG-0800, Chapter 13.3, "Emergency Planning," specifies that applicants for a combined license address the Commission orders issued February 25, 2002, as well as any subsequent NRC guidance, to determine what security-related aspects of EP and preparedness are to be addressed in the emergency plan.

The Commission Orders issued February 25, 2002, and security-related enhancements identified in NRC Bulletin 2005-02, "Emergency Preparedness and Response Actions for Security-Based Events," identify the following areas to be addressed in the COL application, Emergency plan, or emergency plan implementing procedures:

1. Security-based Emergency Classification Levels and EALs - The emergency plan includes 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.

2. NRC Notifications - Notification procedures allow for NRC notification of safeguards events immediately after notification of local law enforcement agencies, or within about 15 minutes of the recognition of a security-based threat.

3. Onsite Protective Measures - Consideration has been given to a range of protective measures for site workers, as appropriate, during a security-based event (e.g., evacuation of personnel from target buildings, site evacuation by opening security

gates, dispersal of licensed operators, sheltering of personnel in structures away from potential site targets, and arrangements for accounting for personnel after attack).

4. ERO Augmentation - ERFs and alternative facilities have been identified to support the rapid response from ERO members to mitigate site damage from a security-based event once the site is secured. The alternative facilities could likely be located outside of the PA and should include the following characteristics: accessible even if the site is under threat or actual attack; communication links with the EOF, control room and plant security; the capability to perform offsite notifications; and the capability for engineering assessment activities, including damage control team planning and preparation. The alternative facility should also be equipped with general plant drawings and procedures, telephones, and computer links to the site.

5. Potential Vulnerabilities from Nearby Hazardous Facilities, Dams, and other Sites - The potential effect has been determined on the plant, onsite staffing and augmentation, and onsite evacuation strategies from damage to nearby hazardous facilities, dams, and other nearby sites, in consideration of a security-based event.

6. Drills and Exercises - Emergency Preparedness drill and exercise programs maintain the key skills necessary for mitigating security-based events. The ERO demonstrates security-based emergency preparedness program activities under the schedule as committed to in its emergency plans.

7. Emergency Preparedness and Response to a Security-based Event - Onsite staffing, facilities, and procedures are adequate to accomplish actions necessary to respond to a security-based event, and the emergency plan and/or procedures reflect the site-specific needs.

13.3C.17.2 Security-Based Emergency Classification and Emergency Action Levels

Technical Information in the Emergency Plan: (NUREG-0800) Emergency classifications for security or hostile action-based events are included in the EALs addressed in Section 13.3C.4 of this SER.

Technical Evaluation: (NUREG-0800) The staff‘s evaluation is also included in Section 13.3C.4 of this SER.

13.3C.17.3 NRC Notification

Technical Information in the Emergency Plan: (NUREG-0800) Notification requirements are addressed in Section 13.3C.5.8, ‗Notification to the NRC.”

Technical Evaluation: (NUREG-0800) The staff‘s evaluation is also included in Section 13.3C.5.8 of this SER.

13.3C.17.4 Onsite Protective Measures

Technical Information in the Emergency Plan: (NUREG-0800)

Section 2.J.6, "Protective Measures," of the VCSNS Emergency Plan addresses protective measures in the event of a hostile attack against the site. Section 2.J.6, ―Protective Measures," states that in the event of a hostile attack against the site, conditions may dictate initiation of protective measures other than personnel assembly, accountability and evacuation. The Emergency Coordinator will make decisions regarding appropriate protective measures based on evaluation of site conditions, including input from the security force. If, based on the judgment of the Emergency Coordinator, personnel assembly, accountability, and evacuation may result in undue hazards to site personnel; the Emergency Coordinator may direct other protective measures, including:

- evacuation of personnel from areas and buildings perceived as high-value targets
- site evacuation by opening, while continuing to defend security gates
- dispersal of key personnel
- onsite sheltering
- staging of ERO personnel in alternate locations pending
- restoration of safe conditions
- implementation of accountability measures following restoration of safe conditions

Technical Evaluation: (NUREG-0800)

The staff finds the VCSNS Emergency Plan adequately describes onsite protective measures necessary to respond to a security event. This is acceptable because it meets the guidance in NUREG-0800.

13.3C.17.5 Emergency Response Organization Augmentation

Technical Information in the Emergency Plan: (NUREG-0800) ERO augmentation is addressed in Sections 2.E.2, ―Notification and Mobilization of Emergency Response Personnel Measures," 2.H.5, ―Activation," and 2.N.2, ―Drills," in the VCSNS Emergency Plan. In RAI 13.3-50(1), the staff requested additional information to address alternate ERO facilities to be used during security-based events. In its response, the applicant stated that a statement will be added to the VCSNS Emergency Plan to indicate that the EOF is designed to be an alternate facility to support response to a hostile-action event. The VCSNS EOF is designed to support a remote TSC and OSC in the event of an emergency which limits access to the site. This item is identified as **Confirmatory Item 13.3-6**, pending NRC review and approval of the revised VCSNS COL application. Implementing procedures will provide guidance for notifying the ERO to respond to the EOF instead of the site in the event of a hostile action, which limits access to the site. These procedures will be developed according to Emergency Planning ITAAC Section 9.0. In addition, the applicant's response to RAI 13.3-50(2) stated that the VCSNS Emergency Plan, Part 2, Section 2.J, ―Protective Response," describes protective actions and protective measures to safeguard the health and safety of onsite personnel and the general public during an emergency. Section 2.J.5, ―Accountability," describes the personnel accountability process and incorporates decision making during a security event. During a security event, conditions may dictate initiation of protective measure other than personnel

evacuation, assembly and accountability. The ED makes decisions regarding appropriate protective measures based on evaluation of site conditions, including input from Security. The ED may direct other protective measures if personnel evacuation, assembly and accountability may result in undue hazards to site personnel. In addition, Section 2.B, ―Emergency Response Organization," addresses command and control for any site-wide emergency, such as a security-based event and Section 2.H, ―Emergency Facilities and Equipment," states that Unit 1 will take the lead for any site-wide event. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: (NUREG-0800) The staff finds, pending resolution of **Confirmatory Item 13.3-6** that the VCSNS Emergency Plan adequately describes onsite protective measures, including ERO augmentation, necessary to respond to a security event. This is acceptable because it meets the guidance in NUREG-0800.

13.3C.17.6 Potential Vulnerabilities from Nearby Hazardous Facilities, Dams, and Other Sites

Technical Information in the Emergency Plan: (NUREG-0800) The assessment of other nearby hazards that could potentially affect the safety of the VCSNS facility was not addressed in the VCSNS Emergency Plan. In RAI 13.3-50(2) the staff requested additional information concerning other nearby hazards that could cause a security-based event. In its response, the applicant stated that in VCSNS COL FSAR Chapter 2 discusses external events from nearby hazardous facilities. As stated in FSAR Section 2.2.2, the only industrial facilities located within 5 miles of the proposed VCSNS Units 2 and 3 site are: VCSNS Unit 1, Fairfield Pumped Storage Facility, Parr Hydro and Parr Combustion Turbines. These facilities are owned and operated by SCE&G. FSAR Figure 2.2-203 shows the locations of these SCE&G facilities relative to VCSNS Units 2 and 3.

Technical Evaluation: (NUREG-0800) The staff finds the VCSNS Emergency Plan adequately describes the assessment of other nearby hazards that could potentially affect the safety of the VCSNS facility. This is acceptable because it meets the guidance in NUREG-0800.

13.3C.17.7 Security-Based Drills and Exercises

Technical Information in the Emergency Plan: (NUREG-0800) The VCSNS Emergency Plan did not specifically address security-based drill or exercises. In RAI 13.3-50(3), the staff requested additional information on the security-based drill and exercise program. In its response, the applicant stated Section 2.N, ―Drill and Exercise Program," addresses drills and exercises that are conducted to evaluate emergency response capabilities, including demonstration of emergency response to a security-based threat as required by NRC Bulletin 2005-02. Details describing conduct of drills and exercises are located in the Emergency Plan Implementing Procedures. This procedure must be developed to meet the EP ITAAC Section 9.0 acceptance criteria. The staff's technical evaluation of EP ITAAC is addressed in Section 13.3C.19 of this SER.

Technical Evaluation: (NUREG-0800) The staff finds the VCSNS Emergency Plan adequately describes the security-based drill and exercise program. This is acceptable because it meets the guidance in NUREG-0800.

13.3C.17.8 Emergency Preparedness and Response to a Security-Based Event

Technical Information in the Emergency Plan: (NUREG-0800) The VCSNS Emergency Plan did not specifically address the security-based event in the Emergency Preparedness Program. In RAIs 13.3-50(1), (2), and (3), the applicant was requested to provide additional information on the overall emergency preparedness program as it relates to security-based events. In its response, the applicant indicated where security-based responses were stated, where implementing procedures would be developed and identified changes to the VCSNS Emergency Plan. This item is identified as **Confirmatory Item 13.3-7**, pending NRC review and approval of the revised VCSNS COL application.

Technical Evaluation: (NUREG-0800) The staff finds, pending resolution of **Confirmatory Item 13.3-7**, that the VCSNS Emergency Plan adequately describes the emergency preparedness and response to a security-based event program. This is acceptable because it meets the guidance in NUREG-0800.

13.3C.17.9 Conclusions

The NRC staff concludes, pending resolution of **Confirmatory Items 13.3-6 and 13.3-7**, that the VCSNS Emergency Plan adequately addresses the preparation and response to security-based events program. This is acceptable because it meets the guidance in NUREG-0800.

13.3C.18 Evacuation Time Estimate (ETE) Analysis

The VCSNS Emergency Plan includes an analysis of the time required to evacuate the plume exposure pathway EPZ. The report titled ~~"~~Virgil C. Summer Nuclear Station Development of Evacuation Time Estimates," dated August 2007, (ETE Report) was provided as a separate document in the COL application as Appendix 5, "Evacuation Time Estimate Study. The Pacific Northwest National Laboratory and the Sandia National Laboratory assisted the staff in performing a technical review of the ETE Report. The ETE Report includes analyses and responses to RAIs that provide the basis for the NRC staff's conclusions as to the adequacy of its content and conformity with Appendix 4 to NUREG-0654/FEMA-REP-1.

13.3C.18.1 Regulatory Basis for the ETE Analysis

The staff considered the following regulatory requirements and guidance in the review of the evacuation time estimate analysis:

- 10 CFR 52.79(a)(21) refers to Appendix E to 10 CFR Part 50, Section IV, of which ~~"~~Content of Emergency Plans," 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 staff evaluated the ETE Report 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 used in determining whether the ETE analysis meets the applicable regulatory requirements in Appendix E to 10 CFR 50.

13.3C.18.2 Introductory Materials Related to the ETE Report

Technical Information in the ETE Report: [Section I of Appendix 4] Section 1, "Introduction," provides a basic description of the process used to estimate evacuation times. A simple description, with map (Figure 1-1, "VC Summer Nuclear Station Site Location"), of the EPZ and surrounding area is provided. Additional information regarding the lack of elevations, surrounding communities, and political boundaries on the map was requested in RAI 13.3-3. In its response, the applicant provided a revised Figure 1-1 that includes labels for the lakes, rivers, and communities in the area. The applicant also provided a revised Figure 1-2 in a larger scale that includes sector, quadrant, and county boundaries. Major roadways, communities, lakes, and rivers have also been labeled. Figures 3-1 and 6-1 were also revised to include county boundaries.

Section 2, "Study Estimates and Assumptions," provides the basis for the population data estimates used in the ETE. Population estimates are based on the 2000 census using the ArcGIS software and the block centroid method. Additional information was requested in RAI 13.3-2(A) to resolve differences in population estimates between the ETE Report, the Environmental Report (ER), and the FSAR. In its response, the applicant stated that ER Section 2.5.1.1 uses a 10-mile radius centered at proposed new Units 2 and 3 to estimate its population. The ETE Report uses a 10-mile radius centered at the existing Unit 1. The EPZ also excludes some areas of the 10-mile zone while including others. These two factors account for the differences in population estimates between the ETE and the ER.

Estimates of employee and special facility populations are based on data provided by county emergency management officials. Auto occupancy factors are based on a statistical analysis of data acquired from a telephone survey. Additional assumptions regarding the development of population estimates, including pass-through populations and regional employees, are provided in Section 3, "Demand Estimation," and Appendix E, "Special Facility Data." Assumptions about transit-dependent and special populations are provided in Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates," and Appendix E. Development of trip generation times from survey responses is described in Section 5, "Estimation of Trip Generation Times."

Twelve study assumptions used as the basis for the ETE are provided in Section 2.3, "Study Assumptions." The study assumes that everyone will evacuate according to assigned routes. Schools are to be notified in advance of the general population and are given priority for use of transportation resources. Additional information was requested in RAI 13.3-4(A) with regard to the Assumption #3 concerning the evacuation of school prior to the notification of the general public. In its response, the applicant stated that Assumption #3 does not influence the calculation or results for the ETE and is not feasible under the ETE planning basis. This assumption will be removed in future revisions of the ETE Report. This section will now read:

> 67 percent of households in the EPZ have at least one commuter, 78 percent of which await the return of a commuter before beginning their evacuation trip, based on the telephone survey results.

Buses not being used for school evacuation will be used to transport those without access to private vehicles. Fifty-percent of these people are assumed to ride-share with neighbors or friends. Traffic control points (TCPs) and access control points (ACPs) will be established to aid the flow of traffic out of the plume exposure pathway EPZ. Additional information was requested in RAI 13.3-4(B) and (C) to determine what effect traffic control will have on evacuation time. In its response, the applicant stated that ETE calculations do not rely on any of the traffic control measures identified in Appendix G, –Traffic Management," to enhance or expedite the evacuation. However, the use of TCPs will aid in expediting the movement of transit resources and help with the surveillance of the evacuation operation. The estimates of capacity (Appendix K, –Evacuation Roadway Network Characteristics,"), which are used by the IDYNEV model, are based on the factors described in Section 4 and observations made during the road survey. Capacity estimates are not enhanced nor compromised by the establishment of a TCP at an intersection. The TCPs are to facilitate evacuating traffic movements and discourage travelers from moving closer to the VCSNS. Personnel will also serve a surveillance function to inform the EOC of any problems. Figure 1 of the ETE shows that evacuation is dictated by the mobilization time. The short travel times indicate there is not pronounced traffic congestion within the EPZ. The establishment of TCPs to manage traffic congestion is not necessary; but recommended. There would be no effect on ETE if traffic control points were not established. Thus, the applicant stated that no changes to the ETE are needed due to lack of resources or the regions being evacuated.

Adverse weather is also considered as part of this study. Additional information on the effect of adverse weather was requested in RAI 13.3-4(D). In its response, the applicant stated that the "No Effect" in the table on page 2-5 refers to the mobilization time for the general population. The name of the final column will be changed to "Mobilization Time of the General Population" for clarification. The only portion of this mobilization that involves driving is the time to return home. This occurs prior to the onset of congestion. Reduction in free speed due to weather would not increase travel time. The mobilization times discussed in Section 8 are for transit - dependent persons, schoolchildren, special facility populations, and those without private vehicles. The majority of this time is spent driving; as a result, the reductions of 10 percent in capacity and in speed for rain are assumed to add a total of 10 minutes to the mobilization time, as discussed on page 8-5 of the ETE.

An outline of the approach to estimating the ETE is presented in the Introduction section of the ETE analysis, with a link-node map, Figure 1-2, –V.C. Summer Link-Node Analysis Network," of the highway network developed through the use of Geographic Information System (GIS) mapping software and field observations. Details of the link-node map are presented in Appendix K, –Evacuation Roadway Network Characteristics." The IDYNEV system was used to analyze the highway network to determine routes used for evacuation and estimate evacuation times. A description of the IDYNEV system and associated sub-models is provided in Section 1.3, –Preliminary Activities." The IDYNEV system consists of several submodels - a macroscopic traffic simulation model, an intersection capacity model, and a dynamic, node-centric routing model that adjusts the "base" routing in the event of an imbalance in the levels of congestion on the outbound links. Another model of the IDYNEV System is the traffic

assignment and distribution model, which integrates an equilibrium assignment model with a trip distribution algorithm to compute origin-destination volumes and paths of travel designed to minimize travel time. A discussion of algorithms used is provided in detail in Section 4, ~~"E~~Estimation of Highway Capacity." Additional information on algorithms used in the estimations was requested in RAIs 13.3-5(A), (B), (C) and 13.3-11(C). In RAI 13.3-5(A), the staff requested additional information related to algorithms used by the traffic models. In its response, the applicant stated that information related to models is provided under the "Analytical Tools" sub-heading, and in Appendices B through D of the ETE Report. Further detail of the PC-DYNEV simulation model is found in NUREG/CR-4873, "Benchmark Study of the IDYNEV Evacuation Time Estimate Computer Code," and NUREG/CR-4874, "The Sensitivity of Evacuation Time Estimates to Changes in Input Parameters for the IDYNEV Computer Code." Additional references to papers describing other algorithms are provided as a footnote on page 4-2 of the ETE.

In RAI 13.3-5(B), the staff requested that the applicant provide a discussion of the ~~"v~~various known factors," mentioned on page 4-2. In its response, the applicant provided a discussion of the process used to determine the value of variables described in Section 4. The applicant stated that the values of the variables in the intersection algorithm in Section 4 were derived by applying the IDYNEV System as an analysis tool rather than as a single "pass-through" calculation of an ETE. This tool was used to identify points of congestion and locations where TCPs could be helpful to the evacuating public. Simulation results were analyzed to identify locations where the green time was specified to realistically service the competing traffic volumes under evacuation conditions. The model was executed iteratively to provide assurance that the allocation of "effective green time" appropriately represents the operating conditions of an evacuation. (Note: Green Time is vehicle movement in/through an intersection.) The mean queue discharge headway in seconds per vehicle is equal to 3600 sec/hr - saturation flow rate, expressed in vehicles per hour. Saturation flow rates are presented in Appendix K, ~~"E~~Evacuation Roadway Network Characteristics," based on the field survey and the Highway Capacity Manual (HCM) guidance. Examination of Appendix K shows that some of the highway links have a saturation flow rate of 1895 vehicles per hour per lane, exceeding the 1700 vehicles per hour per lane suggested by the HCM 2000. A sensitivity study was run reducing the capacity of these links to 1700 vehicles per hour per lane. Figure 1 attached to this response indicates that the ETE is unaffected by this change. Chapters 10, 16, 17, and 31 of the 2000 HCM were also cited as a reference for additional information.

In RAI 13.3-5(C), the staff requested additional information related to an intersection equation used in the ETE Report. In its response, the applicant stated that the equation presented on page 4-1 of the report applies to signalized and to manually-controlled intersections. No allowance is made for TCP operations. Figure 1, submitted with the response to RAIs 13.3-4 and 13.3-3(B), shows that the mobilization time distribution, not congestion or traffic control, dictates evacuation time. When there are competing traffic movements at an intersection or juncture, the space must be time shared in order to afford safe passage. This process is implemented in the simulation model by the analyst determining the allocation of effective green. Competing traffic flows may be delayed at the intersection influencing the travel time. Figure 7-4 submitted with the RAI response, illustrates the resulting queuing that can take place as a result of this process when the traffic demand exceeds intersection capacity.

In RAI 13.3-11(C) the staff requested the applicant provide information related to the reduction factor, "R," used in an equation. In its response, the applicant provided a reference to a study performed by Zhang and Levinson. The reference indicates that the variation of queue discharge flow (QDF) at a location is generally in the range of +/- 5 percent about the average QDF. The lower tail of this distribution would be equivalent to a capacity reduction factor of 0.90 - 0.05 = 0.85. which is the figure applied by the IDYNEV system. The ETE Report takes a conservative view in estimating the capacity at bottlenecks when congestion develops by applying a factor of 0.85 only when flow breaks down, as determined by the simulation model. The applicant has provided a revision to page 4-4 that includes a reference to the Zhang and Levinson study.

Further details on the use of traffic models are provided in Appendix C, "Traffic Simulation Model: PC-DYNEV," and Appendix D, "Description of Study Procedure." Because this ETE study supersedes an earlier study performed in 1981 for the existing reactor at the VCSNS site, a list of differences in the approaches is provided in Section 1.4, "Comparison with Prior ETE Study."

Technical Evaluation: [Section I of Appendix 4] The ETE Report includes a map showing the proposed site and plume exposure pathway EPZ, as well as transportation networks, topographical features, and political boundaries. The boundaries of the EPZ, in addition to the evacuation subareas within the EPZ, are based on factors such as current and projected demography, topography, land characteristics, access routes, and jurisdictional boundaries. The EPZ is subdivided into 13 protective action zones (PAZ) that are readily identifiable by local rivers, roads, or other landmarks to the public using them.

The ETE Report describes the method of analyzing the evacuation times. A general description of the evacuation model was provided including the assumptions used in the evacuation time estimate analysis.

The staff finds the clarifications and additional information submitted in response to RAIs 13.3-2(A), 13.3-4(B) and (C), and 13.3-5(A) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1.

In response to RAI 13.3-3, the applicant has provided revised Figures 1-1, 3-1 and 6-1 regarding the VCSNS site location and Protective Action Zones. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-3 to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-3.

In response to RAI 13.3-4(A), the applicant has committed to remove Assumption #3 regarding evacuation movements from Section 2.3 and to revise the text accordingly. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-4(A) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-4(A).

In response to RAI 13.3-4(D) the applicant has revised the final column in the table on page 2-5 to "Mobilization Time of the General Population" for clarification. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-4(D) to be acceptable because they clarify the table. This revision conforms to the guidance in NUREG-0654/FEMA-REP-1 and the staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-4(D).

In response to RAI 13.3-5(B), the applicant has committed to change Saturation Flow Rates in Appendix K from 1895 to 1714. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-5(B) to be acceptable because they clarify the table. This revision conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-5(B).

In response to RAI 13.3-11(C), the applicant has committed to add a reference to the Zhang and Levinson study to page 4-4. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-11(C) to be acceptable because the applicant clarified the mathematical formulas used in the ETE Analysis. This revision conforms to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-11(C).

In response to RAI 13.3-5(C), the applicant provided a discussion of the variables for the intersection algorithm in Section 4, ~~E~~estimation of Highway Capacity," which states that the model was executed iteratively to provide assurance that the allocation of effective green time appropriately represents the operating conditions. The response to RAI 13.3-5(C) discusses that this iterative procedure represents a reasonably efficient operation under evacuation conditions. This approach is appropriate, if the traffic control is in place to support a reasonably efficient operation under evacuation conditions. In RAI 13.3-10(B), the staff asked for clarification regarding how the ETE model addressed the movement of vehicles through traffic control intersections and how the traffic management strategy affected ETE calculations. However, the response to RAI 13.3-5(C) indicates that the ETE does, to some extent, rely on traffic control being in place to represent reasonably efficient operation under evacuation conditions. In its response the applicant provided additional clarifying information and advised that the corrections to the ETE had been reviewed and agreed upon by local and state authorities. The staff finds the additional information and textual revisions submitted in response to RAIs 13.3-5(C) and 13.3-10(B) to be acceptable because they clarify the textual information. This revision conforms to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-10(B). Therefore, the staff finds that description of the process used to estimate evacuation times is acceptable because it conforms to the guidance in Section I of Appendix 4 to NUREG-0654/FEMA-REP-1.

13.3C.18.3 Demand Estimation

Technical Information in the ETE Report: [Section II of Appendix 4] Section 3, ~~D~~emand Estimation," provides an estimate of demand expressed in terms of people and vehicles. The

permanent resident population to conduct the ETE analysis was projected out to 2007 by comparing the local 2005 census assessment with the 2000 official census to obtain growth rates for each county. Additional information was requested in RAI 13.3-2(C) to resolve differences in population growth rates between the ETE Report and the U.S. Census. In its response, the applicant stated that data was obtained from the U.S. Census Bureau website at http://quickfacts.census.gov on November 1, 2006, and December 12, 2008. Annual growth rates calculated for each county were based on these population estimates. Comparisons with estimates in the ER show that they are in agreement.

Based on information obtained in a telephone survey, the permanent resident average household size is estimated at 2.68 persons per household with 1.49 vehicles per household. Estimates of the permanent resident population and their vehicles are presented for each of the 13 PAZs in Table 3-2, "Permanent Resident Population and Vehicles by PAZ," and by polar coordinate representation in Figures 3-2, "Permanent Resident by Sector," and Figure 3-3, "Permanent Resident Vehicles by Sector." In RAI 13.3-2(D)(1-4), the staff requested that the applicant explain differences in population estimates between the ETE Report and State and local plans. In its response, the applicant stated that populations in the ETE Report use the 2000 U.S. Census "blockpop" GIS point shapefile. A description for the use of this system in estimating the 2007 PAZ populations was provided. Data used in the Richland County and Lexington County Emergency Response Plans are based on the estimates made in 1993 based on the 1990 census data. The ETE Report is based on 2007 estimates.

The transient population estimate is based on data provided by South Carolina Department of Parks, Recreation, and Tourism (SCDPRT). It is estimated that 320 people could be recreating within the VCSNS plume exposure pathway EPZ on a peak day. Of these, 90 percent are residents and 10 percent transients. A conservative value of 20 percent was applied to the transient population with an increase of 12 persons to account for rounding. The resultant transient population is 76 persons. Individual activity vehicle occupancy factors were used to estimate average vehicle occupancy of 2.14 transient per vehicle. Estimates of the transient population and their vehicles are presented by polar coordinate representation in Figures 3-4, "Transient Population by Sector," and Figure 3-5, "Transient Vehicles by Sector." In RAI 13.3-7(A), the staff requested additional information on increases in the transient populations due to local holiday celebrations. In its response, the applicant stated that a sensitivity study was conducted to assess the impact on ETE of the influx of transients for the Chapin Labor Day Festival. There are 10,000 people present during peak times at the festival of which 20 percent are transients. The results of the sensitivity study indicate that the ETE for the entire EPZ (Region R03) is not affected by the influx of transients for the festival. The results of this study were included in a draft of the revised Appendix I. The applicant included the new results in the ETE Report.

Employees who commute to jobs within the plume exposure pathway EPZ are assumed to evacuate along with the permanent resident and transient populations. Only two major employers, Virgil C. Summer Nuclear Station and Ellett Brothers-Sporting Goods Equipment Distributors, are within the plume exposure pathway EPZ. Vehicle occupancy of 1.01 is used for the employee population. Estimates of the employee vehicles are presented by polar coordinate representation in Figures 3-7, "Employee Vehicles by Sector." In RAI 13.3-7(B), the staff requested that the applicant provide Figure 3-6, "Employee Population by Sector," which

was omitted. In its response, the applicant updated the ETE which identifies the employee population by sector.

One special event scenario, Scenario 12, is included. Scenario 12 represents the peak construction period for Units 2 and 3 during a typical summer, midweek, and midday, under good weather conditions. The peak construction period is estimated by SCE&G to begin in the year 2014. Population estimates for permanent residents and transients were extrapolated out to 2014, based on county growth rates. An estimated 3,600 workers and their vehicles were also included in Scenario 12. Additional information regarding population projections for the construction period was requested in RAI 13.3-2(B). In its response, the applicant stated that only the permanent resident and shadow populations were extrapolated to 2014. It is assumed that no major transient attractions or major employers would be introduced between 2007 and 2014, so these population estimates were not extrapolated. The 2014 permanent resident populations are estimated to be 12,470 using county-specific growth rates. The estimated shadow population would be 44,096.

Permanent residents, transients, and employees make up the general population. Vehicles traveling through the plume exposure pathway EPZ (external-external trips) are assumed to continue to enter during the first 60 minutes following an accident. Subsequently, none enter and those remaining will evacuate with the general population. Population estimates for special facilities and people without personal vehicles are provided in Section 8, ~~–~~Transit-Dependent and Special Facility Evacuation Time Estimates." There are seven pre-schools, five elementary schools, two middle schools and three high schools within the plume exposure pathway EPZ. In RAI 13.3-8(A), the staff requested that the applicant explain the use of pre-schools in the ETE. In its response, the applicant stated that vehicles used to pick up these children were included. The mobilization time estimates also include picking up children at day care centers. Table 1 summarizes the transportation assets for each day care center, based on a survey of these facilities. Some of the larger day care centers have vans or buses that can be used to evacuate children not picked up in a timely manner. Adding these vehicles will not impact the ETE of the general population. The applicant has committed to including a discussion of day care facilities in Section 8.3 in a future revision of the ETE Report. This section will include the following paragraph:

> Day-care centers are neighborhood facilities that service local children that are dropped off in the morning and picked up subsequently by parents or designees. Since the estimated resident vehicle population is based on household size and on vehicles per household, the vehicles used to pick up these children for evacuation have already been included in the estimate of evacuating vehicles. The mobilization time estimates (Section 5) are based on the telephone survey which reflects the daily activities of EPZ residents, including the picking up of children. Therefore, separate ETE are not provided for day-care centers. A survey of day-care centers within the EPZ was conducted: some of the larger day care centers have vans or buses. While this transport is not capable of servicing all children at these facilities, they can be used to evacuate any children not picked up in a timely manner.

There is only one special care facility, Generations of Chapin Nursing Home, within the 10-mile plume exposure pathway EPZ. There are no hospitals or jails located within the EPZ. The staff

requested additional information on special needs individuals in the area in RAI 13.3-8(C). In its response, the applicant stated that recent communication with the counties has yielded data concerning registered homebound special needs population within the VCSNS EPZ. Based on capacities, the applicant identified transportation resources necessary to evacuate the homebound special needs population. The EPZ counties are parties to the South Carolina state-wide mutual aid agreement, which outlines procedures and policies regarding the delivery of ambulances, wheelchair vans and buses. If a county lacks sufficient resources, they will be provided through this state-wide agreement. The applicant submitted additional information related to the evacuation of special needs persons that revised Section 8.4, "Special Needs Population."

A separate map is provided indicating recreational areas in Appendix E, ~~"S~~Special Facility Data." In RAI 13.3-8(B), the staff requested that the locations of special facilities be added to this map. In its response, the applicant stated that the figure on page E-8 of the ETE Report will be renamed Figure E-1, ~~"R~~Recreational Areas within the VCSNS EPZ." The figure has been updated to include the names of the recreational areas and was enclosed with this response. Figure E-2, ~~"S~~Schools within the VCSNS EPZ," and Figure E-3, ~~"M~~Major Employers, Medical Facilities and Day Care Centers within the VCSNS EPZ," were also included and were added to Appendix E, pages E-9 and E-10, respectively. Figures E-1, E-2, and E-3 collectively provide the locations of all special facilities relative to the location of the VCSNS site.

Telephone survey results (reported in Appendix F, ~~"T~~Telephone Survey") are used to estimate the portion of the population requiring transit service. The transit-dependent population includes persons in households without vehicles and persons in households whose vehicles are unavailable at the time of evacuation due to commuter use. In RAI 13.3-6, the staff requested additional information to clarify the inconsistent use of the percentage of households with commuters. In its response, the applicant stated that the results of the telephone survey indicate that 67 percent of households have at least one commuter. The value of 33 percent is the number of households that do not have a commuter, as indicated in column 3 of Table 6-3. The telephone survey further indicates that 78 percent of those households with a commuter will await the return of the commuter prior to evacuating. The number of households with a commuter who will not await the return of the commuter is 22 percent. This value was used to estimate the number of transit-dependent persons in the EPZ, as shown in the formula on Section 8. The applicant revised Section 2.3 to read:

> It is further assumed that 67 percent of households in the EPZ have at least one commuter, 78 percent of which await the return of a commuter before beginning their evacuation trip, based on the telephone survey results.

It is assumed that half of the 444 estimated people without transportation would ride-share with friends or neighbors, but that a residual 222 persons would require assistance to evacuate. Additional information regarding the estimation of this population group was requested in RAI 13.3-8(D) and (E). In RAI 13.3-8(D), the staff requested that the applicant clarify whether employees and transients were considered in the transit-dependent population estimate as stated in the text. In its response, the applicant stated that the study assumes all transients and employees will have private vehicles available for evacuation due to the lack of mass transit services. Therefore, employees and transients will not require transit resources for evacuation. The first paragraph of Section 8 was revised to reflect this assumption.

In RAI 13.3-8(E), the staff requested that the applicant clarify the value used to represent the number of households with two vehicles. In its response, the applicant stated that the data in Table 8-1, "Transit Dependent Population Estimates," showing that 38.5 percent of households have two vehicles are accurate. The 58 percent shown in the calculation on page 8-3 is a typographical error. However, the results of the calculations shown in the second and third lines of the equation are correct. The applicant has revised the equation and text on page 8-3 to reflect the correct value of 38.5 percent.

The total number of people expected to evacuate for each scenario and vehicles to be used is discussed in Section 6, "Demand Estimation for Evacuation Scenarios." The VCSNS plume exposure pathway EPZ contains 13 PAZs with boundaries along major roads or rivers. The boundary definitions are provided in Appendix L, "Protective Action Zone Boundaries." Evacuation will be performed by regions that include multiple PAZs. These regions approximate (by radius/area): two miles/four 90-degree sectors, five miles/four 90-degree sectors, 10-miles (EPZ)/four 90-degree sectors, and 10-miles (EPZ)/entire EPZ. A description of the evacuation regions and their associated PAZs can be found in Table 6-1, "Description of Evacuation Regions."

A description of the evacuation scenarios used for this study can be found in Table 6-2, "Evacuation Scenario Definitions." The percentages of population groups expected to evacuate for each scenario are described in Table 6-3, "Percentage of Population Groups for Various Scenarios." Additional information on Table 6-3 was requested in RAI 13.3-9(B). In its response, the applicant stated that the numbers presented in Table 6-4, "Vehicle Estimates by Scenario," are for evacuation of the full EPZ. Voluntary evacuation percentages are not applied in obtaining the numbers in Table 6-4 because all PAZs evacuate 100 percent. The vehicle totals represent the upper bound of vehicles evacuating for a given scenario. The applicant has provided Table H-1, "Percent of ERPA Population Evacuating for Each Region," which identifies the voluntary evacuation percentages for each PAZ for each Regional configuration. This table was added to Appendix H.

Technical Evaluation: [Section II of Appendix 4] The ETE Report provides an estimate of the number of people who may need to evacuate. Three population segments are considered: permanent residents, transients, and persons in special facilities. The permanent population is adjusted for growth, and the population data is translated into two groups: those using automobiles and those without automobiles. The number of vehicles used by permanent residents is estimated using an appropriate automobile occupancy factor. In addition, evacuation time estimates for simultaneous evacuation of the entire plume exposure pathway EPZ were determined.

Estimates of transient populations were developed using local data including peak tourist volumes and employment data. Estimates for special facility populations are also provided. The subareas, for which evacuation time estimates were determined, encompass the entire area within the plume exposure EPZ. The maps are generally adequate for the purpose, and the level of detail is approximately the same as United States Geological Survey (USGS) quadrant maps. The assumptions on evacuation are based on simultaneous evacuation of inner and outer sectors. The staff finds the clarifications submitted in response to RAI 13.3-2(C)

and (D)(1-4) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1.

In response to RAI 13.3-7(A), the applicant provided a revision to Appendix I, ~~–~~Evacuation Sensitivity Studies," to include an analysis of the effect of transient influx due to the Chapin Festival. The applicant also provided a new Table I-1, Evacuation Time Estimates for Trip Generation Sensitivity Study," and Table I-3, ~~–~~Evacuation Time Estimates for Evacuating Vehicles per Household Sensitivity Study". The staff finds the additional information and textual revisions submitted in response to RAI 13.3-7(A) regarding the effect of population flux due to special events to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-7(A).

In response to RAI 13.3-7(B), the applicant provided Figure 3-6, ~~–~~Employee Population by Sector," which was omitted from the ETE Report. The applicant also provided a new Table I-1, ~~–~~Evacuation Time Estimates for Trip Generation Sensitivity Study," and Table I-3, ~~–~~Scenario 3 (Base) and Scenario 14 (Labor Day Festival) ETE for Region 3." The staff finds the additional information and textual revisions submitted in response to RAI 13.3-7(B) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-7(B).

In response to RAI 13.3-8(A), the applicant provided revised text for Section 8.3 to discuss the evacuation of day-care centers. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-8(A) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-8(A).

In response to RAI 13.3-8(C), the applicant provided revised text for Section 8 to discuss the evacuation of special needs individuals that will be included in a new Section 8.4, ~~–~~Special Needs Population," on page 8-8. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-8(C) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-8(C).

In response to RAI 13.3-8(B), the applicant provided revised Figure E-1 and new Figures E-2 and E-3 to identify special facilities in the EPZ. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-8(B) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-8(B).

In response to RAI 13.3-6, the applicant provided a revision to the text in Section 2.3 to address the number of households that have commuters. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-6 to be acceptable because they conform to

the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-6.

In response to RAI 13.3-8(D), the applicant provided a revision to the first paragraph in Section 8 to omit the statement about the use of transit resources by transients and employees. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-8(D) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-8(D).

In response to RAI 13.3-8(D), the applicant provided a revision to the text and equation on page 8-3 that incorrectly identified a value of 58 percent instead of 38.5 percent. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-8(D)(2) be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-8(D)(2).

In response to RAI 13.3-9(B), the applicant provided a new Table H-1 which identifies the voluntary evacuation percentages for each PAZ for each Regional configuration. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-9(B) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-9(B).

In response to RAI 13.3-2(B), the applicant stated that the ETE Report assumes that no major transient attractions or major employers would be introduced between 2007 and 2014, so these population estimates were not extrapolated. The applicant also provided additional information on the permanent resident and shadow estimated populations for 2014. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-2(B) to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-2(B).

The staff finds the ETE Report adequately addresses the estimate of the number of people who may need to be evacuated. This is acceptable because it conforms to the guidance in Section II of Appendix 4 to NUREG-0654/FEMA-REP-1.

13.3C.18.4 Traffic Capacity

Technical Information in the ETE Report: [Section III of Appendix 4] Section 4, ~~–~~Estimation of Highway Capacity," describes the process used to determine vehicle capacities for roadways in the transportation network. The methods used are generally taken from the HCM published by the Transportation Research Board of the National Research Council. Appendix K, "Evacuation Roadway Network Characteristics," identifies all evacuation route segments and their characteristics, including capacity. A map of the transportation network is provided in Figure 1-2, ~~–~~Summer Link-Node Analysis Network." Additional information describing the road

network used for evacuation routes was requested in RAI 13.3-10(A). In its response, the applicant provided a 48-inch by 36-inch PDF file of Figure 1-2 that includes the node numbers from Appendix K, sector, quadrant and county boundaries.

The ETE Report states that the characteristics of each section of the highway were recorded during field surveys. These included unusual characteristics, such as narrow bridges, sharp curves, poor pavement, flood warning signs, inadequate delineations, etc. These areas were not identified in the report. In RAIs 13.3-11(A) and (B), the staff requested additional information regarding unusual roadway characteristic and highway lane widths. In its response, the applicant stated that the term "full lanes" is used to identify the number of lanes that extend over the entire length of the roadway segment or link. Many network links are widened with additional lanes near the downstream intersection and are all properly represented in the input stream for the IDYNEV system. The estimation of capacity is based on the narrowest section of the roadway segment. The free-flow speed (Appendix K) is based on observation of traffic movements during the field survey. Lane widths were observed but not measured during the field survey. The number of bridges, sharp curves, narrow shoulders and other capacity-reducing features on the evacuation network were observed and considered in estimating capacity. The applicant also provided a discussion for how the model uses roadway characteristics to adjust traffic flow. In any case, mobilization time dictates the ETE. There is excess capacity within the EPZ, and the reduced capacities on the narrowest road segments have no effect on ETE.

Section 9, "Traffic Management Strategy," presents a traffic control and management strategy that is designed to expedite the movement of evacuating traffic. The traffic management strategy is based on a field survey of critical locations and consultation with emergency management and enforcement personnel. Appendix G, ―Traffic Management," provides a description of TCPs and ACPs and provides maps of their location within the plume exposure pathway EPZ (Figure G-1, ―VC Summer Traffic Control Points" and Figure G-2, ―VC Summer Access Control Points"). Additional information regarding the use of the traffic management strategy was requested in RAIs 13.3-10(B) and (C). In RAI 13.3-10(B), the staff requested that the applicant explain the use of TCPs and ACPs. In its response, the applicant stated that ETE calculations do not rely on any of the traffic control measures identified in Appendix G. The estimates of capacity, which are used by the IDYNEV model and are documented in Appendix K, are based on the factors described in Section 4 and on the observations made during the road survey. The applicant further stated that TCPs could be used to facilitate evacuating traffic movements and discourage travelers from moving closer to the VCSNS. Personnel manning TCPs will also serve a surveillance function to inform the EOC of any problems. As illustrated in Figure 1, the ETE for the VCSNS EPZ is dictated by the mobilization time. The short travel times indicate there is not pronounced traffic congestion within the EPZ delaying the departure of evacuees from the EPZ. The establishment of TCPs to manage traffic congestion is not necessary, but recommended to provide guidance, reassurance, fixed point surveillance. There would be no effect on ETE if traffic control points were not established.

In RAI 13.3-10(C), the staff requested that the applicant explain the effect of reentry on the ETE. In its response, the applicant stated that Assumption #6 in Section 2.3 indicates that ACPs are staffed one to two hours after the advisory to evacuate (ATE). The inputs to the model indicate that traffic stops entering the EPZ at 90 minutes after the ATE. Figure F-10, ―Work to Home Travel Time," indicates that approximately 99 percent of the EPZ population could travel home

from work in 90 minutes or less, justifying the use of 90 minutes. The assumed 90 minute timeframe for allowing entry into the EPZ was reviewed by the EPZ counties as they were presented with the ETE Report prior to the COL application submittal. The applicant has revised Assumption #6 and the footnote on page 6-5 to eliminate the reference estimate of one to two hours following notification and replaced it with the correct estimate of 90 minutes. A revision to Assumption #7 was also provided.

Section 10, "Evacuation Routes," illustrates the emergency evacuation routes for the four counties surrounding the VCSNS site. Evacuation routes provide for evacuation first to the EPZ boundary and then to reception centers. The TRAD model was used to determine routes that would minimize exposure to risk by balancing traffic demand relative to road capacity. Evacuation routes were also developed to minimize travel outside the EPZ and relate traffic volume to reception center capacity. Section 7.2, "Patterns of Congestion," identifies areas of traffic congestion that arise for the case when the entire EPZ (Region R3) is advised to evacuate during the summer, weekend, and midday period under good weather, in Figure 7-3, "Congestion Patterns at 2 Hours after the Order to Evacuate (Scenario 1)," and Figure 7-4, "Congestion Patterns at 2 Hours after the Order to Evacuate (Scenario 12)." Additional information regarding travel times and delay durations was requested in RAI 13.3-15 and 13.3-8(E)(1-3). In RAI 13.3-9(E)(1), the staff requested that the applicant provide maps that include queuing locations and estimated delay times. In its response, the applicant stated that there is no significant traffic congestion during evacuation for all Year 2007 Scenarios (1 through 11). There is congestion for the Construction Scenario (Scenario 12) due to the large influx of vehicles transporting workers for the construction of Units 2 and 3. The applicant has revised the second paragraph on page 7-3 of the ETE Report to read:

> There is no significant congestion within the EPZ for all Year 2007 cases (Scenarios 1 through 11); consequently the ETE reflects the mobilization activities of the EPZ population. There is congestion under Scenario 12 conditions (peak construction - Year 2014); however all congestion within the EPZ is clear by 3 hours and 20 minutes after the advisory to evacuate. Therefore, the 100th percentile ETE for Scenario 12 is also dictated by mobilization time. Specifically, as detailed in Table 7-1 D, the ETE for 100% of the population approximates the time required for those relatively few persons who need up to 4 hours to mobilize for the evacuation trip. Any decrease in this mobilization time will translate to a commensurate reduction in ETE. The recommendations in Section 13 address this issue.

In RAI 13.3-9(E)(2), the staff requested that the applicant clarify how potential congestion will be managed. In its response, the applicant stated that congestion within the EPZ clears by three hours and 20 minutes after the advisory to evacuate for Scenario 12; therefore, the ETE for the 100th percentile is still dictated by the mobilization time of four hours. The applicant has provided additional information to describe the buildup of congestion points and the use of ACPs and TCPs to reduce congestion. Implementation of these ACPs and TCPs will help manage congestion during construction, but the ETE is not dependent on them being established.

In RAI 13.3-9(E)(3), the staff requested that the applicant clarify the effect congestion will have on the ETE. In its response, the applicant stated that congestion under Scenario 12 conditions

increases the ETE by 15 and 10 minutes for the 50th and 90th percentiles of EPZ population, respectively. The ETE for the 95th percentile is 10-minutes less for Scenario 12 than it is for Scenario 1. Therefore, the ETE for the 95th and 100th percentiles are not affected by the congestion caused by construction worker vehicles. Following review of output files, the applicant determined that the 95th percentile ETE for Scenario 12, Region R03 should be 3:20. The applicant has provided revised Tables 7-1D, "Time to Clear the Indicated Area of 95% of the Affected Population," and J-1D, "Time to Clear the Indicated Area of 100% of the Affected Population," to reflect this correction.

In RAI 13.3-15, the staff requested that the applicant provide maps that include queuing locations and estimated delay times. In its response, the applicant stated that Figures 7-3, "Congestion Patterns at 2 Hours after the Order to Evacuate (Region 3, Scenario 1)," and 7-4, "Congestion Patterns at 2 Hours after the Order to Evacuate (Region 2, Scenario 13)," have been revised. The major roads in the study area have been identified on the map. The major congestion points in the study area have been labeled with an identification number. Table 7-3, "Description of Congestion Points in Figures 7-3 and 7-4," provides a description of each congestion point and the link from Figure 1-2, "Summer Link-Node Analysis," corresponding to that area of congestion. Estimates of the average delay in minutes per vehicle are provided in the Table 7-3, for each of the congestion points. The delay presented is over the previous 10 minutes of simulation. For example, Figure 7-4 shows the congestion patterns at 2 hours after the Advisory to Evacuate for Scenario 13. The average delay for each link provided in the table (column 6) applies to the 10 minute time interval from 110 to 120 minutes after the Advisory to Evacuate. Therefore, the vehicles occupying the link from node 168 to node 8 experience an average delay of 1.8 minutes during this 10-minute interval. Table 7-3 was added to page 7-16 of the revised ETE Report.

In RAI 13.3-11(B), the staff asked the applicant to clarify the road characteristics. A detailed discussion is provided on the application of field data into the calculation and states that bridges are treated as links in the network. The inclusion of the large scale nodal map supports review of the integration of highway characteristics and some bridges are clearly defined as links in the roadway network. However, there is a bridge located between nodes 185 and 186 and there are two bridges between nodes 171 and 172. The discussion in the response to RAI 13.3-11(B) indicates that these bridges should be identified as separate links in the system to account for their unique characteristics. In RAI 13.3-11(B), the staff asked for clarification regarding whether two bridges should be identified as separate links in the system to account for their unique characteristics. In its response, the applicant provided additional information that explained that the bridges should be considered separate links and revised text was added to the ETE Report.

In RAI 13.3-10(B), the staff asked for clarification regarding how the ETE model addressed the movement of vehicles through traffic control intersections and how the traffic management strategy affected ETE calculations. However, the response to RAI 13.3-5(C) indicated that the ETE does, to some extent, rely on traffic control being in place to represent reasonably efficient operation under evacuation conditions. In its response, the applicant provided additional clarifying information and stated that the corrections made to the ETE had been reviewed and agreed upon by local and state authorities.

Technical Evaluation: [Section III of Appendix 4] The ETE Report provides a complete review of the evacuation road network. Analyses are made of travel times and potential locations for congestion. The evacuation time estimates are not dependent on the establishment of traffic control points and access control points. Therefore, manpower and equipment shortages have no effect on the evacuation time estimate calculations. In addition, all evacuation route segments and their characteristics, including capacity, are described. A traffic control and management strategy that is designed to expedite the movement of evacuating traffic is described. The traffic management strategy is based on a field survey of critical locations and consultation with emergency management and enforcement personnel. The applicant also analyzed travel times and potential locations for serious congestion along the evacuation routes and found none would be expected. The staff finds the additional information submitted in response to RAIs 13.3-9(E)(2), 13.3-10(A), and 13.3-11(A), regarding congestion and the impact of TCPs and ACPs on the evacuation process, to be acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

In response to RAI 13.3-10(C), the applicant revised Assumption #6 on page 2-4 and the footnote on page 6-5 to eliminate the estimate of one to two hours following notification and replaced it with the correct estimate of 90 minutes. A revised Assumption #7 on page 2-4 was also provided. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-10(C), which clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-10(C).

In response to RAI 13.3-9(E)(1), the applicant revised the second paragraph on page 7-3 to discuss congestion in Scenario 12. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-9(E)(1), which clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-9(E)(1).

In response to RAI 13.3-9(E)(3), the applicant determined that the 95th percentile ETE for Scenario 12, Region R03 should be 3:20. The applicant has provided revised Tables 7-1 D and J-1 D to reflect this correction. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-9(E)(3), which clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-9(E)(3).

In response to RAI 13.3-15, the applicant has revised Figures 7-3 and 7-4 to include congestion point labels to match Table 7-3 and identify major roads. Table 7-3 will also be added to page 7-16. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-15, which clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-15.

In response to RAI 13.3-10(B), the applicant provided additional clarifying information and advised that the corrections to the ETE had been reviewed and agreed upon by local and state authorities. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-10(B), which clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-10(B).

In response to RAI 13.3-11(B), the applicant provided additional information that explained that the bridges should be considered separate links and revised text was proposed for the ETE Report. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-11(B), which clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-11(B).

The staff finds the ETE Report adequately describes the highway capacity estimates. This is acceptable because it conforms to the guidance in Section III of Appendix 4 to NUREG-0654/FEMA-REP-1.

13.3C.18.5 Analysis of Evacuation Times

Technical Information in the ETE Report: [Section IV of Appendix 4] Sections 4, 5, and 6 of the ETE Report describe the methods used to estimate the evacuation times. Section 4, "Estimation of Highway Capacity," describes how data collected during field surveys of the transportation network were combined with methods suggested in the 2000 HCM. Section 5, "Estimation of Trip generation Time," provides estimates of the four different distributions of elapsed times associated with mobilization activities undertaken by the public to prepare for the evacuation trip. The elapsed time associated with each activity is represented as a statistical distribution reflecting differences between members of the public. Additional information regarding evacuation activity distributions was requested in RAIs 13.3-7(C) and (D), 13.3-13(B), 13.3-14(A) and (D). In RAI 13.3-7(C) the staff requested additional information related to the logistics for evacuating the reservoir. In its response, the applicant identified three major boat ramps located on the Monticello Reservoir. Page 3-8 of the report states the SCDPRT estimated that approximately 90 percent of the people at recreational areas are residents and 10 percent are transients. Thus, the majority of the people are familiar with the evacuation procedures through public information distribution. Section 2.G, "Public Education and Information," states that the EPIO publication for the VCSNS is updated annually, in coordination with state and county agencies, to address how the general public is notified and what their actions should be in an emergency. SCE&G distributes the publication annually to all residents within the 10-mile plume exposure EPZ and to appropriate locations where a transient population may obtain a copy. Table 6-3, "Percent of Population Groups for Various Scenarios," of the report shows the majority of residents are home during summer weekends when peak populations on the reservoir are expected. Thus, Distribution 4 of Table 5-1, "Event Sequence for Evacuation Activities," is applicable; this distribution extends over four hours. It is reasonable to assume that boaters on the reservoir will be able to return to boat launch sites, trailer their boats and begin to evacuate the area within this time frame.

In RAI 13.3-7(D), the staff requested additional information related to transient mobilization activities depicted in Figure 5-1, Events and Activities Preceding the Evacuation Trip,". In its response, the applicant stated that the mobilization distribution for transients extends over a period of 2½ hours, as shown in Table 5-1. Those who elect to return to collect their belongings will be able to do so and then evacuate. The existing Figure 5-1 has been revised; the diagrams for scenarios (b) and (d) do not include those households with employees who work during the evening or on weekends. The applicant revised Figure 5-1 to clarify its meaning. The final paragraph on page 5-3 was revised to read:

> A household within the EPZ that has one or more commuters at work, and will await their return before beginning the evacuation trip, will follow the first sequence of Figure 5-1 (a). A household within the EPZ that has no commuters at work, or that will not await the return of any commuters, will follow the second sequence of Figure 5-1 (a), regardless of day of week or time of day. Note that event 5, "Leave to evacuate the area," is conditional either on event 2 or on event 4. For this study, we adopt the conservative posture that all activities will occur in sequence. Households with no commuters on weekends or in the evening/night-time will follow the applicable sequence in Figure 5-1 (b). Transients will always follow one of the sequences of Figure 5-1 (b). Some transients away from their residence could elect to evacuate immediately without returning to the residence, as indicated in the second sequence.

In RAI 13.3-13(B), staff requested that the applicant explain how data was normalized to distribute the "don't know" response. In its response, the applicant stated that a review of the survey instrument reveals that several questions have a "don't know" or "refused" entry for a response. It is accepted practice to accept these answers for a few questions. To address this issue, the practice is to assume that the distribution of these responses is the same as the underlying distribution of the positive responses. In effect, the "don't know" responses are ignored and the distributions are based on the positive data that is acquired.

In RAI 13.3-14(A), the staff requested the applicant to provide the basis for the statement that 85 percent of the population within the EPZ will be aware of the accident within 30 minutes. In its response, the applicant stated that the notification distribution is assumed based on the presence of the siren alert system. The discussion of Distribution #1 on page 5-4 was revised to indicate that the distribution is assumed. This design objective is in agreement with the assumed notification distribution provided on page 5-4 of the ETE Report.

In RAI 13.3-14(D), the staff requested the applicant discuss whether the curves in Figure 5-3, "Comparison of Trip Generation Distributions," are intended to approach 100 percent, or whether the elapsed time axis should be extended. In its response, the applicant stated that the response to RAI 13.3-9(C) identifies that the curves in Figure 5-2, "Evacuation Mobilization Activities," and Figure 5-3 do not reflect the results of the procedure discussed in the response whereby the trip generation of the stragglers is advanced. The applicant has provided revised figures in response to RAI 13.3-9(C).

The quantification of activity-based distributions in Section 5 relies largely on the results of a telephone survey included in Appendix F, "Telephone Survey." In RAI 13.3-14(C), the staff requested that the applicant explain how the data in Figure F-11, "Time to Prepare Home for

Evacuation," were used in the development of the ETE. In its response, the applicant stated that as noted in the response to RAI 13.3-9(C), Distribution # 4 on page 5-8 of the ETE Report was revised to reflect the results of the trip generation truncation procedure identified in the response. The distribution was input correctly to the simulation model; however, the distribution was not properly documented in the ETE Report.

Section 6, "Demand Estimation for Evacuation Scenarios," defines the various evacuation cases for which time estimates were made; a case is a combination of a scenario and a region. A scenario is a combination of circumstances, including time of day, day of week, season, and weather conditions. Scenarios define the number of people in each of the affected population groups and their respective mobilization time distributions. A region is defined as a grouping of contiguous evacuation PAZs, which forms either a "keyhole" sector-based area, or a circular area within the plume exposure pathway EPZ, that must be evacuated in response to a radiological emergency. Reception centers are shown on maps in Section 10, "Evacuation Routes." The assumptions on evacuation are based on simultaneous evacuation of inner and outer sectors.

A summary of the ETE is provided in Section 7, "General Population Evacuation Time Estimates (ETE)." These results cover 21 regions within the VCSNS EPZ and the 12 evacuation scenarios discussed in Section 6, "Demand Estimation for Evacuation Scenarios." The evacuation times are presented for 21 evacuation regions and 12 scenarios in Appendix J, "Evacuation Time Estimates for All Evacuation Regions and Scenarios and Evacuation Time Graphs for Region R03, for all Scenarios." Results are presented for 50 percent, 90 percent, 95 percent, and 100 percent of vehicles. Additional information on evacuation times was requested in RAIs 13.3-9(C), 13.3-14(B). In RAI 13.3-9(C), the staff requested that the applicant explain how the distribution in Section 5, "Estimation of Trip Generation Time," was derived using the telephone survey information. In its response, the applicant stated that Figure F-11, "Time to Prepare Home for Evacuation," shows about 99 percent of respondents complete the home preparation within 4 hours, with the remaining stragglers requiring another two hours. Truncating the cited distribution at four hours ensures that these ETE of interest (i.e., 90th and 95th percentiles) are based on a conservative estimate of traffic demand. Advancing the departures of the stragglers to four hours provides assurance that the traffic demand includes all evacuees over that time frame when congested conditions could arise. Since traffic flow is generally a first-in-first-out (FIFO) process, any "tail truncation" that occurs well after the 90th and 95th percentile ETE does not influence these values. The applicant sited NUREG/CR-6953, "Review of NUREG-0654, Supplement 3, "Criteria for Protective Action Recommendations for Severe Accidents," Vol. 2, as a reference. The applicant also provided, "Procedure for Estimating Mobilization Curve Based on Survey Data," which discusses the methodology for advancing the trip generation times of those persons who take longer to mobilize.

In RAI 13.3-14(B), the staff requested that the applicant explain the factors that cause the ETE for Scenario 5, in Table 7-1C, to be longer than all other summer scenarios including Scenario 2. In its response, the applicant stated that as indicated in the response to RAI 13.3-14(B), the ETEs for all cases are reflective of mobilization time. Table 5-1 presents the mobilization time of the evacuating vehicles for each time period for Scenarios 3, 4 and 5. The "Cumulative Vehicles Mobilized" is calculated using the vehicle totals and the trip generation rates provided in Table 5-1. Figure 5-1 presents the time distribution of mobilized

vehicles. The mobilization curve for Scenarios 3 and 4 is significantly steeper than that for Scenario 5. This difference reflects the fact that the majority of the vehicles evacuating in Scenario 5 are resident vehicles with longer mobilization times than employees and transients. Scenario 5 has 199 evacuating vehicles, 137(69 percent) of which are residents. Scenarios 3 and 4 have 607 evacuating vehicles, 137(23 percent) of which are residents. Therefore, the ETE time distribution for Scenario 5, which tracks that of the mobilization time, is longer at the 50th, 90th and 95th percentiles than that for Scenarios 3 and 4.

Results are provided for good and adverse conditions. Additional information concerning the possible impacts on evacuation time caused by adverse weather conditions was requested in RAIs 13.3-12(A), (B), and (C). In RAI 13.3-12(A), the staff requested that the applicant explain why icy conditions were not included in the evaluation. In its response, the applicant stated that the ice weekend/evening scenario not being included was an oversight. Scenarios 11 and 12 will be renumbered as Scenarios 12 and 13 and a new Scenario 11 (winter weekend/evening with ice), will be added. Scenarios 9, 10 and 11 (all winter, weekend scenarios) will appear in adjoining columns in the ETE tables (7-1A through D) so that a rapid assessment of the effect of rain and ice on the ETE can be made. The applicant added that rain is estimated to reduce the free speed and capacity of all links in the analysis network by 10 percent, while ice reduces the free speed and capacity by 20 percent. The only difference between the weekday and weekend rain scenarios is the number of people evacuating, as shown in Table 6-4. The weekend and the evening scenarios are similar in that most commuters are home, as shown in Table 6-3. The applicant revised Table 6-2 "Evacuation Scenario Definitions," Tables 7-1 A through D, and the table on page 2-5 to reflect this change. All references to "l 2 scenarios" were also changed to "l 3 scenarios."

In RAI 13.3-12(B), the staff requested that the applicant explain why only Regions 12 and 13 are affected by ice when evacuating 50 percent and 90 percent of the population. In its response, the applicant stated that the input files were reviewed, and the capacity reduction used was actually 20 percent, not 15 percent. Rain and ice do not influence the ETE because the volume of traffic following the Advisory to Evacuate never attains a level where capacity is a factor in influencing travel time even when reduced by inclement weather. The applicant sited various sections of the ETE Report and provided an explanation of the PC-DYNEV model to support this statement. Revised Tables 7-1A, 7-1B, and 7-1D were also provided.

In RAI 13.3-12(C), the staff requested that the applicant explain why icy conditions were not considered in the estimates provided for schools and transit dependent people in Tables 8-5A/B, ~~–~~School Evacuation Time Estimates-Good Weather/Rain," and 8-6, ~~–~~Summary of Transit Dependent Bus Routes for the Summer Nuclear Station." In its response, the applicant stated that travel speed was reduced by 10 percent for rain scenarios and was reduced 20 percent for ice scenarios. A 10-minute increase in mobilization time was assumed for rain conditions to allow for slower travel speeds as the bus driver drives to the depot to pick up the bus and then drives from the depot to the school. A 20-minute increase was added to the base mobilization time for ice scenarios. The loading time was increased by five minutes for rain scenarios to account for students who may be carrying umbrellas who have to close the umbrella before boarding the bus. It is assumed that this loading time is also adequate for ice scenarios. The ETE for ice assumes 10 additional minutes of route travel time and of passenger pickup time. The applicant has revised Table 8-5C, "School Evacuation Time

Estimates – Ice" and Table 8-6C, "Transit Dependent Evacuation Time Estimates – Ice," to reflect these changes. The text in Section 8.4 was also revised to reflect these changes.

The methodology for the general population uses distribution functions. Figures describing the time distribution of evacuating vehicles follow the format on Figure 4, "Example of Additional Reporting Format for Time Estimates of Population Evacuation When Probability Distributions Are Used," of Appendix 4, to NUREG-0654/FEMA-REP-1. In RAI 13.3-13(A), the staff requested that the applicant explain why separate estimates were not made for transients and permanent residents. In its response, the applicant stated that all of the data requested in Table 2, "Example of Summary of Results of Evacuation Time Analysis," of NUREG-0654/FEMA-REP-1 are presented in various sections of the ETE Report to include Figure 3-4, "Transient Population by Sector," and Figure 3-5, Transient Vehicles by Sector."

Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates," discusses evacuation plans for schools, residents without vehicles, and special care facilities. These groups are expected to merge with general evacuation traffic following notification and mobilization. Separate estimates of population size and necessary transportation were made for schools, special facilities and the transit-dependent populations. Schools are given advanced notification, if possible, in order to determine transportation needs. The estimated students and their transportation needs, based on student to bus ratios, are provided in Table 8-2, "School Population Demand Estimates." Additional information on school transportation needs was requested in RAIs 13.3-8(D), (J), (K), and (M). In RAI 13.3-8(J)(1), the staff requested that the applicant explain why Table 6-4, "Vehicle Estimates by Scenario," indicates that 200 buses are needed to support evacuation of the schools and not the 95 buses identified in Table 8-2, "School Population Demand Estimates." In its response, the applicant stated that 100 buses are needed to evacuate all schoolchildren in the EPZ. The ETE Report indicates that one bus is equivalent to two passenger vehicles. Thus, Table 6-4 indicates that 200 vehicles (not buses) are modeled to represent 100 school buses in the simulation.

In RAI 13.3-8(J)(2), the staff requested the applicant clarify the column labeled, "Distance" in Table 8-2. In its response, the applicant stated that the column is the radial distance of the school from the existing reactor (Unit 1) at the VCSNS site. The column heading was revised to read "Distance from VCSNS (miles)."

In RAI 13.3-8(K), the staff requested the applicant explain why the number of children per bus is estimated differently for Mid-Carolina and Chapin Middle School. In its response, the applicant stated that the number of buses required for Chapin Middle School in Table 8-2 is incorrectly identified as 13. The value should be 18, resulting in a total of 100 buses for Table 8-2. This error was only in documentation. The correct number of buses was input to the evacuation model. Table 8-2 has been revised to reflect this correction.

In RAI 13.3-8(M), the staff requested the applicant clarify the number of buses necessary to evacuate students from McCrorey-Liston Elementary School. In its response, the applicant stated that Tab A to Appendix 9 to Annex Q of the Fairfield County Radiological Emergency Plan identifies an enrollment of 354 students. Internet searches indicate that the current enrollment for McCrorey-Liston Elementary is 250 students, which supports the data reported in the ETE Report.

In RAI 13.3-9(D), the staff requested the applicant discuss the use of school buses in Scenarios 1 and 2 as described in Tables 6-3, "Percent of Population Groups for Various Scenarios," and 6-4, "Vehicle Estimates by Scenario." In its response, the applicant stated that the buses shown for Scenarios 1 and 2 in Tables 6-3 and 6-4 are evacuating summer school students. It is assumed that summer school enrollment is approximately 10 percent of enrollment for the regular school year.

Transportation resources should be adequate to evacuate schools in one wave, but additional resources can be requested from nearby cities if necessary. Additional information regarding evacuation resources was requested in RAIs 13.3-7(F), (G), and (L). In RAI 13.3-8(F)(1), the staff requested that the applicant provide information regarding the process used to request additional resources. In its response, the applicant stated that the "Concept of Operations" section of Appendix L, "Transportation," to the Fairfield County Emergency Operations Plan indicates that transportation operations will be controlled from the County Emergency Operations Center. The Transportation Service Coordinator will coordinate all transportation requirements. State and Federal support will be committed, as available, on a mission-type basis on request to the State. Requests for use of additional transportation resources will be made through the County EOC.

In RAI 13.3-8(F)(2), the staff requested that the applicant explain how the implementation of the resource request process could affect evacuation times. In its response, the applicant stated that bus mobilization time is estimated to be 90 minutes, but would most likely exceed 90 minutes if additional resources had to be brought in from other cities. However, this should not be necessary.

In RAI 13.3-8(G)(1), the staff requested that the applicant clarify whether a time difference associated with other inclement conditions, such as ice, has been considered in the estimate of travel time back to the EPZ. In its response, the applicant stated that Table 8-6C, "Transit Dependent Evacuation Time Estimates – Ice," was added to the ETE Report. Additional information is provided in response to RAI 13.3-12(C).

In RAI 13.3-8(G)(2), the staff requested that the applicant explain whether travel time includes transferring traffic control points. In its response, the applicant states that primary objectives of traffic control points are to facilitate and guide the flow of evacuating traffic as discussed in the response to RAI 13.3-4(B). It is especially critical that traffic control points facilitate the movements of transit resources (buses and ambulances), which are needed to evacuate the transit-dependent and special facility populations within the EPZ. Therefore, the inbound bus speed of 45 mph will be unaffected as buses traverse traffic control points. Appendix 9 to Annex Q of the Fairfield County Radiological Emergency Plan states the following:

> Once a bus driver has left the 10-mile EPZ, the bus will be permitted to re-enter the affected area only if driven by an adult driver. Adult bus drivers may re-enter the affected area on a voluntary basis, only if the bus has no student passengers. No buses will be permitted back into the EPZ unless multi-trips are necessary.

It is anticipated in the county plans that buses may have to re-enter the EPZ to evacuate others who need transportation assistance. The following statement was added to the end of Section 9 of the ETE Report:

> As discussed in Section 2.3, these TCPs are not expected to influence the ETE results. Access control points (ACP) are deployed near the periphery of the EPZ to divert "through" trips. The ETE calculations reflect the assumption that all "external-external" trips are interdicted after 90 minutes have elapsed after the advisory to evacuate (ATE). All transit trips and other responders entering the EPZ to support the evacuation are assumed to be unhindered by personnel manning TCPs. Study Assumptions 6 and 7 in Section 2.3 discuss ACP and TCP staffing schedules and operations.

In RAI 13.3-8(L), the staff requested that the applicant clarify that there are sufficient resources to evacuate the schools in a single wave. In its response, the applicant provided an estimate of bus resources needed to evacuate schools in the EPZ and total enrollment by county. Estimates indicate that there are more than adequate transportation resources to evacuate the schools within the EPZ. The applicant submitted a revised Table 8-2 that includes this information.

The estimated time to evacuate schools within the plume exposure pathway EPZ is provided in Table 8-5A, ~~"S~~School Evacuation Time Estimates-Good Weather," and Table 8-5B, ~~"S~~School Evacuation Time Estimates-Adverse Weather." Evacuation of other special facilities, Generation of Chapin Nursing Home, is given the same consideration as schools with the exception of increased loading time. Mobilization of drivers and students has been built into the total evacuation times. The estimated population and necessary transportation resources can be found in Table 8-4, ~~"S~~Special Facility Transit-Demand Estimate."

Remaining transportation resources and those that become available following the evacuation of schools will be used to evacuate the portion of the population without vehicles. The study estimates 222 people needing transportation can be evacuated in 8 bus runs. These individuals will be picked up along routes proposed in Section 8.4, ~~"E~~Evacuation Time Estimates for Transit-Dependent People," and depicted in Figure 8-2, ~~"P~~Proposed Transit Dependent Bus Routes." Additional information regarding evacuation of transit dependent people was requested in RAIs 13.3-8(H) and (I). In RAI 13.3-8(H), the staff requested that the applicant explain how transit-dependent individuals are expected to get from their residences to the bus routes, and whether this time was factored into the ETE. In its response, the applicant stated that evacuees are assumed to walk to the nearest route and ~~"fl~~ag" down a bus traversing the route. Based on route design, the walking distance should be less than one mile. The 2000 HCM recommends a walking speed of 4.0 ft/sec for a pedestrian, which means the walk should take 22 minutes. Transit-dependent persons will be able to complete their preparation activities and walk to the routes by the time the buses arrive. Subsequent buses on a route will arrive later to service those who take longer to mobilize. Thus, the time needed for transit-dependent people to walk to the bus routes has been considered in the calculation of the transit-dependent ETE.

In RAI 13.3-8(I)(1) and (2), the staff requested that the applicant provide additional information on bus stop locations. In its response, the applicant stated that transit-dependent persons will walk to the nearest route and "flag" down a bus. There are no pre-established pickup points.

In RAI 13.3-8(I)(3), the staff requested that the applicant clarify whether stopping and dwell time were considered in the estimation of the average route travel time. In its response, the applicant stated that dwell time was considered pickup time, which was estimated to be about 15 minutes per bus run taking into consideration slowing of the bus and loading of passengers.

The estimated time to evacuate transit-dependent people within the plume exposure pathway EPZ is provided in Table 8-6A, "Transit Dependent Evacuation Time Estimates-Good Weather," and Table 8-5B, "Transit Dependent Evacuation Time Estimates-Adverse Weather."

A series of sensitivity tests are documented in Appendix I, "Evacuation Sensitivity Studies," regarding the sensitivity of the results to trip generation time (directly related to time-dependent traffic loading) and to the amount of shadow evacuation. Additional information was requested in RAIs 13.3-13(C) and (D) to clarify assumptions regarding "shadow " population that is expected to evacuate and the numbers of vehicles that were proposed to be used. In RAI 13.3-13(C), the staff requested that the applicant explain what percentage of shadow residents are expected to evacuate. In its response, the applicant stated that the population within the shadow region is comprised of residents and employees. Employees in the shadow region are estimated to be in the same proportion relative to residents, as determined for the EPZ. This proportion is the ratio of 732 vehicles for employees to the total number of evacuating vehicles used by residents (4,439 + 2,123 = 6,562, listed in Columns 2 and 3 for Scenarios 1 and 2). This ratio is equal to 0.112. The total population of residents plus employees within the shadow region is 1.112 x the number of residents. Multiplying 1.112 by 0.3 (the percentage assumed to evacuate) yields 0.33 or the 33 percent figures shown in Column 6 of Table 6-3, "Percent of Population Groups for Various Scenarios," for Scenarios 1 and 2. The same methodology applied to all scenarios in Column 6 of Table 6-3, and the estimates of evacuating vehicles shown in column 6 entitled "Shadow" of Table 6-4, "Vehicle Estimates by Scenario."

In RAI 13.3-13(D), the staff requested that the applicant discuss the timing of the traffic loading onto the network for the shadow population identified in Table 6-4. In its response, the applicant stated that Table 6-4 indicates 7,678 shadow vehicles evacuating versus the 6,908 evacuating shadow vehicles shown in Table I-2, "Evacuation Time Estimates for Shadow Sensitivity Study." Table I-2 only shows the shadow resident population and shadow resident vehicles evacuating. Based on the information provided in response to RAI 13.3-13(D), the applicant has revised Table I-2 to reflect the correct number of evacuating vehicles. The text on page I-2 will also be revised to reflect this correction. The following sentence was added to the end of the first paragraph:

> The case considered was Scenario 1, Region 3; a summer, midweek, midday, good weather evacuation for the entire EPZ.

The following two sentences were added to the end of the second paragraph followed by an updated formula used to calculate evacuating vehicles:

> As discussed in the "Shadow" footnote to Table 6-3, the shadow evacuation demand assumes a 30% relocation of shadow residents along with a proportional percentage of shadow employees. The percentage of shadow employees is

computed using the scenario-specific ratio of EPZ employees to residents. Thus, for Scenario 1, with reference to Table 6-4:

$$23{,}026 \times \left(1 + \frac{732}{4{,}439 + 2.123}\right) \times 30\% = 7{,}678 \text{ vehicles}$$

Technical Evaluation: [Section IV of Appendix 4] A total of 252 evacuation time estimates are computed for the evacuation of the general public. Each evacuation time estimate quantifies the aggregate evacuation time estimated for the population within one of the 21 Evacuation Regions to completely evacuate from that Region, under the circumstances defined for one of twelve Evacuation Scenarios (21 x 12 = 252). Separate evacuation time estimates are calculated for transit-dependent evacuees, including school children. An acceptable variant of the NUREG-0654/FEMA–REP-1, format is used for the presentation of the evacuation times in Appendix J.

Distribution functions for notification of the various categories of evacuees were developed. The distribution functions for the action stages after notification predict what fraction of the population will complete a particular action within a given span of time. There are separate distributions for auto-owning households, school population, and transit-dependent populations. These times are combined to form the trip generation distributions. There are separate distributions for auto-owning households, school population, and transit-dependent populations.

On-road travel and delay times are calculated. An estimate of the time required to evacuate a particular segment of the non-auto-owning population dependent on public transportation is developed, in a manner similar to that used for the auto-owning population.

The staff finds the additional information submitted in response to RAIs 13.3-8(F)(1) and (2), 13.3-8(H), 13.3-8(I)(1), (2), and (3), 13.3-8(J)(1), 13.3-8(M), 13.3-9(D), 13.3-13(A), (B), and (C), and 13.3-14(B) to be acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1.

In response to RAI 13.3-7(D), the applicant revised Figure 5-1 to include those households with employees who work during the evening or on weekends. The final paragraph on page 5-3 was revised to reflect this change. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-7(D) that clarified the textual information concerning transients to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-7(D).

In response to RAI 13.3-14(A), the applicant revised the discussion of Distribution 1 on page 5-4 to indicate that the distribution of notified persons within 30 minutes of an accident is assumed based on siren coverage. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-14(A) that clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-14(A).

In response to RAIs 13.3-14(C) and 13.3-14(D), the applicant revised Figures 5-2, 5-3 and Distribution 4 on page 5-8 to reflect the truncation procedure discussed in response to RAI 13.3-9(C). The staff finds the additional information and textual revisions submitted in response to RAIs 13.3-14(C) and 13.3-14(D) that clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAIs 13.3-14(C) and 13.3-14(D).

In response to RAIs 13.3-12(A) and (B), the applicant revised the ETE to include a new Scenario 11. Scenarios will be renumbered accordingly. The applicant has also revised the table on page 2-2, Table 6-2, Tables 7-1 A through D, and the table on page 2-5 to reflect this change. All references to –12 scenarios" will also be changed to –13 scenarios." The staff finds the additional information and textual revisions submitted in response to RAIs 13.3-12(A) and (B) that clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAIs 13.3-12(A) and (B).

In response to RAI 13.3-8(J)(2), the applicant revised column labeled, –Distance" in Table 8-2 to –Distance from VCSNS (miles)." The staff finds the additional information and textual revisions submitted in response to RAI 13.3-8(J)(2) that clarified the textual information to be acceptable because they clarify the information in the table, which conforms to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-8(J)(2).

In response to RAI 13.3-8(K), the applicant revised Table 8-2 to identify the correct number of buses required to evacuate Chapin Middle School. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-8(K) that clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-8(K).

In response to RAI 13.3-8(G)(1), the applicant provided a new Table 8-6C, –Transit Dependent Evacuation Time Estimates – Ice." The staff finds the additional information and textual revisions submitted in response to RAI 13.3-8(G)(1) that clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-8(G)(1).

In response to RAI 13.3-8(G)(2), the applicant provided additional information to the end of Section 9 to support the assumption that the evacuation is unhindered by personnel manning TCP. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-8(G)(2) that clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-8(G)(2).

In response to RAI 13.3-8(L), the applicant provided a revised Table 8-2 that clarified that transportation resources are adequate. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-8(L) that clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-8(L).

In RAI 13.3-9(C), the staff requested clarification regarding truncation of data. The response provides a detailed discussion and basis for truncating data developed from the telephone survey. The ETE Report currently does not include any discussion on truncating data. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-9(C) that clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-9(C).

In RAI 13.3-13(D), the staff requested that the applicant explain the values used in the shadow population and discuss the timing of traffic loading onto the network for the shadow population identified in Table 6-4. The applicant provided a detailed response on the development and calculation of the shadow population vehicles that included a revision to page I-2 of the ETE report. The staff finds the additional information and textual revisions submitted in response to RAI 13.3-13(D) that clarified the textual information to be acceptable because they conform to the guidance in NUREG-0654/FEMA-REP-1. The staff confirmed that Revision 2 of the VCSNS Emergency Plan incorporated the information and textual changes provided in the response to RAI 13.3-13(D).

The staff finds the ETE Report adequately addresses the descriptions of the methods used to estimate the evacuation times. This is acceptable because it conforms to the guidance in Section IV of Appendix 4 to NUREG-0654/FEMA-REP-1.

13.3C.18.6 Other Requirements

Technical Information in the ETE Report: [Section V of Appendix 4] Section 11, ~~–~~Surveillance of Evacuation Operations," addresses the surveillance of the evacuation by use of staff at traffic control points, ground and aerial surveillance and citizen reports via cellular telephones. Surveillance of the evacuation will be coordinated and executed by local authorities. Section 12, ~~–~~Confirmation Time," states the necessity to confirm the evacuation process. This is a county level responsibility and will be addressed in local procedures suggests a possible alternative procedure to confirm that the evacuation process is effective in the sense that the public is complying with the ETE. The development of the ETE Report was coordinated with emergency planners from the State of South Carolina and Fairfield, Lexington, Newberry, and Richland County who are involved in emergency response for the site. County Emergency Plans discuss reports on the "Status of Evacuation," and "completion time of evacuation." The signed certification letters for each county indicate that the EPZ counties have reviewed the ETE Report and will consider its content in their respective emergency plans.

In RAI 13.3-16(B), the staff requested that the applicant provide information regarding mobilization times for people who will be conducting the evacuation confirmation. In its

response, the applicant stated that Section 12, Estimated Number of Telephone Calls Required for Confirmation of Evacuation," of the ETE Report suggests the use of a telephone survey to confirm evacuation. As indicated on Table 12-1, "Estimated Number of Telephone Calls Required for Confirmation of Evacuation," the confirmation process should not begin until three hours after the ATE, to ensure that households have had enough time to mobilize. This three hour timeframe will enable telephone operators to arrive at their workplace, access the call list and prepare to make phone calls. Section 12 of the ETE Report provides a methodology for evacuation confirmation. The suggested approach can be reinforced by other methods but this is a state/local planning issue and outside the scope of the ETE. Section 13, Recommendations," provides a list of recommendations offered to the State and local authorities on how to increase the efficiency and effectiveness of the evacuation operation.

Technical Evaluation: [Section V of Appendix 4] The staff finds the additional information submitted in response to RAI 13.3-16(B) to be acceptable because it conforms to the guidance in NUREG-0654/FEMA-REP-1. In addition, the development of the ETE Report was coordinated with emergency planners from the state of South Carolina and Fairfield, Lexington, Newberry, and Richland County who are involved in emergency response for the site. The staff finds the ETE Report adequately addresses the description of the procedure to confirm that the evacuation process is effective. This is acceptable because it conforms to the guidance in Section V of Appendix 4 to NUREG-0654/FEMA-REP-1.

13.3C.18.7 Conclusions

On the basis of its review of the analysis of the ETE Report as described above, the NRC staff concluded that the information provided in the ETE Report is consistent with those portions of Section 13.3 of NUREG-0800 related to the evacuation time estimate analysis and is consistent with the guidance in Appendix 4 to NUREG-0654/FEMA-REP-1. Therefore, the ETE Report is acceptable and meets the applicable requirements of 10 CFR Part 50, Appendix E.IV.

13.3C.19 Inspection, Test, Analysis, and Acceptance Criteria (EP ITAAC)

13.3C.19.1 Regulatory Basis

The staff considered the following regulatory requirement and guidance in the evaluation of the information in the COL application related to EP ITAAC:

10 CFR 52.80(a), requires that a COL application include the proposed inspections, tests, and analyses, including those applicable to EP, 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 be operated in conformity with the COL, the provisions of the Atomic Energy Act, and the Commission's rules and regulations.

Table 14.3.10-1, "Emergency Planning Generic Inspections, Tests, Analyses, and Acceptance Criteria," of NUREG-0800.

13.3C.19.2 Technical Information in the Application

The applicant addresses EP ITAAC in Table 3.8-1, ~~"I~~nspections, Tests, Analyses, and Acceptance Criteria," of Part 10 to the VCSNS COL application. The VCSNS COL application also incorporates by reference Tier 1 Table 3.1-1, ~~"I~~nspections, Tests, Analyses, and Acceptance Criteria," from the AP1000 DCD. The results of the NRC staff's evaluation of the information incorporated by reference in the VCSNS COL application are documented in NUREG-1793 and its supplements. As noted in Section 13.3.4 of this SER, the staff will include the following license condition for VCSNS Units 2 and 3:

The licensee shall perform and satisfy the ITAAC defined in SER Table 13.3-1, ~~"E~~mergency Plan ITAAC."

SER Table 13.3-1 consists of the EP ITAAC identified in Table 3.8-1 of Appendix B to Part 10 of the VCSNS COL application, as modified by the applicant's letters dated May 18, August 24, and November 16, 2010.

In its review of Table 3.8-1 of Appendix B to Part 10 of the application, the NRC staff used as review guidance the generic EP ITAAC in Table 14.3.10-1 to Section 14.3.10 of NUREG-0800. Table 14.3.10-1 identifies a generic set of acceptable emergency planning EP ITAAC. Since these EP ITAAC were established on a generic basis; they are not associated with any particular site or design. As such, several of the generic EP ITAAC require the COL applicant to provide more specific acceptance criteria that reflect the plant-specific design and site-specific emergency response plans and facilities.

Based on this comparison the staff requested the applicant, in RAI 13.3-30(B)[6], to address the following questions pertaining to the full-participation exercise.

1. RG 1.206, Appendix B, Table C.II.1-B1, Acceptance Criterion 14.1.2 includes the statement that ~~"[t]~~he COL applicant will identify responsibilities and associated acceptance criteria." The applicant was asked to explain why Table 3.8-1 in the COL application, Acceptance Criteria 8.1.2 did not identify any responsibilities and associated acceptance criteria, in relation to onsite emergency response personnel successfully performing their assigned responsibilities. In its May 8, 2009, response, the applicant stated that the acceptance criteria for exercise demonstration will be provided in the procedures submitted in accordance with ITAAC Section 9.0 180 days prior to fuel load. The development of these procedures will address the new ERFs (TSC and EOF) as well as integration of the additional operating unit(s), and the expansion of the emergency response organization will determine the acceptance criteria for the performance of the emergency response personnel performing their assigned responsibilities.

2. RG 1.206, Appendix B, Table C.II.1-B1, Acceptance Criterion 14.1.1 includes the bracketed statement that ~~"[t]~~he COL applicant will identify exercise objectives and associated acceptance criteria." Table 3.8-1, Acceptance Criterion 8.1.1 states that exercise objectives, including acceptance criteria, address each of the 8 listed EP

[6] This RAI referred to Table C.II.1-B11 in Appendix B of RG 1.206, which corresponds to Table 14.3.10-1 in Section 14.2.10 of NUREG-0800.

program elements. However, Table 3.8-1 does not identify (in the acceptance criteria) what the exercise objectives and associated acceptance criteria are (as called for in Table C.II.1-B1). In its May 8, 2009, response, the applicant stated that the acceptance criteria for the demonstration of each exercise objective will be provided in the procedures submitted in accordance with ITAAC Section 9.0 180 days prior to fuel load. The development of these procedures will address the new ERFs (TSC and EOF) as well as the integration of the additional operating unit(s), and the expansion of the ERO will determine the acceptance criteria for the performance of the emergency response personnel performing their assigned responsibilities. In RAI 13.3-45, the staff requested the ITAAC table be revised for exercise criteria 8.1.1 to include the appropriate acceptance criteria for each of the 12 exercise objectives. In its May 18, 2010, response, the applicant provided further details associated with the acceptance criteria for exercise objectives in the ITAAC table that are consistent with NUREG-0800 EP ITAAC guidance.

In a letter dated August 24, 2010, regarding EP ITAAC 8.1.3, the applicant proposed that if offsite exercise deficiencies were not corrected prior to the 10 CFR 52.103(g) finding, then a license condition that requires offsite full participation exercise deficiencies to be corrected prior to operation above 5 percent of rated power will be requested. The staff finds that a reference to a license condition in EP ITAAC 8.1.3 is unnecessary because this license condition is now in 10 CFR 50.54(gg). However, the staff finds the applicant's request to modify EP ITAAC 8.1.3 to allow operation up to 5 percent power with uncorrected offsite exercise deficiencies acceptable because it is consistent with 10 CFR 50.54(gg). The staff is tracking, as **Confirmatory Item 13.3-8**, updating Part 10 of the application to reflect this information.

The applicant has proposed amending EP ITAAC 1.1, 5.1.5, and 5.2.4 to address specific plant parameters listed in the AP1000 DCD Table 7.5.1 and FSAR Table 7.5-201 that will be listed in each unit annex that will be retrievable in the Control Room, TSC, and EOF. This will be tracked as **Confirmatory Item 13.3-9**.

In a letter dated November 16, 2010, the applicant proposed an additional HFE ITAAC Acceptance Criteria 8.1.1.D.2 to demonstrate the capability of the TSC and EOF equipment and data displays to clearly identify the affected unit. This will be tracked as Confirmatory **Item 13.3-10**.

13.3C.19.3 Technical Evaluation

Because the RAI responses are consistent with NUREG-0800 EP ITAAC guidance, the staff finds the responses acceptable. The staff has incorporated the proposed markup to Table 3.8-1 into SER Table 13.3-1. The response to RAI 13.3-45 included a proposed markup to ITAAC Table 3.8-1. This item is identified as **Confirmatory Item 13.3-11**, pending NRC review and approval of the revised VCSNS COL application.

The staff reviewed the EP ITAAC provided in Table 3.8-1 of Appendix B to Part 10 of the VCSNS COL application, as modified by the applicant's letters dated May 18, August 24 and November 16, 2010, and confirmed that each of the ITAAC in NUREG-0800 Table 14.3.10-1 that provides an acceptable set of generic emergency planning ITAAC were included in Table 3.8-1. The staff further confirmed, pending the acceptable resolution of **Confirmatory**

Items 13.3-8, 13.3-9, 13.3-10 and 13.3-11, that the proposed ITAAC have been tailored to the specific reactor design and emergency planning program requirements of the VCSNS site. The complete set of EP ITAAC are provided in SER Table 13.3-1 that is based on Table 3.8-1 of Appendix B to Part 10 of the VCSNS COL application, as modified by the applicant's letters dated August 24 and November 16, 2010, as discussed in the previous section of this SER. Therefore, the staff finds that the VCSNS COL application adequately provides EP ITAAC as required by 10 CFR 52.80(a).

13.3C.19.4 Conclusions

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the required information relating to EP ITAAC, and there is no outstanding information expected to be addressed in the VCSNS COL application related to this section. The results of the NRC staff's technical evaluation of the information incorporated by reference in the VCSNS COL application are documented in NUREG-1793 and its supplements.

As required by 10 CFR 52.80(a), pending resolution of **Confirmatory Items 13.3-8, 13.3-9, 13.3-10, and 13.3-11**, the EP ITAAC in SER Table 13.3-1 include the proposed emergency planning 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.

Table 13.3-1 Emergency Plan ITAAC

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
1.0 Emergency Classification System			
10 CFR 50.47(b)(4) — 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.	1.1 A standard emergency classification and emergency action level (EAL) scheme exists, and identifies facility system and effluent parameters constituting the bases for the classification scheme. [D.1**] [**D.1 corresponds to NUREG-0654/FEMA-REP-1 evaluation criteria.]	1.1 An inspection of the Control Rooms, Technical Support Center (TSC), and Emergency Operations Facility (EOF) will be performed to verify that they have displays for retrieving facility system and effluent parameters that are specified in the Emergency Classification and EAL scheme and the displays are functional.	1.1 The specified parameters, as listed in AP1000 DCD Table 7.5.1 and FSAR Table 7.5-201, are retrievable in the Control Rooms, TSC and EOF, and the ranges of the displays encompass the values specified in the Emergency Classification and EAL Technical Basis Document.
2.0 Notification Methods and Procedures			
10 CFR 50.47(b)(5) — Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow-up messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.	2.1 The means exists to notify responsible State and local organizations within 15 minutes after the licensee declares an emergency. [E.1] 2.2 The means exists to notify emergency response personnel. [E.2]	2.1. A test of the ESSX line will be performed to demonstrate the capabilities for providing initial notification to the offsite authorities after a simulated emergency classification. 2.2 A test of the primary and back-up ERO notification systems will be performed.	2.1 Using the ESSX line the State of South Carolina and the counties of Fairfield, Lexington, Newberry and Richland received notification within 15 minutes after the declaration of an emergency from the Control Room and the EOF. A test of each facility ESSX line was successful using the standard South Carolina notification form. 2.2 Emergency response personnel received the notification message and mobilization communication was validated by personnel response to the notification system and by telephone during off-hours. Also demonstrated work hours electronic notification and plant page system during working hours.

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
2.0 Notification Methods and Procedures (continued)			
	2.3 The means exists to notify and provide instructions to the populace within the plume exposure EPZ. [E.6]	2.3 The full test of the ANS capabilities will be conducted.	2.3 The ANS was demonstrated to notify and provide instructions to the public and was demonstrated to meet the design objectives, as stated in the emergency plan.
3.0 Emergency Communications			
10 CFR 50.47(b)(6) — Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.	3.1 The means exists for communications among the Control Rooms, TSC, EOF, principal State and local emergency operations centers (EOCs), and radiological field assessment teams. [F.1.d]	3.1 A test will be performed of the capabilities. The test for the contact with the principal EOCs and the radiological field assessment teams will be from the Control Room and the EOF. See also ITA 5.1.1.	3.1 Communications (both primary and secondary methods/systems) were established among the Control Rooms and the EOF with the South Carolina Emergency Management Division (SCEMD) warning point and EOC; Fairfield County Warning Point and EOC; Richland County Warning Point and EOC; Newberry County Warning Point and EOC; and Lexington County Warning Point and EOC. Communications were established between the Control Rooms and the EOF with the VCSNS radiological field monitoring teams. See also AC 5.1.4.

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
3.0 Emergency Communications (continued)			
	3.2 The means exists for communications from the Control Rooms, TSC, and EOF to the NRC headquarters and regional office EOCs (including establishment of the Emergency Response Data System (ERDS) [or its successor system] between the onsite computer system and the NRC Operations Center.) [F.1.f]	3.2 A test is performed of the capabilities to communicate using ENS from each operating Control Room, TSC and EOF to the NRC headquarters and regional office EOCs. HPN is tested to ensure communications between the TSC and EOF with the NRC Operations Center. ERDS is established [or its successor system] between the onsite computer systems and the NRC Operations Center.	3.2 Communication was established from the Control Rooms, TSC and EOF to the NRC headquarters and regional office EOCs utilizing the ENS. The TSC and EOF demonstrated communications with the NRC Operations Center using HPN. The access port for ERDS [or its successor system] successfully completed a transfer of data to the NRC Operations Center.
4.0 Public Education and Information			
10 CFR 50.47(b)(7) — Information is 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) are established in advance, and procedures for coordinated dissemination of information to the public are established.	4.1 The licensee has provided space which may be used for a limited number of the news media. [G.3.b]	4.1 An inspection of the facility/area provided for the news media will be performed in the Joint Information Center (JIC). The space provides adequate equipment to support JIC operation, including communications with the site and with the Emergency Operation Centers in the state and counties as well as a limited number of news media.	4.1 The licensee has provided space which may be used for a limited number of the news media in the Joint Information Center. This space provides the needed equipment per approved administrative procedures.

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
5.0 Emergency Facilities and Equipment			
10 CFR 50.47(b)(8) — Adequate emergency facilities and equipment to support the emergency response are provided and maintained.	5.1 The licensee has established a TSC and onsite OSC. [H.1, H.9]	5.1.1 An inspection of the TSC and OSCs will be performed, including a test of the capabilities. These facilities will meet the criteria of NUREG-0696 with exceptions.	5.1.1 See DCD Table 3.1-1 Item 1 5.1.2 The TSC is located outside the Protected Area and advanced communication capabilities are available and utilized to ensure communications between the emergency response facilities. Procedures are in place to enhance passage through security checkpoints expeditiously. 5.1.3 The TSC ventilation system includes a high efficiency particulate air (HEPA) and charcoal filter and radiation monitors are installed. 5.1.4 TSC communications equipment is installed per specifications and is operable. Communications have been initiated and found to be acceptable in giving and receiving voice communications with the Control Rooms, the OSC and the EOF. 5.1.5 The TSC has the means to receive, store, process, and display plant and environmental information, as listed in AP1000 DCD Table 7.5.1 and FSAR Table 7.5-201, and to initiate emergency measures and conduct emergency assessment. 5.1.6 There is an OSC located inside each Unit. It is separate from the Control Room and within the Protected Area. 5.1.7 OSC communications equipment is installed, and voice transmission and reception have been demonstrated between the OSC, OSC Teams, the TSC, and Control Room. 5.2.1 The EOF working space size is consistent with NUREG-0696 (75 ft^2/ person), and is large

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
			enough for required systems, equipment, records and storage. 5.2.2 The EOF habitability is consistent with Table 2 of NUREG-0696. • Distance at or beyond 10 mi of the TSC
	5.2 The licensee has established an EOF. [H.2]	5.2 The licensee has established an EOF. [H.2]	• Built to meet the criteria of the County Building Code 5.2.3 EOF communications equipment is installed, and voice transmission and reception are accomplished with the Control Rooms, TSC, radiological monitoring teams, NRC, state and county agencies using typical data generated during facility activation. 5.2.4 Radiological data identified in the EP Unit Annex, meteorological data, and plant system data pertinent to determining offsite protective measures, as listed in AP1000 DCD Table 7.5.1 and FSAR Table 7.5-201, are available and displayed when activated in the EOF
6.0 Accident Assessment			
10 CFR 50.47(b)(9) — Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	6.1 The means exists to provide initial and continuing radiological assessment throughout the course of an accident. [I.2]	6.1 A test will be performed to demonstrate that the means exist to provide initial and continuing radiological assessment throughout the course of an accident through the plant computer or communications with the Control Room.	6.1 The means exist to provide initial and continuing radiological assessment through displays of instrumentation indicators in the Control Room, TSC and EOF during the course of drills and/or exercises.
	6.2 The means exists to determine the source term of	6.2 A test will be performed to demonstrate that the means	6.2 Emergency Planning Implementing Procedures, through use in training and

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
	releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors. [I.3]	exist to determine the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors.	a drill, provided direction to accurately calculate the source terms and the magnitude of the release of postulated accident scenario releases.
	6.3 The means exists to continuously assess the impact of the release of radioactive materials to the environment, accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions. [I.4]	6.3 A test will be performed 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.	6.3 Response personnel demonstrated that the means exist to continuously assess the impact of the release of radioactive materials to the environment, accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions under drill conditions.
	6.4 The means exists to acquire and evaluate meteorological information. [I.5]	6.4 A test will be performed to acquire and evaluate meteorological data/information.	6.4 Meteorological data was available at the EOF, TSC, Control Room, offsite NRC Operations Center, and the state of South Carolina. This data was in the format needed for the appropriate emergency planning implementing procedures.
	6.5 The means exists 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. [I.8]	6.5 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.	6.5 The field monitoring team(s) was activated and evaluated. They demonstrated an ability to make rapid assessment of actual or potential magnitude and locations of any radiological hazards through simulated liquid or gaseous release pathways. A qualified field team was notified, activated, briefed and dispatched from the EOF during a radiological release scenario. The team demonstrated the procedural guidance in team composition, use of monitoring equipment, communication from the field, and locating specific sampling locations.
	6.6 The capability exists to detect	6.6 A test will be performed of	6.6 A field monitoring team was dispatched during

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
	and measure radioiodine concentrations in air in the plume exposure EPZ, as low as 10-7 µCi/cc (microcuries per cubic centimeter) under field conditions. [I.9]	the capabilities to detect and measure radioiodine concentrations in air in the plume exposure EPZ, as low as 10-7 µCi/cc (microcuries per cubic centimeter) under field conditions.	a radiological release scenario and demonstrated the use of sampling and detection equipment for air concentrations in the plume exposure EPZ, as low as 10^{-7} µCi/cc.
	6.7 The means exists to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with the EPA protective action guides (PAGs). [I.10]	6.7 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 protective action guides.	6.7 The means were demonstrated to estimate integrated dose from the dose assessment program and the field monitoring team reading during a radioactive release scenario. The results were compared with the EPA PAGs.
7.0 Protective Response			
10 CFR 50.47(b)(10) — A range of protective actions has been developed for the plume exposure 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 developed and in place, and protective actions for the ingestion exposure EPZ appropriate to the locale have been developed.	7.1 The means exists to warn and advise onsite individuals of an emergency, including those in areas controlled by the operator, including: [J.1] 1. employees not having emergency assignments; 2. visitors; 3. contractor and construction personnel; and 4. other persons who may be in the public access areas, on or passing through the site, or within the owner controlled area.	7.1 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.	7.1 The means exist and was successfully demonstrated to warn and advise onsite individuals including: 1. non-essential employees; 2. visitors; 3. contractor and construction personnel; and 4. other personnel within the owner controlled area.

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
8.0 Exercises and Drills			

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
10 CFR 50.47(b)(14) – Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.	8.1 Licensee conducts a full participation exercise to evaluate major portions of emergency response capabilities, which includes participation by each state and local agency within the plume exposure EPZ, and each state within the ingestion control EPZ. [N.1]	8.1 A full participation exercise (test) will be conducted within the specified time periods of Appendix E to 10 CFR Part 50.	8.1.1 The exercise was completed within the specified time periods of Appendix E to 10 CFR Part 50, onsite exercise objectives were met, including: A. *Accident Assessment and Classification* 1. Demonstrate the ability to identify initiating conditions, determine emergency action levels (EAL) parameters, and correctly classify the emergency throughout the exercise. Standard Criteria: a. Determine the correct emergency classification level based on events which were in progress, considering past events and their impact on the current conditions within 15 minutes from the time the initiating condition(s) or EAL is exceeded during the exercise. B. *Notifications* 1. Demonstrate the ability notify responsible state and local government agencies within 15 minutes and the NRC within 60 minutes after declaring an emergency. Standard Criteria: a. Accurately transmit information in accordance with Emergency Plan Implementing Procedures within 15 minutes of the emergency declaration. 2. Demonstrate the ability to alert, notify, and mobilize site emergency response personnel during the exercise. Standard Criteria: a. Complete the designated actions in accordance with Emergency Plan Implementing Procedures and perform the

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
			announcement concerning the initial event classification of Alert or higher during the exercise. b. Mobilize site emergency responders in accordance with Emergency Plan implementing Procedures at the initial event classification for an Alert or higher during the exercise. 3. Demonstrate the ability to warn or advise onsite individuals of emergency conditions. Standard Criteria: a. Initiate notification of onsite protective actions. 4. Demonstrate the capability of the Alert and Notification System (ANS) to operate properly when required. Standard Criteria: a. 90% of the sirens operate properly, as indicated by the feedback system. *C. Emergency Response* 1. Demonstrate the ability to direct and control emergency operations. Standard Criteria a. Command and control is demonstrated by the Control Room (simulator) in the early phase of the emergency and by the Technical Support Center (TSC) and Emergency Operations Facility (EOF) within 75 minutes of the emergency declaration. 2. Demonstrate the ability to transfer emergency

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
			direction from the Control Room (simulator) to the EOF. Standard Criteria: a. Turnover briefings are conducted in accordance with Emergency Plan Implementing Procedures. 3. Demonstrate the ability to prepare for around-the-clock staffing requirements. Standard Criteria a. Complete 24-hour staffing assignments. 4. Demonstrate the ability to perform assembly and accountability for personnel in the Protected Area within 30 minutes of the declaration of a Site Area Emergency or higher classification. Standard Criteria: a. Protected Area personnel assembly and accountability completed within 30 minutes of the declaration of a Site Area Emergency or higher classification. D. *Emergency Response Facilities* 1. Demonstrate activation of the Operational Support Center (OSC), and full functional operation of the TSC and EOF within 75 minutes of a declaration of Alert or higher emergency classification. Standard Criteria: a. The TSC, OSC, and EOF are activated within 75 minutes of the declaration of an Alert of higher emergency classification. 2. Demonstrate the adequacy of equipment, security provisions, and habitability precautions for the TSC, OSC, and EOF, as

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
			appropriate. Standard Criteria a. Demonstrate the adequacy of the emergency equipment in the emergency response facilities as specified in Emergency Plan Implementing Procedures, as appropriate. b. The security force implements and follows applicable security plan procedures as appropriate during the exercise. c. Demonstrate the capability of TSC and EOF equipment and data displays to clearly identify and reflect the affected unit. 3. Demonstrate the adequacy of communications for emergency support resources. Standard Criteria: a. Emergency response facility personnel are able to operate primary or backup communication systems in accordance with Emergency Plan Implementing Procedures as needed during the exercise. b. Primary or backup emergency response communication systems listed in the Emergency Plan Implementing Procedures are available and operational for the duration of the exercise. E. *Radiological Assessment and Control* 1. Demonstrate the ability to obtain onsite radiological surveys and samples Standard Criteria: a. Health Physics personnel demonstrate the ability to obtain appropriate instruments and perform surveys as needed during the exercise. b. Airborne samples are taken, as appropriate,

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
			in accordance with Emergency Plan Implementing Procedures during the exercise. 2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers. Standard Criteria: a. Emergency workers are issued self-reading dosimeters when radiation levels require, and exposures are controlled to 10 CFR Part 20 limits (unless the Emergency Coordinator authorizes emergency limits), as appropriate during the exercise. b. Exposure records are available during the exercise. 3. Demonstrate the ability to assemble and deploy field monitoring teams. Standard Criteria: a. Field Monitoring Teams are briefed, obtain equipment, and are dispatched in accordance with Emergency Plan Implementing Procedures. 4. Demonstrate the ability to collect and disseminate field team data. Standard Criteria: a. Field teams collect data for dose rate and airborne radioactivity levels, as applicable, in accordance with emergency plan implementing procedures. b. Field team communicates data to the EOF in accordance with Emergency Plan Implementing Procedures during the exercise. 5. Demonstrate the ability to develop dose

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
			projections. Standard Criteria a. Timely and accurate dose projections are performed in accordance with Emergency Plan Implementing Procedures during the exercise. 6. Demonstrate the ability to develop appropriate Protective Action Recommendations (PARs) and notify appropriate authorities within 15 minutes, once data is available, after the declaration of a General Emergency or change in PARs during the exercise. Standard Criteria: a. Total Effective Dose Equivalent (TEDE) and Committed Dose Equivalent (CDE) dose projections from the dose assessment computer code are developed in accordance with Emergency Plan Implementing Procedures during the exercise. b. PARs are developed and transmitted within 15 minutes of data availability during the exercise. 8.1.2 Onsite emergency response personnel were mobilized in sufficient numbers to fill emergency response positions, and they successfully performed their assigned responsibilities. 8.1.3 The exercise was completed within the specified time periods of Appendix E to 10 CFR Part 50, offsite exercise objectives were met, and there were no uncorrected offsite exercise deficiencies, or offsite deficiencies will be corrected prior to operation above 5 percent of rated power as provided in 10 CFR 50.54(gg).
9.0 Implementing Procedures			

Planning Standard	EP Program Elements	Inspections, Tests, Analyses	Acceptance Criteria
10 CFR Part 50, App. E.V – No less than 180 days prior to the scheduled issuance of an operating license for a nuclear power reactor or a license to possess nuclear material, the applicant's detailed implementing procedures for its emergency plan shall be submitted to the Commission.	9.1 The licensee has submitted detailed implementing procedures for its emergency plan no less than 180 days prior to fuel load.	9.1 An inspection of the submittal letter will be performed.	9.1 The licensee submitted detailed implementing procedures for the onsite emergency plan no less than 180 days prior to fuel load.

List of Acronyms for Table 3.8-1:

ANS–Alert and Notification System
EAL–Emergency Action Level
EAS–Emergency Alerting System
ENS–Emergency Notification System
EOC–Emergency Operations Center
EOF–Emergency Operations Facility
EPA–Environmental Protection Agency
EP–Emergency Plan
EPZ–Emergency Planning Zone
ERDS–Emergency Response Data System
ERO–Emergency Response Organization
ESSX–Electric Switch System Exchange
FEMA–Federal Emergency Management Agency
HEPA–High Efficiency Particulate Air
HPN–Health Physics Network
JIC–Joint Information Center
KI–Potassium Iodide
OSC–Operations Support Center
PAG–Protective Action Guide
SCEMD–South Carolina Emergency Management Division
TSC–Technical Support Center
VCSNS–V. C. Summer Nuclear Station