13.0 CONDUCT OF OPERATIONS

13.1 Organizational Structure of Applicant

13.1.1 Introduction

The organizational structure includes the design, construction, and preoperational responsibilities of the organizational structure. The management and technical support organization includes a description of the corporate or home office organization, its functions and responsibilities, and the number and the qualifications of personnel. Its activities include facility design, design review, design approval, construction management, testing, and operation of the plant. The descriptions of the design and construction and preoperational responsibilities include the following:

- how these responsibilities are assigned by the headquarters staff and implemented within the organizational units
- the responsible working- or performance-level organizational unit
- the estimated number of persons to be assigned to each unit with responsibility for the project
- the general educational and experience requirements for identified positions or classes of positions
- early plans for providing technical support for the operation of the facility

This section also describes the structure, functions, and responsibilities of the onsite organization established to operate and maintain the plant.

13.1.2 Summary of Application

Section 13.1 of the V.C. Summer Nuclear Station (VCSNS) combined license (COL) Final Safety Analysis Report (FSAR), Revision 5, incorporates by reference Section 13.1 of the AP1000 Design Control Document (DCD), Revision 19.

In addition, in VCSNS COL FSAR Section 13.1, the applicant provided the following:

AP1000 COL Information Items

- VCS COL 13.1-1

The applicant provided additional information in VCS COL 13.1-1 to resolve COL Information Item 13.1-1 (COL Action Item 13.1-1). COL Information Item 13.1-1 requires the COL applicant to describe its organizational structure. VCS COL 13.1-1 describes organizational positions of the nuclear power station and owner/applicant corporations and associated functions and responsibilities.

- VCS COL 9.5-1

The applicant provided additional information in VCS COL 9.5-1, describing the fire protection program in Section 9.5.1.8. For this VCSNS COL item, the applicant added a new Section 13.1.1.2.10, "Fire Protection," and a new Section 13.1.1.3.2.1.4, "Engineer in Charge of Fire Protection." Table 1.8-202, "COL Item Tabulation," provides VCS COL 9.5-1 cross-references.

- VCS COL 18.6-1

The applicant provided additional information in VCS COL 18.6-1, describing the qualifications of the nuclear plant technical support personnel. VCS COL 18.6-1 is addressed under Section 13.1.1.4, "Qualifications of Technical Support Personnel," and Section 13.1.3.1, "Qualification Requirements." Table 1.8-202, "COL Item Tabulation," provides VCS COL 18.6-1 cross-references.

- VCS COL 18.10-1

The applicant provided additional information in VCS COL 18.10-1 to address the responsibilities of the manager in charge of nuclear training. VCS COL 18.10-1 is addressed in Section 13.1.1.3.2.2.1, "Functional Manager in Charge of Training (Nuclear Training)." Table 1.8-202, "COL Item Tabulation," provides VCS COL 18.10-1 cross-references.

13.1.3 Regulatory Basis

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

In addition, the acceptance criteria associated with the relevant requirements of the Commission regulations for VCS COL 13.1-1, VCS COL 9.5-1, VCS COL 18.6-1, and VCS COL 18.10-1 are given in Sections 13.1.1, "Management and Technical Support Organization," and 13.1.2-13.1.3, "Operating Organization," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)."

The applicable regulatory guidance for the organizational structure of the applicant is as follows:

- American National Standards Institute (ANSI)/American Nuclear Society (ANS)-3.1-1993, as endorsed and amended by Regulatory Guide (RG) 1.8, Revision 3, "Qualification and Training of Personnel for Nuclear Power Plants."

The applicable regulations and regulatory guidance for the management, technical support, and operating organizations of the applicant are as follows:

- Title 10 of the *Code of Federal Regulations* (10 CFR) 50.40, "Common standards"
- 10 CFR 50.54, "Conditions of licenses"
- RG 1.33, Revision 2, "Quality Assurance Program Requirements (Operation)"

13.1.4 Technical Evaluation

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed Section 13.1 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 the organizational structure of the applicant. 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:

AP1000 COL Information Items

- VCS COL 13.1-1

The NRC staff reviewed VCS COL 13.1-1 related to the organizational structure of the COL applicant included under Section 13.1 of the VCSNS COL FSAR. Section 13.1 of the VCSNS COL FSAR describes the organizational positions of a nuclear power plant and owner/applicant corporations and associated functions and responsibilities.

The applicant provided the following additional VCSNS site-specific COL information to resolve COL Information Item 13.1-1, which addresses the organizational structure of the COL applicant. COL Information Item 13.1-1 states:

> Combined License applicants referencing the AP1000 certified design will address adequacy of the organizational structure.

The commitment was also captured as COL Action Item 13.1-1 in Appendix F of NUREG-1793, which states:

> The COL applicant will describe its organizational structure.

The applicant provided additional information as part of the VCSNS COL FSAR to describe the organizational positions of a nuclear power station and owner/applicant corporations and associated functions and responsibilities. The position titles used in the text are generic and describe the function of the position. The applicant stated that VCSNS COL FSAR Table 13.1-201, "Generic Position/Site-Specific Position Cross-Reference" provides a cross-reference to identify site-specific position titles.

The applicant added new sections and information related to the site-specific organizational structure to VCSNS COL FSAR Section 13.1 beyond the structure given in RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)." The new section titles are:

> 13.1.1, "Management and Technical Support Organization"
> 13.1.2, "Operating Organization"
> 13.1.3, "Qualifications of Nuclear Plant Personnel"

[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).

Table 13.1-201, “Generic Position/Site-Specific Position Cross-Reference”
Table 13.1-202, “Minimum On-Duty Operations Shift Organization for Two-Unit Plant”

In addition, the applicant added a new appendix to Chapter 13 titled “Appendix 13AA Construction-Related Organization.” This appendix describes the applicant’s construction organization. Once plant operation commences, this appendix will become historical information.

The NRC staff has reviewed VCS COL 13.1-1 and concludes that the management, technical support, and operating organizations, as described, are acceptable and meet the requirements of 10 CFR 50.40(b) based on the following.

The applicant has described its organization for the management of, and its means of providing, technical support for the plant staff for the design, construction, and operation of the facility and has described its plans for managing the project and utilizing the nuclear steam system supplier (NSSS) vendor and architect-engineer (AE). These plans provide reasonable assurance that the applicant will establish an acceptable organization and that sufficient resources are available to provide offsite technical support and to satisfy the applicant's commitments for the design, construction, and operation of the facility.

The applicant has described the assignment of plant operating responsibilities; the reporting chain up through the chief executive officer; the functions and responsibilities of each major plant staff group; the proposed shift crew complement for single-unit or multiple-unit operation; the qualification requirements for members of its plant staff; and staff qualifications. In Table 1.9-202, “Conformance with SRP Acceptance Criteria,” of the VCSNS COL FSAR, the applicant noted an exception to the criteria of NUREG-0800, Section 13.1.2-13.1.3 that suggests resumes of personnel holding plant managerial and supervisory positions be included in the FSAR. The staff finds this exception to the criteria of NUREG-0800, Section 13.1.2-13.1.3 acceptable because resumes for management and principal supervisory and technical positions will be available for review after position vacancies are filled.

NUREG-0800, Section 13.1.2-13.1.3, “Operating Organization,” provides the following acceptable characteristics for an applicant's operating organization:

1. The applicant is technically qualified, as specified in 10 CFR 50.40(b).

2. An adequate number of licensed operators will be available at all required times to satisfy the minimum staffing requirements of 10 CFR 50.54(j).

3. On-shift personnel are able to provide initial facility response in the event of an emergency.

4. Organizational requirements for the plant manager and radiation protection manager have been satisfied.

5. Qualification requirements and qualifications of plant personnel conform to the guidance of RG 1.8.

6. Organizational requirements conform to the guidance of RG 1.33.

The NRC staff finds that the operating organization proposed by the applicant will comply with these characteristics. These findings contribute to the judgment that the applicant complies with the requirements of 10 CFR 50.40(b). That is, the applicant is technically qualified to engage in design and construction activities and to operate a nuclear power plant; that the applicant will have the necessary managerial and technical resources to support the plant staff in the event of an emergency; and that the applicant has identified the organizational positions responsible for fire protection matters and delegated the authorities to these positions to implement fire protection requirements.

- VCS COL 9.5-1

The applicant added text to VCSNS COL FSAR Section 13.1.1.2.10, "Fire Protection," indicating that the nuclear power station is committed to maintaining a fire protection program as described in VCSNS COL FSAR Section 9.5, and that the site vice president, through the engineer in charge of fire protection, is responsible for the fire protection program. The applicant added text to VCSNS COL FSAR Section 13.1.1.3.2.1.4, "Engineer in Charge of Fire Protection," describing the responsibilities of the engineer in charge of the fire protection program.

The NRC staff reviewed VCS COL 9.5-1 relative to the text added to Sections 13.1.1.2.10 and 13.1.1.3.2.1.4 of the VCSNS COL application. Based on the management descriptions provided in Sections 13.1.1.2.10 and 13.1.1.3.2.1.4, the staff finds the applicant's fire protection organization meets the guidance of NUREG-0800. The technical review for VCS COL 9.5-1 as it relates to the programmatic requirements is addressed in Section 9.5 of this safety evaluation report (SER).

- VCS COL 18.6-1

The NRC staff reviewed VCS COL 18.6-1, which describes the qualifications of the nuclear plant technical support personnel.

In Table 1.9-202, "Conformance with SRP Acceptance Criteria," of the VCSNS COL FSAR, the applicant noted an exception to the criteria of NUREG-0800, Section 13.1.1 that suggests the experience requirements of managers and supervisors of the technical support organization are included in the FSAR. The staff finds this exception to the criteria of NUREG-0800, Section 13.1.1 acceptable because the applicant added text to VCSNS COL FSAR Section 13.1.1.4, "Qualifications of Technical Support Personnel," stating the qualifications of managers and supervisors of the technical support organization will meet the education and experience requirements described in ANSI/ANS-3.1-1993 and RG 1.8.

The applicant added text to VCSNS COL FSAR Section 13.1.3, "Qualification Requirements," stating, in Section 13.1.3.1, the qualifications of managers, supervisors, operators, and technicians of the operating organization will meet the education and experience requirements described in ANSI/ANS-3.1-1993 and RG 1.8. In addition, Section 13.1.3.2 states that resumes and other documentation of the qualifications and experience of initial appointees to appropriate management and supervisory positions will be available for review after position vacancies are filled.

The applicant added VCSNS COL FSAR Table 13.1-202, "Minimum On-Duty Operations Shift Organization for Two-Unit Plant." Table 13.1-202 describes the minimum composition of the operating shift crew for all modes of operation. Position titles, license requirements and

minimum shift manning for the various modes of operation are addressed in Technical Specifications and will be addressed in administrative procedures.

The NRC staff reviewed the text added to VCSNS COL FSAR Sections 13.1.1.4 and 13.1.3.1 relative to VCS COL 18.6-1 and concludes that the qualification requirements are acceptable and meet the requirements of 10 CFR 50.40(b) based on the following.

The applicant has described its organization for the management of, and its means of providing, technical support for the plant staff for the design, construction, and operation of the facility and has described its plans for managing the project and utilizing the NSSS vendor and AE. These plans give reasonable assurance that the applicant will establish an acceptable organization and that sufficient resources are available to provide offsite technical support and to satisfy the applicant's commitments for the design, construction, and operation of the facility.

- VCS COL 18.10-1

The NRC staff reviewed VCS COL 18.10-1 included under Section 13.1.1.3.2.2.1, “Functional Manager in Charge of Training (Nuclear Training).” This section describes the responsibilities of the manager in charge of nuclear training relative to the site training programs required for the safe and proper operation and maintenance of the plant. This item is cross-referenced to VCSNS COL FSAR Section 18.10 in Table 1.8-202, “COL Item Tabulation.” The NRC staff concludes that the qualification requirements are acceptable and meet the requirements of 10 CFR 50.40(b) and the regulatory guidelines in NUREG-0800, Sections 13.1.1 and 13.1.2-13.1.3 because the applicant described how the training manager will carry out his or her position responsibilities for designing, developing, implementing, and maintaining training programs for the safe and proper operation and maintenance of the plant.

13.1.5 Post Combined License Activities

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

13.1.6 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 the organizational structure of the applicant, 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.

In addition, the staff concludes that the information presented in the VCSNS COL FSAR is acceptable because it meets the acceptance criteria provided in NUREG-0800, Section 13.1. The staff based its conclusion on the following:

- VCS COL 13.1-1, related to the organizational structure of the COL applicant, is acceptable because it meets the requirements of 10 CFR 50.40(b).

- VCS COL 9.5-1, related to the fire protection organization meets the guidance of Section 13.1 of NUREG-0800 and is acceptable.

- VCS COL 18.6-1, related to the qualifications of nuclear plant technical support personnel, is acceptable because it meets the requirements of 10 CFR 50.40(b).

- VCS COL 18.10-1, related to the qualification requirements for the manager in charge of nuclear training, is acceptable because it meets the requirements of 10 CFR 50.40(b).

13.2 Training

13.2.1 Introduction

This section addresses the description and schedule of the training program for reactor operators (ROs) and senior reactor operators (SROs), i.e., licensed operators. It addresses the scope of licensing examinations as well as training requirements. The licensed operator training program also includes the requalification programs as required in 10 CFR 50.54(i)(i-1) and 10 CFR 55.59, "Requalification." In addition, this section of the VCSNS COL FSAR includes the description and schedule of the training program for non-licensed plant staff.

13.2.2 Summary of Application

Section 13.2 of the VCSNS COL FSAR, Revision 5, incorporates by reference Section 13.2 of the AP1000 DCD, Revision 19.

In addition, in VCSNS COL FSAR Section 13.2, the applicant provides the following:

AP1000 COL Information Items

- STD COL 13.2-1

The applicant provided additional information in Standard (STD) COL 13.2-1 to resolve COL Information Item 13.2-1 (COL Action Item 13.2-1), which incorporates the provisions of Nuclear Energy Institute (NEI) 06-13A, "Template for an Industry Training Program Description," providing the description and scheduling of the training program for plant personnel, including the requalification program for licensed operators.

- STD COL 18.10-1

The applicant provided additional information in STD COL 18.10-1 to address training for those operators involved in the Human Factors Engineering (HFE) Verification and Validation Program, using a systematic approach to training and Westinghouse Commercial Atomic Power (WCAP)-14655, "Designer's Input to the Training of the Human Factors Engineering Verification and Validation Personnel."

License Conditions

- Part 10, License Condition 3, Items B.1, C.3

The applicant proposed a license condition in Part 10 of the VCSNS COL application, which provides the milestones for implementing the Reactor Operator Training (B.1) and the applicable portions of the Non-Licensed Plant Staff Training Program (C.3) (required in accordance with 10 CFR 50.120, "Training and qualification of nuclear power plant personnel").

The license condition related to the portions of the Non-Licensed Plant Staff Training Program applicable to radioactive material is addressed in Chapter 1 of this SER.

- Part 10, License Condition 6

The applicant proposed a license condition to provide a schedule to support the NRC's inspection of operational programs included in VCSNS COL FSAR Table 13.4-201, including the Non-Licensed Plant Staff Training Program, (required in accordance with 10 CFR 50.120), Reactor Operator Training Program, and the Reactor Operator Requalification Program.

13.2.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed in NUREG-1793 and its supplements.

In addition, the acceptance criteria associated with the relevant requirements of the Commission regulations for the description and schedule of the training program for licensed operators are given in Sections 13.2.1 and 13.2.2 and Chapter 18 of NUREG-0800.

The applicable regulations and regulatory guidance documents for STD COL 13.2-1 are as follows:

- 10 CFR 50.54(m)
- 10 CFR Part 55, "Operators' licenses"
- RG 1.8
- RG 1.149, "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations"
- NUREG-1021, "Operator Licensing Examination Standards for Power Reactors"

The applicable regulations for the Non-Licensed Plant Staff Training Program are as follows:

- 10 CFR 50.120
- 10 CFR 52.79(a)(33), "Contents of applications; technical information"

The applicable regulations for the licensed operators training program are as follows:

- 10 CFR 55.13, "General exemptions"
- 10 CFR 55.31, "How to apply"
- 10 CFR 55.41, "Written examinations: Operators"
- 10 CFR 55.43, "Written examinations: Senior operators"
- 10 CFR 55.45, "Operating tests"

The applicable regulations for the licensed operator's requalification program are found in:

- 10 CFR 50.34(b), "Final safety analysis report"
- 10 CFR 50.54(i)
- 10 CFR 55.59, "Requalification"

The applicable regulatory guidance for STD COL 18.10-1 is as follows:

- NUREG-0711, "Human Factors Engineering Program Review Model"

13.2.4 Technical Evaluation

The NRC staff reviewed Section 13.2 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 the description and schedule of the training programs for nuclear plant personnel. 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.

Section 1.2.3 of this SER provides a discussion of the strategy used by the NRC to perform one technical review for each standard issue outside the scope of the DC and use this review in evaluating subsequent COL applications. To ensure that the staff's findings on standard content that were documented in the SER for the reference COL application (Vogtle Electric Generating Plant (VEGP), Units 3 and 4) were equally applicable to the VCSNS Units 2 and 3 COL application, the staff undertook the following reviews:

- The staff compared the VEGP COL FSAR, Revision 2 to the VCSNS COL FSAR. In performing this comparison, the staff considered changes made to the VCSNS COL FSAR (and other parts of the COL application, as applicable) resulting from requests for additional information (RAIs).

- The staff confirmed that all responses to RAIs identified in the corresponding standard content evaluation were endorsed.

- The staff verified that the site-specific differences were not relevant.

The staff has completed its review and found the evaluation performed for the standard content to be directly applicable to the VCSNS COL application. This standard content material is identified in this SER by use of italicized, double-indented formatting. Section 1.2.3 of this SER provides an explanation of why the standard content material from the SER for the reference COL application (VEGP) includes evaluation material from the SER for the Bellefonte Nuclear Plant (BLN) Units 3 and 4 COL application.

The following portion of this technical evaluation section is reproduced from Section 13.2.4 of the VEGP SER:

AP1000 COL Information Items

- *STD COL 13.2-1*

The NRC staff reviewed STD COL 13.2-1 related to COL Information Item 13.2-1 (COL Action Item 13.2-1) included under Section 13.2 of the BLN COL FSAR. COL Information Item 13.2-1 states:

> *The Combined License applicants referencing the AP1000 certified design will develop and implement training programs for plant personnel. This includes the training program for the operations personnel who participate as subjects in the human factors engineering verification and validation. These Combined License applicant training programs will address the scope of licensing examinations as well as new training requirements.*

The commitment was also captured as COL Action Item 13.2-1 in Appendix F of the NRC staff FSER for the AP1000 DCD (NUREG-1793), which states:

> *The COL applicant will develop and implement training programs for plant personnel.*

The applicant provided the following text to supplement Section 13.2, "Training," of the AP1000 DCD, dealing with the training program for plant personnel.

> *This section incorporates by reference NEI 06-13* (sic) [NEI 06-13A]*, Template for an Industry Training Program Description. See Table 1.6-201.*

This technical report provides a complete training program description for use with COL applications. The staff has endorsed NEI 06-13A, Revision 1, as it provides an acceptable template for describing licensed operators and non-licensed plant staff training programs. The applicant has incorporated by reference NEI 06-13A, Revision 1.

The applicant provided the following text to supplement Section 13.2, "Training," of the AP1000 DCD, which is included in the [design certification] *DC amendment as part of the BLN COL FSAR to address STD COL 13.2-1, dealing with the training program for plant personnel.*

> *Table 13.4-201 provides milestones for training implementation.*

NUREG-0800, Section 13.2.1, establishes milestones for the licensed operators and non-licensed plant staff training programs and for the licensed operator requalification training program. The BLN COL FSAR has identified those milestones in Table 13.4-201. The staff determined that this is acceptable, as the milestone information included in this table meets the criteria found in NUREG-0800.

- *STD COL 18.10-1*

The NRC staff reviewed STD COL 18.10-1, related to COL Information Item 18.10-1 (COL Action Item 18.10.3-1). COL Information Item 18.10-1 states:

> *Combined License applicants referencing the AP1000 certified design will develop and implement training programs for plant personnel. This includes the training program for the operations personnel who participate as subjects in the human factors engineering verification and validation. These Combined License applicant training programs will address the scope of licensing examinations as well as new training requirements.*

The commitment was also captured as COL Action Item 18.10.3-1 in Appendix F of the NRC staff's FSER for the AP1000 DCD (NUREG-1793), which states:

> *With regard to the training program development, the COL applicant will: (1) address the training program development considerations in NUREG-0711, (2) address relevant concerns identified in this report* [NUREG-1793], *and (3) identify the minimum documentation that the COL applicant will provide to enable the staff to complete its review.*

This section refers to Sections 13.1, "Organizational Structure of Applicant" and 13.2, "Training" regarding the training program development.

The NRC staff reviewed the resolution to STD COL 18.10-1, related to staffing and qualifications included under Section 18.10 of the BLN COL FSAR. The applicant provided the referenced NRC-endorsed NEI 06-13A, Revision 1, to address COL Information Item 18.10-1.

NEI 06-13A, Revision 1 was written to provide COL applicants with a generic program description for use with COL application submittals. In a letter dated December 5, 2008, the staff stated that the training template of NEI 06-13A, Revision 1, was an acceptable means for describing licensed operator and non-licensed plant staff training programs. The staff finds the applicant's incorporation of NEI 06-13A, Revision 1 to be acceptable because it utilizes an NRC-endorsed methodology.

In Table 1.9-202, "Conformance with SRP Acceptance Criteria," of the BLN COL FSAR, the applicant identified two exceptions to the criteria of NUREG-0800, Section 13.2, which recommends following the guidance in NUREG-0711 and RG 1.149. Further, the applicant stated in Table 1.9-202 that NEI 06-13A is incorporated by reference into the BLN COL FSAR. The staff's safety evaluation report for NEI 06-13A (ML0709504790) states that NEI 06-13A complies with the guidance in NUREG-0711 and RG 1.149. Therefore, the staff finds the two exceptions to the criteria in NUREG-0800, Section 13.2 to be acceptable because NEI 06-13A complies with the guidance in NUREG-0711 and RG 1.149.

License Conditions

- *Part 10, License Condition 3, Item B1*

The NRC staff finds the implementation milestone for the Reactor Operator Training Program (18 months prior to schedule date of initial fuel load) to be acceptable because it is consistent with 10 CFR 50.120.

- *Part 10, License Condition 6*

The applicant proposed a license condition in Part 10 of the VEGP COL application to provide a schedule to support the NRC's inspection of operational programs, including the Non-Licensed Plant Staff Training Program, (required in accordance with 10 CFR 50.120), Reactor Operator Training Program, and Reactor Operation Requalification Program. The proposed license condition is consistent with the policy established in SECY-05-0197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria," for operational programs in general, and is acceptable.

13.2.5 Post Combined License Activities

For the reasons discussed in the technical evaluation section above, the staff finds the following license conditions proposed by the applicant acceptable:

- License Condition (13-1) – The licensee shall implement the Reactor Operator Training Program at least 18 months prior to schedule date of initial fuel load.

- License Condition (13-2) – No later than 12 months after issuance of the COL, the licensee shall submit to the Director of the Office of New Reactors (NRO) a schedule that supports planning for and conduct of NRC inspection of the operational programs (the Non-Licensed Plant Staff Training Program (required in accordance with 10 CFR 50.120), Reactor Operator Training Program, and Reactor Operation Requalification Program). The schedule shall be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until these operational programs have been fully implemented.

13.2.6 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 the description and schedule of the training program for licensed operators, 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.

In addition, the staff concludes that the information presented in the VCSNS COL FSAR is acceptable because it meets the acceptance criteria provided in NUREG-0800 Section 13.2. The staff based its conclusion on the following:

- STD COL 13.2-1 incorporates by reference NEI 06-13A, Revision 1, which provides an acceptable template for describing licensed operators and non-licensed plant staff training programs. The staff determined that this is acceptable, as it applies an NRC-endorsed approach.

- STD COL 18.10-1, relating to training, references Section 13.2 of the VCSNS COL FSAR, in which the applicant has committed to use WCAP-14655 to ensure a systematic approach to training development, and has referenced NEI 06-13A, Revision 1. The staff finds this acceptable because it applies an NRC-endorsed approach.

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 COL application. This includes both the applicant's onsite emergency plan and State and local offsite emergency plans, which the 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 VCSNS COL FSAR, Revision 5, incorporates by reference Section 13.3 of the AP1000 DCD, Revision 19.

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, "Departures and Exemptions," provides additional information regarding the departures.

AP1000 COL Information Items

- STD COL 13.3-1

The applicant provided additional information in 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 5, 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 5, 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 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 and its supplements.

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

- 10 CFR 52.79(a)(21), "Contents 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, "Emergency plans," and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities" to 10 CFR Part 50, "Domestic licensing of production and utilization facilities," 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, "Licenses, 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, "Contents of applications; general information"; 10 CFR 52.80, "Contents of applications; additional technical information"; 10 CFR 50.33(g), and 10 CFR 100.21, "Non-seismic siting criteria."

- NUREG-0800 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, "Memorandum 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.

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 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 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 letters dated May 18, 2010, and June 28, 2011. 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**.

Correction and Resolution of Confirmatory Item 13.3-1

To resolve Confirmatory Item 13.3-1, the applicant committed to revise EP ITAAC 8.1.3 in Part 10 of the COL application to include a reference to 10 CFR 50.54(gg). The staff verified that Part 10 of the COL application included this revision to EP ITAAC 8.1.3. However, the staff has reconsidered the content of EP ITAAC 8.1.3 and notes the following issue associated with this ITAAC:

- Initially in the November 19, 2010, advanced safety evaluation (ASE), Section 13.3 indicated that a reference to a license condition in EP ITAAC 8.1.3 was not required and that a reference to 10 CFR 50.54(gg) was necessary. However, since the requirements of 10 CFR 50.54(gg) are a license condition (i.e., the title of 10 CFR 50.54 is "Conditions of licenses"), the staff has determined that referring to a license condition is appropriate and that referring to 10 CFR 50.54(gg) in EP ITAAC 8.1.3 is redundant and unnecessary.

Based on the staff's reconsideration, differences now exist between the EP ITAAC 8.1.3 proposed by the applicant in Part 10 of its COL application and Table 13.3-1 of this FSER. The difference being that the applicant's proposed EP ITAAC 8.1.3 includes a reference to 10 CFR 50.54(gg) while Table 13.3-1 of this FSER does not.

Therefore, the staff proposes to include the applicant's proposed EP ITAAC 8.1.3 in Table 13.3-1 of this FSER, which includes a reference to a license condition but the staff does not propose including the applicant's proposed reference to 10 CFR 50.54(gg). Because EP ITAAC 8.1.3 will be based on FSER Table 13.3-1, further updating of Part 10 of the application is not necessary. As a result, Confirmatory Item 13.3-1 is now closed.

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).

Correction of Last Paragraph in Section 13.3.4

The last sentence of the last paragraph in Section 13.3.4 of the ASE, as indicated above, stated that "the staff finds that a specific license condition is not required because this requirement is now specifically addressed in 10 CFR 50.54 (gg)." As stated above, the staff has reconsidered its position documented in the ASE. Therefore, the last sentence of the last paragraph in Section 13.3.4 has been revised to state the following:

> *The staff finds that a reference to 10 CFR 50.54(gg) is not required because the requirements of 10 CFR 50.54(gg) are a license condition.*

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, "Emergency Plan ITAAC."

- License Condition (13-3) – No later than 12 months after issuance of the COL, the licensee shall submit to the Director of NRO a schedule that supports planning for and conduct of NRC inspections of the EP program implementation. The schedule shall be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until the EP operational program has been fully implemented.

- 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, "Methodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors," 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.

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 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 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 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, "Standards for review of applications"; and 10 CFR 52.83, "Finality of referenced NRC approvals; partial initial decision on site suitability."

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, "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, "Emergency 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**.

Resolution of Confirmatory Item 13.3-2

Confirmatory Item 13.3-2 is an applicant commitment to update its FSAR to include an incorporated by reference statement for the emergency plans. The staff verified that VCSNS

COL FSAR Section 13.3 was appropriately updated (or revised). As a result, Confirmatory Item 13.3-2 is now closed.

- 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 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 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, "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, "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, "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**.

Resolution of Confirmatory Item 13.3-3

Confirmatory Item 13.3-3 is an applicant commitment to update its COL application Part 7, to remove reference to the TSC location being Tier 2* information. The staff verified that the VCSNS COL application Part 7 was appropriately updated. As a result, Confirmatory Item 13.3-3 is now closed.

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 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 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 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.

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[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

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), 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, 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.1 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.2 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 VCSNS 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 MOU 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.3 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.4 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.5 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.6 Post Combined License Activities

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

13.3B.7 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, "Agency 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, "VCSNS 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, "Continuous 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, "Emergency Response Organization Block Diagram," of the VCSNS Emergency Plan states that Table B-1a, "Shift Emergency Response Organization," of each unit annex and Table B-1b, "Staffing Requirements for the VCSNS ERO," lists the key positions of the ERO and the supporting positions assigned to interface with Federal, State, and county/local authorities. Figure B-1a, "Overall ERO Command Structure," illustrates the interrelationships of the overall ERO organization. Figure B-1b, "On-site Emergency Response Organization," through Figure B-1d, "Emergency 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, "Emergency 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, "Onsite ERO," Section 2.B.5.b, "Offsite ERO," and Section 2.B.5.c, "EPI 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, "Industry/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, "Onsite ERO," Section 2.B.5.b, "Offsite ERO," and Section 2.B.5.c, "EPI Organization," of the VCSNS Emergency Plan details licensee employees with special qualifications for coping with emergency conditions. Section 2.B.7, "Industry/Private Support Organizations" discusses contractors that will be providing assistance during emergencies. Section 2.B.8, "Supplemental 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, "Supplemental 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, "Letters of Agreement." Services to be provided include: law enforcement; fire protection; ambulance services; medical and hospital support; transportation and treatment of injured station personnel. 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, "Medical 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, “Emergency 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, “Assignment 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, “Emergency Response Support and Resources,” and Section 2.C.1, “Federal 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, “NRC Incident Response Plan.” 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 NEI 07-01, as it applies to AP1000 facilities and postulated accidents identified in the FSAR. Section 3, "Classification of Emergencies,” of each annex for Units 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. <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.

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, “Immediate notification requirements for operating nuclear power reactors.”[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 EROs. 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,

[5] Parentheses identify other applicable regulatory requirements

"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.

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, "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 "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, "Follow-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, "Notification 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, “Emergency Telecommunications.”

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 the 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, "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 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, "Notification 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, "Communications Testing," and Section 2.N.2.a, "Communications 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, "Communications/Notifications," of the VCSNS Emergency Plan, 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. Section 2.F.3, "Communications Testing," and Section 2.N.2.a, "Communications 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, "Communications Testing," and Section 2.N.2.a, "Communications 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 page 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, "Media 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 equipment, 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, “Contents of applications; technical information,” 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, “Control 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, “Emergency 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 describes the location of the TSC structure but does not state whether the TSC is designed in accordance with the Uniform Building Code (UBC). 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 personnel in the TSC shall be protected from radiological hazards. The Emergency Plan also states that the TSC directly meets most of the requirements of NUREG-0696, “Functional Criteria for Emergency Response Facilities.” ITAAC Section 5.1.1, under the Inspections, Tests, Analysis column, states, “An inspection of the TSC and OSC will be performed, including a test of capabilities. These facilities meet the criteria of NUREG-0696 with exceptions.”

In RAI 13.3-22(D)(1) the staff asked for clarification concerning the exceptions to the guidance of NUREG-0696. In it’s response to RAI 13.3-22(D)(1) the applicant explained that the only exception is the proximity of the TSC to the respective control room and facilitation of face-to-face interactions between control room and TSC personnel.

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, and EP ITAAC Acceptance Criterion 5.1.8 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 the clarification and additional information submitted in response to RAI 13.3-22(D)(1) to be acceptable . The staff finds that the VCSNS Emergency Plan adequately describes the TSC environmental controls and the availability of backup electrical supply for the TSC. 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 personnel in the TSC shall be protected from radiological hazards. 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, “Functional Criteria for Emergency Response Facilities,” 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, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," 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, "Content 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, “Onsite Meteorological Measurement Program,” and 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: (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, “Overview,” 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, "Operations 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, "Departures 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, "Annex 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, "Operations Support Center," of the VCSNS Emergency Plan provides an overview of coordination between the control room, TSC and OSC. Section 2.8.10, "OSC 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, "Operations 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, 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, "Meteorological 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, "Emergency 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, "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. 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, "Procedure 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, "Emergency 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, "On-shift 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**.

Resolution of Confirmatory Item 13.3-4

Confirmatory Item 13.3-4 is an applicant commitment to update COL application Part 5, Emergency Plan, to include a discussion regarding the variables to be available in the ERDS. The staff verified that the COL application Part 5, Emergency Plan, was appropriately updated. As a result, Confirmatory Item 13.3-4 is now closed.

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 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 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, "Onsite Meteorological Instrumentation," of each unit annex states the meteorological data necessary for making offsite dose projections is available to personnel in the control room, TSC, and EOF. The dose projection model is discussed in more depth in Section 4.2.F, "Dose Projection Model," of each unit annex. Section 4.2.F, describes the MIDAS system that is used for dose assessments. 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, "Meteorological 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, "Meteorological 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, "ERDS," 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, "Onsite 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, "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, "Field 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 "alert" or higher classification. Teams will assemble in the EOF and then are dispatched in company vehicles into the surrounding areas. Initial surveys involve simple measurements to quickly confirm or modify the dose projections. Subsequent measurements will be made to further define offsite consequences. Data collected by the field monitoring team will be transmitted to the emergency facilities. The data is used to define affected area boundaries, verify or modify dose projections and PARs, and assess the actual magnitude, extent, and significance of a liquid or gaseous release. The 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 "limited 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, "Iodine 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, "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, "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 OCA. 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 PAs 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, “Manual of Protective Action Guides and Protective Actions for Nuclear

Incidents"; 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, “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, “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, “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, “Standards for protection against radiation,” 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, “Personal 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, “Personal 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, “Contamination 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, “Contamination Control Measures,” states that contaminated personnel, equipment, and materials, will be decontaminated in accordance with procedures to “acceptable limits.” In RAI 13.3-33(C)(1)(2), the staff requested the definition of “acceptable 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 Part 50, Appendix E, Section 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.

Resolution of Confirmatory Item 13.3-5

Confirmatory Item 13.3-5 is an applicant commitment to update the COL application Part 5, Emergency Plan, to include a description of the specific locations for the decontamination sites and associated supplies. The staff verified that the VCSNS COL application Part 5, Emergency Plan, was appropriately updated. As a result, Confirmatory Item 13.3-5 is now closed.

The staff finds 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, "Contamination 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, "Contamination 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, "Contamination Control for Equipment and Materials;" and HPP-0160, "Control 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, “Decontamination 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 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 LOA with the physician available for onsite medical emergencies. In its response, the applicant provided an LOA 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, "Exercises," 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, "Augmentation 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, "Biennial 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, "Operational 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, Section 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 identifies 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, "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, "Emergency 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, "Fire 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, "Fire Protection Program." FSAR Section 9.5.1.8.2.2.4, "Drills," states that fire brigade drills are conducted at least once per calendar quarter for each shift. Each member of the fire brigade participates in at least two drills annually, one will be unannounced. At least one drill is performed annually on a "back shift" for each shift's fire brigade. The drills provide for off-site fire department 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, "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, "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, "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, "Health Physics Drills," of the VCSNS Emergency Plan states that health physics drills are conducted semiannually in each PA. The VCSNS Emergency Plan also states that HPs 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, "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, "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, "Drill 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, "Functional 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. Offisite 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 identified in the Emergency Planning Telephone Directory as Directors, Managers, and Coordinators for the Station ERO receive position specific training in accordance with the approved ERO training program. Contents of the training program are also discussed in 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 Sections 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 information in the Commission orders issued February 25, 2002, as well as any subsequent NRC guidance, to determine what security-related aspects of EP and preparedness should be addressed in the emergency plan.

NUREG-0800, 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 that applicants should consider 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.

Resolution of Confirmatory Item 13.3-6

Confirmatory Item 13.3-6 is an applicant commitment to update COL application Part 5, Emergency Plan, to indicate that the EOF is designed to be an alternate facility to support response to a hostile-action event. The staff verified that the COL application Part 5, Emergency Plan, was appropriately updated. As a result, Confirmatory Item 13.3-6 is now closed.

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 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.

Resolution of Confirmatory Item 13.3-7

Confirmatory Item 13.3-7 is an applicant commitment to update COL application Part 5, Emergency Plan, to add a discussion regarding security-based responses. The staff verified that the COL application Part 5, Emergency Plan, was appropriately updated. As a result, Confirmatory Item 13.3-7 is now closed.

Technical Evaluation: (NUREG-0800) The staff finds 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 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 Part 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, “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 “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, “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 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 13.3-5(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, “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, “Demand 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, VCSNS 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, “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, “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, “Schools within the VCSNS EPZ,” and Figure E-3, “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, “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, relies 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), the 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, “School Evacuation Time Estimates-Good Weather,” and Table 8-5B, “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, “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, “Evacuation Time Estimates for Transit-Dependent People,” and depicted in Figure 8-2, “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 “flag” 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, Section 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, “Inspections, 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, “Inspections, 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, “Emergency 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, and June 28, 2011.

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 requires 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 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.

[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.

Correction and Resolution of Confirmatory Item 13.3-8

To resolve Confirmatory Item 13.3-8, the applicant committed to revise EP ITAAC 8.1.3 in Part 10 of the COL application to include a reference to 10 CFR 50.54(gg). The staff verified that Part 10 of the COL application included this revision to EP ITAAC 8.1.3. However, the staff has reconsidered the content of EP ITAAC 8.1.3 and notes the following issue associated with this ITAAC:

- Initially in the November 19, 2010, ASE, Section 13.3C.19.2 indicated that a reference to a license condition in EP ITAAC 8.1.3 was not required and that a reference to 10 CFR 50.54(gg) was necessary. However, since the requirements of 10 CFR 50.54(gg) are a license condition (i.e., the title of 10 CFR 50.54 is "Conditions of licenses"), the staff has determined that referring to a license condition is appropriate and that referring to 10 CFR 50.54(gg) in EP ITAAC 8.1.3 is redundant and unnecessary.

Based on the staff's reconsideration, differences now exist between the EP ITAAC 8.1.3 proposed by the applicant in Part 10 of its COL application and Table 13.3-1 of this FSER. The difference being that the applicant's proposed EP ITAAC 8.1.3 includes a reference to 10 CFR 50.54(gg), while Table 13.3-1 of this FSER does not.

Therefore, the staff has adopted the applicant's proposed EP ITAAC 8.1.3 in Table 13.3-1 of this FSER, which includes a reference to a license condition but does not include the applicant's proposed reference to 10 CFR 50.54(gg). Because EP ITAAC 8.1.3 will be based on FSER Table 13.3-1, further updating of Part 10 of the application is not necessary. As a result, Confirmatory Item 13.3-8 is now closed.

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**.

Resolution of Confirmatory Item 13.3-9

Confirmatory Item 13.3-9 is an applicant commitment to update COL application Part 10 to make changes to EP ITAAC 1.1, 5.1.5, and 5.2.4. The staff verified that the COL application Part 10 was appropriately updated. As a result, Confirmatory Item 13.3-9 is now closed.
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**.

Resolution of Confirmatory Item 13.3-10

Confirmatory Item 13.3-10 is an applicant commitment to update COL application Part 10, to change HFE ITAAC 8.1.1.D.2. The staff verified that the COL application Part 10 was appropriately updated. As a result, Confirmatory Item 13.3-10 is now closed.

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.

Resolution of Confirmatory Item 13.3-11

Confirmatory Item 13.3-11 is an applicant commitment to update COL application Part 10, to make changes to the ITAAC Table 3.8-1. The staff verified that the COL application Part 10 was appropriately updated. As a result, Confirmatory Item 13.3-11 is now closed.

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 June 28, 2011, 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 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, and June 28, 2011, 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) 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.

13.4 Operational Programs (Related to RG 1.206, Section C.III.1, Chapter 13, C.I.13.4, "Operational Program Implementation")

13.4.1 Introduction

In SECY-05-0197, the NRC staff detailed its plan for reviewing operational programs in a COL application. The Commission approved the NRC staff's plan in the related Staff Requirements Memorandum (SRM), dated February 22, 2006. Although numerous programs support the

operation of a nuclear power plant, SECY-05-0197 focused on those programs that meet the following three criteria:

1. Required by regulation
2. Reviewed in a COL application
3. Inspected to verify program implementation as described in the FSAR

The programs that meet the above criteria are collectively referred to as "operational programs" and most are identified in SECY-05-0197.

13.4.2 Summary of Application

Section 13.4 of the VCSNS COL FSAR, Revision 5, incorporates by reference Section 13.4 of the AP1000 DCD, Revision 19.

In addition, in VCSNS COL FSAR Section 13.4 and in Part 10 of the VCSNS COL application, "Proposed License Conditions and ITAAC)," the applicant provided the following:

AP1000 COL Information Item

- STD COL 13.4-1

The applicant provided additional information in STD COL 13.4-1 to address COL Information Item 13.4-1 and COL Action Item 13.4-1, identified in Appendix F of NUREG-1793 and its supplements. This item states that COL applicants referencing the AP1000 certified design will address each operational program.

License Conditions

- Part 10, License Condition 3, "Operational Program Implementation"
- Part 10, License Condition 6, "Operational Program Readiness"

Both license conditions are related to STD COL 13.4-1. License Condition 3 addresses implementation milestones for those operational programs whose implementation is not addressed in the regulations. License Condition 6 includes the timing of information related to operational programs to support NRC inspection activities.

13.4.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed in NUREG-1793 and its supplements.

In addition, the regulatory basis for acceptance of the supplementary information presented in this application is identified in the individual chapters of this SER that address the evaluations of the specific operational programs, which are itemized in the next section, as clarified by the regulatory guidance in SECY-05-0197 and RG 1.206.

13.4.4 Technical Evaluation

The NRC staff reviewed Section 13.4 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 operational programs. 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.

Section 1.2.3 of this SER provides a discussion of the strategy used by the NRC to perform one technical review for each standard issue outside the scope of the DC and use this review in evaluating subsequent COL applications. To ensure that the staff's findings on standard content that were documented in the SER for the reference COL application (VEGP Units 3 and 4) were equally applicable to the VCSNS Units 2 and 3 COL application, the staff undertook the following reviews:

- The staff compared the VEGP COL FSAR, Revision 2 to the VCSNS COL FSAR. In performing this comparison, the staff considered changes made to the VCSNS COL FSAR (and other parts of the COL application, as applicable) resulting from RAIs.

- The staff confirmed that all responses to RAIs identified in the corresponding standard content evaluation were endorsed.

- The staff verified that the site-specific differences were not relevant.

The staff has completed its review and found the evaluation performed for the standard content to be directly applicable to the VCSNS COL application. This standard content material is identified in this SER by use of italicized, double-indented formatting. Section 1.2.3 of this SER provides an explanation of why the standard content material from the SER for the reference COL application (VEGP) includes evaluation material from the SER for the BLN Units 3 and 4 COL application.

The following portion of this technical evaluation section is reproduced from Section 13.4.4 of the VEGP SER:

> *Although the staff concluded that the evaluation performed for the standard content is directly applicable to the VEGP COL application, there were differences in the response provided by the VEGP applicant from that provided by the BLN applicant regarding the standard content material. These differences affect the two license conditions and the table listing the operational programs. These differences are evaluated by the staff below, following the standard content material.*
>
> *<u>AP1000 COL Information Item</u>*
>
> - *STD COL 13.4-1*
>
> *The applicant provided supplemental information by adding the following statement to Section 13.4 of the VEGP COL FSAR:*
>
> *Operational programs are specific programs that are required by regulations. Table 13.4-201 lists each operational program, the regulatory source for the*

program, the section of the FSAR in which the operational program is described, and the associated implementation milestone(s).

Each operational program is evaluated by the staff in the applicable SER chapters.

License Conditions

- *License Condition 3, "Operational Program Implementation"*
- *License Condition 6, "Operational Program Readiness"*

These two proposed license conditions are evaluated by the NRC staff as part of its evaluation of each of the operational programs in the applicable SER chapters.

The following portion of this technical evaluation section provides the staff's general evaluation of the operational programs and associated license conditions and is reproduced from Section 13.4.4 of the BLN SER:

The NRC staff's review of the acceptability of the supplemental information added by STD COL 13.4-1 and the proposed license conditions is based on four considerations. The first consideration is the acceptability of the individual operational programs, including the implementation of the different phases of these operational programs. The second consideration is whether the applicant correctly identified those operational programs whose implementation requirements are not addressed in the regulations, and, therefore, need to be included in License Condition 3. The third consideration is whether the applicant correctly specified in License Condition 6 the timing of information related to operational programs to support NRC inspection activities. The fourth consideration is whether the list of operational programs in BLN COL FSAR Table 13.4-201 is complete.

In regard to the first consideration, the SER sections referenced in the above table address the NRC staff's regulatory evaluation of the individual operational programs. For each of these operational programs, the staff has either concluded that the applicant has satisfied the applicable regulatory guidance (including the implementation requirements when specified in the regulations), or the staff's review is still ongoing. For those operational program reviews that are ongoing, the staff's final conclusions will be provided in the SER sections referenced in the above table at a later date.

In regard to the second consideration, the NRC staff verified that those operational programs, whose implementation requirements are not specified in the regulations, are captured in License Condition 3.

In regard to the third consideration, the NRC staff compared License Condition 6 to the recommended license condition in SECY-05-0197 related to the timing of information to support NRC inspection activities of operational programs. The staff finds that the applicant used language similar to the recommended license condition specified in SECY-05-0197 to develop License Condition 6. It should be noted that License Condition 6 addresses additional scheduler requirements

(Sections b. through d.) that are not related to the operational programs evaluated in this section of the SER, and, therefore, are not evaluated in this SER section.

In regard to the fourth consideration, the NRC staff compared the operational programs provided by the applicant in BLN COL FSAR Table 13.4-201 (included in the above table) to the operational programs specified in SECY-05-0197. The staff finds that the applicant has included all the operational programs specified in SECY-05-0197, including the two operational programs (Motor-Operated Valve Testing Program and the Safeguards Contingency Program) added by the NRC to the list of operational programs provided by the NEI in its letter dated August 31, 2005.

There are differences between BLN COL FSAR Table 13.4-201 and the table of operational programs in SECY-05-0197 with respect to implementation milestone information. The first difference is the SECY paper states that there are no required implementation milestones in the regulations for the Maintenance Rule Program and the Quality Assurance Program (Operation), while BLN COL FSAR Table 13.4-201 references regulations that require implementation milestones for these two programs. The staff has reviewed the regulation references provided by the applicant and concludes that they do provide appropriate requirements for implementation milestones. Further support for this conclusion is the regulatory guidance in Section C.I.13.4 of RG 1.206. The example table located in this section of the RG references the same implementation regulatory guidance for the Maintenance Rule Program and the Quality Assurance Program (Operation) as does BLN COL FSAR Table 13.4-201.

The second difference is that the SECY paper states that 10 CFR Part 50, Appendix J, specifies implementation requirements for the Containment Leakage Rate Testing Program, while BLN COL FSAR Table 13.4-201 states that the implementation milestones for this program will be controlled by a license condition. The staff has reviewed the implementation milestone proposed in License Condition 3 for the Containment Leakage Rate Testing Program, and finds that it is more stringent than the regulatory guidance in Appendix J. Therefore, the staff finds this difference to be acceptable.

The applicant added an operational program to BLN COL FSAR Table 13.4-201, the Initial Test Program, which is not in the list of operational programs specified in SECY-05-0197. The option of adding operational programs to this list is specifically allowed by SECY-05-0197. Further support for the acceptability of adding the Initial Test Program is that the example table located in Section C.I.13.4 of RG 1.206 also lists this operational program.

Therefore, the NRC staff concludes that the additional information (STD COL 13.4-1) provided by the applicant in BLN COL FSAR Section 13.4, in conjunction with the conditions specified in BLN COL FSAR, Part 10, License Conditions 3 and 6, complies with the applicable regulatory guidance provided in SECY-05-0197.

Evaluation of Site-specific Response to Standard Content

The staff notes that the VEGP applicant separated the fitness-for-duty (FFD) program from the overall security program and added a new operational program, Cyber Security, to the list of operational programs in FSAR Table 13.4-201. The implementation requirements for these additional operational programs comply with the considerations identified above in the standard content material, and are, therefore, acceptable. In addition, the VEGP applicant also made minor changes to operational program implementation details in License Condition 3 and also modified Sections a. through d. associated with License Condition 6. The changes to these two license conditions are evaluated by the staff in the applicable SER chapters and do not affect the evaluation of operational programs covered in this section of the SER. Therefore, the conclusions reached by the NRC staff related to STD COL 13.4-1 are directly applicable to the VEGP COL application.

The BLN SER text refers to an SER table listing operational programs. This table was not reproduced for the VEGP SER since it duplicates the information in VEGP COL FSAR Table 13.4-201.

13.4.5 Post Combined License Activities

The license conditions for each of the operational programs are discussed in the applicable SER chapters. Therefore, there are no post-COL activities related to this section.

13.4.6 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 operational programs, 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 concludes that the relevant information presented in the VCSNS COL FSAR is acceptable based on the regulatory guidance in SECY-05-0197, in conjunction with the applicable regulations specified in the individual sections of this SER that evaluated each of the operational programs discussed above. The staff based its conclusion on the following:

- STD COL 13.4-1, as related to operational programs, is acceptable because each of the operational programs in VCSNS COL FSAR Table 13.4-201 has been found acceptable by the NRC staff in other sections of this SER, as noted in Section 13.4.4 above. In addition, the guidance in SECY-05-0197 and RG 1.206 was used to verify that the applicant's list of operational programs is complete.

13.5 Plant Procedures

13.5.1 Introduction

Descriptions of the administrative and operating procedures that the applicant uses to ensure routine operating, off-normal, and emergency activities are conducted in a safe manner are

provided. The applicant, in its plant procedures, provided a brief description of the nature and content of the procedures and a schedule for the preparation of appropriate written administrative and operating procedures. The applicant delineated in the description of the procedures the functional position for procedural revision and approval prior to implementation. Inspection of procedures will occur as part of the construction inspection program.

13.5.2 Summary of Application

Section 13.5 of the VCSNS COL FSAR, Revision 5, incorporates by reference Section 13.5 of the AP1000 DCD, Revision 19.

In addition, in VCSNS COL FSAR Section 13.5, the applicant provided the following:

AP1000 COL Information Item

- STD COL 13.5-1

The applicant provided additional information in STD COL 13.5-1 to resolve COL Information Item 13.5-1 (COL Action Item 13.5-1), which addresses plant procedures.

Supplemental Information

- VCS SUP 13.5-1 and VCS SUP 13.5-2

The applicant provided plant-specific supplemental information in VCS SUP 13.5-1 and VCS SUP 13.5-2 to resolve COL Information Item 13.5-1 (COL Action Item 13.5-1), which addresses plant procedures.

13.5.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed in NUREG-1793 and its supplements.

In addition, the acceptance criteria associated with the relevant requirements of the Commission regulations for plant procedures are given in Sections 13.5.1.1 and 13.5.2.1 of NUREG-0800.

The applicable regulations and regulatory guidance are as follows:

- 10 CFR 50.34(a), “Preliminary safety analysis report”
- 10 CFR 50.34(b), “Final safety analysis report”
- RG 1.33

13.5.4 Technical Evaluation

The NRC staff reviewed Section 13.5 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 plant procedures. 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.

Section 1.2.3 of this SER provides a discussion of the strategy used by the NRC to perform one technical review for each standard issue outside the scope of the DC and use this review in evaluating subsequent COL applications. To ensure that the staff's findings on standard content that were documented in the SER for the reference COL application (VEGP Units 3 and 4) were equally applicable to the VCSNS Units 2 and 3 COL application, the staff undertook the following reviews:

- The staff compared the VEGP COL FSAR, Revision 2 to the VCSNS COL FSAR. In performing this comparison, the staff considered changes made to the VCSNS COL FSAR (and other parts of the COL application, as applicable) resulting from RAIs.

- The staff confirmed that all responses to RAIs identified in the corresponding standard content evaluation were endorsed.

- The staff verified that the site-specific differences were not relevant.

The staff has completed its review and found the evaluation performed for the standard content to be directly applicable to the VEGPCSNS COL application. This standard content material is identified in this SER by use of italicized, double-indented formatting. Section 1.2.3 of this SER provides an explanation of why the standard content material from the SER for the reference COL application (VEGP) includes evaluation material from the SER for the BLN Units 3 and 4 COL application.

The following portion of this technical evaluation section is reproduced from Section 13.5.4 of the VEGP SER:

AP1000 COL Information Item

- *STD COL 13.5-1, addressing plant procedures*

The applicant provided the following additional information to resolve COL Information Item 13.5-1, which addresses the plant procedures of the COL applicant. COL Information Item 13.5-1 states:

> *Combined License applicants referencing the AP1000 certified design will address plant procedures including the following:*
>
> - *Normal operation*
> - *Abnormal operation*
> - *Emergency operation*
> - *Refueling and outage planning*
> - *Alarm response*
> - *Maintenance, inspection, test and surveillance*
> - *Administrative*
> - *Operation of post-72 hour equipment*

The commitment was also captured as COL Action Item 13.5-1 in Appendix F of the staff's FSER for the AP1000 DCD (NUREG-1793).

The applicant provided additional text in BLN COL FSAR Section 13.5 to describe the administrative, operating and maintenance procedures that the operating organizational staff uses to conduct routine operating, abnormal, and emergency activities in a safe manner.

In BLN COL FSAR Section 13.5, the applicant described the different classifications of procedures that the operators will use, including normal, abnormal, emergency, refueling and outage, and alarm response procedures. The staff finds this information acceptable because it meets the criteria in NUREG-0800, Chapter 13.5.2.1.

In BLN COL FSAR Section 13.5, the applicant stated that the format and content of procedures are controlled by the applicable AP1000 writer's guideline. The DCD, Section 13.5.1, describes a referenced document, APP-GW-GLR-040, "Plant Operations Maintenance and Surveillance Procedures," dated August 23, 2007, which includes the AP1000 writer's guidelines. The staff finds this acceptable because the applicant-provided procedure format and content are consistent with the guidance in NUREG-0800, Section 13.5.2.1.

In BLN COL FSAR Section 13.5.1, the applicant describes the nature and content of administrative procedures for both Category (A) - Controls, and Category (B) - Specific Procedures. The staff finds this acceptable because the listed procedures are consistent with the guidance in NUREG-0800, Section 13.5.1.1.

In BLN COL FSAR Section 13.5.2, the applicant stated that EP procedures are discussed in the Emergency Plan and that security procedures are discussed in the Security Plan. The evaluation of EP procedures may be found in Section 13.3 of this SER. The evaluation of security procedures is found in Section 13.6 of this SER.

In BLN COL FSAR Section 13.5.2, the applicant stated the Quality Assurance Program description (QAPD) provides a description of procedural requirements for maintenance, instrument calibration and testing, inspection, and material control. The evaluation of QAPD procedures is found in Section 17.5 of this SER.

In BLN COL FSAR, Section 13.5.2.1, the applicant stated that information related to EOPs is addressed in the DCD. The DCD, Section 13.5.1, describes the program for developing and implementing EOPs and the required content of EOPs procedures in the referenced document, APP-GW-GLR-040. In addition, this information clarifies the procedure development program (PDP) as described in the procedures generation package (PGP) for EOPs, provides a description of the EOP [emergency operating plan] *verification and validation (V&V) program, and describes the program for training operators on EOPs, including an explanation of how the recommendations of TMI Action Plan, Item I.C.1, will be met. The staff finds the program for developing and implementing EOPs acceptable because it meets the criteria in NUREG-0800, Section 13.5.2.1.*

Evaluation of Plant Procedure Issues Not Address in the Standard Content Evaluation

In VEGP COL FSAR Table 1.9-202, "Conformance with SRP Acceptance Criteria," the applicant identified two exceptions to the criteria of NUREG-0800, Section 13.5, which recommend[s] *providing a schedule for procedure development in the FSAR, and including a description of procedures to be used by operators in the FSAR. The staff notes that the BLN COL FSAR Table 1.9-202 includes these same two exceptions to the criteria of Section 13.5 of NUREG-0800. The guidance of NUREG-0800, Section 13.5.2.1, states that while the submittal should describe the different classifications of procedures that operators will use, it is not necessary that each applicant's procedures conform precisely. In addition, the procedures, regardless of title or classification, are to be available to accomplish the functions identified in RG 1.33. NUREG-0800 makes allowance for "general areas." The staff finds the two exceptions to the criteria of NUREG-0800, Section 13.5 to be acceptable because the applicant's procedure classification follows the guidance in NUREG-0800, Section 13.5.*

In RAI [request for additional information] *13.6-36, the staff requested the VEGP applicant address the requirements of 10 CFR 73.58, "Safety/security requirements for nuclear power plants." In its response dated May 14, 2010, the applicant stated that management controls and processes used to establish and maintain an effective interface between nuclear safety and physical security are addressed by administrative controls. The VEGP applicant committed to revise FSAR Section 13.5.1 to include the safety/security interface implementation process in the list of procedural instructions provided in plant administrative procedures. The NRC staff's review of this safety/security procedural issue, which includes tracking the incorporation of the relevant material into the VEGP COL application, is addressed in Section 13.6.4.1.17 of this SER.*

Supplemental Information

- VCS SUP 13.5-1 and VCS SUP 13.5-2

In VCSNS COL FSAR Section 13.5.1, the applicant provides plant-specific supplemental information describing the nature and content of administrative procedures for specific procedures. The staff finds this acceptable because the listed procedures are consistent with the guidance in NUREG-0800, Sections 13.5.1.1 and 13.5.2.1.

13.5.5 Post Combined License Activities

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

13.5.6 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 plant procedures, 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.

In addition, the staff concludes that the relevant information presented in the VCSNS COL FSAR is acceptable and meets the recommendations of NUREG-0800, Sections 13.5.1.1 and 13.5.2.1. The staff based its conclusion on the following:

- STD COL 13.5-1, as related to plant procedures, is acceptable because it describes the procedures used by the applicant's operating organizational staff to conduct routine administrative, operating, abnormal, and emergency activities in a safe manner, in accordance with the regulatory guidance in NUREG-0800, Sections 13.5.1.1 and 13.5.2.1.

- VCS SUP 13.5-1 and VCS SUP 13.5-2, as related to plant-specific plant procedures, is acceptable because they describe procedures used by the applicant's operating organizational staff to conduct routine administrative, operating, abnormal, and emergency activities in a safe manner, in accordance with the regulatory guidance in NUREG-0800, Sections 13.5.1.1 and 13.5.2.1.

- In VCSNS COL FSAR Table 1.9-202, the applicant identified two exceptions to the criteria of NUREG-0800, Section 13.5, related to providing FSAR descriptions of, and a development schedule for, procedures to be used by operators. The guidance of NUREG-0800, Section 13.5.2.1, makes allowances for "general areas," stating that while the FSAR submittal should describe the different classifications of procedures used by operators, it is not expected that each applicant's procedures conform precisely. The staff finds the two exceptions to be acceptable because the applicant's procedure classification follows the guidance in NUREG-0800, Section 13.5.

13.6 Physical Security

13.6.1 Introduction

The COL application for the VCSNS Units 2 and 3 describes the COL applicant's physical protection program, which is intended to meet NRC regulations for protection against the design basis threat (DBT) of radiological sabotage as stated in 10 CFR 73.1 and provide a high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.

The physical protection program includes the design of a physical protection system that ensures the capabilities to detect, assess, interdict, and neutralize threats of radiological sabotage are maintained at all times. The applicant incorporates by reference the standard AP1000 design that includes design of physical protection systems within the design of the vital island and vital structures, as described in the Westinghouse Electric Company (Westinghouse) design certification document for the AP1000 standard design Tier 1 and Tier 2 information, including Technical Report (TR)-49, "AP1000 Enhancement Report, TR-94, "AP1000 Safeguards Assessment Report," and TR-96, "Interim Compensatory Measures Report." Part 8 of the COL application consists of the VCSNS Units 2 and 3 Physical Security Plan (PSP), Training and Qualification Plan (T&QP), and Safeguards Contingency Plan (SCP). Section 13.6 of the VCSNS COL FSAR describes the physical protection program and the physical protection system that are not addressed within the scope of the standard AP1000 design for meeting NRC performance and prescriptive requirements for physical protection stated in

10 CFR Part 73, “Physical Protection of Plants and Material.” Those persons with the correct access authorization and need-to-know may view the safeguards information version of the VCSNS COL application Section 13.6 SER, which is located in the NRC’s Secure Local Area Network, document number ES100015156.

13.6.2 Summary of Application

Section 13.6 of the VCSNS COL FSAR, Revision 5, incorporates by reference Section 13.6 of the AP1000 DCD, Revision 19.

Part 8 – Safeguards/Security Plans

In a letter dated March 27, 2008, SCE&G submitted a PSP to the NRC as part of the COL application for proposed VCSNS Units 2 and 3. In a letter dated April 2, 2009, SCE&G submitted Revision 1 to the PSP. In a letter dated August 14, 2010, SCE&G submitted Revision 2 to its PSP.

In addition, in VCSNS COL FSAR Section 13.6, the applicant provided the following:

AP1000 COL Information Items

- STD COL 13.6-1

The applicant provided additional information in STD COL 13.6-1 to address COL Information Item 13.6-1, which provides information related to the security plan. The security plan consists of three parts, the PSP, T&QP, and SCP.

- STD COL 13.6-5

The applicant provided additional information in STD COL 13.6-5 to address COL Information Item 13.6-5, which provides information related to the cyber security program. This COL item is evaluated in Section 13.8 of this SER.

License Conditions

- Part 10, License Condition 3, Items C.5, D.3, and G.9

The applicant proposed a license condition in Part 10 of the VCSNS COL application, which provides the milestones for implementing applicable portions of the Security Program.

- Part 10, License Condition 5

The applicant proposed a license condition in Part 10 of the VCSNS COL application, which proposed the maintenance of the PSP, T&QP, and the SCP when nuclear fuel is onsite, and continuing until all nuclear fuel is permanently removed from the site.

- 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 PSP, T&QP, and the SCP.

13.6.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed in NUREG-1793 and its supplements.

The applicable regulatory requirements for physical protection are as follows:

- The provisions of 10 CFR 52.79(a)(35)(i) and (ii) require that information submitted for a (COL) describe how the applicant will meet the requirements of 10 CFR Part 73, "Physical Protection of Plants and Material"; and provide a description of the implementation of the PSP. The provisions of 10 CFR 52.79(a)(36)(i) through (v) require that the application include an SCP in accordance with the criteria set forth in Appendix C, "Nuclear Power Plant Safeguards Contingency Plans," to 10 CFR Part 73, and a T&QP in accordance with Appendix B of 10 CFR Part 73, that the applicant provide a description of the implementation of the SCP and the T&QP and that the applicant protect the PSP, SCP and T&QP in accordance with the requirements of 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

- The provisions of 10 CFR Part 73 include performance-based and prescriptive regulatory requirements that, when adequately met and implemented, provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety. A COL applicant must describe how it will meet the regulatory requirements of 10 CFR Part 73 that are applicable to nuclear power plants.

A COL applicant is required to identify and describe design features, analytical techniques, and technical bases for its design and how it will meet provisions of physical protection system requirements in the NRC regulations, using applicable RGs and NUREG-0800. However, the NRC RGs and NUREG-0800 are not regulatory requirements and are not a substitute for compliance with established regulations. Where alternative methods are chosen or differences exist, the COL applicant is required to describe how the proposed alternatives to guidance or acceptance criteria provide acceptable methods of compliance with the NRC regulations.

NUREG-0800 Section 13.6.1, Revision 1, June 15, 2010 was used by the NRC staff to complete the physical security COL review.

Regulatory guidance documents, TRs, and accepted industry codes and standards that an applicant may apply to meet regulatory requirements include, but are not limited to the following:

- RG 5.7, "Entry/Exit Control for Protected Areas, Vital Areas, and Material Access Areas," Revision 1

- RG 5.12, "General Use of Locks in the Protection and Control of Facilities and Special Nuclear Materials"

- RG 5.44, “Perimeter Intrusion Alarm Systems,” Revision 3

- RG 5.62, “Reporting of Safeguards Events,” Revision 1

- RG 5.65, “Vital Area Access Controls, Protection of Physical Protection System Equipment and Key and Lock Controls”

- RG 5.66, “Access Authorization Program for Nuclear Power Plants”

- RG 5.68, “Protection Against Malevolent Use of Vehicles at Nuclear Power Plants”

- RG 5.74, “Managing the Safety/Security Interface”

- RG 5.75, “Training and Qualification of Security Personnel at Nuclear Power Reactor Facilities”

- NRC letter dated April 9, 2009, NRC Staff Review of NEI 03-12, “Template for Security Plan, Training and Qualification, Safeguards Contingency Plan, [and Independent Spent Fuel Storage Installation Security Program]” (Revision 6)

- SECY-05-0197

The following documents include security-related or safeguards information and are not publicly available:

- RG 5.69, “Guidance for the Application of Radiological Sabotage Design Basis Threat in the Design, Development, and Implementation of a Physical Security Protection Program that Meets 10 CFR 73.55 Requirements”

- RG 5.76, “Physical Protection Programs at Nuclear Power Reactors”

- NEI 03-12, Revision 6, “Template for the Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Installation Security Program”

- NUREG/CR-6190, “Update of NUREG/CR-6190 Material to Reflect Postulated Threat Requirements”

13.6.4 Technical Evaluation

The NRC staff reviewed Section 13.6 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 physical security. 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.

Section 1.2.3 of this SER provides a discussion of the strategy used by the NRC to perform one technical review for each standard issue outside the scope of the DC and use this review in

evaluating subsequent COL applications. To ensure that the staff's findings on standard content that were documented in the SER for the reference COL application (VEGP Units 3 and 4) were equally applicable to the VCSNS Units 2 and 3 COL application, the staff undertook the following reviews:

- The staff compared the VEGP COL FSAR, Revision 2 to the VCSNS COL FSAR. In performing this comparison, the staff considered changes made to the VCSNS COL FSAR (and other parts of the COL application, as applicable) resulting from RAIs.

- The staff compared the VEGP PSP, T&QP, and SCP to the corresponding VCSNS programs. The staff has determined that these plans are sufficiently similar to warrant standard content treatment.

- The staff confirmed that all responses to RAIs identified in the corresponding standard content evaluation were endorsed.

- The staff verified that the site-specific differences were not relevant.

The staff has completed its review and found the evaluation performed for the standard content to be directly applicable to the VCSNS COL application, with the exception discussed in the following paragraph. This standard content material is identified in this SER by use of italicized, double-indented formatting. One clarification to the standard content material presented below is that the NRC staff's detailed evaluation of the physical protection program, which is site-specific, is provided in the safeguards information version of the VCSNS COL application Section 13.6 SER, which is located in the NRC's Secure Local Area Network, document number ES1000015156.

There were site-specific RAIs issued to the VCSNS applicant that resulted in site-specific evaluations for several of the Security Plan review areas. There were also site-specific RAIs issued to the VEGP applicant that were not applicable to the VCSNS application. In addition, there are several Security Plan review areas with site-specific characteristics requiring a specific review by the staff. For these cases, the staff provides the VCSNS evaluation in the same location as provided in the VEGP SER, but without the use of italicized, double-indented formatting.

The following portion of this technical evaluation section is reproduced from Section 13.6.4 of the VEGP SER:

AP1000 COL Information Item

- *STD COL 13.6-1*

The NRC staff reviewed STD COL 13.6-1 related to COL Information Item 13.6-1, which identified the need for a COL applicant to address the security plan. STD COL 13.6-1 supplemented Section 13.6 of the VEGP COL FSAR by stating the following text is to be added after Section 13.6 of the VEGP ESP SSAR:

> *The Security Plan consists of the Physical Security Plan, the Training and Qualification Plan, and the Safeguards Contingency*

Plan. The Security Plan is submitted to the Nuclear Regulatory Commission as a separate licensing document in order to fulfill the requirements of 10 CFR 52.79(a)(35) and 52.79(a)(36). The Security Plan meets the requirements contained in 10 CFR Part 73 and will be maintained in accordance with the requirements of 10 CFR 52.98. The Plan is categorized as Security Safeguards Information and is withheld from public disclosure pursuant to 10 CFR 73.21.

Section 13.6 of the VEGP COL FSAR also refers to FSAR Table 13.4-201, "Operational Programs Required by NRC Regulations," as providing the milestones for implementing the security program and cyber security program.

The NRC staff's evaluation of the PSP is documented in Section 13.6.4.1 of this SER. The NRC staff's evaluation of the T&QP is documented in Section 13.6.4.2 of this SER. The NRC staff's evaluation of the SCP is documented in Section 13.6.4.3 of this SER. The NRC staff's evaluation of the safety/security interface is documented in Section 13.6.4.1.17 of this SER. Section 13.6.5 of this SER includes the post-combined license activities. Section 13.6.6 of this SER includes the NRC staff's overall conclusions regarding each of the plan submissions.

The NRC staff's evaluation of the physical protection program is provided in detail in the safeguards information version of the VEGP COL application Section 13.6 SER, which is located in the NRC's Secure Local Area Network, document number ES1000015157. Due to security restraints, the NRC staff's evaluation of the physical protection program presented in this publicly-available SER does not include the same level of detail as the safeguards information version. Those persons with the correct access authorization and need-to-know may view the safeguards information version of the VEGP COL application Section 13.6 SER.

<u>License Conditions</u>

- *Part 10, License Condition 3, Items C.5, D.3, and G.9*

The applicant proposed a license condition in Part 10 of the VEGP COL application, which provides the milestones for implementing applicable portions of the Security Program. Specifically, the applicant proposed the following:

> *C. Receipt of Materials – The licensee shall implement each operational program identified below prior to initial receipt of byproduct, source, or special nuclear materials onsite (excluding Exempt Quantities as described in 10 CFR 30.18).*
>
> *C.5 – Security Program (applicable portions)*
>
> *D. Fuel Receipt – The licensee shall implement each operational program identified below prior to initial receipt of fuel onsite.*
>
> *D.3 – Security Program (applicable portions)*

G. Fuel Loading – The licensee shall implement each operational program identified below prior to initial fuel load.
G.9 – Physical Security

- *Part 10, License Condition 5*

The applicant proposed a license condition in Part 10 of the VEGP COL application, which proposed the maintenance of the PSP, T&QP, and the SCP when nuclear fuel is onsite, and continuing until all nuclear fuel is permanently removed from the site. Specifically, the applicant proposed the following:

> *The licensee shall maintain in effect the provisions of the physical security plan, security personnel training and qualification plan, and safeguards contingency plan, and all amendments made pursuant to the authority of 10 CFR 50.90, 50.54(p), 52.97, and Section VIII of Appendix D to Part 52 when nuclear fuel is onsite, and continuing until all nuclear fuel is permanently removed from the site.*

In a letter dated October 22, 2010, the applicant proposed to revise the [security plan] milestone included in VEGP COL FSAR Table 13.4-201 to implement the [security plan] prior to receipt of fuel onsite (protected area.) The NRC staff finds the implementation milestone for the security ~~program~~[plan] (~~security~~ prior to receipt of fuel onsite (protected area)) appropriate and in accordance with the requirement in 10 CFR 73.55, "Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage." Therefore the staff finds that the proposed License Condition 3, Items C.5, D.3, and G.9 and License Condition 5 are not necessary. The incorporation of proposed changes to the VEGP COL FSAR is tracked as ***Confirmatory Item 13.6-1.***

Resolution of Standard Content Confirmatory Item 13.6-1

Confirmatory Item 13.6-1 is an applicant commitment to revise its FSAR Table 13.4-201 regarding the implementation milestones for the security program. The staff verified that the VEGP COL FSAR was appropriately revised. As a result, Confirmatory Item 13.6-1 is now closed.

- *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 PSP, T&QP, and the SCP. 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 SRM dated February 22, 2006. The staff concludes these proposed license conditions conform to the guidance in SECY-05-0197 and is, therefore, acceptable.

13.6.4.1 Physical Security Plan

The applicant submitted Part 8 of the COL application for the VEGP PSP, T&QP and SCP, to meet the requirements of 10 CFR 52.79(a)(35) and (36). Part 2, FSAR, Chapter 13, Section 13.6 references the VEGP PSP, T&QP, and SCP in describing the licensing basis for establishing a physical protection program, design of a physical protection system, and security organization, which will have, as its objective, to provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety. The VEGP submitted PSP makes references to 10 CFR 50.34(c)(2) and (d)(2). The correct references should be 10 CFR 52.79(a)(35) and (36). It is noted that this is a template error, and both references require that the same criteria be met.

Security plans must describe how the applicant will implement Commission requirements and those site-specific conditions that affect implementation as required by 10 CFR 73.55(c)(1)(i).

The requirements are provided in 10 CFR 73.55(c), and (d) to establish, maintain, and implement a PSP to meet the requirements of 10 CFR 73.55, and 10 CFR Part 73, Appendices B and C. The applicant must show establishment and maintenance of a security organization, the use of security equipment and technology, the training and qualification of security personnel, the implementation of predetermined response plans and strategies, and the protection of digital computer and communication systems and networks. The applicant must have a management system for development, implementation, revision, and oversight of security implementing procedures. The approval process for implementing security procedures will be documented.

The NRC staff has reviewed the applicant's description in PSP Section 1 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(c) and (d), and is, therefore, acceptable.

13.6.4.1.1 Introduction and Physical Facility Layout

The provisions of 10 CFR 52.79(a)(35):

(i) A PSP, describing how the applicant will meet the requirements of 10 CFR Part 73 (and 10 CFR Part 11, "Criteria and procedures for determining eligibility for access to or

control over special nuclear material," if applicable, including the identification and description of jobs as required by 10 CFR 11.11(a) of this chapter, at the proposed facility). The plan must list tests, inspections, audits, and other means to be used to demonstrate compliance with the requirements of 10 CFR Parts 11 and 73, if applicable;

(ii) A description of the implementation of the PSP;

The provisions of 10 CFR 52.79(a)(36) require:

(i) An SCP in accordance with the criteria set forth in Appendix C to 10 CFR Part 73. The safeguards contingency plan shall include plans for dealing with threats, thefts, and radiological sabotage, as defined in 10 CFR Part 73 of this chapter, relating to the special nuclear material and nuclear facilities licensed under this chapter and in the applicant's possession and control. Each application for this type of license shall include the information in the applicant's SCP. (Implementing procedures required for this plan need not be submitted for approval);

(ii) A T&QP in accordance with the criteria set forth in Appendix B to 10 CFR Part 73;

(iii) A cyber security plan (CSP) in accordance with the criteria set forth in 10 CFR 73.54 of this chapter;

(iv) A description of the implementation of the SCP, T&QP, and CSP; and

(v) Each applicant who prepares a PSP, an SCP, a T&QP, or a CSP, shall protect the plans and other related Safeguards Information against unauthorized disclosure in accordance with the requirements of 10 CFR 73.21 of this chapter.

The provisions of 10 CFR 52.79(a)(44) require a description of the FFD program required by 10 CFR Part 26 and its implementation.

Requirements are established in 10 CFR 73.55(c)(2) to ensure protection of safeguards information (SGI) against unauthorized disclosure in accordance with 10 CFR 73.21. The applicant's submittal acknowledges that the PSP, the TQ&P and the SCP discuss specific features of the physical security system or response procedures and are SGI.

Section 1 of the PSP describes the applicant's commitment to satisfying 10 CFR 50.34(c), 10 CFR 50.34(d) and 10 CFR Part 73 by submitting a PSP, and to controlling the PSP and appendices as Safeguards Information according to 10 CFR 73.21.

The provisions of 10 CFR Part 73, Appendix C, Section II.B.3.b, requires a description of the physical layout of the site.

Section 1.1 of the PSP provides descriptions of location, site layout, and facility configuration. The PSP describes the physical structures and their locations on the site, description of the protected area, and a description of the site in relation to nearby town, roads, and other environmental features important to the coordination of response operations. The plant layout includes identification of main and alternate entry routes for law enforcement assistance forces and the location of control points for marshaling and coordinating response activities.

In addition, Section 1.2 of the VCSNS COL application provides general plant descriptions that include details of the 10 to 50 mile radius of the geographical area of the VCSNS Units 2 and 3 site, a site area map, and general plant and site descriptions. VCSNS COL FSAR, Chapter 1, references the AP1000 DCD for the principal design and operating characteristics for the design and construction of the VCSNS Units 2 and 3. Part 1, General Information, of the VCSNS COL application describes the name of the applicant and principal business locations.

The NRC staff has reviewed the facility physical layout provided in Section 1.1 of the PSP and as supplemented by VCSNS COL FSAR. The NRC staff determined that the applicant included site-specific conditions that affect the applicant's capability to satisfy the requirements of a comprehensive PSP. The applicant has adequately described the physical structures and their locations onsite and the site in relation to nearby towns, roads, and other environmental features important to the effective coordination of response operations. The applicant described the main and alternate entry routes for law-enforcement assistance forces and the location of control points for marshaling and coordinating response activities in the site-specific law enforcement response plan. The NRC staff concludes that the applicant's security plans have met the requirements for content of a PSP as stated above. Therefore, the NRC staff finds the "Facility Layout" described in the PSP and the VCSNS COL FSAR is adequate.

The following portion of this technical evaluation section is reproduced from Section 13.6.4.1 of the VEGP SER:

> *13.6.4.1.2 Performance Objectives*
>
> *The provisions of 10 CFR 73.55(b)(1) requires, in part, that the applicant shall establish and maintain a physical protection program with an objective to provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety. The provisions of 10 CFR 73.55(b)(2) establish, in part, the requirement to protect a nuclear power reactor against the DBT of radiological sabotage as described in 10 CFR 73.1*,[. The provisions of] *10 CFR 73.55(b)(3)(i), and 10 CFR 73.55(b)(3)(ii) require the applicant to establish a physical protection program designed to ensure the capabilities to detect, assess, interdict, and neutralize threats up to and including the DBT of radiological sabotage as stated in 10 CFR 73.1, are maintained at all times, provide defense-in-depth, supporting processes, and implementing procedures, which ensure the effectiveness of the physical protection program.*
>
> *Section 2 of the PSP outlines the requirements for the establishment and maintenance of an onsite physical protection system, security organization, and integrated response capability. As part of the objective, the security program design shall incorporate supporting processes such that no single event can disable the security response capability because of defense-in-depth principles including diversity and redundancy. The physical protection systems and programs described herein are designed to protect against the DBT of radiological sabotage in accordance with the requirements of 10 CFR 73.55(a) through (r) or equivalent measures that meet the same high assurance objectives provided by paragraph (a) through (r). VEGP Units 3 and 4 uses the corrective action program to track, trend, correct and prevent recurrence of failures and deficiencies in the physical protection program.*

The NRC staff has reviewed the applicant's description in PSP Section 2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(b), and is, therefore, acceptable.

13.6.4.1.3 Performance Evaluation Program

Requirements are established in 10 CFR 73.55(b)(4) through (b)(11) for the applicant to analyze and identify site-specific conditions, establish programs, plans, and procedures that address performance evaluations, access authorization, cyber security, insider mitigation, FFD, corrective actions, and operating procedures. 10 CFR 73.55(b)(6) prescribes specific requirements to establish, maintain, and implement a performance evaluation program in accordance with 10 CFR Part 73, Appendix B, Section VI for implementation of the plant protective strategy.

Section 3.0 of the PSP describes that drills and exercises, as discussed in the T&QP, will be used to assess the effectiveness of the contingency response plan and the effectiveness of the applicant's response strategy. Other assessment methods include formal and informal exercises or drills, self-assessments, internal and external audits and evaluations.

The performance evaluation processes and criteria that assess the effectiveness of the security program, including adequate protection against radiological sabotage, will be established in facility procedures and the deficiencies identified are managed through the corrective action program.

Section 3.0 of the PSP references Section 4.0 of the T&QP, which provides additional details related to the performance evaluation of security personnel in accordance with 10 CFR Part 73, Appendix B, Section VI. Section 4.0 of the T&QP includes the requirements to conduct security force tactical ~~dills~~ [drills] *and force-on-force exercises to evaluate security systems effectiveness and response performances of security personnel. In addition, Section 17 of the PSP describes additional detail regarding the applicant's processes for reviews, evaluations and audits that will complement the performance evaluation program.*

The NRC staff has reviewed the applicant's description in PSP Section 3, for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(b)(6), and is, therefore, acceptable.

13.6.4.1.4 Establishment of Security Organization

The provisions of 10 CFR 73.55(d) establish requirements to describe a security organization, including the management system for oversight of the physical protection program. The security organization must be designed, staffed, trained, qualified, re-qualified, and equipped to

implement the physical protection program as required by 10 CFR 73.55(b) and 10 CFR Part 73, Appendices B and C.

Section 4.0 of the PSP describes how the applicant meets the requirements of 10 CFR 73.55(d)(1).

Security Organization Management

Section 4.1 of the PSP describes the organization's management structure. The PSP establishes that the security organization is a critical component of the physical protection program and is responsible for the effective application of engineered systems, technologies, programs, equipment, procedures, and personnel necessary to detect, assess, interdict, and neutralize threats up to and including the DBT of radiological sabotage. The security organization may be proprietary, contractor, or other qualified personnel.

The PSP describes that the organization will be staffed with appropriately trained and equipped personnel, in a command structure with administrative controls and procedures, to provide a comprehensive response. Section 4.1 of the PSP also describes the roles and responsibilities of the Security Organization. The PSP provides that at least one full-time, dedicated Security Shift Team Leader that has the authority for command and control of all security operations is onsite at all times.

The security force implementing the security functions as described in this section of the plan will be either a proprietary force, contractor, or other qualified personnel. The training qualification requirements are described in the T&QP.

The NRC staff has reviewed the applicant's description in PSP Sections 4 and 4.1 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the meets the requirements of 10 CFR 73.55(d) and is, therefore, acceptable.

The following portion of this technical evaluation section is reproduced from Section 13.6.4.1 of the VEGP SER:

> *13.6.4.1.5 Qualification for Employment in Security*
>
> *The requirements of 10 CFR 73.55(d)(3) state, in part, that the applicant may not permit any individual to implement any part of the physical protection program unless the individual has been trained, equipped and qualified to perform assigned duties and responsibilities in accordance with Appendix B to 10 CFR Part 73 and the applicant's T&QP.*
>
> *Section 5 of the PSP describes that employment qualifications for members of the security force are delineated in the T&QP.*
>
> *The NRC staff has reviewed the applicant's description in PSP Section 5 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in*

NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(d)(3), and is, therefore, acceptable.

13.6.4.1.6 Training of Facility Personnel

Consistent with requirements in 10 CFR 73.55(d)(3),10 CFR 73.56, "Personnel access authorization requirements for nuclear power plants"; and 10 CFR Part 73, Appendix B, Section VI.C.1, all personnel who are authorized unescorted access to the applicant's PA receive training, in part to ensure that they understand their role in security and their responsibilities in the event of a security incident. Individuals assigned to perform security-related duties or responsibilities, such as, but not limited to, material searches and vehicle escort are trained and qualified in accordance with the T&QP to perform these duties and responsibilities and to ensure that each individual has the minimum knowledge, skills, and abilities required for effective performance of assigned duties and responsibilities.

Section 6 of the PSP describes the training provided for all personnel who have been granted unescorted access to the applicant's PA.

The NRC staff has reviewed the applicant's description in PSP Section 6 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.56 and 10 CFR Part 73, Appendix B, and is, therefore, acceptable.

13.6.4.1.7 Security Personnel Training

The provisions of 10 CFR 73.55(d) require that all security personnel are trained and qualified in accordance with 10 CFR Part 73, Appendix B, Section VI prior to performing their duties.

Section 7 of the PSP describes that all security personnel are trained, qualified and perform tasks at levels specific for their assignments in accordance with the applicant's T&QP.

The NRC staff has reviewed the applicant's description in PSP Section 7 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(d), and is, therefore, acceptable. The NRC staff's review of the licensee T&QP is located in Section 13.6.4.2 of this SER.

13.6.4.1.8 Local Law Enforcement Liaison

The following requirement is stated in 10 CFR 73.55(k)(9) "To the extent practicable, licensees shall document and maintain current agreements with applicable law enforcement agencies to include estimated response times and capabilities." In addition, 10 CFR 73.55(m)(2) requires, in part, that an evaluation of the effectiveness of the physical protection system include an audit of response commitments by local, State and Federal law enforcement authorities.

Section 8 of the PSP provides a detailed discussion of its ongoing relationship with local law enforcement agencies (LLEAs). The plans addressing response, communication methodologies and protocols, command and control structures and marshaling locations are located in the operations procedures, emergency plan procedures and the site-specific law enforcement response plan. The law enforcement response plan is reviewed biennially concurrent with the PSP effectiveness review.

The NRC staff has reviewed the applicant's description in PSP Section 8 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(k)(9) and 10 CFR 73.55(m)(2), and is, therefore, acceptable.

13.6.4.1.9 Security Personnel Equipment

The requirements of 10 CFR 73.55(d)(3) state, in part, the applicant may not permit any individual to implement any part of the physical protection program unless the individual has been trained, equipped and qualified in accordance with 10 CFR Part 73, Appendix B and the T&QP. The provisions of 10 CFR Part 73, Appendix B, Section VI.G.2(a) state, in part, that the applicant must ensure that each individual is equipped or has ready access to all personal equipment or devices required for the effective implementation of the NRC-approved security plans, the applicant's protective strategy, and implementing procedures. The provisions of 10 CFR Part 73, Appendix B, Sections VI.G.2(b) and (c) delineate the minimum equipment requirements for security personnel and armed response personnel.

Section 9 of the PSP describes the equipment, including armament, ammunition, and communications equipment that is provided to security personnel in order to ensure that security personnel are capable of performing the function stated in the Commission-approved security plans, applicant's protective strategy, and implementing procedures.

The NRC staff has reviewed the applicant's description in PSP Section 9 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(d)(3) and Appendix B, Section VI.G.2, and is, therefore, acceptable.

The following portion of this technical evaluation section is reproduced from Section 13.6.4.1 of the VEGP SER:

> *13.6.4.1.10 Work Hour Controls*
>
> *The provisions of 10 CFR Part 26, "Fitness for duty programs," Subpart I, "Managing Fatigue," establish the requirements for managing fatigue. 10 CFR 26.205 establishes requirements for work hours. 10 CFR 26.205(a) requires that any individual who performs duties identified in 10 CFR 26.4(a)(1) through (a)(5) shall be subject to the requirements of this section.*
>
> *Section 10 of the PSP describes that the site will implement work hour controls consistent with 10 CFR Part 26, Subpart I, and that site procedures shall describe performance objectives and implementing procedures.*
>
> *The NRC staff's review of the fitness-for-duty program is found in Section 13.7 of this SER.*

13.6.4.1.11 Physical Barriers

The following requirements are established in 10 CFR 73.55(e): "Each applicant shall identify and analyze site-specific conditions to determine the specific use, type, function, and placement of physical barriers needed to satisfy the physical protection program design requirements of 10 CFR 73.55(b). (1) The applicant shall: (i) Design, construct, install and maintain physical barriers as necessary to control access into facility areas for which access must be controlled or denied to satisfy the physical protection program design requirements of paragraph (b) of this section." The regulation 10 CFR 73.55(b)(3)(ii) states, "Provide defense-in-depth through the integration of systems, technologies, programs, equipment, supporting processes, and implementing procedures as needed to ensure the effectiveness of the physical protection program."

Section 11 of the PSP provides a general description of how the applicant has implemented its program for physical barriers, and that this implementation is in accordance with the performance objectives and requirements of 10 CFR 73.55(b).

Owner Controlled Area (OCA) Barriers

Section 11.1 of the PSP describes VCSNS use of OCA barriers at the site.

Vehicle Barriers

PSP Sections 11.2.1 and 11.2.2 establish and maintain vehicle control measures, as necessary, to protect against the DBT of radiological sabotage, consistent with the physical protection program design requirements of 10 CFR 73.55(b)(3)(ii) and 10 CFR 73.55(e)(10)(i), and in accordance with site-specific analysis. The PSP identifies measures taken to provide high assurance that such an event can be defended against. The applicant's PSP also provides that the inspection, monitoring, and maintenance of the vehicle barrier system (VBS) are included in the facility procedures.

Waterborne Threat Measures

The provisions of 10 CFR 73.55(e)(10)(ii) require the applicant to "Identify areas from which a waterborne vehicle must be restricted, and where possible, in coordination with local, State, and Federal agencies having jurisdiction over waterway approaches, deploy buoys, markers, or other equipment. In accordance with the site-specific analysis, provide periodic surveillance and observation of waterway approaches and adjacent areas."

Section 11.2.3 of the PSP describes that a site-specific analysis for a water-borne DBT has been conducted and documented. However, there is no waterborne access to VCSNS Units 2 and 3.

Protected Area Barriers

The provisions of 10 CFR 73.55(e)(8)(i) require that the protected area perimeter must be protected by physical barriers that are designed and constructed to: (1) limit access to only those personnel, vehicles, and materials required to perform official duties; (2) channel personnel, vehicles, and materials to designated access control portals; and (3) be separated from any other barrier designated as a vital area physical barrier, unless otherwise identified in the PSP.

The descriptions of the PA barrier are provided in the PSP Section 11.3. These descriptions meet the definitions of physical barriers and protected areas in 10 CFR 73.2 and requirements of 10 CFR 73.55(e)(8).

In RAI 13.6-13, the NRC staff asked for a description of measures taken to ensure that detection, assessment, observation, and surveillance requirements of 10 CFR 73.55 are met and appropriate barriers are installed to prevent potential exploitation of structures and buildings whose walls and roofs comprise a portion of the PA.

In its response the applicant stated that the RAI 13.6-5 response from VEGP Units 3 and 4, dated October 16, 2009, is applicable to VCSNS Units 2 and 3. The VEGP Units 3 and 4 response to RAI 13.6-15 provided an explanation of measures that the applicant will take when a structure or building comprises a portion of the PA barrier.

On the basis of its review, the NRC staff finds the response to RAI 13.6-13 to be acceptable as it provides clarification on how the applicant meets requirements for describing where buildings or structures comprise a portion of the PA, consistent with 10 CFR 73.55(e)(10)(iv).

Section 11.3 of the PSP describes the extent to which the protected area barrier at the perimeter is separated from a vital area/island barrier. The security plan identifies where the PA barrier is not separated from a vital area barrier.

Section 11.3 of the PSP describes isolation zones. As required in 10 CFR 73.55(e)(7), the isolation zone is maintained in outdoor areas adjacent to the protected area perimeter barrier and is designed to ensure the ability to observe and assess activities on either side of the protected area perimeter.

Vital Area Barriers

The provisions of 10 CFR 73.55(e)(9) require that "Vital equipment must be located only within vital areas, which must be located within a protected area so that access to vital equipment requires passage through at least two physical barriers, except as otherwise approved by the Commission and identified in the security plans." In addition, 10 CFR 73.55(e)(5) requires that certain vital areas shall be bullet resisting.

Section 11.4 of the PSP describes that vital areas are restricted access areas surrounded by physical barriers with the capability to restrict access to only authorized individuals. All vital areas are constructed in accordance with established regulatory requirements. Section 11.4 also describes that the reactor control room, central alarm station (CAS) and the location within which the last access control function for access to the protected area is performed, must be bullet resisting.

Target Set Equipment

The provisions of 10 CFR 73.55(f) require the following, "The licensee shall document and maintain the process used to develop and identify target sets, to include the site-specific analyses and methodologies used to determine and group the target set equipment or elements. The licensee shall consider cyber attacks in the development and identification of target sets. Target set equipment or elements that are not contained within a protected or vital area must be identified and documented consistent with the requirements in 10 CFR 73.55(f)(1) and be accounted for in the licensee's protective strategy. The licensee shall implement a process for the oversight of target set equipment and systems to ensure that changes to the configuration of the identified equipment and systems are considered in the licensee's protective strategy. Where appropriate, changes must be made to documented target sets."

Section 11.5 of the PSP describes that target set equipment or elements that are not contained within a protected or vital area are identified and accounted for in the site protective strategy.

The staff identified several RAIs relating to target sets for the purpose of reviewing the Westinghouse physical protection program. Westinghouse provided design details as background information to assist an applicant with the development of site-specific target set analyses. The staff evaluated the applicant's responses, and found them to be acceptable for the DC review of the AP1000 physical protection program. Westinghouse stated, in TR-94 that target sets were created to aid in the development of the AP1000 physical security system, and that final target sets will be developed by the COL applicant prior to fuel onsite (inside PA).

The NRC staff has reviewed the applicant's description in Sections 11.5 and 14.5 of the PSP, Section 7 of the SCP and information in Westinghouse TR-94, for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in Sections 11.5 and 14.5 of the PSP, Section 7 of the SCP and the information in Westinghouse TR-94 are consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the Sections 11.5 and 14.5 of the PSP and Section 7 of the SCP meets the requirements of 10 CFR 73.55(f)(1), (3), and (4), and is, therefore, acceptable. The target sets, target set analysis and site protective strategy are in the facility implementing procedures, which were not subject to an NRC staff review as part of this COL application, and are, therefore, subject to future NRC inspections in accordance with 10 CFR 73.55(c)(7)(iv) and 10 CFR Part 73, Appendix C, Section II.B.5(iii).

Delay Barriers

The provisions of 10 CFR 73.55(e)(3)(C)(ii) require that physical barriers must "provide deterrence, delay, or support access control" to perform the required function of the applicant physical protection program. The PSP describes the use of delay barriers at VCSNS Units 2 and 3.

Section 11.6 of the PSP includes a description of the use of Delay Barriers to meet requirement of 10 CFR 73.55(e).

The NRC staff has reviewed the applicant's description in PSP Sections 11, 11.1, 11.2, 11.2.1, 11.2.2, 11.2.3, and Sections 11.3 through 11.6 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meet the requirements of 10 CFR 73.55(e), and are, therefore, acceptable.

The following portion of this technical evaluation section is reproduced from Section 13.6.4.1 of the VEGP SER:

> *13.6.4.1.12 Security Posts and Structures*
>
> *The provisions of 10 CFR 73.55(e)(5) require that the reactor control room, the CAS, and the location within which the last access control function for access to the PA is performed, must be bullet-resisting.*
>
> *Section 12 of the PSP describes that security posts and structures are qualified to a level commensurate with their application within the site protective strategy, and that these positions are constructed of bullet resisting materials.*
>
> *The NRC staff has reviewed the applicant's description in PSP Section 12 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(e)(5), and is, therefore, acceptable.*
>
> *13.6.4.1.13 Access Control Devices*
>
> *It is stated in 10 CFR 73.55(g)(1) that, consistent with the function of each barrier or barrier system, the applicant shall control personnel, vehicle, and material access, as applicable, at each access control point in accordance with the physical protection program design requirements of 10 CFR 73.55(b).*
>
> *The provisions of 10 CFR 73.55(g)(6) require control of access control devices as stated: "The licensee shall control all keys, locks, combinations, passwords and related access control devices used to control access to protected areas, vital areas and security systems to reduce the probability of compromise."*

Types of Security-Related Access Control Devices

Section 13.1 of the PSP describes that the applicant uses security-related access control devices to control access to protected and vital areas and security systems.

Control and Accountability

Section 13.2.1 of the PSP describes the control of security related locks. Section 13.2.2 of the PSP describes the controls associated with the changes to and replacements of access control devices and the accountability and inventory control process, and the circumstances that require changes in security-related locks. The applicant uses facility procedures to produce, control, and recover keys, locks, and combinations for all areas and equipment, which serve to reduce the probability of compromise. The issue of access control devices is limited to individuals who have unescorted access authorization and require access to perform official duties and responsibilities. Keys and locks are accounted for through a key inventory control process as described in facility procedures.

The NRC staff has reviewed the applicant's description in PSP Sections 13, 13.1, 13.2, 13.2.1, and 13.2.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meet the requirements of 10 CFR 73.55(g)(1) and (6), and are, therefore, acceptable.

13.6.4.1.14 Access Requirements

Access Authorization and Fitness for Duty

The provisions of 10 CFR 73.55(b)(7) require the applicant shall establish, maintain, and implement an access authorization program in accordance with 10 CFR 73.56 and shall describe the program in the PSP. The provisions of 10 CFR Part 26 require the applicant to establish and maintain a FFD program.

Section 14.1 of the PSP describes that the access authorization program implements regulatory requirements utilizing the provisions in RG 5.66.

The NRC staff has reviewed the applicant's description in PSP Section 14.1 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(b)(7), 10 CFR 73.56 and 10 CFR Part 26 and is, therefore, acceptable.

Insider Mitigation Program

The provisions of 10 CFR 73.55(b)(9) require that the applicant shall establish, maintain, and implement an insider mitigation program and shall describe the program in the PSP. The insider mitigation program must monitor the initial and continuing trustworthiness and reliability

of individuals granted or retaining unescorted access authorization to a protected or vital area, and implement defense-in-depth methodologies to minimize the potential for an insider to adversely affect, either directly or indirectly, the applicant's capability to prevent significant core damage and spent fuel sabotage. The insider mitigation program must include elements from: the access authorization program, the FFD program, the cyber security program and the physical protection program.

Section 14.2 of the PSP describes how the applicant will establish, maintain, and implement an insider mitigation program. The insider mitigation program requires elements from the access authorization program described in 10 CFR 73.56; FFD program described in 10 CFR Part 26; the cyber security program described in 10 CFR 73.54; and the physical security program described in 10 CFR 73.55. In addition, Section 14.2 describes the integration of the programs mentioned above to form a cohesive and effective insider mitigation program. The applicant addresses the observations for the detection of tampering. The NRC staff finds that this approach is an acceptable method for meeting the requirements 10 CFR 73.55(b)(9).

The NRC staff has reviewed the applicant's description in PSP Section 14.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(b)(9) and is, therefore, acceptable.

Picture Badge Systems

Requirements for badges are stated in 10 CFR 73.55(g)(6)(ii). "The licensee shall implement a numbered photo identification badge system for all individuals authorized unescorted access to the protected area and vital areas." In addition, identification badges may be removed from the protected area under limited conditions and only by authorized personnel. Records of all badges shall be retained and shall include name and areas to which persons are granted unescorted access.

The provisions of 10 CFR 73.55(g)(7)(ii) require that individuals not employed by the applicant but who require frequent or extended unescorted access to the protected area and/or vital areas to perform duties and responsibilities required by the applicant at irregular or intermittent intervals, shall satisfy the access authorization requirements of 10 CFR 73.56 and 10 CFR Part 26 of this chapter, and shall be issued a non-employee photo identification badge that is easily distinguished from other identification badges before being allowed unescorted access to the protected and vital areas. Non-employee photo identification badges must visually reflect that the individual is a non-employee and that no escort is required.

Section 14.3 of the PSP describes the site picture badge system. Identification badges will be displayed while individuals are inside the protected area or vital areas. When not in use, badges may be removed from the protected area by authorized holders, provided that a process exists to deactivate the badge upon exit and positively confirm the individual's true identity and authorization for unescorted access prior to entry into the protected area. Records are maintained to include the name and areas to which unescorted access is granted of all individuals to whom photo identification badges have been issued.

The NRC staff has reviewed the applicant's description in PSP Section 14.3 for the implementation of the site-specific physical protection program in accordance with Commission

regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(g)(6) and (7) and is, therefore, acceptable.

Searches

The provisions of 10 CFR 73.55(h) require, in part, that applicants meet the objective to detect, deter, and prevent the introduction of firearms, explosives, incendiary devices, or other items, which could be used to commit radiological sabotage. To accomplish this, applicant's shall search individuals, vehicles, and materials consistent with the physical protection program design requirements in paragraph (b) of this section, and the function to be performed at each access control point or portal before granting access.

Section 14.4 of the PSP provides an overview description of the search process for vehicle, personnel and materials. The search process is conducted using security personnel, specifically trained non-security personnel and technology. Detailed discussions of actions to be taken in the event unauthorized materials are discovered are found in implementing procedures.

Vehicle Barrier Access Control Point

The provisions of 10 CFR 73.55(h)(2)(ii) through (v) provide the requirements the applicant to search vehicles at the owner controlled area and 10 CFR 73.55(h)(3) provides requirements for searches of personnel, vehicles and materials prior to entering the protected area.

Section 14.4.1 of the PSP describes the process for the search of personnel, vehicles and materials at predetermined locations prior to granting access to designated facility areas identified by the applicant as needed to satisfy the physical protection program. The applicant states that it has developed specific implementing procedures to address vehicle and materials searches at these locations.

PA Packages and Materials Search

Section 14.4.2 of the PSP describes the process for conducting searches of packages and materials for firearms, explosives, incendiary devices, or other items, which could be used to commit radiological sabotage using equipment capable of detecting these items or through visual and physical searches, or both, to ensure that all items are clearly identified before these items can enter the VCSNS Units 2 and 3 protected area. Detailed requirements for conducting these searches are found in applicant implementing procedures and include the search and control of bulk materials and products. Applicant implementing procedures also discuss the control of packages and materials previously searched and tamper sealed by personnel trained in accordance with the T&QP.

PA Vehicle Search

Section 14.4.3 of the PSP describes the process for the search of vehicles for firearms, explosives, incendiary devices, or other items, which could be used to commit radiological sabotage using equipment capable of detecting these items or through visual and physical searches, or both, to ensure that all items are clearly identified at the protected area. Detailed requirements for conducting these searches are found in the applicant's implementing

procedures. The applicant's implementing procedures also address the search methodologies for vehicles that must enter the protected area under emergency conditions.

PA Personnel Searches

Section 14.4.4 of the PSP describes the process for searches of all personnel requesting access into protected areas. The PSP describes the search for firearms, explosives, incendiary devices, or other items, which could be used to commit radiological sabotage using equipment capable of detecting these items or through visual and physical searches or both to ensure that all items are clearly identified prior to granting access into the protected area. All persons except official Federal, State, and LLEA personnel on official duty are subject to these searches upon entry to the PA. Detailed discussions of observation and control measures are found in implementing procedures.

PA Access Controls

Section 14.4.5 of the PSP describes the process for controlling access at all points where personnel or vehicles could gain access into the applicant's PA. The plan notes that principal personnel access to the PA is through a lockable portal. Personnel are only permitted into the PA after positive ID verification, access authorization verification, and a search is performed in accordance with Section 14.4 of the PSP. Vehicles are controlled through positive control methods described in the facility procedures.

Escort and Visitor Requirements

The provisions of 10 CFR 73.55(g)(7) state in part, that the applicant may permit escorted access to protected and vital areas to individuals who have not been granted unescorted access in accordance with the requirements of 10 CFR 73.56 and 10 CFR Part 26 of this chapter. 10 CFR 73.55(g)(8) discusses escort requirements. Applicants are required to implement procedures for processing, escorting and controlling visitors. Procedures shall address confirmation of identity of visitors, maintenance of a visitor control register, visitor badging and escort controls including, training, communications, and escort ratios.

Section 14.4.6 of the PSP describes the process for control of visitors. The PSP affirms that procedures address the identification, processing, and escorting of visitors and the maintenance of a visitor control register. Training requirements for escorting visitors includes responsibilities, communications and escort ratios. All escorts are trained to perform escort duties in accordance with site requirements. All visitors wear a badge that clearly indicates that an escort is required.

The NRC staff has reviewed the applicant's description in PSP Sections 14.4, and 14.4.1 through 14.4.6 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(h)(2), (h)(3), (g)(7) and (g)(8), and are, therefore, acceptable.

Vital Area Access Controls

The provisions of 10 CFR 73.55(g)(4) require that applicants control access into vital areas consistent with established access authorization lists. In response to a site-specific credible

threat or other credible information, applicants shall implement a two-person (line-of-sight) rule for all personnel in vital areas so that no one individual is permitted access to a vital area.

The provisions of 10 CFR 73.56(j) require the applicant to establish, implement, and maintain a list of individuals who are authorized to have unescorted access to specific nuclear power plant vital areas during non-emergency conditions. The list must include only those individuals who have a continued need for access to those specific vital areas in order to perform their duties and responsibilities. The list must be approved by a cognizant applicant manager or supervisor who is responsible for directing the work activities of the individual who is granted unescorted access to each vital area, and updated and re-approved no less frequently than every 31 days.

Section 14.5 of the PSP describes vital areas and states that the applicant maintains vital areas locked and protected by an active intrusion alarm system. An access authorization system is established to limit unescorted access that is controlled by an access authorization list, which is reassessed and reapproved at least once every 31 days. Additional access control measures are described in the facility procedures.

The NRC staff has reviewed the applicant's description in PSP Section 14.5 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(g)(4) and is, therefore, acceptable.

The following portion of this technical evaluation section is reproduced from Section 13.6.4.1 of the VEGP SER:

> *13.6.4.1.15 Surveillance Observation and Monitoring*
>
> *The provisions of 10 CFR 73.55(i)(1) require that the applicant establish and maintain intrusion detection systems that satisfy the design requirements of 10 CFR 73.55(b) and provide, at all times, the capability to detect and assess unauthorized persons and facilitate the effective implementation of the protective strategy.*
>
> *Illumination*
>
> *The provisions of 10 CFR 73.55(i)(6) require, in part, that all areas of the facility are provided with illumination necessary to satisfy the design requirements of 10 CFR 73.55(b) and implement the protective strategy. Specific requirements include providing a minimum illumination level of 0.2 foot-candles, measured horizontally at ground level, in the isolation zones and appropriate exterior areas within the PA. Alternatively, the applicant may augment the facility illumination system by means of low-light technology to meet the requirements of this section or otherwise implement the protective strategy. The applicant shall describe in the security plans how the lighting requirements of this section are met and, if used, the type(s) and application of low-light technology.*
>
> *Section 15.1 of the PSP describes that all isolation zones and appropriate exterior areas within the PA have lighting capabilities that provide illumination sufficient for the initiation of an adequate response to an attempted intrusion of*

the isolation zone, a PA, or a vital area. A discussion of the implementation of technology using fixed and non-fixed low light level cameras or alternative technological means is provided. The applicant has addressed the potential for loss of lighting and the compensatory actions that would be taken if that event were to occur.

Surveillance Systems

The provisions of 10 CFR 73.55(i)(1) require, in part, that the applicant implement, establish, and maintain intrusion detection and assessment, surveillance, observation and monitoring systems to satisfy the design requirements of 10 CFR 73.55(b), and of the applicant's OCA.

Section 15.2 of the PSP describes that surveillance is accomplished by human observation and technology. Surveillance systems include a variety of cameras, video display, and annunciation systems designed to assist the security organization in observing, detecting assessing alarms or unauthorized activities. Certain systems provide real-time and recorded play back of recorded video images. The specifics of surveillance systems are described in facility implementing procedures.

Intrusion Detection Equipment

Section 15.3 of the PSP describes the perimeter intrusion detection system, and the PA and vital area intrusion detection systems. These systems are capable of detecting attempted penetration of the PA perimeter barrier; are monitored with assessment equipment designed to satisfy the requirements of 10 CFR 73.55(i) and provide real-time and play-back/recorded video images of the detected activities before and after each alarm annunciation. The PSP describes how the applicant will meet regulatory requirements for redundancy, tamper indication and uninterruptable power supply.

Central Alarm Station (CAS) and Secondary Alarm Station (SAS) Operation

The provisions of 10 CFR 73.55(i)(4) provide requirements for alarm stations. It is required, in 10 CFR 73.55(i)(4)(i), that both alarm stations must be designed and equipped to ensure that a single act, in accordance with the DBT of radiological sabotage defined in 10 CFR 73.1, cannot disable both alarm stations. The applicant shall ensure the survivability of at least one alarm station to maintain the ability to perform the following functions: 1) detect and assess alarms; 2) initiate and coordinate an adequate response to an alarm; 3) summon offsite assistance; and 4) provide command and control. 10 CFR 73.55(i)(4)(iii) requires that alarm stations must be equal and redundant.

Section 15.4 of the PSP describes the functional operations of the CAS and the SAS. The PSP provides that the alarm stations are equipped, such that no single act will disable both alarm stations. The applicant's PSP provides that each alarm station is properly manned and that no activities are permitted that would interfere with the operator's ability to execute assigned duties and responsibilities.

Security Patrols

Owner Controlled Area (OCA) Surveillance and Response

The provisions of 10 CFR 73.55(e)(6) require that the applicant establish and maintain physical barriers in the OCA as needed to satisfy the physical protection program design requirements of 10 CFR 73.55(b). It is required, in 10 CFR 73.55(i)(5)(ii), in part, that the applicant provide continuous surveillance, observation and monitoring of the OCA and that these responsibilities may be performed by security personnel during continuous patrols, through the use of video technology, or by a combination of both.

Section 15.5.1 of the PSP describes the processes used to meet this requirement. The PSP discusses the process to be used and provides that details regarding the implementation of OCA surveillance techniques are found in facility procedures. The PSP provides a discussion regarding the implementation of manned and video options for patrolling and surveillance of the OCA.

Protected and Vital Area Patrols

The provisions of 10 CFR 73.55(i)(5)(iii) through (viii) require, in part, that armed patrols check unattended openings that intersect a security boundary, such as an underground pathways, check external areas of the PA and vital area portals, periodically inspect vital areas, conduct random patrols of accessible target set equipment, be trained to recognize obvious tampering and if detected, initiate an appropriate response in accordance with established plans and procedures.

Section 15.5.2 of the PSP describes the process employed by the applicant to meet the above requirements. The PSP describes the areas of the facility that will be patrolled and observed, as well as the frequency of these patrols and observations. The applicant has addressed the observations for the detection of tampering in Section 14.2 of the PSP and in the facility procedures.

The NRC staff has reviewed the applicant's description in PSP Sections 15, 15.1 through 15.4, 15.5.1, and 15.5.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(b) and (i), and are, therefore, acceptable.

13.6.4.1.16 Communications

The provisions of 10 CFR 73.55(j)(1) through (6) describe the requirements for establishment and maintenance of continuous communication capabilities with both onsite and offsite resources to ensure effective command and control during both normal and emergency situations. Alarm stations must be capable of calling for assistance, on-duty security force personnel must be capable of maintaining continuous communication with each alarm station and vehicle escorts, and personnel escorts must maintain timely communication with security personnel. Continuous communication capabilities must terminate in both alarm stations,

between LLEA and the control room. Non-portable communications must remain operable from independence power sources. The applicant must identify areas where communications could be interrupted or not maintained.

Notifications (Security Contingency Event Notifications)

Section 16.1 of the PSP describes that the applicant have a process to ensure that continuous communications are established and maintained between the onsite security force staff and the offsite support agencies.

System Descriptions

Section 16.2 of the PSP describes the establishment and maintenance of the communications system. Detailed descriptions of security systems are included in the facility procedures. VEGP has access to both hard wired and alternate communications systems. Site security personnel are assigned communications devices with which to maintain continuous communications with the CAS and SAS. All personnel and vehicles are assigned communications resources with which to maintain continuous communications. Continuous communication protocols are available between the CAS, SAS and the control room.

The NRC staff has reviewed the applicant's description in PSP Sections 16, 16.1 and 16.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(j)(1) through (6), and are, therefore, acceptable.

13.6.4.1.17 Review, Evaluation and Audit of the Physical Security Program

The provisions of 10 CFR 73.55(m) require, in part, that each element of the physical protection program will be reviewed at least every 24 months. An initial review is required within 12 months after original plan implementation, or a change in personnel, procedures, equipment or facilities, which could have a potentially adverse affect on security, or as necessary based on site-specific analysis assessments, or other performance indicators. Reviews must be conducted by individuals independent of the security program and must include the plans, implementing procedures and local law enforcement commitments. Results of reviews shall be presented to senior management above the level of the security manager and findings must be entered in the site corrective action program.

Section 17 of the PSP describes that the physical security program is reviewed 12 months following initial implementation and at least every 24 months by individuals independent of both security program management and personnel who have a direct responsibility for implementation of the security program. The physical security program review includes, but is not limited to, an audit of the effectiveness of the physical security program, cyber security plans, implementing procedures, safety/security interface activities, the testing,

maintenance, and calibration program, and response commitments by local, State, and Federal law enforcement authorities.

A review shall be conducted as necessary based upon site-specific analyses, assessments, or other performance indicators and as soon as reasonably practical, but no longer than 12 months, after changes occur in personnel, procedures, equipment, or facilities that potentially could adversely affect safety/security.

The results and recommendations of the physical security program review, management's finding on whether the physical security program is currently effective and any actions taken as a result of recommendations from prior program reviews are documented in a report to plant management and to appropriate corporate management at least one level higher than that having responsibility for the day-to-day plant operation. These reports are maintained in an auditable form and maintained for inspection.

Findings from the onsite physical security program reviews are entered into the facility corrective action program.

In RAI 13.6-36, the NRC staff requested that the applicant address the requirements of 10 CFR 73.58, "Safety/security requirements for nuclear power reactors." In its response dated May 14, 2010, the applicant stated that management controls and processes used to establish and maintain an effective interface between nuclear safety and physical security are addressed by administrative procedures. The applicant committed to revise VEGP COL FSAR Section 13.5.1 to include the safety/security interface implementation process in the list of procedural instructions provided in plant administrative procedures.

On the basis of its review, the NRC staff finds that since the applicant will revise VEGP COL FSAR Section 13.5.1 to incorporate the requirements for safety/security interfaces, the response to RAI 13.6-36 meets the requirements of 10 CFR 73.58 and is, therefore, acceptable. The incorporation of changes to the VEGP COL FSAR Section 13.5.1 is being tracked as ***Confirmatory Item 13.6-2****.*

Resolution of Standard Content Confirmatory Item 13.6-2

Confirmatory Item 13.6-2 is an applicant commitment to revise its FSAR Section 13.5 regarding the requirements of safety/security interfaces. The staff verified that the VEGP COL FSAR was appropriately revised. As a result, Confirmatory Item 13.6-2 is now closed.

The NRC staff has reviewed the applicant's description in PSP Section 17 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(m), and is, therefore, acceptable.

13.6.4.1.18 Response Requirements

The provisions of 10 CFR 73.55(k) require, in part, that the applicant establish and maintain a properly trained, qualified, and equipped security force required to interdict and neutralize threats up to and including the DBT defined in 10 CFR 73.1, to prevent significant core damage and spent fuel sabotage. To meet this objective, the applicant must ensure that necessary equipment is in supply, working, and readily available. The applicant must ensure training has been provided to all armed members of the security organization who will be available onsite to implement the applicant's protective strategy as described in the facility procedures and 10 CFR Part 73, Appendix C. The applicant must have facility procedures to reconstitute armed response personnel and have established working agreement(s) with LLEA. The applicant must have implemented a threat warning system to accommodate heightened security threats and coordination with NRC representatives.

Section 18 of the PSP describes an armed response team, responsibilities, training, and equipment, and requires an adequate number of armed response force personnel immediately available at all times to implement each site's protective strategy. The applicant ensures that training is conducted in accordance with the requirements of 10 CFR Part 73, Appendix B that will ensure implementation of the site protective strategy in accordance with 10 CFR Part 73, Appendix C. Procedures are in place to reconstitute the armed response personnel as are agreements with LLEA. Procedures are in place to manage the threat warning system.

The NRC staff has reviewed the applicant's description in PSP Section 18 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(k) and is, therefore, acceptable.

The following portion of this technical evaluation section is reproduced from Section 13.6.4.1 of the VEGP SER:

> *13.6.4.1.19 Special Situations Affecting Security*
>
> *The provisions of 10 CFR 73.58 require that each operating nuclear power reactor applicant with a license issued under 10 CFR Part 50, or 10 CFR Part 52 shall comply with the following requirements: the applicant shall assess and manage the potential for adverse effects on safety and security, including the site emergency plan, before implementing changes to plant configurations, facility conditions, or security; the scope of changes to be assessed and managed must include planned and emergent activities (such as, but not limited to, physical modifications, procedural changes, changes to operator actions or security assignments, maintenance activities, system reconfiguration, access modification or restrictions, and changes to the security plan and its implementation); where potential conflicts are identified, the applicant shall communicate them to appropriate personnel and take compensatory and/or mitigative actions to maintain safety and security under applicable Commission regulations, requirements, and license conditions.*
>
> *Section 19 of the PSP includes requirements for assessments to manage increased risk of special situations affecting security.*

Refueling/Major Maintenance

Section 19.1 of the PSP describes that, for refueling or major maintenance activities, the PSP describes that security procedures identify measures for implementation of actions prior to refueling or major maintenance activities. These measures include controls to ensure that a search is conducted prior to revitalizing an area, that protective barriers and alarms are fully operational, and post-maintenance performance testing to ensure operational readiness of equipment in accordance with 10 CFR 73.55(n)(8).

Construction and Maintenance

Section 19.2 of the PSP describes that during periods of construction and maintenance when temporary modifications are necessary, that the applicant will implement measures that provide for equivalency in the physical protective measures and features impacted by the activities, such that physical protection measures are not degraded. The process for making such changes or modifications is included in the facility procedures.

The NRC staff has reviewed the applicant's description in PSP Sections 19, 19.1, and 19.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(n)(8) and 10 CFR 73.58, and are, therefore, acceptable.

13.6.4.1.20 Maintenance, Testing and Calibration

In accordance with 10 CFR 73.55(n), the applicant is required to establish, maintain, and implement a maintenance, testing, and calibration program to ensure that security systems and equipment, including secondary and uninterruptible power supplies, are tested for operability and performance at predetermined intervals, maintained in operable condition, and have the capability of performing their intended functions. The regulation requires that the applicant describe their maintenance testing and calibrations program in the PSP, and that the implementing procedures describe the details and intervals for conducting these activities. Applicant procedures must identify criteria for documenting deficiencies in the corrective action program and ensuring data protection in accordance with 10 CFR 73.21. The applicant must conduct periodic operability testing of the intrusion alarm system and must conduct performance testing in accordance with the PSP and implementing procedures. Communication equipment must be tested not less than daily, and search equipment must also be tested periodically. Procedures must be established for testing equipment located in hazardous areas, and procedures must be established for returning equipment to service after each repair.

Sections 20.1 through 20.6 of the PSP describe the maintenance, testing and calibration program for security-related equipment. Section 20.1 states that the applicant shall conduct intrusion detection testing in accordance with

recommended testing procedures described in RG 5.44," Perimeter Intrusion Alarm System". Each operational component required for the implementation of the security program is at a minimum, tested in accordance with 10 CFR 73.55(n), the PSP and implementing procedures.

The NRC staff has reviewed the applicant's description in PSP Sections 20 and 20.1 through 20.6 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(n), and are, therefore, acceptable.

13.6.4.1.21 Compensatory Measures

The provisions of 10 CFR 73.55(o) require, in part, that the applicant shall identify criteria and measures to compensate for degraded or inoperable equipment, systems, and components to meet the requirements of this section. Compensatory measures must provide a level of protection that is equivalent to the protection that was provided by the degraded or inoperable, equipment, system, or components. Compensatory measures must be implemented within specific time frames necessary to meet the appropriate portions of 10 CFR 73.55(b) and described in the security plans.

Section 21 of the PSP identifies measures and criteria required to compensate for degraded or inoperable equipment, systems, and components in accordance with 10 CFR 73.55(o) to assure that the effectiveness of the physical protection system is not reduced by failure or other contingencies affecting the operation of the security-related equipment or structures. Sections 21.1 through 21.12 of the PSP address PA and vital area barriers, intrusion detection and alarm systems, lighting, fixed and non-fixed closed circuit television, play-back and recorded video systems, computer systems, access control devices, vehicle barrier systems, channeling barrier systems, and other security-related equipment.

The NRC staff has reviewed the applicant's description in PSP Sections 21 and 21.1 through 21.12, for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(o), and are, therefore, acceptable.

13.6.4.1.22 Records

The provisions of 10 CFR Part 26, 10 CFR 73.55(q), 10 CFR 73.56(k) and (o), 10 CFR Part 73, Appendix B. Section VI.H., Appendix C, Section II.C and 10 CFR 73.70, "Records," require that the applicant must retain and maintain all records required to be kept by the Commission regulations, orders, or license conditions until the Commission terminates the license for which the records were developed, and shall maintain superseded portions of these records for at least three years after the record is superseded, unless otherwise specified by

the Commission. The applicant is required to keep records of contracts with any contracted security force that implements any portion of the onsite physical protection program for the duration of the contract. The applicant must make all records, required to be kept by the Commission, available to the Commission and the Commission may inspect, copy, retain and remove all such records, reports and documents, whether kept by the applicant or a contractor. Review and audit reports must be maintained and available for inspection for a period of three years.

Section 22.0 of the PSP addresses the requirements to maintain records. Sections 22.1 through 22.13 address each kind of record that the applicant will maintain and the duration of retention for each record. The following types of records are maintained in accordance with the above mention regulations: access authorization records; suitability, physical and psychological qualification records for security personnel; PA and vital area access control records; PA visitor access records; PA vehicle access; vital area access transaction records; vitalization and de-vitalization records; vital area access list reviews; security plans and procedures; security patrols, inspections and tests; maintenance; CAS and SAS alarm annunciation and security response records; local law enforcement agency records; records of audits and reviews; access control devices; security training and qualification records; firearms testing and maintenance records; and engineering analysis for the vehicle barrier system.

The NRC staff has reviewed the applicant's description in PSP Sections 22 and 22.1 through 22.13 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(q), 10 CFR 73.55(o) and 10 CFR 73.70, and are, therefore, acceptable.

13.6.4.1.23 Digital Systems Security

Section 23 of the PSP addresses digital systems security. The applicant stated in its PSP that it has implemented the requirements of 10 CFR 73.54 and maintains a cyber security plan that describes how it has provided high assurance that safety, security, and emergency preparedness functions are protected against the DBT.

The NRC staff's review of the cyber security plan is found Section 13.8 of this SER.

13.6.4.1.24 Temporary Suspension of Security Measures

The provisions of 10 CFR 73.55(p) allow the applicant to "suspend implementation of affected requirements of this section under the following conditions: In accordance with 10 CFR 50.54(x) and 10 CFR 50.54(y) of this chapter, the licensee may suspend any security measures under this section in an emergency when this action is immediately needed to protect the public health and safety and no action consistent with license conditions and technical

specifications that can provide adequate or equivalent protection is immediately apparent. This suspension of security measures must be approved as a minimum by a licensed senior operator before taking this action. During severe weather when the suspension of affected security measures is immediately needed to protect the personal health and safety of security force personnel and no other immediately apparent action consistent with the license conditions and technical specifications can provide adequate or equivalent protection. This suspension of security measures must be approved, as a minimum, by a licensed senior operator, with input from the security supervisor or manager, before taking this action."

Suspension of Security Measures in Accordance with 10 CFR 50.54(x) and (y)

Section 24.1 of the PSP addresses suspension of security measures in accordance with 10 CFR 50.54(x) and 10 CFR 50.54(y). Specifically, the plan provides a description of the conditions under which suspension is permissible, the authority for suspension, and the requirements for reporting such a suspension.

Suspension of Security Measures during Severe Weather or Other Hazardous Conditions

As required in 10 CFR 73.55(p), suspension of security measures are reported and documented in accordance with the provisions of 10 CFR 73.71, "Reporting of safeguards events.". This suspension of security measures must be approved, as a minimum, by a licensed senior operator, with input from the security supervisor or manager, before taking this action. Suspended security measures must be reinstated as soon as conditions permit.

Section 24.2 of the PSP provides that certain security measures may be temporarily suspended during circumstances such as imminent, severe or hazardous weather conditions, but only when such action is immediately needed to protect the personal health and safety of security force personnel and no other immediately apparent action consistent with the security measures can provide adequate or equivalent protection. Under the PSP, suspended security measures shall be restored as soon as practical.

The NRC staff has reviewed the applicant's description in PSP Sections 24, 24.1, and 24.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the PSP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the PSP meets the requirements of 10 CFR 73.55(p), and are, therefore, acceptable.

13.6.4.1.25 Appendix A Glossary of Terms and Acronyms

Appendix A, "Glossary of Terms and Acronyms," was reviewed and found to be consistent with the NRC endorsed NEI 03-12, Revision 6 template.

13.6.4.1.26 Conclusions on the Physical Security Plan

On the basis of the NRC staff's review described in Sections 13.6.4.1.1 through 13.6.4.1.25 of this SER, the PSP meets the requirements of 10 CFR 73.55(a) through (r). The target sets, Target Set Analysis and Site Protective Strategy are in the facility implementing procedures, which were not subject to NRC staff review as part of this COL application and are, therefore, subject to future NRC inspection in accordance with 10 CFR 73.55(c)(7)(iv) and 10 CFR Part 73, Appendix C, Section II.B.5(iii). The NRC staff concludes that complete and procedurally correct implementation of the PSP will provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.

13.6.4.2 <u>Appendix B Training and Qualification Plan</u>

13.6.4.2.1 Introduction

The provisions of 10 CFR 73.55(c)(4) state that the applicant establish, maintain, implement, and follow a T&QP that describes how the criteria set forth in 10 CFR Part 73, Appendix B will be implemented.

The provisions of 10 CFR 73.55(d)(3) state that the applicant may not permit any individual to implement any part of the physical protection program unless the individual has been trained, equipped, and qualified to perform their assigned duties and responsibilities in accordance with 10 CFR Part 73, Appendix B and the T&QP. Non-security personnel may be assigned duties and responsibilities required to implement the physical protection program and shall:

- *(i) Be trained through established applicant training programs to ensure each individual is trained, qualified, and periodically requalified to perform assigned duties.*
- *(ii) Be properly equipped to perform assigned duties.*
- *(iii) Possess the knowledge, skills, and abilities to include physical attributes, such as sight and hearing, required to perform their assigned duties and responsibilities.*

In addition, 10 CFR Part 73, Appendix B, Section VI.D.2(a) states armed and unarmed individuals shall be requalified at least annually in accordance with the requirements of the Commission-approved T&QP.

The T&QP describes that it is written to address the requirements found in 10 CFR Part 73, Appendix B, Section VI. The objective of the plan is to provide a mechanism to ensure that members of the security organization, and all others who have duties and responsibilities in implementing the security requirements and protective strategy, are properly trained, equipped and qualified. Deficiencies identified during the administration of T&QP requirements are documented in the site corrective action program.

The NRC staff has reviewed the introduction section in the T&QP and has determined that it includes all of the programmatic elements necessary to satisfy the requirements of 10 CFR 73.55 and 10 CFR Part 73, Appendix B, Section VI applicable to the T&QP. Additional section-by-section evaluations and discussions are found in the following paragraphs.

13.6.4.2.2 Employment Suitability and Qualification

The requirements for mental qualifications, documentation, and physical requalification for security personnel (applicant employee and contractor) are described in the following T&QP sections.

Suitability

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.1(a) require, in part, that before employment, or assignment to the security organization, an individual shall: (1) possess a high school diploma or pass an equivalent performance examination designed to measure basic mathematical, language, and reasoning skills, abilities, and knowledge required to perform security duties and responsibilities; (2) attained the age of 21 for an armed capacity or the age of 18 for an unarmed capacity; (3) not have any felony convictions that reflect on the individual's reliability; and (4) individuals in an armed capacity would not be disqualified from possessing or using firearms or ammunition in accordance with applicable State or Federal law, to include 18 U.S.C. 922. Applicants shall use information that has been obtained during the completion of the individual's background investigation for unescorted access to determine suitability. Satisfactory completion of a firearms background check for the individual under 10 CFR 73.19 of this part will also fulfill this requirement. The provisions of 10 CFR Part 73, Appendix B, Section VI.B.1(b) require the qualification of each individual to perform assigned duties and responsibilities must be documented by a qualified training instructor and attested to by a security supervisor.

Section 2.1 of the T&QP details the requirements of qualifications for employment in the security organization that follows the regulation in 10 CFR Part 73, Appendix B, Section VI.B.1(a).

Physical Qualifications

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.2 require, in part, that individuals whose duties and responsibilities are directly associated with the effective implementation of the Commission-approved security plans, applicant protective strategy, and implementing procedures, may not have any physical conditions that would adversely affect their performance of assigned security duties and responsibilities.

Section 2.2 of the T&QP details those individuals that are directly associated with implementation of the security plans. Protective strategy and procedures may not have any physical conditions that would adversely affect their performance of assigned security duties and responsibilities. All individuals that are found on the critical task matrix shall demonstrate the necessary physical qualifications prior to duty.

Physical Examination

It is stated in 10 CFR Part 73, Appendix B, Section VI.B.2(a)(2), that armed and unarmed individuals assigned security duties and responsibilities shall be subject to a physical examination designed to measure the individual's physical ability to perform assigned duties and responsibilities as identified in the Commission-approved security plans, applicant protective strategy, and implementing procedures.

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.2(a)(3) state, in part, that the physical examination must be administered by a licensed health professional with the final determination being made by a licensed physician to verify the individual's physical capability to perform assigned duties and responsibilities.

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.2(b) through (e) provide the minimum requirements that individuals must meet, and include requirements for vision, hearing, review of existing medical conditions, and examination for potential addictions.

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.2(f) address medical examinations before returning to assigned duties following any incapacitation.

Section 2.3 of the T&QP describes the physical examinations for armed and unarmed individuals assigned security duties, as well as other individuals that implement parts of the physical protection program. Minimum requirements exist for physical examinations of vision, hearing, existing medical conditions, addiction or other physical requirements.

The NRC staff has reviewed the applicant's description in T&QP Sections 2.1, 2.2, and 2.3 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73 Appendix B, Sections VI.B.1 and VI.B.2, and are, therefore, acceptable.

Medical Examinations and Physical Fitness Qualifications

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.4(a) require, in part, that armed members of the security organization shall be subject to a medical examination by a licensed physician, to determine the individual's fitness to participate in physical fitness tests, and that the applicant shall obtain and retain a written certification from the licensed physician that no medical conditions were disclosed by the medical examination that would preclude the individual's ability to participate in the physical fitness tests or meet the physical fitness attributes or objectives associated with assigned duties.

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.4(b) require, in part, that before assignment, armed members of the security organization shall demonstrate physical fitness for assigned duties and responsibilities by performing a practical physical fitness test. The physical fitness test must consider physical conditions such as strenuous activity, physical exertion, levels of stress, and exposure to the elements as they pertain to each individual's assigned security duties. The physical fitness qualification of each armed member of the security organization must be documented by a qualified training instructor and attested to by a security supervisor.

Section 2.4 of the T&QP is explicit in its requirements for medical examinations and physical qualifications.

The NRC staff has reviewed the applicant's description in T&QP Section 2.4 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.B.4(a) and 10 CFR Part 73, Appendix B, Section VI.B.4(b), and is, therefore, acceptable.

Psychological Qualifications

General Psychological Qualifications

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.3(a) require, in part, that armed and unarmed individuals shall demonstrate the ability to apply good judgment, mental alertness, the capability to implement instructions and assigned tasks, and possess the acuity of senses and ability of expression sufficient to permit accurate communication by written, spoken, audible, visible, or other signals required by assigned duties and responsibilities.

Section 2.5.1 of the T&QP details that individuals whose security tasks and jobs directly associated with the effective implementation of the security plan and protective strategy shall demonstrate the qualities in 10 CFR Part 73, Appendix B, Section VI.B.3(a).

Professional Psychological Examination

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.3(b) require, in part, that a licensed psychologist, psychiatrist, or physician trained in part to identify emotional instability shall determine whether armed members of the security organization and alarm station operators in addition to meeting the requirement stated in paragraph (a) of this section, have no emotional instability that would interfere with the effective performance of assigned duties and responsibilities.

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.3(c) require that a person professionally trained to identify emotional instability shall determine whether unarmed individuals, in addition to meeting the requirement stated in

paragraph (a) of this section, have no emotional instability that would interfere with the effective performance of assigned duties and responsibilities.

Section 2.5.2 of the T&QP provides for the administration of psychological and emotional determination that will be conducted by appropriately licensed and trained individuals.

The NRC staff has reviewed the applicant's description in T&QP Sections 2.5.1 and 2.5.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Sections VI.B.3(a), (b) and (c), and are, therefore, acceptable.

Documentation

The provisions of 10 CFR Part 73, Appendix B, Section VI.H.1 require, in part, the retention of all reports, records, or other documentation required by Appendix B and 10 CFR 75.55(q).

Section 2.6 of the T&QP describes that qualified training instructors create the documentation of training activities and that security supervisors attest to these records as required. Records are retained in accordance with Section 22 of the PSP.

The NRC staff has reviewed the applicant's description in T&QP Section 2.6 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.H.1 and is, therefore, acceptable.

Physical Requalification

The provisions of 10 CFR Part 73, Appendix B, Section VI.B.5 require that: (a) at least annually, armed and unarmed individuals shall be required to demonstrate the capability to meet the physical requirements of this appendix and the applicant's T&QP; and (b) the physical requalification of each armed and unarmed individual must be documented by a qualified training instructor and attested to by a security supervisor.

Section 2.7 of the T&QP describes that physical requalification is conducted at least annually, and documented as described in the PSP.

The NRC staff has reviewed the applicant's description in T&QP Section 2.7 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in

the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.B.5 and is, therefore, acceptable.

13.6.4.2.3 Individual Training and Qualification

Duty Training

The provisions of 10 CFR Part 73, Appendix B, Section VI.C.1 provide for duty training and qualification requirements. The regulation states, in part, that all personnel who are assigned to perform any security-related duty or responsibility shall be trained and qualified to perform assigned duties and responsibilities to ensure that each individual possesses the minimum knowledge, skills, and abilities required to effectively carry out those assigned duties and responsibilities. These areas of training include performing assigned duties and responsibilities in accordance with the requirements of the T&QP and the PSP, and be trained and qualified in the use of all equipment or devices required to effectively perform all assigned duties and responsibilities.

Section 3.1 of the T&QP details the requirements that individuals assigned duties must be trained in their duties, meet minimum qualifications, and be trained and qualified in all equipment or devices required to perform their duties.

The NRC staff has reviewed the applicant's description in T&QP Sections 3.0 and 3.1 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.C.1, and is, therefore, acceptable.

On-the-job Training

The provisions of 10 CFR Part 73, Appendix B, Sections VI.C.2(a) through (c) provides requirements for on-the-job training. On-the-job training must include individual demonstration of the knowledge, skills and abilities provided during the training process. Individuals assigned contingency duties must complete a minimum of 40 hours of on-the-job training.

On-the-job training for contingency activities and drills must include, but is not limited to, hands-on application of knowledge, skills, and abilities related to: (1) response team duties; (2) use of force; (3) tactical movement; (4) cover and concealment; (5) defensive positions; (6) fields-of-fire; (7) re-deployment; (8) communications (primary and alternate); (9) use of assigned equipment; (10) target sets; (11) table top drills; (12) command and control duties; (13) applicant's protective strategy.

The T&QP provides a comprehensive discussion of the applicant's approach to meeting the requirements for on-the-job training.

The NRC staff has reviewed the applicant's description in T&QP Section 3.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Sections VI.C.2(a) through (c), and is, therefore, acceptable.

Critical Task Matrix

The provisions of 10 CFR Part 73, Appendix B, Section VI.C.2(b) require, in part, that each individual who is assigned duties and responsibilities identified in the Commission-approved security plans, licensee protective strategy, and implementing procedures shall, before assignment, demonstrate proficiencies in implementing the knowledge, skills and abilities to perform assigned duties.

The T&QP includes a critical task matrix as Table 1 of the T&QP. This matrix addresses the means through which each individual will demonstrate the required proficiencies. Tasks that individuals must perform are listed in RG 5.75.

The NRC staff has reviewed the applicant's description in T&QP Section 3.3 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.C.2(b), and is, therefore, acceptable.

Initial Training and Qualification Requirements

The provisions of 10 CFR Part 73, Appendix B, Sections VI.C.1(a) through (b) provide the requirements for duty training.

The provisions of 10 CFR Part 73, Appendix B, Section VI.D.1(a) provide the requirements for demonstration of qualification.

Section 3.4 of the T&QP details that individuals are trained and qualified prior to performing security-related duties within a security organization and must meet the minimum qualifying standards in Sections 3.4.1 and 3.4.2.

Written Examination

The provisions of 10 CFR Part 73, Appendix B, Section VI.D.1(b)(1) provide that written exams must include those elements listed in the Commission-approved T&QP to demonstrate an acceptable understanding of assigned duties and responsibilities, to include the recognition of potential tampering involving both safety and security equipment and systems.

Hands on Performance Demonstration

The provisions of 10 CFR Part 73, Appendix B, Section VI.D.1(b)(2) require that armed and unarmed individuals shall demonstrate hands-on performance for assigned duties and responsibilities by performing a practical hands-on demonstration for required tasks. The hands-on demonstration must ensure that theory and associated learning objectives for each required task are considered and each individual demonstrates the knowledge, skills, and abilities required to effectively perform the task.

Sections 3.4.1 and 3.4.2 of the T&QP describe the measures that are implemented by the applicant that meet the requirements stated above.

The NRC staff has reviewed the applicant's description in T&QP Sections 3.4, 3.4.1, and 3.4.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Sections VI.C.1 and D.1, and is, therefore, acceptable.

Continuing Training and Qualification

The provisions of 10 CFR Part 73, Appendix B, Section VI.D.2 state, in part, that armed and unarmed individuals shall be re-qualified at least annually in accordance with the requirements of this appendix and the Commission-approved T&QP. The results of requalification must be documented by a qualified training instructor and attested by a security supervisor.

Section 3.5 of the T&QP provides discussion regarding the management of the requalification program to ensure that each individual is trained and qualified. In part, the applicant's plan provides that annual requalification may be completed up to three (3) months before or three (3) months after the scheduled date. However, the next annual training must be scheduled (12) months from the previously scheduled date rather than the date the training was actually completed.

The NRC staff has reviewed the applicant's description in T&QP Section 3.5 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.D.2, and is, therefore, acceptable.

Annual Written Examination

The provisions of 10 CFR Part 73, Appendix B, Section VI.D.(b)(3) provide that armed individuals shall be administered an annual written exam that demonstrates the required knowledge, skills, and abilities to carry out assigned duties and responsibilities as an armed member of the security organization. The annual written exam must include those elements listed in the Commission-approved T&QP to demonstrate an acceptable understanding of assigned duties and responsibilities.

Section 3.5.1 of the T&QP provides that each individual will be tested, in part, with an annual written exam that, at a minimum, covers: the role of security personnel; use of deadly force; the requirements in 10 CFR 73.21; authority of private security personnel; power of arrest; search and seizure; offsite law enforcement response; tactics and tactical deployment and engagement.

The NRC staff has reviewed the applicant's description in T&QP Section 3.5.1 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.D.1.(3), and is, therefore, acceptable.

Demonstration of Knowledge Skills and Abilities

The provisions of 10 CFR Part 73, Appendix B, Sections VI, A., B., C., D., (A.4, B.2(c)(2), B.3(a), B.4(b)(1), B.4(b)(3), B.5(a), C.2(a), C.2(b), C.3(a), C.3(b) C.3(d), D.1(a), D.1(b)(1), D.1(b)(2), D.1(b)(3), and D.1(c) state, in part, that an individual must demonstrate required knowledge, skills and abilities, to carry out assigned duties and responsibilities.

Section 3.5.2 of the T&QP provides that all knowledge, skills and abilities will be demonstrated in accordance with a systematic approach to training (SAT) program as described in RG 5.75.

The NRC staff has reviewed the applicant's description in T&QP Section 3.5.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Sections VI.A, B, C, and D and is, therefore, acceptable.

Weapons Training and Qualification

General Firearms Training

The provisions of 10 CFR Part 73, Appendix B, Section VI.E provide that armed members of the security organization shall be trained and qualified in accordance with the requirements of this appendix and the Commission-approved T&QP. Training must be conducted by certified firearms instructors who shall be recertified at least every three (3) years. Applicants shall conduct annual firearms familiarization, and armed members of the security organization must participate in weapons range activities on a nominal four (4) month periodicity.

Section 3.6.1 of the T&QP addresses the requirements in 10 CFR Part 73, Appendix B, Sections VI.E.1(d)(1) through (11) and includes the requirements for training in the use of deadly force and participation in weapons range activities on a nominal four (4) month periodicity.

The NRC staff has reviewed the applicant's description in T&QP Section 3.6.1 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.E.1, and is, therefore, acceptable.

General Weapons Qualification

The provisions of 10 CFR Part 73, Appendix B, Section VI.F.1 Weapons Qualification and Requalification Program require that qualification firing must be accomplished in accordance with Commission requirements and the Commission-approved T&QP for assigned weapons. The results of weapons qualification and requalification must be documented and retained as a record.

Section 3.6.2 of the T&QP provides that all armed personnel are qualified and re-qualified with assigned weapons. All weapons qualification and re-qualification will be documented and retained as a record.

The NRC staff has reviewed the applicant's description in T&QP Section 3.6.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.F.1, and is, therefore, acceptable.

Tactical Weapons Qualification

The provisions of 10 CFR Part 73, Appendix B, Section VI.F.2 require that the applicant conduct tactical weapons qualification. The applicant T&QP must describe the firearms used, the firearms qualification program, and other tactical training required to implement the Commission-approved security plans, applicant protective strategy, and implementing procedures. Applicant developed tactical qualification and requalification courses must describe the performance criteria needed to include the site specific conditions (such as lighting, elevation, fields-of-fire) under which assigned personnel shall be required to carry out their assigned duties.

Section 3.6.3 of the T&QP provides that a tactical qualification course of fire is used to assess armed security force personnel in tactical situations to ensure they are able to demonstrate required tactical knowledge, skills and abilities remain proficient.

The NRC staff has reviewed the applicant's description in T&QP Section 3.6.3 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.F.2 and is, therefore, acceptable.

Firearms Qualification Courses

The provisions of 10 CFR Part 73, Appendix B, Section VI.F.3 state, in part, that the applicant shall conduct the following qualification courses for each weapon used: (a) an annual daylight fire qualification course; and (b) an annual night fire qualification course.

Courses of Fire

The provisions of 10 CFR Part 73, Appendix B, Section VI.F.4 describe required courses of fire.

Section 3.6.4 of the T&QP provides a description of the firearms qualification courses used to ensure armed members of the security organization are properly trained and qualified. Courses of fire are used individually for handguns, shotguns, and semiautomatic rifles, and enhanced weapons.

The NRC staff has reviewed the applicant's description in T&QP Section 3.6.4 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73,

Appendix B, Section VI.F.3, and 10 CFR Part 73, Appendix B, Section VI.F.4, and is, therefore, acceptable.

Firearms Requalification

The provisions of 10 CFR Part 73, Appendix B, Section VI.F.5 provide that armed members of the security organization shall be re-qualified for each assigned weapon at least annually in accordance with Commission requirements and the Commission-approved T&QP, and the results documented and retained as a record. Firearms requalification must be conducted using the courses of fire outlined in 10 CFR Part 73, Appendix B, Sections VI.F.2, VI.F.3, and VI.F.4.

Section 3.6.5 of the T&QP describes that armed members of the security organization re-qualify at least annually with each weapon assigned, using the courses of fire provided in the T&QP.

The NRC staff has reviewed the applicant's description in T&QP Section 3.6.5 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.F.5, and is, therefore, acceptable.

Weapons, Personal Equipment and Maintenance

The provisions of 10 CFR Part 73, Appendix B, Section VI.G provide the requirements for the maintenance of weapons and personal equipment. These requirements provide that the applicant shall provide armed personnel with weapons that are capable of performing the function stated in the Commission-approved security plans, applicant protective strategy, and implementing procedures. In addition, the applicant shall ensure that each individual is equipped or has ready access to all personal equipment or devices required for the effective implementation of the Commission-approved security plans, applicant protective strategy, and implementing procedures.

Section 3.7 of the T&QP describes that personnel are provided with weapons and personal equipment necessary to meet the plans and the protective strategy. The equipment provided is described in Section 9.0 of the PSP, and maintenance is performed as described in Section 20.0 of the PSP.

The NRC staff has reviewed the applicant's description in T&QP Section 3.7 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.G, and is, therefore, acceptable. The staff's review of Sections 9.0 and 20.0 of the PSP is in Section 13.6.4.1.9 and 13.6.4.1.20 of this SER.

Documentation

The provisions of 10 CFR Part 73, Appendix B, Section VI.H require that the applicant shall retain all reports, records, or other documentation required by this appendix in accordance with the requirements of 10 CFR 73.55(r). The applicant shall retain each individual's initial qualification record for three (3) years after termination of the individual's employment and shall

retain each re-qualification record for three (3) years after it is superseded. The applicant shall document data and test results from each individual's suitability, physical, and psychological qualification and shall retain this documentation as a record for three (3) years from the date of obtaining and recording these results.

Section 3.8 of the T&QP provides that records are retained in accordance with Section 22 of the PSP.

The NRC staff has reviewed the applicant's description in T&QP Section 3.8 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.H and is, therefore, acceptable.

The following portion of this technical evaluation section is reproduced from Section 13.6.4.2 of the VEGP SER:

> *13.6.4.2.4 Performance Evaluation Program*
>
> *10 CFR Part 73, Appendix B, Section VI.C.3, Performance Evaluation Program*
>
> *(a) Applicants shall develop, implement and maintain a performance evaluation program that is documented in procedures, which describes how the applicant will demonstrate and assess the effectiveness of their onsite physical protection program and protective strategy, including the capability of the armed response team to carry out their assigned duties and responsibilities during safeguards contingency events. The performance evaluation program and procedures shall be referenced in the applicant's T&QP.*
>
> *(b) The performance evaluation program shall include procedures for the conduct of tactical response drills and force-on-force exercises designed to demonstrate and assess the effectiveness of the applicant's physical protection program, protective strategy and contingency event response by all individuals with responsibilities for implementing the SCP. The performance evaluation program must be designed to ensure, in part, that each member of each shift who is assigned duties and responsibilities required to implement the SCP and applicant protective strategy participates in at least one tactical response drill on a quarterly basis and one force-on-force exercise on an annual basis.*
>
> *Section 4 of the T&QP details the performance evaluation program consistent with the requirements of 10 CFR Part 73, Appendix B, Sections VI.C.3(a) through (m). Additional details of the performance evaluation program are described in the facility procedures.*
>
> *The NRC staff has reviewed the applicant's description in T&QP Section 4 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in*

the T&QP meets the requirements of 10 CFR Part 73, Appendix B, Section VI.C.3 and is, therefore, acceptable.

13.6.4.2.5 Definitions

The provisions of 10 CFR Part 73, Appendix B, Section VI.J state, in part, that terms defined in 10 CFR Part 50, 10 CFR Part 70, and 10 CFR Part 73 have the same meaning when used in this appendix. Definitions are found in the PSP, Appendix A, "Glossary of Terms and Acronyms." [On the basis of its review, the NRC staff finds that the definitions sections of the PSP meet the requirements of 10 CFR 73.2, and are, therefore, acceptable.]

Included in this section of the T&QP is the Critical Task Matrix, which is considered SGI and has not been included in this SER.

The NRC staff has reviewed the applicant's description in T&QP of the Critical Task Matrix tasks for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the T&QP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the T&QP meets the requirements of 10 CFR Part 73, Appendix B, and are, therefore, acceptable.

13.6.4.2.6 Conclusion on the Training and Qualification Plan

On the basis of the NRC staff's review described in Sections 13.6.4.2.1 through 13.6.4.2.5 of this SER, the T&QP meets the requirements of 10 CFR Part 73, Appendix B. The target sets, Target Set Analysis and Site Protective Strategy are in the facility implementing procedures, which were not subject to NRC staff review as part of this COL application and are, therefore, subject to future NRC inspection in accordance with 10 CFR 73.55(c)(7)(iv) and 10 CFR Part 73, Appendix C, Section II.B.5(iii). The NRC staff concludes that complete and procedurally correct implementation will provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.

13.6.4.3 <u>Appendix C Safeguards Contingency Plan</u>

13.6.4.3.1 Background Information

This category of information identifies the perceived dangers and incidents that the plan addresses and a general description of how the response is organized.

<u>Purpose of the Safeguards Contingency Plan</u>

The provisions of 10 CFR Part 73, Appendix C, Section II.B.1.b state that the applicant should discuss general goals, objectives and operational concepts underlying the implementation of the SCP.

Section 1.1 of the SCP describes the purpose and goals of the SCP, including guidance to security and management for contingency events.

Scope of the Safeguards Contingency Plan

The provisions of 10 CFR Part 73, Appendix C, Section II.B.1.c delineate the types of incidents that should be covered by the applicant in the SCP, how the onsite response effort is organized and coordinated to effectively respond to a safeguards contingency event and how the onsite response for safeguards contingency events has been integrated into other site emergency response procedures.

Section 1.2 of the SCP details the scope of the SCP to analyze and define decisions and actions of security force personnel, as well as facility operations personnel, for achieving and maintaining safe shutdown.

Perceived Danger

The provisions of 10 CFR Part 73, Appendix C, Section II.B.1a require that, consistent with the DBT specified in 10 CFR 73.1(a)(1), the applicant shall identify and describe the perceived dangers, threats, and incidents against which the SCP is designed to protect.

Section 1.3 of the SCP outlines the threats used to design the physical protection systems.

The applicant adequately addresses perceived danger, provides a purpose of the plan, and describes the scope of the plan.

Definitions

Section 1.4 of the SCP describes that a list of terms and their definitions used in describing operational and technical aspects of the approved SCP as required by 10 CFR Part 73, Appendix C, Section II.B.1.d is found in Appendix A of the PSP.

The NRC staff has reviewed the applicant's description in SCP Sections 1, 1.1, 1.2, 1.3, and 1.4 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the SCP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the SCP meets the requirements of 10 CFR Part 73, Appendix C, Section II.B.3 and are, therefore, acceptable.

13.6.4.3.2 Generic Planning Base

As required in 10 CFR Part 73, Appendix C, Section II.B.2, this section of the plan defines the criteria for initiation and termination of responses to security events, to include the specific decisions, actions, and supporting information needed to respond to each type of incident covered by the approved SCP.

Situations Not Covered by the Contingency Plan

Section 2.1 of the SCP details the general types of conditions that are not covered in the plan.

Situations Covered by the Contingency Plan

The provisions of 10 CFR Part 73, Appendix C, Section II.B.2.a require, in part, that the plan identify those events that will be used for signaling the beginning or aggravation of a safeguards contingency according to how they are perceived initially by the applicant's personnel. Applicants shall ensure detection of unauthorized activities and shall respond to all alarms or other indications signaling a security event, such as penetration of a PA, vital area, or unauthorized barrier penetration (vehicle or personnel); tampering, bomb threats, or other threat warnings—either verbal, such as telephoned threats, or implied, such as escalating civil disturbances.

The provisions of 10 CFR Part 73, Appendix C, Section II.B.2.b require, in part, that the plan define the specific objective to be accomplished relative to each identified safeguards contingency event. The objective may be to obtain a level of awareness about the nature and severity of the safeguards contingency to prepare for further responses; to establish a level of response preparedness; or to successfully nullify or reduce any adverse safeguards consequences arising from the contingency.

The provisions of 10 CFR Part 73, Appendix C, Section II.B.2.c require, in part, that the applicant identify the data, criteria, procedures, mechanisms and logistical support necessary to achieve the objectives identified.

Section 2.2 of the SCP describes in detail the specific situations covered by the SCP, including objectives and information required for each.

The NRC staff has reviewed the applicant's description in SCP Sections 2, 2.1 and 2.2 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the SCP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the SCP meets the requirements of 10 CFR Part 73, Appendix C Section II.B.2 and are, therefore, acceptable.

13.6.4.3.3 Responsibility Matrix

The provisions of 10 CFR Part 73, Appendix C, Section II.B.4 state that this category of information consists of the detailed identification of responsibilities and specific actions to be taken by the applicant's organizations and/or personnel in response to safeguards contingency events. To achieve this result the applicant must address the following.

The provisions of 10 CFR Part 73, Appendix C, Section II.B.4.a require, in part, that the applicant develop site procedures that consist of matrixes detailing the organization and/or personnel responsible for decisions and actions associated with specific responses to

safeguards contingency events. The responsibility matrix and procedures must be referenced in the applicant's SCP.

The provisions of 10 CFR Part 73, Appendix C, Section II.B.4.b require, in part, that the responsibility matrix procedures shall be based on the events outlined in the applicant's generic planning base and include specific objectives to be accomplished, description of responsibilities for decisions and actions for each event, and overall description of response actions each responding entity.

The provisions of 10 CFR Part 73, Appendix C, Section II.B.4.c require, in part, that responsibilities are to be assigned in a manner that precludes conflict of duties and responsibilities that would prevent the execution of the SCP and emergency response plans.

The provisions of 10 CFR Part 73, Appendix C, Section II.B.4.d require, in part, that the applicant ensure that predetermined actions can be completed under the postulated conditions.

Section 3 of the SCP includes the responsibility matrix. The responsibility matrix integrates the response capabilities of the security organization (described in Section 4 of the SCP) with the background information relating to decision/actions and organizational structure (described in Section 1 of the SCP). The responsibility matrix provides an overall description of the response actions and their interrelationships. Responsibilities and actions have been predetermined to the maximum extent possible and assigned to specific entities to preclude conflicts that would interfere with or prevent the implementation of the SCP or the ability to protect against the DBT of radiological sabotage.

The NRC staff has reviewed the applicant's description in SCP Section 3 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the SCP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the SCP meets the requirements of 10 CFR Part 73, Appendix C, Section II.B.4 and is, therefore, acceptable.

13.6.4.3.4 Licensee Planning Base

The provisions of 10 CFR Part 73, Appendix C, Section II.B.3 require, in part, that the applicant planning base include factors affecting the SCP specific for each facility.

Licensee Organization

The provisions of 10 CFR Part 73, Appendix C, Section II.B.3.a require in part, that the SCP describe the organization's chain of command and delegation of authority during safeguards contingency events, to include a general description of how command and control functions will be coordinated and maintained.

Duties/Communication Protocols

Section 4.1.1 of the SCP details the duties and communications protocols of each member of the security organization responsible for implementing any portion of the applicant's protective strategy.

Security Chain of Command/Delegation of Authority

Section 4.1.2 of the SCP details the chain of command and delegation of authority during normal operations is discussed in the PSP. The chain of command and delegation of authority during contingency events is also described in the responsibility matrix portions of the SCP. The chain of command and delegation of authority during normal operations is discussed in the PSP.

Physical Layout

The provisions of 10 CFR Part 73, Appendix C, Section II.B.3(b) require, in part, that the SCP include a site map depicting the physical structures located on the site, including onsite independent spent fuel storage installations, and a description of the structures depicted on the map. Plans must also include a description and map of the site in relation to nearby towns, transportation routes (e.g., rail, water, and roads), pipelines, airports, hazardous material facilities, and pertinent environmental features that may have an effect upon coordination of response activities. Descriptions and maps must indicate main and alternate entry routes for law enforcement or other offsite response and support agencies and the location for marshaling and coordinating response activities.

Section 4.2 of the SCP references Section 1.1 of the PSP for layouts of the OCA, PA, vital areas, site maps, and descriptions of site features.

Safeguards Systems

The provisions of 10 CFR Part 73, Appendix C, Section II.B.3.c require, in part, that the SCP include a description of the physical security systems that support and influence how the applicant will respond to an event in accordance with the DBT described in 10 CFR 73.1(a). The description must begin with onsite physical protection measures implemented at the outermost perimeter, and must move inward through those measures implemented to protect target set equipment.

Section 4.3 of the PSP describes that safeguards systems are described in PSP Sections 9, 11, 12, 13, 15 and 16, and in facility implementing procedures/documents. Section 8 of the SCP describes how physical security systems will be used to respond to a threat at the site.

Law Enforcement Assistance

The provisions of 10 CFR Part 73, Appendix C, Section II.B.3.d require in part, that the applicant provide a listing of available law enforcement agencies and a general description of their response capabilities and their criteria for response and a discussion of working agreements or arrangements for communicating with these agencies.

Section 4.4 of the SCP details the role of LLEA in the site protective strategy. Additional details regarding LLEA are included in Section 8 of the PSP and Section 5.6 of the SCP.

Policy Constraints and Assumptions

The provisions of 10 CFR Part 73, Appendix C, Section II.B.3.e require in part, that the SCP include a discussion of State laws, local ordinances, and company policies and practices that govern applicant response to incidents and must include, but is not limited to, the following:

1) use of deadly force; 2) recall of off-duty employees; 3) site jurisdictional boundaries; and 4) use of enhanced weapons, if applicable.

Section 4.5 of the SCP details the site security policies, including the use of deadly force and authority to request offsite assistance.

Administrative and Logistical Considerations

The provisions of 10 CFR Part 73, Appendix C, Section II.B.3.f require in part, that the applicant provide descriptions of applicant practices, which influence how the security organization responds to a safeguards contingency event to include, but is not limited to, a description of the procedures that will be used for ensuring that equipment needed to facilitate response will be readily accessible, in good working order, and in sufficient supply.

Section 4.6 of the SCP outlines administrative duties of the Security Manager, Security Shift Team Leader, facility procedures and administrative forms.

The NRC staff has reviewed the applicant's description in SCP Sections 4, 4.1, 4.1.1, 4.1.2, and 4.2 through 4.6 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the SCP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the SCP meets the requirements of 10 CFR Part 73, Appendix C, Section II.B.3 and is, therefore, acceptable.

13.6.4.3.5 Response Capabilities

This section outlines the response by the applicant to threats to the facility. The applicant details how they protect against the DBT with onsite and offsite organizations, consistent with the regulation of 10 CFR 50.54(p)(1) and (hh), 10 CFR 73.55(k), 10 CFR Part 73, Appendix B, Section VI and 10 CFR Part 73, Appendix C, Section II.B.3. In addition, 10 CFR Part 73, Appendix C, "Introduction," states, in part, it is important to note that a applicant's SCP is intended to be complementary to any emergency plans developed pursuant to Appendix E to 10 CFR Part 50 and 10 CFR 52.17.

Response to Threats

Section 5.1 of the SCP describes how the protective strategy is designed to defend the facility against all aspects of the DBT. Each organization has defined roles and responsibilities.

Armed Response Team

Section 5.2 of the SCP notes individuals from the Responsibility Matrix and their role in the site protective strategy. This section also notes the minimum number of individuals and their contingency equipment for implementation of the protective strategy. The applicant described the armed response team consistent with 10 CFR 73.55(k)(4), (5), (6), and (7), 10 CFR Part 73, Appendix B, Section VI, and 10 CFR Part 73, Appendix C, Section II.B.3.

Supplemental Security Officer

Section 5.3 of the SCP details the role of supplemental security officers in the site protective strategy. The applicant described the use of supplemental security officers, consistent with the requirements in 10 CFR 73.55(k)(4).

Facility Operations Response

Section 5.4 of the SCP details the role of operations personnel in the site protective strategy, including responsibilities, strategies, and conditions for operator actions as discussed in 10 CFR 50.54(hh).

Emergency Plan Response

Section 5.5 of the SCP notes the integration of the Emergency Plan with the site's protective strategy, and gives some examples of how the Emergency Plan can influence the protective strategy as discussed in 10 CFR 73.55(b)(11).

Local Law Enforcement Agencies (LLEA)

Section 5.6 of the SCP meets the requirements of 10 CFR 73.55(k)(9) and 10 CFR Part 73, Appendix C, Section II.B.3.d and lists the LLEAs that will respond to the site as a part of the protective strategy. Details on the response of the LLEA are located in Section 8 of the PSP.

State Response Agencies

Section 5.7 of the SCP meets the requirements of 10 CFR 73.55(k)(9) and 10 CFR Part 73, Appendix C, Section II.B.3.d and lists the State response agencies that will respond to the site as a part of the protective strategy.

Federal Response Agencies

Section 5.8 of the SCP meets the requirements of 10 CFR 73.55(k)(9) and 10 CFR Part 73, Appendix C, Section II.B.3.d and lists the Federal response agencies that will respond to the site as a part of the protective strategy.

Response to ISFSI Events

VCSNS Units 2 and 3 do not have an ISFSI, so this section does not apply.

The NRC staff has reviewed the applicant's description in SCP Sections 5.0 through 5.9 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the SCP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the SCP meets the requirements of 10 CFR 50.54(p)(1) and (hh), 10 CFR 73.55(k), 10 CFR Part 73, Appendix B, Section VI and 10 CFR Part 73, Appendix C, Section II.B.3 and is, therefore, acceptable. In addition, Appendix C, "Introduction" states, in part, that it is important to note that an applicant's SCP is intended to be complementary to any emergency plans developed pursuant to Appendix E to 10 CFR Part 50 and 10 CFR 52.17.

The following portion of this technical evaluation section is reproduced from Section 13.6.4.3 of the VEGP SER:

> *13.6.4.3.6 Defense-In-Depth*
>
> *Section 6 of the SCP lists site physical security characteristics, programs, and the strategy elements that illustrate the defense-in-depth nature of the site protective strategy as required in 10 CFR 73.55(b)(3).*
>
> *The NRC staff has reviewed the applicant's description in SCP Section 6 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the SCP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the SCP meets the requirements of 10 CFR 73.55(b)(3) and is, therefore, acceptable.*
>
> *13.6.4.3.7 Primary Security Functions*
>
> *Section 7 of the SCP details the primary security functions of the site, and their roles in the site protective strategy. It also notes the development of target sets, and their function in the development of the site's protective strategy.*
>
> *The NRC staff has reviewed the applicant's description in SCP Section 7 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the SCP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the SCP meets the requirements of 10 CFR 10 CFR 73.55(b) and is, therefore, acceptable.*

13.6.4.3.8 Protective Strategy

The provisions of 10 CFR Part 73, Appendix C, Section II.B.3.c(v) require that applicants develop, implement and maintain a written protective strategy that shall: 1) be designed to meet the performance objectives of 10 CFR 73.55(a) through (k); 2) identify predetermined actions, areas of responsibilities, and timelines for the deployment of armed personnel; 3) include measures that limit the exposure of security personnel to possible attack; 4) include a description of the physical security systems and measures that provide defense-in-depth; 5) describe the specific structure and responsibilities of the armed response organization; and 6) provide a command and control structure.

Section 8 of the SCP describes the site protective strategy.

The NRC staff has reviewed the applicant's description in SCP Section 8 for the implementation of the site-specific physical protection program in accordance with Commission regulations and NUREG-0800 acceptance criteria. Because the applicant's description in the SCP is consistent with the acceptance criteria in NUREG-0800, Section 13.6.1, the staff finds that the description provided in the SCP meets the requirements of 10 CFR Part 73, Appendix C, Section II.B.3.c(v) and is, therefore, acceptable.

The following portion of this technical evaluation section is reproduced from Section 13.6.4.3 of the VEGP SER:

> *13.6.4.3.9 Conclusions on the Safeguards Contingency Plan*
>
> *On the basis of the NRC staff's review described in Sections 13.6.4.3.1 through 13.6.4.3.8 of this SER, the SCP meets the requirements of 10 CFR Part 73, Appendix C, in accordance with the DBT of radiological sabotage as stated in 10 CFR 73.1. The target sets, Target Set Analysis and Site Protective Strategy are in the facility implementing procedures, which were not subject to NRC staff review as part of this COL application and are, therefore, subject to future NRC inspection in accordance with 10 CFR 73.55(c)(7)(iv) and 10 CFR Part 73, Appendix C, Section II.B.5(iii). The NRC staff concludes that complete and procedurally correct implementation of the SCP will provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.*

13.6.5 Post Combined License Activities

For the reasons discussed in the technical evaluation section above, the staff finds the following license condition proposed by the applicant acceptable:

- License Condition (13-5) - No later than 12 months after issuance of the COL, the licensee shall submit to the Director of NRO, a schedule that supports planning for and conduct of NRC inspection of the physical security programs. The schedule shall be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until the physical security program has been fully implemented.

13.6.6 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 physical security, 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 concludes that the relevant information presented in the VCSNS COL FSAR is acceptable based on the applicable regulations specified in Section 13.6.4 of this SER. The staff based its conclusion on the following:

- STD COL 13.6-1, as related to the physical protection program, is acceptable based on the following discussion. The NRC staff's review of the VCSNS Units 2 and 3 PSP, T&QP, and SCP has focused on ensuring the necessary programmatic elements are included in these plans to provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.

  The NRC staff has determined that these plans include the necessary programmatic elements that, when effectively implemented, will provide the required high assurance.

The burden to effectively implement these plans remains with the applicant. Effective implementation is dependent on the procedures and practices the applicant develops to satisfy the programmatic elements of its PSP, T&QP, and SCP. The NRC staff has not reviewed the site-specific target set analysis, site protective strategy and the facility implementing procedures. The target set analysis, site protective strategy and the facility implementing procedures are subject to future NRC inspections and review. As required by Section 3 of the applicant's PSP, a performance evaluation program will be implemented that periodically tests and evaluates the effectiveness of the overall protective strategy. This program requires that deficiencies be corrected. In addition, NRC inspectors will conduct periodic force-on-force exercises that will test the effectiveness of the applicant's protective strategy. Based on the results of the applicant's own testing and evaluation, the NRC's baseline inspections and force-on-force exercises, enhancements to the applicant's PSP, T&QP, and SCP may be required to ensure the overall protective strategy can be effectively implemented. As such, staff approval of the applicant's PSP, T&QP, and SCP is limited to the programmatic elements necessary to provide the required high assurance as stated above. Should deficiencies be identified with the programmatic elements of these plans as a result of the periodic applicant or NRC conducted drills or exercises that test the effectiveness of the overall protective strategy, the plans shall be corrected to address these deficiencies in a timely manner and to notify the NRC of these plan changes in accordance with the requirements of 10 CFR 50.54(p) or 10 CFR 50.90.

The COL applicant's security plan information is withheld from public disclosure in accordance with the provisions of 10 CFR 73.21.

13.6.A Site-Specific ITAAC for Physical Security

13.6.A.1 *Introduction*

Part 10, "Proposed License Conditions and ITAAC," Appendix B, "Inspections, Tests, Analysis, and Acceptance Criteria" of the VCSNS COL application describes the license conditions for the plant's physical protection systems or features to provide physical protection of the site specific protective strategy and elements of a site security program. The COL application incorporates by reference the Tier 1 Section 2.6.9 of the AP1000 DCD, including plant layout and configurations of barriers, and lists ITAAC related to the site-specific design for achieving detection, assessment, communications, delay, and response for physical protection against potential acts of radiological sabotage and theft of special nuclear material.

The design bases or supporting security analyses and assumptions related to the design descriptions of security-related features incorporated by reference from the AP1000 DCD are in TR-94, APP-GW-GLR-066. Descriptions of site-specific security structures, programs and contingency measures are in the VCSNS PSP, which includes the site PSP, T&QP and the SCP.

13.6.A.2 *Summary of Application*

Section 14.3 of the VCSNS COL FSAR, Revision 5, incorporates by reference Section 14.3 of the AP1000 DCD, Revision 19. Part 10, Revision 5 of the VCSNS COL application incorporates by reference DCD Tier 1 Section 2.6.9, which includes the physical security ITAAC that are in the scope of the AP1000 standard design. Site-specific physical security-ITAAC (PS-ITAAC)

that are outside the scope of AP1000 DCD Tier 1 Section 2.6.9 are provided in Table 2.6.9-2 of Appendix B to Part 10 of the VCSNS COL application.

In addition, in VCSNS COL FSAR Section 14.3, the applicant provided the following:

Supplemental Information

- STD SUP 14.3-1

The applicant provided supplemental information related to physical security in STD SUP 14.3-1 in VCSNS COL FSAR Section 14.3.2.3.2.

License Condition

- Part 10, License Condition 1

The applicant provided a license condition in Part 10 of the VCSNS COL application, Revision 2, which will incorporate the ITAAC identified in the tables in Appendix B. The staff evaluates this license condition in Chapter 1 of this SER.

13.6.A.3 *Regulatory Basis*

The regulatory basis of the information incorporated by reference is addressed in NUREG-1793 and its supplements.

In addition, the acceptance criteria associated with the relevant requirements of the Commission regulations are given in 10 CFR Part 73. The regulation includes specific security and performance requirements that, when adequately implemented, are designed to protect nuclear power reactors against acts of radiological sabotage, prevent the theft or diversion of special nuclear material, and protect safeguards information against unauthorized release.

The provisions of 10 CFR 52.80, Subpart A require that information submitted for a COL include the proposed ITAAC that the licensee shall perform, and the acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, analyses, and acceptance criteria are met, the facility has been constructed and will operate in conformity with the COL, the provisions of the Atomic Energy Act, and the NRC's regulations.

The VCSNS Units 2 and 3 design descriptions, commitments, and acceptance criteria for the security features, including the plant's layout and determination of vital equipment and areas, for a certified design are based on physical protection systems or hardware provided for meeting requirements of the following Commission regulations:

- 10 CFR Part 50, "Domestic licensing of production and utilization facilities"
- 10 CFR Part 52, "Licenses, certifications, and approvals for nuclear power plants"
- 10 CFR 73.1(a)(1), "Radiological sabotage"
- 10 CFR 73.55, "Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage," and Appendices B, C, G and H

- 10 CFR Part 74, “Material control and accounting of special nuclear material”

- 10 CFR 100.21(f), “Non-seismic siting criteria”

Regulatory requirements and acceptance criteria related to physical protection systems or hardware are identified in Section 14.3.12 of NUREG-0800.

Regulatory guidance documents that are applicable to this evaluation are:

- RG 1.91, “Evaluations of Explosions Postulated to Occur at Transportation Routes Near Nuclear Power Plants,” Revision 1

- RG 1.206, “Combined License Applications for Nuclear Power Plants”

- RG 4.7, “General Site Suitability Criteria for Nuclear Power Stations,” Revision 2

- RG 5.12, “General Use of Locks in the Protection and Control of Facilities and Special Nuclear Materials”

- RG 5.62, “Reporting of Safeguards Events,” Revision 1

- RG 5.65, “Vital Area Access Controls, Protection of Physical Security Equipment and Key and Lock Controls”

- RG 5.66, “Access Authorization Program for Nuclear Power Plants”

- RG 5.7, “Entry/Exit Control for Protected Areas, Vital Areas, and Material Access Areas,” Revision 1

- RG 5.44, “Perimeter Intrusion Alarm Systems,” Revision 3

- Information Notice 86-83, “Underground Pathways into Protected Areas, Vital Areas, and Controlled Access Areas,” September 19, 1986.

- Regulatory Information Summary (RIS) 2005-04, “Guidance on the Protection of Unattended Openings that Intersect a Security Boundary or Area,” April 14, 2005. (Exempt from public disclosure in accordance with 10 CFR 2.390)

The COL applicant is required to describe commitments for establishing and maintaining a physical protection system (engineered and administrative controls), organization, programs, and procedures for implementing a site-specific strategy that, if adequately implemented, provide high assurance for protection of the plant against the DBT. The site-specific physical protection system described must be reliable and available and implement the concept of defense-in-depth protection in order to provide a high assurance of protection. The security operational programs and the physical protection system are required to meet the specific performance requirements of 10 CFR Part 26; 10 CFR 73.54; 10 CFR 73.55; 10 CFR 73.56; 10 CFR 73.57, “Requirements for criminal history records checks of individuals granted unescorted access to a nuclear power facility or access to Safeguards Information”; and

10 CFR 73.58. Physical protection hardware within the scope of the AP1000 design is addressed in the AP1000 DCD.

13.6.A.4 *Technical Evaluation*

The NRC staff reviewed Section 14.3 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 ITAAC for physical security. 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.

Section 1.2.3 of this SER provides a discussion of the strategy used by the NRC to perform one technical review for each standard issue outside the scope of the DC and use this review in evaluating subsequent COL applications. To ensure that the staff's findings on standard content that were documented in the SER for the reference COL application (VEGP Units 3 and 4) were equally applicable to the VCSNS Units 2 and 3 COL application, the staff undertook the following reviews:

- The staff compared the VEGP COL FSAR, Revision 2 to the VCSNS COL FSAR. In performing this comparison, the staff considered changes made to the VCSNS COL FSAR (and other parts of the COL application, as applicable) resulting from RAIs.

- The staff confirmed that all responses to RAIs identified in the corresponding standard content evaluation were endorsed.

- The staff verified that the site-specific differences were not relevant.

The staff has completed its review and found the evaluation performed for the standard content to be directly applicable to the VCSNS COL application. This standard content material is identified in this SER by use of italicized, double-indented formatting. The staff confirmed that the July 1, 2010, VCSNS letter contained the same technical information provided in the June 11, 2010, VEGP letter discussed in the standard content material below.

The following portion of this technical evaluation section is reproduced from Section 13.6.A.4 of the VEGP SER:

Supplemental Information

- *STD SUP 14.3-1*

STD SUP 14.3-1 adds the following after DCD Section 14.3.2.2 as new Section 14.3.2.3.2:

> *Generic PS-ITAAC have been developed in a coordinated effort between the NRC and the Nuclear Energy Institute (NEI) as outlined in Appendix C.II.I-C of Regulatory Guide 1.206. These generic ITAAC have been tailored to the AP1000 design and site-specific security requirements.*

In Part 10, Appendix B of the VEGP Units 3 and 4 COL application, SNC describes the ITAAC for the plant's physical protection systems or features to provide physical protection of the site-specific protective strategy and elements of a site security program. The COL application incorporates by reference Tier 1 Section 2.6.9 of the AP1000 DCD, including plant layout and configurations of barriers, and listed ITAAC related to the site-specific design for achieving detection, assessment, communications, delay, and response for physical protection against potential acts of radiological sabotage and theft of special nuclear material. DCD Tier 1 Section 2.6.9 includes the physical security ITAAC that are in the scope of the AP1000 standard design. Site-specific physical security ITAAC that are outside the scope of AP1000 DCD Tier 1 Section 2.6.9 are provided in Table 2.6.9-2 of Appendix B to Part 10 of the VEGP COL application.

The NRC staff's evaluation of the PS-ITAAC (STD SUP 14.2-1) is documented in the Sections 13.6.A.4.1 through 13.6.A.4.3 of this SER.

13.6.A.4.1 Detection and Assessment Hardware

The applicant submitted the following ITAAC for detection and assessment hardware in their letter dated June 11, 2010, "Response to Request for Additional Information Letter No. 047, Supplement 2, Physical Security Inspections, Tests, Analyses, and Acceptance Criteria," This letter was used to complete the evaluation below.

1. *The external walls, doors, ceiling, and floors in the location within which the last access control function for access to the protected area is performed are bullet resistant to at least Underwriters Laboratory Ballistic Standard 752, Level 4. (Item 6 in Appendix A to Section 14.3.12 of NUREG-0800.)*

2. *Physical barriers for the protected area perimeter are not part of vital area barriers. (Item 2.a in Appendix A to Section 14.3.12 of NUREG-0800.)*

3.
    a) *Isolation zones exist in outdoor areas adjacent to the physical barrier at the perimeter of the protected area that allows 20 feet of observation on either side of the barrier. (Item 3.a in Appendix A to Section 14.3.12 of NUREG-0800.)*

    b) *Where permanent buildings do not allow a 20-foot observation distance on the inside of the protected area, the building walls are immediately adjacent to, or an integral part of, the protected area barrier. (Item 3.c in Appendix A to Section 14.3.12 of NUREG-0800.) The isolation zones are monitored with intrusion detection equipment that provides the capability to detect and assess unauthorized persons. (Item 3.b in Appendix A to Section 14.3.12 of NUREG-0800.)*

4. *The intrusion detection and assessment equipment at the protected area perimeter:*

   a) *Detects penetration or attempted penetration of the protected area barrier and concurrently alarms in both the Central Alarm Station and Secondary Alarm Station. (Item 4.a in Appendix A to Section 14.3.12 of NUREG-0800.)*

   b) *The intrusion detection and assessment equipment at the protected area perimeter remains operable from an uninterruptible power supply in the event of the loss of normal power. (Item 4.c in Appendix A to Section 14.3.12 of NUREG-0800.)*

6. *An access control system with numbered picture badges is installed for use by individuals who are authorized access to protected areas without escort. (Item 9 in Appendix A to Section 14.3.12 of NUREG-0800.)*

8.

   a) *Penetrations through the protected area barrier are secured and monitored. (Item 2.b in Appendix A to Section 14.3.12 of NUREG-0800.)*

   b) *Unattended openings (such as underground pathways) that intersect the protected area boundary or vital area boundary will be protected by a physical barrier and monitored by intrusion detection equipment or provided surveillance at a frequency sufficient to detect exploitation. (Item 2.c in Appendix A to Section 14.3.12 of NUREG-0800.)*

On the basis of its review the NRC staff determined that the applicant has adequately revised Table 2.6.9-2 for Part 10 to the VEGP COL application PS-ITAAC items 2(a), 2(b), 2 (c), 3(a), 3(b), 3(c), 4(a), 4(c), 6(partially), and 9 identified in Appendix A to Section 14.3.12 of NUREG-0800.

The VEGP COL application references the AP1000 DCD, which addressed NUREG-0800, Section 14.3.12 PS-ITAAC 4(b), 5, 6(partially), 10, 11(a), 11(b), 11(c) and 14. The staff has determined that PS-ITAAC 6, described in NUREG-0800, Section 14.3.12 has been fully addressed between the VEGP submission and the AP1000 DCD.

In a supplemental response to RAI 14.3.12-1, the applicant stated:

The information contained in SRP ITAAC number 11(d) is redundant to existing ITAAC in the AP1000 Design Certification Document (DCD). AP1000 DCD security ITAAC numbers 1, 4, 5(a), 5(b), 5(c), 13(a), 13(b), 13(c), and 15(b) demonstrate that the central and secondary alarm stations are equal and redundant, by being constructed, located, protected, and equipped to the standards for the central alarm station.

In RAI SRP 14.3.12-NSIR-7, Revision 1, Westinghouse stated:

No corresponding ITAAC has been provided for SRP 14.3.12 ITAAC number 11(d). The information contained in SRP ITAAC number 11(d) is redundant to existing ITAACs. AP1000 security ITAAC numbers 1, 4, 5(a), 5(b), 5(c), 13, and 15(b) demonstrate that the central and secondary alarm stations are constructed, located, protected, and equipped to the standards for the central alarm station.

On the basis of its review, the NRC staff determined that the applicant has adequately shown that NUREG-0800, Section 14.3.12 detection and assessment hardware ITAAC 11(d) is addressed.

13.6.A.4.2 Delay or Barrier Design

The applicant submitted the following ITAAC for Delay or Barrier Design in their "Response to Request for Additional Information Letter No. 047, Supplement 2, Physical Security Inspections, Tests, Analyses, and Acceptance Criteria," dated June 11, 2010. This letter was used to complete the evaluation below.

5. *Access control points are established to:*

    a) *Control personnel and vehicle access into the protected area. (Item 8.a in Appendix A to Section 14.3.12 of NUREG-0800.)*

    b) *Detect firearms, explosives, and incendiary devices at the protected area personnel access points. (Item 8.b in Appendix A to Section 14.3.12 of NUREG-0800.)*

7. *Access to vital equipment physical barriers requires passage through the protected area perimeter barrier. (Item 1.b in Appendix A to Section 14.3.12 of NUREG-0800.)*

On the basis of its review, the NRC staff determined that the applicant has adequately addressed NUREG-0800, Section 14.3.12 delay or barrier design PS-ITAAC 1(b)(partially),8(a) and 8(b).

The VEGP COL application references the AP1000 DCD, which addressed NUREG-0800, Section 14.3.12 PS-ITAAC 1(a), 1(b)(partially), 7, 13(a) and 13(b). The staff has determined that PS-ITAAC 1(b) described in NUREG-0800, Section 14.3.12 has been fully addressed between the VEGP submission and the AP1000 DCD.

13.6.A.4.3 Systems, Hardware, or Features Facilitating Security Response and Neutralization

The applicant submitted the following ITAAC for Systems, Hardware, or Features Facilitating Security Response and Neutralization in their "Response to Request for Additional Information Letter No. 047, Supplement 2, Physical Security Inspections, Tests, Analyses, and Acceptance Criteria," Dated June 11, 2010. This letter was used to complete the evaluation below.

9. *Emergency exits through the protected area perimeter are alarmed and secured with locking devices to allow for emergency egress. (Item 15 in Appendix A to Section 14.3.12 of NUREG-0800.)*

On the basis of its review, the NRC staff determined that the applicant has adequately addressed NUREG-0800, Section 14.3.12 delay or barrier design PS-ITAAC 15(partially).

The VEGP COL application references the AP1000 DCD, which addressed NUREG-0800, Section 14.3.12 PS-ITAAC 12, 15(partially) 16(a), 16(b) and 16(c). The staff has determined that PS-ITAAC 15 described in NUREG-0800, Section 14.3.12 has been fully addressed between the VEGP submission and the AP1000 DCD.

13.6.A.5 *Post-Combined License Activities*

For the reasons discussed in the technical evaluation section above, the staff proposes to include the following ITAAC for physical security:

- The licensee shall perform and satisfy the ITAAC defined in Table 13.6A-1, "Site Specific Physical Security."

13.6.A.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 PS-ITAAC, 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 concludes that the relevant information presented in VCSNS COL FSAR and the additional information received in the letter dated June 11, 2010, is acceptable based on the applicable regulations specified in Section 13.6.A.4 of this SER. The staff based its conclusion on the following:

- STD SUP 14.3-1, as related to PS-ITAAC, is acceptable based on the following discussion. The NRC staff finds that the applicant adequately describes the physical security systems or provides and/or facilitates the implementation of the site-specific protective strategy and security programs. The applicant adequately describes the site-specific PS-ITAAC for meeting the requirements of 10 CFR 73.55 and provides the technical bases for establishing a PS-ITAAC for the protection against acts of radiological sabotage and theft of special nuclear material. The applicant includes systems and features as stated in VCSNS COL FSAR Chapter 13 and referenced TRs. The applicant has provided adequate descriptions of objectives, prerequisites, test methods, data required, and acceptance criteria for security related ITAAC for the approval of the VCSNS COL.

13.7 Fitness for Duty

13.7.1 Introduction

Pursuant to 10 CFR 52.79(a)(44), COL applications must include a description of the FFD program required by 10 CFR Part 26, "Fitness for Duty Programs," and its implementation. The FFD program is designed to provide reasonable assurance that: (1) individuals are trustworthy and reliable as demonstrated by the avoidance of substance abuse; (2) individuals are not under the influence of any substance, legal or illegal, or mentally or physically impaired from any cause, which in any way adversely affects their ability to safely and competently perform their duties; (3) measures are established and implemented for the early detection of individuals who are not fit to perform their duties; (4) the construction site is free from the presence and effects of illegal drugs and alcohol; (5) the work places are free from the presence and effects of illegal drugs and alcohol; and, (6) the effects of fatigue and degraded alertness on an individual's ability to safely and competently perform his or her duties are managed commensurate with maintaining public health and safety.

13.7.2 Summary of Application

VCSNS COL FSAR Section 13.7 is a new section added after Section 13.6 of the AP1000 DCD. The references that are currently in AP1000 DCD Section 13.7 have been redistributed to other VCSNS COL FSAR sections. There is no information associated with the FFD program incorporated by reference from the AP1000 DCD.

In addition, in VCSNS COL FSAR Section 13.7, the applicant provided the following:

Supplemental Information

- STD SUP 13.7-1

The applicant provided standard supplemental information in VCSNS COL FSAR Section 13.7 describing the FFD program for both the construction phase and the operating phase of the units. The construction phase program will be consistent with NEI 06-06, "Fitness for Duty Program Guidance for New Nuclear Power Plant Construction Sites," and the construction phase program will be implemented prior to onsite construction of safety- and security-related structures, systems, and components (SSCs). The operations phase program will be consistent with 10 CFR Part 26.

License Conditions

- Part 10, License Condition 6

The applicant proposed a license condition to provide a schedule to support the NRC's inspection of operational programs included in the VCSNS COL FSAR Table 13.4-201 including the FFD program.

13.7.3 Regulatory Basis

The applicable regulatory requirements for STD SUP 13.7-1 are as follows:

- 10 CFR Part 26, "Fitness for duty programs"
- 10 CFR 52.79(a)(44)

Regulatory guidance for FFD programs is included in RG 1.206.

13.7.4 Technical Evaluation

The NRC staff reviewed Section 13.7 of the VCSNS COL FSAR to ensure that 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 addresses the required information relating to the FFD program.

Section 1.2.3 of this SER provides a discussion of the strategy used by the NRC to perform one technical review for each standard issue outside the scope of the DC and use this review in evaluating subsequent COL applications. To ensure that the staff's findings on standard content that were documented in the SER for the reference COL application (VEGP Units 3 and 4) were equally applicable to the VCSNS Units 2 and 3 COL application, the staff undertook the following reviews:

- The staff compared the VEGP COL FSAR, Revision 2 to the VCSNS COL FSAR. In performing this comparison, the staff considered changes made to the VCSNS COL FSAR (and other parts of the COL application, as applicable) resulting from RAIs.

- The staff verified that the site-specific differences were not relevant.

The staff has completed its review and found the evaluation performed for the standard content to be directly applicable to the VCSNS COL application. This standard content material is identified in this SER by use of italicized, double-indented formatting. Instead of confirming that all responses to RAIs identified in the corresponding standard content evaluation were endorsed by the VCSNS applicant (which is a typical step when comparing the two applications), the NRC staff provides its evaluation of similar RAIs issued to VCSNS, following the standard content material. The one confirmatory item in the standard content material retains the number assigned in the VEGP SER, and is also addressed following the standard content material.

The following portion of this technical evaluation section is reproduced from Section 13.7.4 of the VEGP SER:

Supplemental Information

- *STD SUP 13.7-1*

The applicant provided a new Section 13.7 in the VEGP COL FSAR describing the FFD program. STD SUP 13.7-1 added the following text to Section 13.7:

> *The Fitness for Duty (FFD) Program (Program) is implemented and maintained in two phases; the construction phase program*

and the operating phase program. The construction and operations phase programs are implemented as identified in [FSAR] *Table 13.4-201.*

The construction phase program is consistent with NEI 06-06 ([FSAR] *Reference 201). The workforce population subject to random testing during construction is determined on a weekly basis by averaging the total number of active construction badges over each preceding seven-day period. The random selection from each week's workforce population is identified by a standard computer-generated random number generator using this number of active badges as the range of numbers considered in the weekly random testing selection.*

The operations phase program is consistent with 10 CFR Part 26.

The staff notes that Reference 201 in the above text refers to Revision 4 of NEI 06-06.

The NRC staff's review of STD SUP 13.7-1 included the following: (1) the adequacy of the FFD program for the construction phase; (2) the adequacy of the FFD program for the operations phase; and (3) the implementation schedule proposed by the applicant for both the construction phase and operations phase FFD operational programs.

The NRC staff issued three RAIs to obtain further clarification on the applicant's FFD Program. The first two RAIs discussed below are associated with the resolution of STD SUP 13.7-1.

In RAI 13.6-33, the staff asked how the applicant intends to update its FFD program for the construction phase. NEI 06-06 provides examples of the FFD program that is required and, if this guidance is endorsed by the NRC, will provide an acceptable method of complying with the NRC's regulations. If the NRC endorses NEI 06-06, does the applicant intend to update its FFD program for the construction phase to comply with NEI 06-06? If future revisions to NEI 06-06 are endorsed by the NRC, does the applicant intend to update its FFD program for the construction phase to comply with certain clarifications, additions, and exceptions in these future, endorsed revisions, as necessary?

The applicant replied that it submitted an FFD Program for NRC approval as part of the Limited Work Authorization (LWA) request, and that the program is now being implemented as part of the construction activities. If NEI 06-06 is endorsed by the NRC, SNC plans to transition to a program that follows the guidance in NEI 06-06. The COL application currently commits to NEI 06-06, Revision 4, and will be changed in a future revision to commit to NEI 06-06, Revision 5. The applicant will evaluate substantial changes in subsequent revisions to NEI 06-06 and modify the construction phase FFD program to incorporate those substantial changes determined to be appropriate.

The applicant's response to RAI 13.6-33, as well as its supplemental response, revises Section 13.7 to address the issues discussed above. The relevant

portion of the proposed revised text, to be included in a future revision of the VEGP COL FSAR, is included below:

> *The Fitness for Duty Program (FFD) is implemented and maintained in multiple and progressive phases dependent on the activities, duties, or access afforded to certain individuals at the construction site. In general, two different FFD programs will be implemented: a construction FFD program and an operations FFD program. The construction and operations phase programs are illustrated in* [FSAR] *Table 13.4-201.*
>
> *The construction FFD program is consistent with NEI 06-06 (*[FSAR] *Reference 201). NEI 06-06 applies to persons constructing or directing the construction of safety- and security-related structures, systems, or components performed onsite where the new reactor will be installed and operated. Management and oversight personnel, as further described in NEI 06-06, and security personnel prior to the receipt of special nuclear material in the form of fuel assemblies (with certain exceptions) will be subject to the operations FFD program that meets the requirements of 10 CFR Part 26, Subparts A through H, N, and O. At the establishment of a protected area, all persons who are granted unescorted access will meet the requirements of an operations FFD program. Prior to issuance of a Combined License, the construction FFD program at a new reactor construction site for those subject to Subpart K will be reviewed and revised as necessary should substantial revisions occur to either NEI 06-06 following NRC endorsement or the requirements of 10 CFR Part 26.*

The staff notes that Reference 201 in the above text refers to Revision 5 of NEI 06-06.

In RAI 13.6-34, the staff asked the applicant to: (1) describe how FSAR Table 13.4-201, Item 15, related to the security operational program, comports with 10 CFR 26.3, "Scope," and 10 CFR 26.4, and the guidance provided in the NRC's letter to NEI dated December 2, 2009, entitled "Status of U.S. Nuclear Regulatory Commission Review and Endorsement of NEI 06-06, 'Fitness for Duty Program Guidance for New Nuclear Power Plant Construction Sites,'" and (2) provide site-specific information to clearly and sufficiently describe the applicant's FFD program. This information would include, but is not limited to, any deviations or exceptions to the requirements of 10 CFR Part 26 as further described in NEI 06-06.

The applicant stated that the response to RAI 13.6-33 provided the changes to the COL application that will describe the FFD program required by 10 CFR Part 26. Site-specific information is also provided in that response to clarify which program will be used to cover the various classifications of workers that must be covered in accordance with 10 CFR Part 26. The applicant's response to RAI 13.6-35 (below) revises FSAR Table 13.4-201, Item 20 to address the guidance provided in the NRC's December 2, 2009 letter. The

proposed revision to Item 20 of FSAR Table 13.4-201, to be included in a future revision of the VEGP COL FSAR, is included below:

Item	Program Title	Program Source (required by)	FSAR Section	Implementation Milestone	Implementation Requirements
20.	Fitness for Duty (FFD) Program for Construction (workers and first-line supervisors)	10 CFR 26.4(f)	13.7	Prior to initiating 10 CFR Part 26 construction activities	10 CFR Part 26, Subpart K
	FFD Program for Construction (management and oversight personnel)	10 CFR 26.4(e)	13.7	Prior to initiating 10 CFR Part 26 construction activities	10 CFR Part 26, Subparts A - H, N, and O
	FFD Program for Security Personnel	10 CFR 26.4(e)(1)	13.7	Prior to initiating 10 CFR Part 26 construction activities	10 CFR Part 26, Subparts A - H, N, and O
		10 CFR 26.4(a)(5) or 26.4(e)(1)		Prior to the earlier of: A. Licensee's receipt of SNM in the form of fuel assemblies, or B. Establishment of a protected area, or C. The 10 CFR 52.103(g) finding	10 CFR Part 26, Subparts A - I, N, and O
	FFD Program for FFD Program personnel	10 CFR 26.4(g)	13.7	Prior to initiating 10 CFR Part 26 construction activities	10 CFR Part 26, Subparts A, B, D - H, N, O, and C per licensee's discretion
	FFD Program for persons required to physically report to the Technical Support Center (TSC) or Emergency Operations Facility (EOF)	10 CFR 26.4(c)	13.7	Prior to the conduct of the first full-participation emergency preparedness exercise under 10 CFR Part 50, App. E, Section F.2.a	10 CFR Part 26, Subparts A - I, N, and O, except for §§ 26.205 – 209
	FFD Program for Operation	10 CFR 26.4(a) and (b)	13.7	Prior to the earlier of: A. Establishment of a protected area, or B. The 10 CFR 52.103(g) finding	10 CFR Part 26, Subparts A - I, N, and O, except for individuals listed in § 26.4(b), who are not subject to §§ 26.205 – 209

In its December 2, 2009, letter to NEI, the NRC stated that during the review and approval process for NEI 06-06, the applicant should provide the following statements in its application:

- *NEI 06-06, Revision 5 was used in the development of the construction site FFD program.*

- *The applicant will review and revise its construction site FFD program as necessary to ensure that it comports with the NRC-endorsed version of NEI 06-06.*

- *If the NRC staff's review of NEI 06-06 results in substantive changes to the most recent, docketed FFD program description provided by the applicant, the applicant must amend its application to reflect the changes.*

The applicant's proposed revisions to FSAR Section 13.7 satisfactorily address the three items described above. The December 2, 2009, letter also provided implementation milestones for consideration by applicants. The staff confirmed that the proposed revisions to FSAR Table 13.4-201, Item 20, include all of the implementation milestones in the December 2, 2009, letter.

Therefore, based on the staff's acceptance of the proposed revisions to FSAR Section 13.7 and to FSAR Table 13.4-201, Item 20, as noted above, the NRC staff concludes that the applicant has satisfactorily addressed STD SUP 13.7-1 by providing sufficient information on the FFD program for both the construction phase and the operating phase of the units. The inclusion of this information in a future revision of the VEGP COL FSAR is ***Confirmatory Item 13.7-1****.*

Resolution of VEGP Site-Specific Confirmatory Item 13.7-1

Confirmatory Item 13.7-1 is an applicant commitment to revise its FSAR Section 13.7 and Table 13.4-201 regarding the FFD program for the construction phase and the operating phase of the units. The staff verified that the VEGP COL FSAR was appropriately revised. As a result, Confirmatory Item 13.7-1 is now closed.

License Conditions

In RAI 13.6-35, the staff asked the applicant if proposed License Condition 3, A.1, and G.7, described in Part 10 of the COL application comports with FSAR Table 13.4-201, Item 15, which itemizes the aspects of the security operational program.

The staff further evaluated the need for License Condition 3, A.1 and G.7, for the VEGP COL application and determined it was not needed because the implementation milestones for FFD are governed by 10 CFR Part 26. The staff communicated this information to SNC, which then submitted Supplement 1 to its response to this RAI, removing this license condition for FFD.

- *Part 10, License Condition 6*

The applicant proposed a license condition in Part 10 of the VEGP COL application to provide a schedule to support the NRC's inspection of operational programs, including the FFD program.

The proposed license condition is consistent with the policy established in SECY 05-0197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria," for operational programs and is acceptable.

Evaluation of VCSNS RAIs

The NRC staff issued RAIs to the VCSNS applicant that mirrored the RAIs issued to the VEGP applicant. Specifically, RAIs 13.6.1-1, 13.6.1-2, and 13.6.1-3 issued to the VCSNS applicant correspond to RAIs 13.6-33, 13.6-34, and 13.6-35, respectively, issued to the VEGP applicant.

The NRC staff's evaluation of the responses provided by the VCSNS applicant to the three questions related to the FFD program is discussed below. The VCSNS applicant responded to these three RAIs in a letter dated March 15, 2010, and superseded its response to RAI 13.6.1-3 in its letter dated July 1, 2010.

In response to RAI 13.6.1-1, the VCSNS applicant stated that it currently commits to NEI 06-06, Revision 4, and will change its application in a future revision to commit to NEI 06-06, Revision 5. The VCSNS applicant stated that it will evaluate substantial changes in subsequent revisions to NEI 06-06 and modify the construction phase FFD program to incorporate those substantial changes determined to be appropriate. The applicant's response to RAI 13.6.1-1 revised Section 13.7 to address the issues discussed above. The relevant portion of the proposed revised text, to be included in a future revision of the VCSNS COL FSAR, is included below:

> The Fitness for Duty Program (FFD) is implemented and maintained in multiple and progressive phases dependent on the activities, duties, or access afforded to certain individuals at the construction site. In general, two different FFD programs will be implemented: a construction FFD program and an operations FFD program. The construction and operations phase programs are illustrated in Table 13.4-201.
>
> The construction FFD program is consistent with NEI 06-06 ([FSAR] Reference 201). NEI 06-06 applies to persons constructing or directing the construction of safety- and security- related structures, systems, or components performed onsite where the new reactor will be installed and operated. Management and oversight personnel, as further described in NEI 06-06, and security personnel prior to the receipt of special nuclear material in the form of fuel assemblies (with certain exceptions) will be subject to the operations FFD program that meets the requirements of 10 CFR Part 26, Subparts A through H, N, and 0. At the establishment of a protected area, all persons who are granted unescorted access will meet the requirements of an operations FFD program. Prior to issuance of a Combined License, the construction FFD program at a new reactor construction site for those subject to Subpart K will be reviewed and

revised as necessary should substantial revisions occur to either NEI 06-06 following NRC endorsement or the requirements of 10 CFR Part 26.

In response to RAI 13.6.1-2, the VCSNS applicant stated that the response to RAI 13.6.1-1 provides the changes to the COL application that will describe the FFD program required by 10 CFR Part 26. The site-specific information is also provided in that response to clarify which program will be used to cover the various classifications of workers that must be covered in accordance with 10 CFR Part 26. The response to RAI 13.6.1-3 provides the information on modifications to VCSNS COL FSAR Table 13.4-201, Item 20 to address the guidance provided in the NRC's December 2, 2009, letter to NEI. That RAI response includes changes to License Condition 3, Items A, C, and D in Part 10 of the COL application to align with the changes to VCSNS COL FSAR Table 13.4-201. The NRC staff verified that the proposed changes to VCSNS COL FSAR Table 13.4-201, Item 20 are identical to the proposed changes to the corresponding VEGP COL FSAR Table 13.4-201, which is provided in the standard content evaluation material above.

In response to RAI 13.6.1-3, the VCSNS applicant stated that it would remove from proposed License Condition 3 any reference to implementation milestones for the FFD program, since these implementation requirements are in the applicable NRC regulations.

The NRC staff compared the responses provided by the VCSNS applicant to the responses provided by the VEGP applicant, and concluded that the responses are essentially identical, after accounting for the differences of an Early Site Permit having been issued for the VEGP site for this issue. Therefore, the conclusions reached by the NRC staff regarding the FFD program at VEGP are applicable to the FFD program at VCSNS. The inclusion of the information provided in the RAI responses in a future revision of the VCSNS COL FSAR is part of **Confirmatory Item 13.7-1** that is discussed in the standard content portion of this safety evaluation above.

13.7.5 Post Combined License Activities

For the reasons discussed in the technical evaluation section above, the staff finds the following license condition proposed by the applicant acceptable:

- License Condition (13-6) - No later than 12 months after issuance of the COL, the licensee shall submit to the Director of NRO a schedule that supports planning for and conduct of NRC inspection of the FFD operational program. The schedule shall be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until the FFD operational program has been fully implemented.

13.7.6 Conclusion

The NRC staff's review confirmed that the applicant addressed the required information relating to the FFD program and there is no outstanding information to be addressed in the VCSNS COL FSAR related to this section.

The staff concludes that the information presented in the VCSNS COL FSAR is acceptable because it meets the regulatory requirements in 10 CFR Part 26 and 10 CFR 52.79(a)(44). The staff based its conclusion on the following:

- STD SUP 13.7-1, relating to the FFD program, is acceptable because it meets 10 CFR Part 26 and 10 CFR 52.79(a)(44).

13.8 Cyber Security

13.8.1 Introduction

In a letter to the NRC, dated June 22, 2010, SCE&G submitted Revision 0 of the CSP for VCSNS Units 2 and 3. The CSP applies to all critical digital assets required for VCSNS operation. In the submittal, the applicant describes how the requirements of 10 CFR 73.54 will be implemented to protect digital computer and communications systems and networks associated with the following functions from those cyber attacks, up to and including the design-basis threat (DBT) described in 10 CFR 73.1, "Purpose and Scope." The scope of 10 CFR 73.54 includes critical digital assets (CDAs) associated with the following:

- safety-related and important-to-safety functions
- security functions
- emergency preparedness functions, including offsite communications
- support systems and equipment which, if compromised, would adversely impact safety, security, or emergency preparedness functions

13.8.2 Summary of Application

The applicant addresses cyber security in Section 13.6 of the VCSNS COL FSAR. Section 13.6 of the VCSNS COL FSAR, Revision 5, incorporates by reference Section 13.6 of the AP1000 DCD, Revision 19. The applicant's CSP includes deviations from RG 5.71, "Cyber Security Programs for Nuclear Facilities." The staff has evaluated these deviations.

In addition, in VCSNS COL FSAR Section 13.6, the applicant provides the following:

AP1000 COL Information Item

- STD COL 13.6-5

The applicant provided additional information in STD COL 13.6-5 to address COL Information Item 13.6-5, which provides information related to the cyber security program.

License Conditions

- Part 10, License Condition 3, Item G.10

The applicant proposed a license condition in Part 10 of the VCSNS COL application requiring the applicant to implement the cyber security program prior to initial fuel load.

- Part 10, License Condition 6

The applicant proposed a license condition in Part 10 of the VCSNS COL application to provide a schedule to support the NRC's inspection of operational programs included in VCSNS COL FSAR Table 13.4-201 including the cyber security program.

13.8.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed in NUREG-1793 and its supplements.

The applicable regulatory requirements for cyber security are as follows:

- 10 CFR 73.1, "Purpose and scope"
- 10 CFR 73.54, "Protection of digital computer and communication systems and networks"
- 10 CFR 73.55, "Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage," paragraphs (a)(1), (b)(8), and (m)
- 10 CFR 73.58, "Safety/security interface requirements for nuclear power reactors"
- 10 CFR Part 73, "Physical protection of plants and materials," Appendix G, "Reportable Safeguards Events"

The applicable regulatory guidance for cyber security is RG 5.71.

13.8.4 Technical Evaluation

The NRC staff reviewed Section 13.6 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 cyber security. 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's review of the VCSNS CSP has focused on ensuring that the necessary programmatic elements are included in these plans to provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety. The staff reviewed the VCSNS CSP to assure the necessary programmatic elements that, when effectively implemented, will provide the required high assurance of adequate protection. Effective implementation is dependent on the procedures and practices the applicant develops to satisfy the programmatic elements of its CSP. The facility implementing procedures are subject to future NRC inspection.

Section 1.2.3 of this SER provides a discussion of the strategy used by the NRC to perform one technical review for each standard issue outside the scope of the DC and use this review in evaluating subsequent COL applications. To ensure that the staff's findings on standard content that were documented in the SER for the reference COL application (VEGP Units 3 and 4) were equally applicable to the VCSNS Units 2 and 3 COL application, the staff undertook the following reviews:

- The staff compared the VEGP COL FSAR, Revision 2 to the VCSNS COL FSAR. In performing this comparison, the staff considered changes made to the VCSNS COL FSAR (and other parts of the COL application, as applicable) resulting from RAIs.

- The staff confirmed that the June 22, 2010, VCSNS submittal transmitting its CSP was identical to the June 14, 2010, VEGP submittal transmitting its CSP, with the only exceptions being to the title of the units and the identification of the position charged with oversight of the program.

- The staff verified that the site-specific differences were not relevant.

The staff has completed its review and found the evaluation performed for the standard content to be directly applicable to the VCSNS COL application. This finding included verifying that the difference in the position charged with oversight of the program (the General Manager, Organizational Effectiveness at VCSNS and Vice President of Nuclear Operations Support at VEGP) does not affect the staff's conclusions regarding the applicant's CSP. This standard content material is identified in this SER by use of italicized, double-indented formatting. The one confirmatory item in the standard content material retains the number assigned in the VEGP SER.

The following portion of this technical evaluation section is reproduced from Section 13.8.4 of the VEGP SER:

AP1000 COL Information Item

- *STD COL 13.6-5*

The NRC staff reviewed STD COL 13.6-5 related to COL Information Item 13.6-5, which identifies the need for a COL applicant to address cyber security. STD COL 13.6-5 supplemented Section 13.6 of the VEGP COL FSAR by stating the following text is to be added after Section 13.6 of the VEGP ESP SSAR:

> *The Cyber Security Plan is submitted to the Nuclear Regulatory Commission as a separate licensing document to fulfill the requirements contained in 10 CFR 52.79(a)(36) and 10 CFR 73.54. The Cyber Security Plan will be maintained in accordance with the requirements of 10 CFR 52.98. The Plan is withheld from public disclosure pursuant to 10 CFR 2.390.*

Section 13.6 of the VEGP COL FSAR also refers to FSAR Table 13.4-201, "Operational Programs Required by NRC Regulations," as providing the milestone for implementing the cyber security program.

The VEGP applicant submitted its Revision 0 of its CSP in a letter dated June 14, 2010, to demonstrate that the cyber security program will provide high assurance that digital computer and communication systems and networks are adequately protected against cyber attacks, up to and including the DBT as described in 10 CFR 73.1. The CSP has been withheld from public disclosure pursuant to 10 CFR 2.390(d)(1). In its review of this plan, the NRC staff used the guidance in RG 5.71 to determine if the regulatory requirements described in Section 13.8.3 of this SER are satisfied.

The applicant described the cyber security program based on 10 CFR 73.54, including the audit of the effectiveness of the cyber security program as required by 10 CFR 73.55(m), submittal of CSPs and the establishment, maintenance and implementation of a cyber security program required by 10 CFR 73.55(a)(1) and 10 CFR 73.55(b)(8) and reporting requirements in 10 CFR Part 73, Appendix G. The implementation milestones for this program are included in VEGP COL FSAR Table 13.4-201.

As detailed in the remainder of this SER section, the CSP has been reviewed by the NRC staff for format and content utilizing the NRC CSP template in RG 5.71, and found to include all features considered essential for such a program, and is acceptable. In particular, it has been found to comply with the Commission's regulations including 10 CFR 73.54, 10 CFR 73.55(a)(1), 10 CFR 73.55(b)(8), 10 CFR 73.55(m), and 10 CFR Part 73, Appendix G and conforms to the NRC CSP template set forth in RG 5.71.

The applicant has committed to incorporate this CSP into a future revision of the VEGP COL application to address NRC requirements in 10 CFR 73.54. This action will be tracked as ***Confirmatory Item 13.8-1.***

Resolution of VEGP Site-Specific Confirmatory Item 13.8-1

Confirmatory Item 13.8-1 is an applicant commitment to include the CSP into a future revision of the VEGP COL application. The staff verified that the VEGP COL application was appropriately revised. As a result, Confirmatory Item 13.8-1 is now closed.

13.8.4.1 Establishment of Cyber Security Program

The VEGP CSP describes how SNC will establish a cyber security program to achieve high assurance that the VEGP digital computer and communication systems and networks associated with safety, security, and emergency preparedness, including offsite communications and support systems and equipment which if compromised would adversely impact safety, security and/or emergency preparedness (SSEP) functions, and their digital assets, hereafter defined as CDAs, are adequately protected against cyber attacks up to and including the DBT. RG 5.71 provides a method that the staff considers acceptable for complying with this regulation. SNC complies with the requirements of 10 CFR 73.54 by providing a CSP that follows the template in Appendix A of RG 5.71, except as noted in Attachment A, "Vogtle Electric

Generating Plant Units 3 and 4 Cyber Security Plan Deviations from Regulatory Guide RG 5.71." The VEGP CSP included:

> *Within the scope of the NRC's cyber security rule at 10 CFR 73.54, systems or equipment that perform important to safety functions include structures, systems, and components (SSCs) in the balance of plant (BOP) that could directly or indirectly affect reactivity at a nuclear power plant and could result in an unplanned reactor shutdown or transient. Additionally, these SSCs are under the licensee's control and include electrical distribution equipment out to the first inter-tie with the offsite distribution system.*

The VEGP CSP included a deviation from the guidance to clarify that systems or equipment that perform important to safety functions include SSCs in the balance of plant (BOP) that could directly or indirectly affect reactivity and could result in an unplanned reactor shutdown or transient. This deviation is consistent with Commission policy.

The NRC staff reviewed the VEGP CSP against the template in RG 5.71 and the staff requirements memorandum (SRM), CMWCO-10-0001, "Regulation of Cyber Security at Nuclear Power Plants," dated October 21, 2010.

The applicant states in the VEGP CSP that its security program complies with 10 CFR 73.54 by:

(1) establishing and implementing defensive strategies consistent with the defensive model, described in Section 3.1.5, including the security controls described in Sections 3.1, 3.2, and 3.3.

(2) maintaining the program, as described in Section 4.

Based on the above review, the NRC staff finds that establishment of a cyber security program described in Section 1 of the VEGP CSP is acceptable.

The following SER Sections 13.8.4.2 through 13.8.4.23 correlate to specific sections in Appendix A to RG 5.71. These SER sections use the same headings as the corresponding Appendix A sections, and include the Appendix A numbering system in the titles. SER Section 13.8.4.24 addresses each of the deviations identified in the applicant's CSP.

13.8.4.2 <u>Security Assessment and Authorization (Section A.3.1.1 of Appendix A to RG 5.71)</u>

Section 3.1.1 of the VEGP CSP states that the following will be reviewed every 24 months:

- *A formal documented security planning, assessment, and authorization policy that describes the purpose, scope, roles, responsibilities, management commitments, and coordination among departments and*

the implementation of the security program and the controls applied in accordance with Section 3.1.6

- *A formal documented procedure to facilitate the implementation of the cyber security program and the security assessment*

The NRC staff reviewed the above and found that evaluation of the program elements every 24 months is not consistent with Section C.3.1.1 of RG 5.71. The time period between evaluations is 12 months longer than the time period provided in brackets in RG 5.71. However, this 24-month time period conforms to 10 CFR 73.54(g), requiring the applicant to review the cyber security program as a component of the physical security program in accordance with the requirements of 10 CFR 73.55(m), including the periodicity requirements. The requirement of 10 CFR 73.55(m) is that at minimum the applicant review each element of the physical protection program at least every 24 months.

Based on the above review, the NRC staff finds that the security assessment and authorization described in Section 3.1.1 of the VEGP CSP is acceptable.

13.8.4.3 Cyber Security Team (Section A.3.1.2 of Appendix A to RG 5.71)

Section 3.1.2 of the VEGP CSP states that a cyber security team, composed of individuals with broad knowledge, will be established and maintained and that the broad knowledge of the team will include the following areas:

- *Information and digital system technology; this includes cyber security, software development, offsite communications, computer system administration, computer engineering, and computer networking.*

- *Nuclear facility operations, engineering, and safety; this includes overall facility operations and plant technical specification compliance.*

- *Physical security and emergency preparedness; this includes the site's physical security and emergency preparedness systems and programs.*

This section of the VEGP CSP also enumerates the roles and responsibilities of the cyber security team. Aside from the deviations discussed below, this section of the VEGP CSP conforms to the CSP template wording provided in Section A.3.1.2 of RG 5.71.

The VEGP CSP includes several deviations from the text of RG 5.71:

1) *The first deviation clarifies that the cyber security team (CST) will be responsible for "overseeing" preparation of documentation of cyber security controls and that, in fact, non-team members (such as vendor personnel) may perform some of these actions, under the supervision of the CST. This clarification is acceptable to the staff since the responsibility to ensure compliance with 10 CFR 73.54 remains with the CST.*

2) *The second deviation changes the CST responsibility from "assuring the retention" of assessment documentation to "establishing the retention policy" for assessment documentation. Again, the deviation is acceptable to the staff since the responsibility to ensure compliance with 10 CFR 73.54 remains with the CST.*

3) *The third and final deviation seeks to change the basis for CST determinations being made in a free and objective manner. The RG 5.71 wording states that the CST should be free to make determinations that are not constrained by "operational goals." The deviation changes the respective sentence to say "…by business goals." Again, the deviation is acceptable to the staff since it maintains the same objective of keeping financial considerations out of decision making regarding cyber security.*

Based on the above review, the NRC staff finds that the CST described in Section 3.1.2 of the VEGP CSP is acceptable.

13.8.4.4 <u>Identification of Critical Digital Assets (Section A.3.1.3 of Appendix A to RG 5.71)</u>

Section 3.1.3 of the VEGP CSP states that to identify the critical systems (CSs) at VEGP, the CST identified and documented plant systems, equipment, communication systems, and networks that are associated with the SSEP functions described in 10 CFR 73.54(a)(1), as well as the support systems associated with these SSEP functions in accordance with the approved plant licensing basis.

The VEGP CSP also states that the CST identified and documented CDAs that have a direct, supporting, or indirect role in the proper functioning of CSs.

The steps outlined in the VEGP CSP essentially match the corresponding steps described in RG 5.71 for this same activity. The only difference between the corresponding section in RG 5.71 and the VEGP CSP is the addition of the modifying phrase: "…and defined in the approved plant licensing basis."

10 CFR 73.54(a)(1) requires that the licensee protect digital computer and communication systems and networks associated with: (i) safety-related and important-to-safety functions; (ii) security functions; (iii) emergency preparedness functions, including offsite communications; and (iv) support systems and equipment which, if compromised, would adversely impact SSEP functions.

This deviation is acceptable because SNC proposes to use its licensing basis to identify CSs that are associated with SSEP functions, as 10 CFR 73.54 requires. This statement includes the first step in RG 5.71 to analyze digital computer and communication systems and networks to determine if they include CDAs.

Based on the above review, the NRC staff finds the applicant's proposal, described in Section 3.1.3 of the VEGP CSP, to use 10 CFR 73.54(a)(1) and its licensing basis to identify CDAs to be acceptable.

13.8.4.5 Reviews and Validation Testing (Section A.3.1.4 of Appendix A to RG 5.71)

Section 3.1.4 of the VEGP CSP states that the VEGP CST will be responsible for conducting a review, performing validation activities, and for each CDA, the CST determined:

- *its direct and indirect connectivity pathways*
- *infrastructure interdependencies*
- *the application of defensive strategies, including defensive models, security controls, and other defensive measures*

The CSP also requires that the CST validate the above activities through comprehensive walkdowns, which include a range of activities that conform to those activities specified in RG 5.71 for this purpose.

The requirements, processes and procedures described in this section of the VEGP CSP conform to, and encompass all of the same specifications, outlined in the comparable section of RG 5.71.

Based on the above review, the NRC staff finds that reviews and validation testing described in Section 3.1.4 of the VEGP CSP is acceptable.

13.8.4.6 Defense-In-Depth Protective Strategies (Section A.3.1.5 of Appendix A to RG 5.71)

Section 3.1.5 of the VEGP CSP states that the defensive strategy consists of the defensive model described in Section C.3.2 of RG 5.71, and the detailed defensive architecture of Appendix C, Section 6, defense-in-depth controls in Appendix C, Section 7, and security controls applied in accordance with Section 3.1.6 of the VEGP CSP with one deviation to its defensive architecture. The VEGP defensive architecture, including the deviation is consistent with the security model described in RG 5.71, which provides for isolation of safety-related and security CDAs.

Based on the above review, the NRC staff finds that the defense-in-depth protective strategies described in Section 3.1.5 of the VEGP CSP are acceptable.

13.8.4.7 Application of Security Controls (Section A.3.1.6 of Appendix A to RG 5.71)

Section 3.1.6 of the VEGP CSP states that VEGP Units 3 and 4 established defense-in-depth protective strategies by applying and documenting the following:

- *the defensive model described in Section 3.2 of RG 5.71 (discussed in SER Section 13.8.4.6)*

- *the physical and administrative security controls established by the VEGP Units 3 and 4 Physical Security Program and physical barriers, such as locked doors, locked cabinets, and locating CDAs in the VEGP Units 3 and 4 protected area or vital areas, which are part of the overall security controls used to protect CDAs from attacks*

- *verification of the effectiveness of the implemented operational and management controls described in Appendix C to RG 5.71 and implemented alternatives to the Appendix C controls for each CDA*

- *the technical controls described in Appendix B to RG 5.71 and the operational and management controls described in Appendix C to RG 5.71, consistent with the process described below*

The VEGP CSP deviates from RG 5.71, Section C.3.3 Security Controls and Appendix A.3.1.6, by stating that when a control from Appendices B and C of RG 5.71 is not implemented, the licensee will implement alternate control(s) that "do not provide less protection than the corresponding" control in the appendix. This deviation is consistent with the method used in RG 5.71, which states that controls should provide equal or better protection.

The VEGP CSP also deviates from RG 5.71 by stating that when a control can be proved to be unnecessary, the applicant will perform an analysis demonstrating that the control is not necessary, and will provide a documented justification. Although RG 5.71 specifically calls for an attack vector analysis, and the VEGP CSP does not specifically commit to performing an attack vector analysis, the VEGP CSP does commit to justifying the non-applicability of a control by demonstrating that the attack vector does not exist. This provides for the same outcome as RG 5.71.

Based on the above review, the NRC staff finds that the application of security controls described in Section 3.1.6 of the VEGP CSP is acceptable.

13.8.4.8 <u>Incorporating the Cyber Security Program into the Physical Protection Program (Section A.3.2 of Appendix A to RG 5.71)</u>

Section 3.2 of the VEGP CSP states that the licensee will provide the management interfaces necessary to appropriately coordinate physical and cyber security activities, as follows:

- *establish an organization that is responsible for cyber security and is independent from operations*

- *document physical and cyber security interdependencies*

- *develop policies and procedures to coordinate management of physical and cyber security controls*

- *incorporate unified policies and procedures to secure CDAs from attacks up to and including the DBT*

- *coordinate acquisition of physical or cyber security services, training, devices, and equipment*

- *coordinate interdependent physical and cyber security activities and training with physical and cyber security personnel*

- *integrate and coordinate incident response capabilities with physical and cyber incident response personnel*

- *train senior management regarding the needs of both disciplines*

- *periodically exercise the entire security organization using realistic scenarios combining both physical and cyber simulated attacks*

The VEGP CSP deviates from RG 5.71 by not creating a unified security organization. The commitment to provide for appropriate management interfaces to coordinate the physical and cyber security organizations provides for a level of integration equivalent to a unified organization.

Based on the above review, the NRC staff finds that the incorporation of the cyber security program into the physical protection program described in Section 3.2 of the VEGP CSP is acceptable.

13.8.4.9 <u>Policies and Implementing Procedures (Section A.3.3 of Appendix A to RG 5.71)</u>

Section 3.3 of the VEGP CSP states that the licensee will develop policies and procedures to address the security controls in Appendices B and C to RG 5.71 and review and approve issues and uses, and revise the same according to Section 4 of the CSP. The CSP will also establish specific responsibilities for the positions described in Section 10.10 of Appendix C to RG 5.71, with the following deviation.

The CSP states that this will occur "in accordance with the security control application process in Section 3.1.6 of this Plan." This process requires the applicant to justify and demonstrate that any deviation from the controls in RG 5.71 provide no less protection than the corresponding control in Appendices B and C; therefore, the VEGP CSP will require the same level of protection as the corresponding commitment in RG 5.71.

Based on the above review, the NRC staff finds that the policies and implementing procedures described in Section 3.3 of the VEGP CSP are acceptable.

13.8.4.10 Maintaining the Cyber Security Program (Section A.4 of Appendix A to RG 5.71)

Section 4 of the VEGP CSP states that the applicant will establish the programmatic elements necessary to maintain security throughout the life cycle of the CDAs, and that the applicant has implemented these elements. For new assets, SNC commits to follow the process described in Section 4.2.

Section 4 of the VEGP CSP is nearly identical to Section C.4 of RG 5.71, with the deviation of replacing the bracketed text [Licensee/Applicant] *with VEGP Units 3 and 4, and by including the caveat that the operational and management controls are applied following the process described in Section 3.1.6. The process described in Section 3.1.6 allows the licensee/applicant to not apply a control if it can demonstrate that the control is not necessary by justifying that the attack vector associated with the control does not exist. This approach is consistent with the method used in RG 5.71, and does not reduce the protection to the plant.*

Based on the above review, the NRC staff finds that the maintenance of the cyber security program described in Section 4 of the VEGP CSP is acceptable.

13.8.4.11 Continuous Monitoring and Assessment (Section A.4.1 of Appendix A to RG 5.71)

Section 4.1 of the VEGP CSP states that the licensee will continue to monitor security controls for effectiveness; will ensure that they remain in place throughout the life cycle of the CDA; and will verify that rogue assets are not connected to the infrastructure.

The VEGP CSP includes a single deviation from Section A.4.1 of RG 5.71. The RG states that "[Licensee/Applicant] *continuously monitors security controls consistent with Appendix C to RG 5.71," whereas the VEGP CSP states that "VEGP Units 3 and 4 continues to monitor security controls consistent with Appendix C to RG 5.71."*

This deviation is consistent with the method in RG 5.71, which calls for periodic assessments, which is consistent with the statement "continues to monitor."

Based on the above review, the NRC staff finds that the ongoing monitoring and assessment described in Section 4.1 of the VEGP CSP is acceptable.

13.8.4.12 Periodic Assessment of Security Controls (Section A.4.1.1 of Appendix A to RG 5.71)

Section 4.1.1 of the VEGP CSP states that the licensee will periodically assess that security controls implemented for each CDA remain robust, resilient, and effective in place throughout the life cycle, at least every 24 months.

The NRC staff reviewed the above and found that this period of assessment is not consistent with RG 5.71. The time period between evaluations is 12 months longer than the time period provided in RG 5.71. However, this 24-month time

period conforms to 10 CFR 73.54(g) requiring the licensee/applicant to review the cyber security program as a component of the physical security program in accordance with the requirements of 10 CFR 73.55(m), including the periodicity requirements. The requirements of 10 CFR 73.55(m) are that, at a minimum, the licensee/applicant review each element of the physical protection program, which includes the cyber security program, at least every 24 months.

Furthermore, the VEGP CSP states that controls will be reviewed according to the requirements of the security controls if that period of review occurs more often. This is also consistent with the method provided in RG 5.71.

Based on the above review, the NRC staff finds that the periodic assessment of security controls described in Section 4.1.1 of the VEGP CSP is acceptable.

13.8.4.13 Effectiveness Analysis (Section A.4.1.2 of Appendix A to RG 5.71)

Section 4.1.2 of the VEGP CSP states that the licensee will monitor and measure the effectiveness of the cyber security program and its security controls to ensure that both are implemented correctly, operating as intended, and continuing to provide high assurance that CDAs are protected against cyber attacks. The licensee commits to verifying the effectiveness of the security controls every 24 months, or in accordance with the specific requirements of the implemented security controls, whichever is more frequent.

The NRC staff reviewed the above and found that this period of verification is inconsistent with RG 5.71. The time period between evaluations is 12 months longer than the time period provided in RG 5.71. However, this 24-month time period conforms to 10 CFR 73.54(g) requiring the applicant to review the cyber security program as a component of the physical security program in accordance with the requirements of 10 CFR 73.55(m), including the periodicity requirements. The requirements of 10 CFR 73.55(m) are that, at a minimum, the applicant review each element of the physical protection program, which includes the cyber security program, at least every 24 months.

Furthermore, the VEGP CSP states that verification will also occur according to the requirements of the security controls if that period of verification occurs more often. This is also consistent with the method provided in RG 5.71.

Based on the above review, the NRC staff finds that the effectiveness analysis described in Section 4.1.2 of the VEGP CSP is acceptable.

13.8.4.14 Vulnerability Assessments and Scans (Section A.4.1.3 of Appendix A to RG 5.71)

Section 4.1.3 of the VEGP CSP states vulnerability assessments will be performed as specified in the security controls in Appendices B and C of RG 5.71 to identify new vulnerabilities that have the potential to impact the effectiveness of the cyber security program and the security of the CDAs. The applicant also commits to address vulnerabilities that could cause CDAs to become compromised or could have an adverse impact on SSEP functions. Section 13.1 of Appendix C of RG 5.71 provides that vulnerability assessments should occur

no less frequently than once a quarter, at random intervals, and when new potential vulnerabilities are reported and identified.

Section A.4.1.3 of RG 5.71 states that vulnerability assessments will occur no less frequently than quarterly, whereas the VEGP CSP states that this will occur, "as specified in the implemented security controls in Appendices B and C to RG 5.71 and implemented alternatives to the Appendices B and C controls." The process SNC has committed to in Section 3.1.6 of the VEGP CSP requires SNC, if it does not implement the controls in Appendices B and C, to demonstrate that an alternate control does not provide less protection than the corresponding control in Appendices B and C.

Therefore, if SNC does not implement the security control in Section 13.1, or deviates from the requirement for a quarterly vulnerability assessment, it will ensure that this deviation does not provide less protection than performing quarterly vulnerability assessments, and will provide an analysis that demonstrates that the attack vector does not exist and will document this justification for inspection.

Based on the above review, the NRC staff finds that the vulnerability assessments and scans described in Section 4.1.3 of the VEGP CSP are acceptable.

13.8.4.15 Change Control (Section A.4.2 of Appendix A to RG 5.71)

Section 4.2 of the VEGP CSP states that the licensee will systematically plan, approve, test, and document changes to the environment of the CDAs, the addition of CDAs to the environment, and changes to existing CDAs in a manner that provides a high level of assurance that the SSEP functions are protected from cyber attacks. The CSP also commits that the program establish that changes made to CDAs use the design control and configuration management procedures or other procedural processes to ensure that the existing security controls are effective and that any pathway that can be exploited to compromise a CDA is protected from cyber attacks.

The VEGP CSP does not deviate from Section A.4.2 of RG 5.71.

Based on the above review, the NRC staff finds that the change control process described in Section 4.2 of the VEGP CSP is acceptable.

13.8.4.16 Configuration Management (Section A.4.2.1 of Appendix A to RG 5.71)

Section 4.2.1 of the VEGP CSP states that the licensee will implement and document a change management process as described in Section 4.2 of the VEGP CSP. Further, it commits to implement and document the applied configuration management controls described in Appendix C, Section 11 to RG 5.71 following the process described in Section 3.1.6 of the CSP.

The VEGP CSP does not specifically commit to apply the security controls in Section 11 of Appendix C of RG 5.71; however, it does commit to apply the

process in Section 3.1.6 of the CSP. The commitment in Section 4.2.1 is consistent with Section A.4.2.2 of RG 5.71 as the applicant has committed, if it does not implement the security controls in Section 11 of RG 5.71, either to implement alternative controls that do not provide less protection than what is in Section 11, or to demonstrate that this control is unnecessary by demonstrating that the attack vectors associated with Section 11 to Appendix C of RG 5.71 do not exist for VEGP.

Based on the above review, the NRC staff finds that the configuration management process described in Section 4.2.1 of the VEGP CSP is acceptable.

13.8.4.17 Security Impact Analysis of Changes and Environment (Section A.4.2.2 of Appendix A to RG 5.71)

Section 4.2.2 of the VEGP CSP states that the applicant will perform a security impact analysis in accordance with Section 4.1.2 before implementing a design or configuration change to a CDA or, when changes to the environment occur, to manage potential risks introduced by the changes. The CSP also commits to evaluate, document, and incorporate into the security impact analysis safety and security interdependencies of other CDAs or systems, as well as updates, and documents the following:

- *the location of the CDA and connected assets*
- *connectivity pathways (direct and indirect)*
- *infrastructure interdependencies*
- *application of defensive strategies, including defensive models, security controls, and others*
- *defensive strategy measures*
- *plant-wide physical and cyber security policies and procedures that secure CDAs from a cyber attack, including attack mitigation and incident response and recovery*

The VEGP CSP commits to perform these impact analyses as part of the change approval process to assess the impacts of the changes on the security posture of CDAs and security controls, as described in Section 4.1.2 of the VEGP CSP, and to address any identified gaps to protect CDAs from cyber attack, up to and including the DBT as described in Section 4.2.6.

Finally, Section 4.2.2 states that the licensee will manage CDAs for the cyber security of SSEP functions through an ongoing evaluation of threats and vulnerabilities and implementation of each of the applied security controls provided in Appendix B or C of RG 5.71 and implement alternatives to the Appendices B and C controls during all phases of the life cycle. Additionally, SNC has established and documented procedures for screening, evaluating, mitigating, and dispositioning threat and vulnerability notifications received from

credible sources. Dispositioning includes implementation of security controls to mitigate newly reported or discovered threats and vulnerabilities.

The language in Section 4.2.2 of the VEGP CSP is identical to that in Section A.4.2.2 of RG 5.71 and includes no deviations.

Based on the above review, the NRC staff finds that the security impact analysis of changes and environment described in Section 4.2.2 of the VEGP CSP is acceptable.

13.8.4.18 Security Reassessment and Authorization (Section A.4.2.3 of Appendix A to RG 5.71)

Section 4.2.3 of the VEGP CSP states that the licensee will have implemented, documented, and maintained a process that ensures that modifications to CDAs are evaluated before implementation so that security controls remain effective and that any pathway that can be exploited to compromise the modified CDA is addressed to protect CDAs and SSEP functions from cyber attacks. This section further states that the VEGP cyber security program establishes that additions and modifications are evaluated, using a proven and accepted method, before implementation to provide high assurance of adequate protection against cyber attacks, up to and including DBTs, using the process described in Section 4.1.2 of the VEGP CSP.

The licensee also commits to disseminate, review, and update the following when a CDA modification is conducted:

- *a formal, documented security assessment and authorization policy, which addresses the purpose, scope, roles, responsibilities, management commitment, coordination among entities, and compliance to reflect all modifications or additions*

- *a formal, documented procedure to facilitate the implementation of the security reassessment and authorization policy and associated controls*

The VEGP CSP does not deviate from Section A.4.2.3 of RG 5.71.

Based on the above review, the NRC staff finds that the security reassessment and authorization described in Section 4.2.3 of the VEGP CSP is acceptable.

13.8.4.19 Updating Cyber Security Practices (Section A.4.2.4 of Appendix A to RG 5.71)

Section 4.2.4 of the VEGP CSP states that the licensee reviews, updates and modifies cyber security policies, procedures, practices, existing cyber security controls, detailed descriptions of network architecture (including logical and physical diagrams), information on security devices, and any other information associated with the state of the cyber security program or the applied security controls provided in Appendices B and C to RG 5.71 and implemented alternatives to the Appendices B and C controls when changes occur to CDAs or the environment.

This information includes the following:

- *plant- and corporate-wide information on the policies, procedures, and current practices related to cyber security*
- *detailed network architectures and diagrams*
- *configuration information on security devices or CDAs*
- *new plant- or corporate-wide cyber security defensive strategies or security controls being developed and policies, procedures, practices, and technologies related to their deployment*
- *the site's physical and operational security program*
- *cyber security requirements for vendors and contractors*
- *identified potential pathways for attacks*
- *recent cyber security studies or audits (to gain insight into areas of potential vulnerabilities); and identified infrastructure support systems (e.g., electrical power; heating, ventilation, and air conditioning; communications; fire suppression) whose failure or manipulation could impact the proper functioning of CSs*

The VEGP CSP does not deviate from Section A.4.2.4 of RG 5.71.

Based on the above review, the NRC staff finds that updating of cyber security practices described in Section 4.2.4 of the VEGP CSP is acceptable.

13.8.4.20 Review and Validation Testing of a Modification or Addition of a Critical Digital Asset (Section A.4.2.5 of Appendix A to RG 5.71)

The VEGP CSP Section 4.2.5 states the licensee will conduct and document the results of reviews and validation tests of each CDA modification and addition using the process described in Section 3.1.4 of the VEGP CSP.

The VEGP CSP does not deviate from Section A.4.2.5 of RG 5.71.

Based on the above review, the NRC staff finds that the Review and Validation Testing of Modifications or Additions of a Critical Digital Asset described in Section 4.2.5 of VEGP CSP is acceptable.

13.8.4.21 Application of Security Controls Associated with a Modification or Addition (Section A.4.2.6 of Appendix A to RG 5.71)

Section 4.2.6 of the VEGP CSP states that when new CDAs are introduced into the environment of VEGP, the licensee:

- *deploys the CDA into the appropriate level of the defensive model described in Section 3.1.5 of this plan;*
- *applies the technical controls identified in Appendix B to RG 5.71 and the operational and management controls described in Appendix C to RG 5.71 in a manner consistent with the process described in Section 3.1.6 of this plan*
- *confirms that the implemented operational and management controls described in Appendix C to RG 5.71, and implemented alternatives to the Appendix C controls, are effective for the CDA*

The plan also commits that when CDAs are modified, the licensee:

- *verifies that the CDA is deployed into the proper level of the defensive model described in Section 3.1.5 of this plan*
- *performs a security impact analysis, as described in Section 4.2.2 of this plan*
- *verifies that the technical controls identified in Appendix B to RG 5.71 and the operational and management controls described in Appendix C to RG 5.71 are addressed in a manner consistent with the process described in Section 3.1.6 of this plan*
- *verifies that the applied security controls discussed above are implemented effectively, consistent with the process described in Section 4.1.2 of this plan*
- *confirms that the implemented operational and management controls discussed in Appendix C to RG 5.71 and implemented alternatives to the Appendix C controls are effective for the CDA*

The VEGP CSP deviates from Section 4.2.6 of RG 5.71 by modifying the phrase "applies the technical controls identified in Appendix B to RG 5.71 in a manner consistent with the process described in Section 3.2 of RG 5.71," to read "applies the technical controls identified in Appendix B to RG 5.71 and the operational and management controls described in Appendix C to RG 5.71 in a manner consistent with the process described in Section 3.1.6 of this plan." This is consistent with RG 5.71 as the VEGP CSP commits to following the process in Section 3.1.6 of the VEGP CSP, which requires that controls are applied, an alternative that provides equivalent protection is provided, or the licensee demonstrates that the control is not necessary.

The VEGP CSP also deviates from Section A.4.2.6 of RG 5.71 with the modification of this phrase, "verifies that the security controls discussed above are implemented effectively, consistent with the process described in Section 4.1.2 of this plan" to read "verifies that the applied security controls discussed above are implemented effectively, consistent with the process described in Section 4.1.2 of this plan."

This deviation is consistent with the method used in RG 5.71. RG 5.71 assumes that all the controls in Appendices B and C will be applied; whereas, the VEGP CSP commits that if a control is not applied, there will be no reduction in protection as compared to the corresponding control. This method is also captured in RG 5.71 and, therefore, the VEGP CSP is consistent with RG 5.71.

Based on the above review, the NRC staff finds that the application of security controls associated with a modification or addition described in Section 4.2.6 of the VEGP CSP is acceptable.

13.8.4.22 Cyber Security Program Review (Section A.4.3 of Appendix A to RG 5.71)

Section 4.3 of the VEGP CSP states that the applicant has established the necessary measures and governing procedures to implement periodic reviews of applicable program elements, in accordance with the requirements of 10 CFR 73.55(m). Specifically, the VEGP CSP calls for a review of the program's effectiveness at least every 24 months. In addition, reviews are to be conducted as follows:

- *within 12 months following initial implementation of the program*
- *as necessary, based upon site-specific analyses, assessments, or other performance indicators*
- *as soon as reasonably practical, but no longer than 12 months after changes occur in personnel, procedures, equipment, or facilities that potentially could adversely affect cyber security*
- *by individuals independent of those personnel responsible for program management, and any individual who has direct responsibility for implementing the program*

This deviates from RG 5.71 in the specific wording, but includes the same commitments. Specifically, RG 5.71 states that the licensee reviews the program's effectiveness at least every 24 months. In addition, reviews are conducted as follows:

- *within 12 months of the initial implementation of the program*
- *within 12 months of a change to personnel, procedures, equipment, or facilities that potentially could adversely affect security*

- *as necessary based upon site-specific analyses, assessments, or other performance indicators*

- *by individuals independent of those personnel responsible for program implementation and management*

Based on the above review, the NRC staff finds that the cyber security program review described in Section 4.3 of the VEGP CSP is acceptable.

13.8.4.23 Document Control and Records Retention and Handling (Section A.5 of Appendix A to RG 5.71)

Section 5 of the VEGP CSP states the necessary measures and governing procedures to ensure that sufficient records of items and activities affecting cyber security are developed, reviewed, approved, issued, used, and revised to reflect completed work. VEGP will retain records and supporting technical documentation required to satisfy the requirements of 10 CFR 73.54 and 10 CFR 73.55, "Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors against Radiological Sabotage," until the NRC terminates the facility's operating license. Records are retained to document access history, as well as to discover the source of cyber attacks or other security-related incidents affecting CDAs or SSEP functions, or both. VEGP Units 3 and 4 will retain superseded portions of these records for at least three years after the record is superseded, unless otherwise specified by the NRC.

This deviates from RG 5.71 by not specifically detailing the types of records, but instead describes that records will be retained to document access history and information needed to discover the source of cyber attacks and incidents. This is consistent with what is included in RG 5.71, Section 5, and includes all the performance-based characteristics and commitments of that section.

Based on the above review, the NRC staff finds that the document control and records retention handling described in Section 5 of the VEGP CSP is acceptable.

13.8.4.24 Deviations Taken to RG 5.71, Sections C.1 Through C.5

The VEGP CSP states that the plan deviates from Regulatory Positions C.1 through C.5 of RG 5.71, as noted in Attachment A to the CSP. It also deviates from Section A.1 of Appendix A of RG 5.71. For that reason, the staff considers that the full evaluation of the CSP must include a review of the deviations taken to those sections of RG 5.71 as listed in the VEGP CSP. This section of the SER lists those 69 specific deviations and their evaluated security impact. The following deviations were provided in a table, as part of Attachment A to the CSP.

13.8.4.24.1 RG 5.71, Section C.2, fourth paragraph, first sentence (page 8)

SNC added the term "adequately" to the phrase "…systems and equipment are protected from cyber attack." Since 10 CFR 73.54 specifically makes that same statement, the staff found no reason to object to that clarification. The objective is to provide adequate protection to the identified CDAs.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.2 RG 5.71, Section C.2, fourth paragraph, twelfth bullet, third sub-bullet (page 8)

SNC clarifies that its overall design is based on the Westinghouse AP1000 design and states that the AP1000 DCD commits to Revision 1 of RG 1.152, "Criteria for Digital Computers in Safety Systems of Nuclear Power Plants." Since the applicant is required to have a cyber security program that meets the performance objectives outlined in 10 CFR 73.54 and is not obliged to achieve that requirement exclusively through the example provided by RG 5.71, this clarification, in and of itself, was not considered by the staff as deviating from the requirements established by the rule.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.3 RG 5.71, Section C.2, fifteenth bullet (page 8)

The deviation states that the required policies and procedures have not yet been written, reviewed, and approved, and, thus, are not currently available for inspection and review.

The NRC requires that these policies and procedures be completed and available for review by the completion of the CSP implementation schedule proposed by the applicant, since CSP inspections would not occur until that time. The requirements of 10 CFR 73.55(a)(4) and proposed License Condition 6 provide the necessary controls associated with developing the required policies and procedures of the CSP.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.4 RG 5.71, Section C.3, Figure 1 (Page 10)

The deviation changes the arrows on the left side of Figure 1 from "Continuous Monitoring" to "Ongoing Monitoring."

The NRC intended monitoring to occur periodically, and when required, based on certain inputs into the process. SNC states that "continuous" might imply that monitoring was perpetual and not event driven. This was not the staff's intent with the term "continuous." The staff accepts the use of the term "ongoing" to better reflect the intent of this diagram.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.5 RG 5.71, Section C.3, third paragraph, first sentence (Page 10)

The VEGP CSP changes the statement, "An acceptable method to establish a cyber security program at a facility is by performing the following, (1) analyze the digital computer and communication systems and networks, …" to "An acceptable method to establish a cyber security program at a facility is by performing the following: (1) identify critical systems and critical digital assets as described in Section C.3.1.3, (2) analyze the digital computer and communication systems and networks..."

This deviation is acceptable because SNC proposes to use its licensing basis to identify CSs that are associated with SSEP functions, as 10 CFR 73.54 requires. This statement includes the first step in RG 5.71 to analyze digital computer and communication systems and networks to determine if they include CDAs.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.6 RG 5.71, Section C.3.1, first paragraph, first sentence (page 11)

The VEGP CSP changes the statement, "Consistent with the requirements of 10 CFR 73.54(b)(1), a licensee must conduct a site-specific analysis of digital computer and communication systems and networks to identify CDAs, which are those assets that, if compromised, could adversely impact the SSEP functions of nuclear facilities." to "Consistent with the requirements of 10 CFR 73.54(b)(1), a licensee must conduct a site-specific analysis of digital computer and communication systems and networks to identify CDAs, which are those assets that, if compromised, could adversely impact the CSs of nuclear facilities."

SNC defines a CS as:

> *An analog or digital technology-based system in or outside of the plant that performs or is associated with a safety-related, important-to-safety, security, or emergency preparedness function. These critical systems include, but are not limited to, plant systems, equipment, communication systems, networks, offsite communications, or support systems or equipment, that perform or are associated with a safety-related, important-to-safety, security, or emergency preparedness function as defined by the approved plant licensing basis.*

This definition ties CSs to SSEP functions; therefore, the change is consistent with the method used in RG 5.71, as this means that CSs are all those assets associated with SSEP functions, and, therefore, could adversely impact those SSEP functions.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.7 RG 5.71, Section C.3.1, first paragraph, second bullet (page 11)

The VEGP CSP includes a deviation to correct an editorial omission in RG 5.71. Page 11 of RG 5.71 states that:

An acceptable method for identifying and documenting CDAs is as follows:

- *obtain authorization for security assessment*
- *define roles and responsibilities cyber personnel and form the cyber security team*
- *identify and document CDAs at the facility*
- *review and validate configurations of CDAs*

The VEGP CSP corrects the second bullet to read:

- *define roles and responsibilities of cyber personnel and form the cyber security team*

This deviation which supplies the omitted "of" is consistent with the intent of the referenced bullet.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.8 RG 5.71, Section C.3.1.2, third paragraph, second bullet (page 13)

The VEGP CSP changes the second bullet on Page 13 of RG 5.71 from:

> *documenting all key observations, analyses, and findings during the assessment process so that this information can be used as a basis for applying security controls;*

to:

> *documenting all key observations, analyses, and findings during the assessment process so that this information can be used as a basis for addressing security controls;*

This deviation is acceptable because RG 5.71 allows a licensee to address, as opposed to apply, security controls if it follows the process in Appendix A, Section 3.1.6 of RG 5.71, which is to apply the control, apply an alternative that provides no less protection than the corresponding security control, or to demonstrate that the control is not necessary because the attack vector, root cause, or vulnerability associated with the control does not exist.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.9 RG 5.71, Section C.3.1.2, third paragraph, sixth bullet (page 13)

The VEGP CSP changes the sixth bullet on Page 13 from:

- *preparing documentation and overseeing implementation of the cyber security controls provided in Appendices B and C to this guide, documenting the basis for not implementing certain cyber security controls provided in Appendix B, or documenting the basis for the implementation of alternate or compensating measures in lieu of any cyber security controls provided in Appendix B; and*

to:

- *overseeing documentation and implementation of the cyber security controls provided in Appendices B and C to this guide, documenting the basis for not implementing certain cyber security controls provided in Appendix B and C, or documenting the basis for the implementation of alternate or compensating measures in lieu of any cyber security controls provided in Appendix B and C; and*

This deviation is acceptable because overseeing the documentation and implementation of security controls by qualified personnel is an approved method. Further, the extension of this method in Appendix C is also acceptable as the licensee has committed to follow the process in Appendix A, Section 3.1.6 of RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.10 RG 5.71, Section C.3.1.2, third paragraph, seventh bullet (page 13)

The VEGP CSP includes a deviation from RG 5.71 that changes bullet 7 from:

> *assuring the retention of all assessment documentation, including notes and supporting information, in accordance with 10 CFR 73.54(h) and the record retention and handling requirements specified in Section C.5 of this guide.*

to:

> *establishing the retention policy of all assessment documentation, including notes and supporting information, in accordance with 10 CFR 73.54(h) and the record retention and handling requirements specified in Section C.5 of this guide.*

This deviation is acceptable as the licensee has committed to establish the retention policy. Although this may be done by a different team, and not the CST, it is consistent with the intent of RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.11 RG 5.71, Section C.3.1.2, fourth paragraph, first sentence (page 13)

The VEGP CSP deviates from RG 5.71 by changing this sentence:

> *The licensee's CST needs to have the authority to conduct an objective assessment, make determinations that are not constrained by operational goals (e.g., cost),*

to:

> *The licensee's CST needs to have the authority to conduct an objective assessment, make determinations that are not constrained by business goals (e.g., cost),*

This deviation is acceptable because the intent of this statement in RG 5.71 is to ensure that cost is not used as a factor in making determinations about the adequacy of security controls, vulnerabilities, identifying CSs and CDAs, and carrying out other assessment functions of the CST.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.12 RG 5.71, Section C.3.1.3, second paragraph (page 14)

The VEGP CSP deviates from RG 5.71 by changing the identification process from CDAs to CSs. This deviation is acceptable because the VEGP CSP commits to continue identifying CSs by identifying digital computers, networks, communication systems and support systems that perform and are associated with SSEP functions, as well as support systems and equipment that, if compromised, would adversely impact the plant's SSEP functions.

This is consistent with the process in RG 5.71, which identifies CDAs through the same process. The licensee further describes CDAs as a CS or part of a CS; therefore, the use of the term CS as opposed to CDA is also consistent with the method used in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.13 RG 5.71, Section C.3.1.3, fifth paragraph, first sentence (page 15)

The VEGP CSP deviates from RG 5.71 by making an editorial correction to RG 5.71. This involves changing:

> *With the identification of the all the CSs ...*

to:

> *With the identification of all the CSs ...*

This change is acceptable because it accomplishes the intent of this phrase in RG 5.71 eliminating the unnecessary "the."

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.14 RG 5.71, Section C.3.1.3, fifth paragraph, second sentence (page 15)

The VEGP CSP deviates from RG 5.71 by changing the following statement from:

> *A CDA may be a component of a CS ...*

to:

> *A CDA may be a complete CS or component of a CS, ...*

This deviation is acceptable because this statement is factually true. A CDA may be a complete CS and the deviation does not change the level of protection provided by the method outlined in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.15 RG 5.71, Section C.3.1.3, fifth paragraph, fifth sentence (page 15)

The VEGP CSP deviates from RG 5.71 by including additional documentation to help identify CSs and CDAs. Specifically VEGP includes "other licensing basis" documents to identify CSs and CDAs.

This deviation is in line with the intent of using existing documentation to identify CSs and CDAs. This section of RG 5.71 describes "helpful information sources for identifying CSs and CDAs" and is not an exhaustive list, nor is it the only method SNC has committed to use to identify CSs and CDAs. Specifically, SNC has committed to identify all digital computers, networks and communication systems associated with SSEP functions, which is what 10 CFR 73.54 requires.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.16 RG 5.71, Section C.3.1.3, eighth paragraph, first bullet (page 16)

The VEGP CSP deviates from RG 5.71 by stating that CDAs may be an entire CS. As previously discussed in Section 13.8.4.24.14 of this SER, it is true that a CDA may be an entire CS; therefore, this definition does not adversely impact either the method used in RG 5.71 or the protection that RG 5.71 provides.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.17 RG 5.71, Section C.3.1.3, eighth paragraph, second bullet (page 16)

The VEGP CSP deviates from RG 5.71 by stating that CDAs may be an entire CS. As previously discussed in Sections 13.8.4.24.14 and 13.8.4.24.16 of this SER, it is true that a CDA may be an entire CS; therefore, this definition does not adversely impact either the method used in RG 5.71 or the protection that RG 5.71 provides.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.18 RG 5.71, Section C.3.2, first paragraph, first sentence (page 18)

The VEGP CSP deviates from RG 5.71 by providing an editorial correction to RG 5.71. Specifically, the VEGP CSP changes the following sentence from:

> *As stated in 10 CFR 73.54(c)(2), the licensee must design its cyber security program to apply and maintain integrate defense-in-depth protective strategies to ensure the capability to detect, prevent, respond to, mitigate, and recover from cyber attacks.*

to:

> *As stated in 10 CFR 73.54(c)(2), the licensee must design its cyber security program to apply and maintain integrated defense-in-depth protective strategies to ensure the capability to detect, prevent, respond to, mitigate, and recover from cyber attacks.*

This deviation captures the intent of this sentence in RG 5.71 by correcting "integrate" to "integrated."

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.19 RG 5.71, Section C.3.2, second paragraph, fourth sentence (page 18)

The VEGP CSP deviates from RG 5.71 by pointing to an editorial error in RG 5.71. Specifically, the VEGP CSP changes the following sentence from:

> *Therefore, defense-in-depth is achieved not only by implementing multiple security boundaries, but also by instituting and maintaining a robust program of security controls that assess, protect, respond, prevent, detect, and mitigates an attack on a CDA and with recovery.*

to:

> *Therefore, defense-in-depth is achieved not only by implementing multiple security boundaries, but also by instituting and maintaining a robust program of security controls that assess, protect, respond, prevent, detect, and mitigate an attack on a CDA and with recovery.*

This deviation captures the intent of this sentence in RG 5.71 by correcting "mitigates" to "mitigate." Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.20 RG 5.71, Section C.3.2, third paragraph, first sentence (page 18)

The VEGP CSP deviates from RG 5.71 by pointing to an editorial error in RG 5.71. Specifically, the VEGP CSP changes the following sentence from:

> *For example, if a failure in prevention were to occur (e.g., a violation of policy) or if protection mechanisms were to be bypassed (e.g., by a new virus that is not yet identified as a cyber attack), mechanisms would still in place to detect and respond to an unauthorized alteration in an impacted CDA, mitigate the impacts of this alteration, and recover normal operations of the impacted CDA before an adverse impact.*

to:

> *For example, if a failure in prevention were to occur (e.g., a violation of policy) or if protection mechanisms were to be bypassed (e.g., by a new virus that is not yet identified as a cyber attack), mechanisms would still be in place to detect and respond to an unauthorized alteration in an impacted CDA, mitigate the impacts of this alteration, and recover normal operations of the impacted CDA before an adverse impact.*

This is acceptable because the change to add the word "be" to the phrase "would still be in place to detect" captures the intent of this sentence by supplying the "be" omitted from RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.21 RG 5.71, Section C.3.2.1, Figure 5 (Page 19)

The VEGP CSP includes a defensive architecture, which deviates from the example provided in RG 5.71. The proposed architecture is acceptable because it provides defense-in-depth, communication isolation for safety and security systems, and multiple nondeterministic boundaries for nonsafety/nonsecurity CDAs. This provides adequate protection for CDAs and ensures that appropriate isolation and boundary protection exists for all CDAs where appropriate.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.22 RG 5.71, Section C.3.2.1, third paragraph (page 19)

The VEGP CSP deviates from RG 5.71 by modifying the characteristics of an acceptable defensive architecture by stating that the architecture includes CSs and CDAs configured in accordance with Section 5 of Appendix B, and Sections 6 and 7 of Appendix C in accordance with the security control application process described in Section 3.3. As previously discussed in Section 13.8.4.24.9 of this SER, the use of the security control application process to address controls is consistent with RG 5.71.

SNC has committed to apply the security control, demonstrate that alternative controls provide no less protection than the corresponding control, or demonstrate through analysis that the attack vector the control addresses does not exist; therefore, the control is not necessary.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.23 RG 5.71, Section C.3.2.1, third paragraph, first bullet (page 19)

The VEGP CSP deviates from RG 5.71 by modifying the example defensive architecture to match the architecture to be used in the AP1000. This deviation is acceptable because it provides the appropriate isolation of safety and security CDAs, and adequate boundaries for nonsafety/nonsecurity CDAs.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.24 RG 5.71, Section C.3.2.1, third paragraph, second bullet (page 19)

The VEGP CSP deviates from RG 5.71 by modifying the example defensive architecture to match the architecture to be used in the AP1000. As previously discussed in Section 13.8.4.6, this deviation is acceptable because it provides the appropriate isolation of safety and security CDAs, and adequate boundaries for nonsafety/nonsecurity CDAs. This is consistent with the defensive model in

RG 5.71, as the VEGP defensive architecture provides boundaries for safety systems that are deterministic.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.25 RG 5.71, Section C.3.2.1, third paragraph, third bullet (page 19)

The VEGP CSP deviates from RG 5.71 regarding communications from digital assets at lower security levels to digital assets at higher security levels. This deviation is acceptable because the defensive architecture prevents specific communication from lower security levels to specific higher security levels. This is consistent with the defensive model in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.26 RG 5.71, Section C.3.2.1, third paragraph, new second bullet (page 19)

The VEGP CSP deviates from RG 5.71 regarding remote access. This is consistent with the guidance in Section C.7 of RG 5.71, which also states that remote access to CDAs at the highest level be prevented.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.27 RG 5.71, Section C.3.2.1, third paragraph, new sixth bullet (page 19)

The VEGP CSP deviates from RG 5.71 by including in its defensive architecture a statement from Section C.7 of RG 5.71 for validating data (software updates, new firmware, etc.) using a method at or above the level of security the CDA that will have data transferred to it. This concept is already acceptable in RG 5.71 and is also included in the defensive architecture, although in a different section of the document. This is consistent with the method used in RG 5.71 and does not adversely impact the protection provided.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.28 RG 5.71, Section C.3.2.1, third paragraph, seventh bullet (page 19)

The VEGP CSP deviates from RG 5.71 by changing the commitment to eliminate applications, services and protocols not necessary to support the design-basis function of the CDAs to eliminate, disable, or render these inoperable. This is consistent with the method in RG 5.71, because in some cases these elements cannot be eliminated, but rather may have to be disabled or otherwise rendered inoperable. In each case, the result is the same. The asset is only configured to perform its design-based function and nothing more, which produces no less protection than the method in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.29 RG 5.71, Section C.3.2.1, third paragraph, eighth bullet (page 19)

The VEGP CSP deviates from RG 5.71 by eliminating the requirement to configure CDAs and boundary protection systems in accordance with Section 5 of Appendix B and Sections 6 and 7 of Appendix C. However, the VEGP CSP does commit to this in the preamble statement as described in Section 13.8.4.24.22 of this SER. Therefore, the VEGP CSP provides the same commitment to perform this as does RG 5.71, albeit in a different part of the same section.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.30 RG 5.71, Section C.3.2.1, fourth paragraph (page 19)

The VEGP CSP deviates from RG 5.71 by deleting the paragraph that commits to applying the security controls. However, the VEGP security plan commits, in Section 3.1.6, to address these controls and is, therefore, consistent with the method used in RG 5.71. The deleted paragraph is, therefore, unnecessary in the VEGP CSP to achieve the same commitment.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.31 RG 5.71, Section C.3.2.1, Prior to fifth paragraph (page 19)

The VEGP CSP deviates from the RG 5.71 defensive architecture. The VEGP architecture is described in Section 13.8.4.6 of this SER.

Based on the review and assessment in Section 13.8.4.6, the NRC staff finds that this deviation is acceptable.

13.8.4.24.32 RG 5.71, Section C.3.3, first paragraph, second sentence (page 20)

The VEGP CSP deviates from RG 5.71 by changing the following sentence:

> *A cyber compromise of CDAs would adversely impact nuclear facilities' SSEP functions that are necessary for protecting public health and safety.*

to:

> *A cyber compromise of CDAs could adversely impact nuclear facilities' SSEP functions that are necessary for protecting public health and safety.*

This deviation is consistent with the intent of RG 5.71, which implies that a compromise could lead to adverse impact and possible radiological sabotage. The intent of the paragraph is to establish the impact that could occur if a CDA were compromised. The security controls are designed around worst case scenarios, and the change in the VEGP CSP from "would" to "could" maintains this logic.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.33 RG 5.71, Section C.3.3, third paragraph, fourth sentence (page 20)

The VEGP CSP deviates from RG 5.71 by making an editorial correction to RG 5.71. This involves changing the statement:

> *Thus to provide high assurance that CDAs are protected from cyber attacks, potential cyber risks of these CDAs must be addressed known potential cyber risks.*

to:

> *Thus to provide high assurance that CDAs are protected from cyber attacks, potential cyber risks of these CDAs must be addressed for known potential cyber risks.*

This is acceptable because the change captures the intent of this sentence by supplying the "for" omitted from RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.34 RG 5.71, Section C.3.3, third paragraph, first sentence (page 20)

The VEGP CSP deviates from RG 5.71 by adding Appendix C to the list of controls that may be addressed using the method in Section 3.1.6 of Appendix A. This is consistent with the intent of RG 5.71, which assumes that all the controls in Appendix C can be implemented as written. However, if the controls can be addressed to demonstrate that an alternative control provides no less protection than the comparable control in Appendix C, or that the control is not necessary by demonstrating that the attack vector does not exist, this would meet the intent of RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.35 RG 5.71, Section C.3.3, third paragraph, first bullet (page 20)

The VEGP CSP deviates from RG 5.71 by adding Appendix C to the list of controls that may be addressed using the method in Section 3.1.6 of Appendix A. This is consistent with the intent of RG 5.71, which assumes that all the controls in Appendix C can be implemented as written. However, if the controls can be

addressed to demonstrate that an alternative control provides no less protection than the comparable control in Appendix C, or that the control is not necessary by demonstrating that the attack vector does not exist, this would meet the intent of RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.36 RG 5.71, Section C.3.3, third paragraph, second bullet (page 20)

The VEGP CSP deviates from RG 5.71 by stating that alternative controls will not provide equal or better protection to the corresponding control, but rather that they will not provide less protection than the corresponding control. This is consistent with the method used in RG 5.71; providing an alternative that does not provide less protection, and does not adversely impact the security program. Therefore, this change in commitment will provide an adequate level of protection and is consistent with the method used in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.37 RG 5.71, Section C.3.3, third paragraph, second bullet, second sub-bullet (page 20)

The VEGP CSP deviates from RG 5.71 by changing the statement:

> *performing and documenting the attack vector and attack tree analyses of the CDA and alternative countermeasures to confirm that the countermeasures provide the same or greater protection as the corresponding security control in Appendix B.*

to:

> *performing and documenting an attack vector and attack tree analysis of the CDA and alternative countermeasures to confirm countermeasures provide no decrease in the effectiveness of protection as compared to the corresponding security control identified in Appendix B or C.*

This deviation is acceptable because whether the licensee performs a single analysis or multiple analyses, the method is comparable provided that it will demonstrate that there is no decrease in protection. Further, the modification of the second part of the sentence is also acceptable because the intent of this method in RG 5.71 is to ensure that alternative controls do not provide less protection than the corresponding control. Therefore, a commitment to ensure that alternatives do not provide less protection produces a comparable level of protection as stating that the alternatives provide equal or better protection. Finally, the addition of the Appendix C controls to this method is acceptable because the licensee has committed to apply the control, apply an alternative that provides no less protection than the comparable control or not to apply the control and demonstrate that the attack vector does not exist.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.38 RG 5.71, Section C.3.3, third paragraph, second bullet, third sub-bullet (page 20)

The VEGP CSP deviates from RG 5.71 in a similar manner to deviations in Section 13.8.4.24.37 of this SER by changing the commitment to implement alternative countermeasures that provide at least the same degree of protection as the corresponding security control in Appendix B, to implementing alternative controls to provide no decrease in the effectiveness of protection as compared to the corresponding security control identified in Appendices B and C of RG 5.71.

This method is consistent with the method in RG 5.71 as it also meets the criteria for the performance based characteristics of 10 CFR 73.54. As long as the implemented alternative control does not provide less protection than the corresponding control in RG 5.71, the intent of this section of RG 5.71 has been met. Alternative controls are considered to be adequate only if they provide equivalent protection, and the VEGP CSP commits to that minimum standard.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.39 RG 5.71, Section C.3.3, third paragraph, third bullet (page 20)

The VEGP CSP deviates from RG 5.71 by not stating that SNC will specifically perform an attack vector and attack tree analysis to demonstrate that one of the specific security controls is not necessary. SNC does commit to performing an analysis to demonstrate that the attack vector does not exist (i.e., is not applicable), thereby obviating the need for a specific security control.

This method is consistent with the method in RG 5.71 as it commits to demonstrating a conclusion, specifically, that the attack vector does not exist. If the licensee can demonstrate this, and not use an attack vector or attack tree analysis, the results are still the same and, therefore, the method would produce a result that does not provide less protection than the method in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.40 RG 5.71, Section C.3.3, fourth paragraph, second sentence (page 20)

The VEGP CSP deviates from RG 5.71 by making an editorial correction to RG 5.71. This involves changing the statement:

> *When a security control is determined to have an adverse affect, alternate controls should be used by the licensee to protect the CDA from cyber attack up to and including the DBT consistent with the process described above.*

to:

> *When a security control is determined to have an adverse effect, alternate controls should be used by the licensee to protect the CDA from cyber attack up to and including the DBT consistent with the process described above.*

This is acceptable because the change captures the intent of this sentence in RG 5.71, by correcting "affect" to "effect."

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.41 RG 5.71, Section C.3.3, fifth paragraph, second sentence (page 21)

The VEGP CSP deviates from RG 5.71 by making an editorial correction to RG 5.71. This involves changing the statement:

> *If these effectiveness or vulnerability analyses identify a gap in the cyber security program, the licensee may need to implement additional security measures and controls not provided in Appendixes B and C.*

to:

> *If these effectiveness or vulnerability analyses identify a gap in the cyber security program, the licensee may need to implement additional security measures and controls not provided in Appendices B and C.*

This change is acceptable because it captures the intent of this sentence in RG 5.71, by correcting "Appendixes" to "Appendices."

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.42 RG 5.71, Sections C.3.3.1.1 through C.3.3.1.5, first paragraph and last bullet (pages 21 and 22)

The VEGP CSP deviates from RG 5.71 by stating that it will not apply all of the security controls in RG 5.71, but rather will address them. The VEGP CSP already commits to the RG 5.71 process, which is:

1) *applying controls;*

2) *applying an alternative control that does not provide less protection than the corresponding control; or*

3) not applying a control, but demonstrating that the corresponding attack vector does not exist.

The intent of RG 5.71 is to address the controls in Appendices B and C. This can be accomplished in accordance with Section 3.1.6 of Appendix A, to which SNC has committed.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.43 RG 5.71, Section C.3.3.1.1, first paragraph, second bullet, fourth sub-bullet (page 21)

The VEGP CSP deviates from RG 5.71 by committing to audit CDAs at an interval defined for the CDA, or within 5 days following revocation of an individual's unescorted access, due to a lack of trustworthiness or reliability, or as soon as reasonably practical upon changes in personnel. Although this method uses a different frequency than the method in RG 5.71, which calls for annual assessments, or assessments immediately upon changes in personnel, this frequency does meet the requirements of 10 CFR 73.55(m), which allows the licensee to define these intervals based on its own assessments of need.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.44 RG 5.71, Sections C.3.3.2.1 through C.3.3.2.5, first paragraph and last bullet (pages 23 and 24)

The VEGP CSP deviates from RG 5.71 in a fashion similar to the deviation cited in Section 13.8.4.24.42 of this SER by committing not to apply the controls, but rather to address them. As previously stated, this deviation is consistent with the method in RG 5.71, and also meets the intent of the RG, provided that the licensee follows the process in Section 3.1.6 of Appendix A, to which SNC has committed.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.45 RG 5.71, Sections C.3.3.2.6 through C.3.3.2.9, first paragraph and last bullet (pages 24-26)

The VEGP CSP deviates from RG 5.71 in a fashion similar to the deviation cited in Sections 13.8.4.24.42 and 13.8.4.24.44 of this SER by committing to apply the controls, but rather to address them. As previously stated, this deviation is consistent with the method in RG 5.71, and also meets the intent of the RG, provided that the licensee follows the process in Section 3.1.6 of Appendix A, to which SNC has committed.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.46 RG 5.71, Section C.3.3.2.9, first paragraph, first bullet (page 25)

The VEGP CSP deviates from RG 5.71 by making an editorial correction to RG 5.71. This involves changing the first bullet:

- *develop, disseminate, and annually review and update the configuration management policy and program which defines the purpose of the nuclear facility's configuration management policy, scope, roles, requirements, responsibilities, and management commitments necessary to provide, with high assurance, that (1) when a modification to a CDA does not reduce the existing security and (2) any unauthorized or inadvertent modification of a CDA is prevented.*

to:

- *develop, disseminate, and annually review and update the configuration management policy and program which defines the purpose of the nuclear facility's configuration management policy, scope, roles, requirements, responsibilities, and management commitments necessary to provide, with high assurance, that (1) a modification to a CDA does not reduce the existing security and (2) any unauthorized or inadvertent modification of a CDA is prevented.*

This is acceptable because it captures the intent of this sentence in RG 5.71, by striking the word "when" after "(1)." This editorial mistake will be corrected in a future revision.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.47 RG 5.71, Section C.3.3.3.1, first paragraph and last bullet (page 26)

The VEGP CSP deviates from RG 5.71 in a fashion similar to the deviations cited in Sections 13.8.4.24.42, 13.8.4.24.44 and 13.8.4.24.45 of this SER, and by committing not to apply the controls, but rather to address them. As previously stated, this deviation is consistent with the method in RG 5.71, and also meets the intent of RG 5.71, provided that the licensee follows the process in Section 3.1.6 of Appendix A, to which SNC has committed.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.48 RG 5.71, Section C.3.3.3.1, second paragraph (page 26)

The VEGP CSP deviates from RG 5.71 by committing to Revision 1 of RG 1.152 and not Revision 2 of RG 1.152 as stated in RG 5.71. The results of the NRC staff's technical evaluation of the digital instrumentation and controls design of the AP1000 are documented in Chapter 7 of NUREG-1793 and its supplements. SNC's use of the defensive architecture as discussed in Section 13.8.4.6 is acceptable to the staff.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.49 RG 5.71, Section C.3.3.3.2, first paragraph, second sentence (page 26)

The VEGP CSP deviates from RG 5.71 by committing to provide adequate protection of high assurance against cyber attacks. Although this commitment is worded differently than the commitment provided in RG 5.71, it does meet the requirement of 10 CFR 73.54(a), which states that licensees "shall provide high assurance that digital computer and communication systems and networks are adequately protected against cyber attacks, up to and including the design basis threat as described in 10 CFR 73.1."

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.50 RG 5.71, Section C.3.4, second paragraph, first sentence (page 26)

The VEGP CSP deviates from RG 5.71 as described in Section 13.8.4.8 of this SER by committing not to integrate management of physical and cyber security, but rather to provide the management interfaces necessary to appropriately coordinate the physical and cyber security activities. The VEGP CSP includes a commitment to establish an organization that is responsible for cyber security and is independent of operations. The combination of an independent organization responsible for cyber security, and management coordination between physical and cyber security meets the requirements of the rule and does not provide less protection than the method described in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.51 RG 5.71, Section C.3.4, second paragraph, first bullet (page 27)

The VEGP CSP deviates from RG 5.71 as also described in Section 13.8.4.8 of this SER by committing not to form a unified security organization, but rather to establish a cyber security organization that is responsible for cyber security and is independent from operations. The combination of an independent organization responsible for cyber security, and management coordination as described in Section 13.8.4.24.50 of this SER between physical and cyber security meets the requirements of the rule, and does not provide less protection than the method described in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.52 RG 5.71, Section C.4, first paragraph, first sentence (page 27)

The VEGP CSP deviates from RG 5.71 by changing the phrase:

> *Once the security program is in place...*

to:

> *Once the cyber security program is in place...*

This deviation is acceptable because the CSP only applies to the applicant's cyber security program.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.53 RG 5.71, Section C.4, first paragraph, first bullet (page 28)

The VEGP CSP deviates from RG 5.71 as previously described in Section 13.8.4.11 of this SER by changing the phrase "continuous monitoring and assessment" to "ongoing monitoring and assessment." This description is consistent with the method in RG 5.71 by establishing intervals for these assessments, which include the same elements as in RG 5.71, and meeting the periodicity requirements of 10 CFR 73.55(m).

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.54 RG 5.71, Section C.4.1, section heading and first paragraph, first sentence (page 28)

The VEGP CSP deviates from RG 5.71 as previously described in Sections 13.8.4.11 and 13.8.4.24.53 of this SER by changing the phrase "continuous monitoring and assessment" to "ongoing monitoring and assessment." This description is consistent with the method in RG 5.71 by establishing intervals for these assessments, which include the same elements in RG 5.71 and meeting the periodicity requirements of 10 CFR 73.55(m).

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.55 RG 5.71, Section C.4.1, second paragraph, first sentence (page 28)

The VEGP CSP deviates from RG 5.71 as previously described in Sections 13.8.4.11, 13.8.4.24.53 and 13.8.4.24.54 of this SER by changing the phrase "continuous monitoring and assessment" to "ongoing monitoring and assessment." This description is consistent with the method in RG 5.71 by establishing intervals for these assessments, which include the same elements as in RG 5.71 and meeting the periodicity requirements of 10 CFR 73.55(m).

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.56 RG 5.71, Section C.4.1, second paragraph, first bullet (page 28)

The VEGP CSP deviates from RG 5.71 by making an editorial correction to RG 5.71. This involves changing the phrase:

> *ongoing assessments of verify that the security controls...*

to:

> *ongoing assessments to verify that the security controls...*

This change is acceptable because it captures the intent of this sentence in RG 5.71, by substituting "to" for "of."

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.57 RG 5.71, Section C.4.1, third paragraph, first and second sentences (page 28)

The VEGP CSP deviates from RG 5.71 as previously described in Sections 13.8.4.11, 13.8.24.53, 13.8.4.24.54 and 13.8.4.24.55 of this SER by changing the phrase "continuous monitoring and assessment" to "ongoing monitoring and assessment." This description is consistent with the method in RG 5.71 by establishing intervals for these assessments, which include the same elements as in RG 5.71, and meeting the periodicity requirements of 10 CFR 73.55(m).

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.58 RG 5.71, Section C.4.1.1, first paragraph, second sentence (page 28)

Section 3.1.1 of the VEGP CSP states that status of security controls will be verified in accordance with the requirements of 10 CFR 73.55(m).

The NRC staff reviewed the above and found that reviewing security controls in accordance with 10 CFR 73.55(m) is in accordance with RG 5.71. The time period between evaluations may be longer than the time period provided in RG 5.71. However, this period cannot exceed 24 months, which conforms to 10 CFR 73.54(g), requiring the applicant to review the cyber security program as a component of the physical security program in accordance with the requirements of 10 CFR 73.55(m), including the periodicity requirements. The requirements of 10 CFR 73.55(m) are that, at minimum, the applicant review each element of the physical protection program at least every 24 months.

The licensee has also committed to address C.13 of Appendix C to RG 5.71, "Security Assessment and Risk Management," which calls for vulnerability assessments on a quarterly basis. SNC commits to apply this control, apply an alternative that provides no less protection than C.13, or demonstrate that any attack vectors associated with vulnerabilities that may be discovered through quarterly assessments do not exist. The VEGP CSP also includes addressing controls that specifically include defined verification periods and that detect when some controls are not working correctly.

This, coupled with the CSP conforming to requirements of 10 CFR 73.55(m), which includes an initial assessment within 12 months of the program inception, and as necessary based on site-specific analyses, assessments, or other performance indicators, provides a level of protection consistent with the method in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.59 RG 5.71, Section C.4.1.2, first paragraph, third sentence (page 29)

Section 3.1.1 of the VEGP CSP states that effectiveness of security controls will be verified in accordance with the requirements of 10 CFR 73.55(m). As previously discussed in Section 13.8.4.12 of this SER, the NRC staff reviewed the above and found that the period of effectiveness analysis is comparable with that of RG 5.71.

The time period between evaluations is 12 months longer than the time period provided in RG 5.71. However, this 24-month time period conforms to 10 CFR 73.54(g) requiring the applicant to review the cyber security program as a component of the physical security program in accordance with the requirements of 10 CFR 73.55(m), including the periodicity requirements. The requirements of 10 CFR 73.55(m) are that, at minimum, the applicant review each element of the physical protection program, which includes the cyber security program, at least every 24 months and within 12 months of the implementation of the program, or within 12 months when changes that may adversely impact the security program occur.

Furthermore, the VEGP CSP states that controls will be reviewed according to the requirements of the security controls if that period of review occurs more often. This is also consistent with the method provided in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.60 RG 5.71, Section C.4.1.3, first paragraph, second sentence (page 29)

VEGP CSP Section 4.1.3 deviates from RG 5.71 by stating that vulnerability assessments will occur periodically. RG 5.71, Section C.4.1.3 states that vulnerability assessments will occur no less frequently than on a quarterly basis.

As previously described in Section 13.8.4.14 of this SER, the VEGP CSP states vulnerability assessments will be performed as specified in the security controls in Appendices B and C of RG 5.71, and when new vulnerabilities that could affect the effectiveness of the cyber security program and the security of the CDAs are identified. The licensee also commits to addressing vulnerabilities that could cause CDAs to become compromised or could have an adverse impact on SSEP functions. Section 13.1 of Appendix C of RG 5.71, which VEGP commits to address in accordance with the process in Section 3.1.6 of Appendix A, provides that vulnerability assessments should occur no less frequently than once a quarter, at random intervals, and when new potential vulnerabilities are reported and identified. SNC has not deviated from the interval.

The process the applicant has committed to in Section 3.1.6 of the VEGP CSP requires SNC, if it does not implement Section 13.1 of Appendix C, to implement an alternate control that does not provide less protection than the corresponding control in Appendices B and C, or to demonstrate that any attack vectors associated with vulnerabilities that may be discovered through quarterly assessments do not exist.

Therefore, if SNC does not implement the security control in Appendix C, Section 13.1 of RG 5.71, or deviates from the guidance for a quarterly vulnerability assessment, it will ensure that this deviation does not provide less protection than performing quarterly vulnerability assessments, and will provide an analysis that demonstrates that the attack vector does not exist and will document this justification for inspection.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.61 RG 5.71, Section C.4.2, first paragraph, second sentence (page 30)

The VEGP CSP deviates from RG 5.71 by committing not to implement the security controls in Section 11 of Appendix C of RG 5.71, but rather to address those controls in accordance with Section C.3.3 of RG 5.71.

As previously described in Section 13.8.4.7 of this SER, the VEGP CSP deviates from RG 5.71 by committing to address security controls rather than committing to apply them. The VEGP CSP states that when a control from Appendices B and C of RG 5.71, such as Section 11 of Appendix C, is not implemented that the licensee will implement alternate control(s) that "do not provide less protection that the corresponding" control in the appendix. This deviation is consistent with the method used in RG 5.71, which states that controls should provide equal or better protection.

As also previously discussed in Section 13.8.4.7 of this SER, the VEGP CSP deviates from RG 5.71 by stating that when a control can be proven to be unnecessary, the applicant will perform an analysis demonstrating that the control is not necessary, and will provide a documented justification. Therefore, SNC commits that in addressing the security controls in Appendix C, Section 11 of RG 5.71 that it will either apply the control, apply an alternative that does not

provide less protection or will demonstrate that the control is not necessary because the attack vectors do not exist. This method is consistent with the method used in RG 5.71, which also allows for controls to be addressed.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.62 RG 5.71, Section C.4.2.1, first paragraph, third sentence (page 30)

The VEGP CSP deviates from RG 5.71 in a manner similar to the previous deviation in Section 13.8.4.24.61 of this SER. Specifically, that configuration management will be used to ensure that each of the controls is addressed in Appendices B and C of RG 5.71, as opposed to implemented. This method is consistent with the method in RG 5.71, as the applicant commits to follow the process in Section C.3.3 of RG 5.71, which requires that the applicant implement the control, apply an alternative control that does not provide less protection than the corresponding control in RG 5.71, or demonstrate that the attack vector associated with the control does not exist. Therefore, the VEGP CSP method will provide no less protection than the method provided for in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.63 RG 5.71, Section C.4.2.1, second paragraph, third sentence (page 30)

The VEGP CSP deviates from RG 5.71 by including the statement, "in accordance with the process described in Section C.3.3 of this guide." As previously discussed in Section 13.8.4.14 of this SER, the method in Section C.3.3 is consistent with the method in RG 5.71, which requires that the licensee either implement the control, apply an alternative control that does not provide less protection than the corresponding control in RG 5.71, or demonstrate that the attack vector associated with the control does not exist. Therefore, the VEGP CSP method will provide no less protection than the method provided for in RG 5.71.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.64 RG 5.71, Section C.4.3, second paragraph (page 31)

The VEGP CSP deviates from RG 5.71, as previously discussed in Section 13.8.4.22 of this SER, by stating that the applicant has established the necessary measures and governing procedures to implement periodic reviews of applicable program elements, in accordance with the requirements of 10 CFR 73.55(m). Specifically, the VEGP CSP calls for a review of the program's effectiveness at least every 24 months. In addition, reviews are to be conducted as follows:

- *within 12 months following initial implementation of the program*

- *as necessary based upon site-specific analyses, assessments, or other performance indicators*

- *as soon as reasonably practical, but no longer than 12 months, after changes occur in personnel, procedures, equipment, or facilities that potentially could adversely affect cyber security*

- *by individuals independent of those personnel responsible for program management and any individual who has direct responsibility for implementing the program*

This deviates from RG 5.71 in the specific wording, but includes the same commitments as RG 5.71. Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.65 RG 5.71, Section C.5, second paragraph, second and third sentences (page 32)

As previously discussed in Section 13.8.4.23, the VEGP CSP deviates from RG 5.71 documentation retention commitments. Specifically, VEGP CSP Section 5 states the records are retained to document access history and information needed to discover the source of cyber attacks and incidents. The VEGP CSP deletes the phrase:

> *Records required for retention include, but are not limited to, digital records, log files, audit files, and nondigital records that capture, record, and analyze network and CDA events.*

The VEGP CSP commits to retaining all access history records, records to discover the source of cyber attacks or other security-related incidents affecting CDAs or SSEP functions, or both. This is consistent with what is included in RG 5.71 Section 5, as it includes all the performance-based characteristics and commitments of that section.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.66 RG 5.71, Glossary (Page 35)

The VEGP CSP's definition of a CDA deviates from the definition provided in RG 5.71. Specifically, the VEGP CSP deviates by stating that a CDA can be a CS or a subcomponent of a CS. This definition does not materially change the use of the term, and is correct: A CDA can be a CS. This definition is consistent with the definition in RG 5.71. The VEGP CSP, by the use of this definition, does not provide for less protection than RG 5.71, nor does this reduce the scope of the assets required to be protected under the rule.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.67 RG 5.71, Glossary (Page 35)

The VEGP CSP deviates from the definition of a CS in RG 5.71 by adding the caveat "as defined by the plant licensing basis." RG 5.71 states that a CS is an analog or digital technology based system in or outside the plant that performs or is associated with a safety-related, important-to-safety, security, or emergency preparedness function. These CSs include, but are not limited to, plant systems, equipment, communication systems, networks, offsite communications, or support systems or equipment, that perform or are associated with safety-related, important-to-safety, security, or emergency preparedness functions.

The addition of the phrase "as defined by the plants' licensing basis," limits the scope of the functions to those that are defined by the licensing basis. As previously discussed in Section 13.8.4.4 of this SER, the staff ~~was concerned that this modifier might cause the licensee to exclude CSs, which ought to be included, according to the rule~~ [found this modification acceptable]*.*
10 CFR 73.51(a)(1) requires that the licensee protect digital computer and communication systems and networks associated with: (i) safety-related and important-to-safety functions; (ii) security functions; (iii) emergency preparedness functions, including offsite communications; and (iv) support systems and equipment, which if compromised would adversely impact SSEP functions. However, further reviews resulted in the staff finding that the VEGP CSP scoping discussion adequately described a process to include all CDAs within the scope of 10 CFR 73.54(a)(1).

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.68 RG 5.71, Glossary (Page 35)

The VEGP CSP deviates from the RG 5.71 definition of cyber attack by replacing the phrase "conducted by threat agents having either malicious or non-malicious intent" with the phrase "conducted by threat agents." The NRC staff finds this deviation to be acceptable because deletion of the intent of a threat agent, be it malicious or non-malicious, still provides a commitment to protect against threats by threat agents.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

13.8.4.24.69 RG 5.71, Appendix A, Introduction (Page A-1)

The VEGP CSP deviates from the RG 5.71 scope discussion by including within scope systems or equipment that perform important to safety functions SSCs in the BOP that could directly or indirectly affect reactivity at a nuclear power plant and could result in an unplanned reactor shutdown or transient. Additionally, these SSCs are under the licensee's control and include electrical distribution equipment out to the first inter-tie with the offsite distribution system. The NRC

staff finds this deviation to be acceptable because it is consistent with Commission policy.

Based on the above review and assessment, the NRC staff finds that this deviation is acceptable.

License Conditions

- *Part 10, License Condition 2, COL Item 13.6-5 and License Condition 3, Item G.10*

The applicant proposed two license conditions in Part 10 of the VEGP COL application, which will require the applicant to implement the cyber security program prior to initial fuel load.

In a letter dated October 22, 2010, the applicant provided supplemental information which proposed to amend the milestone included in Part 2, FSAR Table 13.4-201 to implement the cyber security program prior to receipt of fuel onsite (protected area.) The NRC staff finds the proposed implementation milestone for the cyber security program (security prior to receipt of fuel onsite (protected area)) appropriate and in accordance with the requirement in 10 CFR 73.55(a)(4). Therefore the staff finds that the proposed License Conditions 2 and 3 are not necessary.

- *Part 10, License Condition 6*

The applicant proposed a license condition in Part 10 of the VEGP COL application to provide a schedule to support the NRC's inspection of operational programs, including the cyber security program. Although the CSP is not identified as an operational program in SECY-05-0197, the proposed license condition is consistent with the policy established in SECY-05-0197 for operational programs in general, and is acceptable.

VCSNS Clarifying Information Regarding License Condition 2, COL Item 13.6-5

VCSNS COL application, Part 10, Revision 2 did not include License Condition 2, COL Item 13.6-5 regarding CSP. Therefore, the discussion above regarding removal of this license condition is not applicable to VCSNS.

13.8.5 Post Combined License Activities

For the reasons discussed in the technical evaluation section above, the staff finds the following license condition proposed by the applicant acceptable:

- License Condition (13-7) - No later than 12 months after issuance of the COL, the licensee shall submit to the Director of NRO a schedule that supports planning for and conduct of NRC inspection of the cyber security program implementation. The schedule shall be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until the cyber security program has been fully implemented.

13.8.6 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 cyber security, 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 NRC staff has reviewed the CSP for format and content using the NRC CSP template in RG 5.71, and found it to include all features considered essential to such a program. In particular the staff has found it to comply with applicable Commission regulations including 10 CFR 73.1, 10 CFR 73.54, 10 CFR 73.55(a)(1), 10 CFR 73.55(b)(8), 10 CFR 73.55(m), and 10 CFR Part 73, Appendix G.