3.0 SITE SAFETY ASSESSMENT

3.5.1.6 Aircraft Hazards

3.5.1.6.1 Introduction

For its ESP application, the applicant provided information evaluating the potential hazards associated with aircraft. The NRC staff reviews these evaluations to ensure that the risks associated with potential aircraft hazards are sufficiently low.

3.5.1.6.2 Regulatory Basis

The acceptance criteria for aircraft hazards are based on meeting the relevant requirements of 10 CFR 52.17 and 10 CFR Part 100. The NRC staff considered the following regulatory requirements in reviewing the site location and area description.

- 10 CFR 52.17, insofar as it requires the applicant to provide the location and description of any nearby military or transportation facilities and routes.

- 10 CFR Part 100, as it relates to the following:

- 10 CFR 100.20(b), which requires that the nature and proximity of man-related hazards (e.g., airports, transportation routes, and military facilities) must be evaluated to establish site parameters for use in determining whether a plant design can accommodate commonly occurring hazards, and whether the risk of other hazards is very low.

- 10 CFR 100.21(e), which states that the potential hazards associated with nearby transportation routes, industrial, and military facilities must be evaluated and site parameters established such that potential hazards from such routes and facilities will pose no undue risk to the type of facility proposed to be located at the site.

RS-002, Section 3.5.1.6, specifies that these requirements are met if the probability of aircraft accidents having the having the potential for radiological consequences greater than the 10 CFR Part 100 exposure guidelines is less than about 10^{-7} per year. The probability is considered to be less than about 10^{-7} per year by inspection if the distance from the site meets all of the following criteria:

1. the site-to-airport distance (D) is between 5 and 10 statute miles and the projected annual number of operations is less than 500 D^2, or the site-to-airport distance (D) is greater than 10 statute miles, and the projected annual number of operations is less than 1000 D^2,

2. the site is at least 5 statute miles from the edge of military training routes, including low-level training routes, except for those associated with usage greater than 1000 flights per year, or where activities (such as practice bombing) may create an unusual stress situation, and

3. the site is at least 2 statute miles beyond the nearest edge of a Federal Airway, holding pattern, or approach pattern

If the above proximity criteria are not met, or if sufficiently hazardous military activities are identified, then a detailed review of aircraft hazards should be performed. Section 3.5.1.6 of RS-002 provides guidance on the performance of such reviews.

3.5.1.6.3 Technical Evaluation

Following the procedures described in RS-002, Section 3.5.1.6, the NRC staff reviewed Section 3.5.1.6 of the SSAR included in the VEGP application. In this section, the applicant provided information that addressed and analyzed aircraft hazards. The applicant's response to the NRC staff's RAI 3.5.1.6-1 further supplements this information with regard to the calculation of effective area being used in the aircraft hazards analysis.

In Section 2.2.2.6 of the SSAR, the applicant presented information concerning the airports, airways, and military training routes in the site vicinity that need to be evaluated for potential hazards with respect to nuclear units that might be constructed on the proposed ESP site.

The applicant stated that all airports in the VEGP site vicinity are greater than 10 miles from the site. The closest and largest commercial airport is the Augusta Regional Airport at Bush Field (Bush Field), which is located about 17 miles north-northwest of the VEGP site. According to the applicant, on the basis of FAA projections up to 2025, the number of airport operations (including landings and take-offs) is estimated to be about 43,000.

The applicant stated that this total number of projected aircraft operations is substantially less than the threshold number of operations set forth in RS-002, Section 3.5.1.6., which indicates that the probability for the aircraft accident is considered acceptable if the projected annual number of operations is less than 1000 D^2, where D is the site-to-airport distance in miles. The applicant also stated that other airports in the vicinity are much smaller than Bush Field. The applicant noted that the aircraft hazard threshold for these airports is greater than the 100,000 annual number of operations because of their distance from the site. This threshold annual number of operations is significantly higher than the estimated annual operations for each of these airports. Therefore, the applicant found that the hazard probability of these airports was acceptable and did not require a detailed evaluation of the potential hazards with respect to aircraft operations at these airports.

The applicant stated that there is a small unimproved grass airstrip located immediately north of the VEGP site (north of Hancock Landing Road and west of the Savannah River). This privately owned and operated airstrip has a 1650-foot turf runway oriented 80 degrees east- 260 degrees west. The airstrip is for personal use and the associated traffic consists of small single-engine aircraft. In addition, a small helicopter landing pad is located on the VEGP site. This facility exists for corporate use and for use in case of emergency. The traffic associated with either of these facilities may be characterized as sporadic. The applicant stated that because of the small amount and the nature of the traffic, these facilities do not present a safety hazard to the VEGP site.

The applicant stated that the closest military training route is VR97-1059, the nearest edge of which is located more than 6 miles from the VEGP site. Military aircraft using route VR97-1059 come mainly from Shaw Air Force Base (about 32 miles east of Columbia, South Carolina) and McEntire Air National Guard Station (about 13 miles east-southeast of Columbia). The applicant stated that the total number of military aircraft using route VR97-1059 is approximately 833 per year. According to RS-002, the aircraft accident probability for a military training route is considered to be less than 10^{-7} per year if the distance from the site is at least 5 miles from the edge of the military training route, including low-level training routes, except for routes that have a usage greater than 1000 flights per year or where activities may create an unusual stress situation. The applicant stated that since the VEGP site is located more than 5 miles from the edge of VR97-1509, and the total military flights (833 per year) using the same route is less than 1000 per year, no aircraft accident analysis is required for flights using VR97-1509. The probability number of 10^{-7} was cited from RG 1.70, Revision 3, issued November 1978, in reference to design basis external events.

The applicant stated in Section 2.2.2.6.2 of the SSAR that the centerline of Airway V185 is approximately 1.5 miles west of the VEGP site. Additionally, Airway V417 is about 12 miles northeast of the VEGP site, and Airway V70 is approximately 20 miles south of the VEGP site. Because the VEGP site is within the 2 statute-mile limit specified in Section 3.5.1.6 of RS-002, the applicant performed a more detailed review of aircraft hazards associated with air traffic along the V185 Airway; and this analysis was presented in Section 3.5.1.6 of the SSAR. The applicant stated that the FAA does not maintain records of air traffic in Airway V185. Therefore, since the traffic data for Airway 185 is not available, the applicant calculated the maximum number of airway flights per year required to exceed the acceptance guideline crash probability of 10^{-7} per year as stated in RS-002 and NUREG-0800. The applicant estimated that the total number of flights traveling along Airway V185 would need to be greater than approximately 51,100 per year in order to exceed a crash probability of 10^{-7} per year. Since this value is higher than the projected yearly total of flights through 2025 at Bush Field, the applicant did not consider Airway V185 to pose a significant hazard to the VEGP site.

The NRC staff independently verified the applicant-identified airports. The NRC staff contacted the FAA, and obtained the Bush Field flight operations data for the 2000 through 2006. These data reveal that the average number of flight operations at Bush Field is about 42,363, which is comparable to the applicant's stated number. Therefore, the NRC staff agrees with the applicant's conclusion that all public and private airports in the vicinity of the VEGP do not have sufficient annual flight operations to warrant a detailed risk analysis for potential nuclear units at the ESP site.

The NRC staff verified the applicant's cited reference of 14 CFR Part 71, "Designation of Class A, B, C, D, and E Airspace Areas; Air Traffic Routes, and Reporting Points." The applicant used the information cited in this regulation in recommending the width of the airway as 4 nautical miles on either side of the centerline, for a total width of 8 nautical miles. The NRC staff also verified the applicant's effective area calculation based on applicant's reference of the 1996 U.S. DOE guidance. The FAA provided the NRC staff with the number of flights that traversed V185 airways (FAA, 2007). As a result of the large amount of data to be analyzed, as well as the limitations of computing time and data handling, the FAA estimated the flight count data by extracting the flight count along V185 airways for every Thursday (typically as this day of the week is observed to have large number of flights) from January 2003 through December 2006. Based on these FAA data, the NRC staff calculated the average number of flights along V185 airways to be about 3000 per year. Also based on this value and the guidance provided in RS-002, Section 3.5.1.6, the NRC staff independently estimated the

annual probability of an aircraft traversing along V185, crashing into the plant to be about 6×10^{-9}.

The NRC staff evaluated the applicant's analysis of military aircraft for route VR97-1059. Based on 3 years of military training route data for Route VR97-1059, Shaw Air Force Base determined the average number of military training flights to be 761 compared to the applicant's referenced data of 833. Because the actual flights are lower than the threshold value of 1000 flights per year, the NRC staff finds the probability to be less than 10^{-7} per year. Regarding the identification of any activities within VR97-1059 that could create an unusual stress situation, Shaw Air Force Base informed the NRC staff that practice bombings are not authorized within Route VR97-1059. However, Shaw Air Force Base indicated that military aircraft will fly to Poinsett Range, to practice bombing and strafing. Inert bombs are used at Poinsett Range, instead of live bombs. Poinsett Range is approximately 10 miles south of Shaw Air Force Base. The NRC staff calculated the distance from the VEGP site to Poinsett Range to be approximately 78 miles. The guidance contained in RG 1.70 specifies that an aircraft hazard analysis should be done for practice bombing ranges within 20 miles from the site. Because the distance from the VEGP site to Poinsett Range is greater than the 20-mile distance specified in RG 1.70, the NRC staff finds the practice bombing at Poinsett Range does not create any unusual stress situations.

The NRC staff has reviewed the applicant's assumptions and calculations and finds them to be reasonable, consistent, and acceptable. On the basis of its independent estimation of the probability of a potential aircraft crash, the NRC staff agrees with the applicant's conclusion that Airway V185 does not present a safety concern for the VEGP site.

3.5.1.6.4 Conclusions

The NRC staff has reviewed the applicant's aircraft hazard analysis using the procedures delineated in RS-002, Section 3.5.1.6. As set forth above, the NRC staff has independently verified the applicant's assessment of aircraft hazards at the site and has concluded that the estimated probability of an accident having the potential for radiological consequences in excess of the exposure criteria found in 10 CFR Part 100 is less than about 10^{-7} per year.

Based on these considerations, the NRC staff concludes that aircraft hazards do not present an undue risk to the safe operation of nuclear units at the proposed ESP site. Therefore, the NRC staff concludes that, with respect to aircraft hazards, the proposed site is acceptable for planned nuclear units, and that the site meets the relevant requirements of 10 CFR Part 52 and 10 CFR Part 100.

3.7 Seismic Design

The AP1000 seismic Category I and II structures, systems, and components (SSCs) are designed to withstand the effects of seismic loads as defined in terms of the certified seismic design response spectra (CSDRS).

Seismic Category I SSCs are designed to withstand the effects of seismic motions defined in terms of the CSDRS and to maintain their specified design functions. Seismic Category II and nonseismic structures are designed or physically arranged (or both) so that seismic motions defined in terms of the CSDRS cannot cause unacceptable structural interaction with or failure of seismic Category I SSCs.

3.7.1 Seismic Design Parameters

3.7.1.1 Introduction

In its application, SSAR Part 2, Section 3.8, the applicant submitted details for performing work within the scope of the limited work authorization (LWA) request in accordance with 10 CFR 52.17(c) and 10 CFR 50.10(d). The scope of the applicant's LWA request involves soil foundation work and the placement of a concrete mudmat, a waterproofing membrane, concrete forms, a mechanically stabilized earth (MSE) retaining wall, and drains. The applicant, in SNC letter AR-08-1337, dated September 10, 2008 (ADAMS Accession No. ML082590048), states that the scope of the LWA request excludes the placement of steel reinforcement, embedments, and concrete for the structural foundation (basemat).

The scope of the staff's review of the applicant's LWA request is limited to SRP Sections 3.7.1,"Seismic Design Parameters," 3.7.2,"Seismic System Analysis," and 3.8.5, "Foundations." These sections address the applicant's LWA request to install a mudmat with an embedded waterproofing membrane. The mudmat, as indicated in SSAR Section 3.8, is to be placed over competent soil and constructed in two halves, with a waterproofing membrane placed between the two halves.

Accordingly, the staff evaluated the applicant's (1) seismic analysis and design, including (a) the design ground motion, (b) the foundation input response spectra, and (c) the supporting media for seismic design, and (2) applicable seismic system analyses, including (a) the foundation stability of the nuclear island (NI) against sliding and overturning, (b) the maximum dynamic bearing pressures developed beneath the foundation basemat, and (c) the horizontal seismic shear stresses developed between the basemat and the top of the mudmat, between the two halves of the mudmat through the waterproofing membrane, and between the bottom of the mudmat and the foundation soils.

The staff will perform the remaining review of the applicant's seismic design (i.e., for portions outside the scope of the LWA request) during its review of the Vogtle subsequent combined operating license (SCOL) application currently on Docket 52-025 and 52-026. The staff's review of Vogtle SCOL FSAR Section 3.7 will reflect the findings of the LWA review as appropriate.

3.7.1.2 Regulatory Basis

The staff relied on the following applicable regulatory requirements in reviewing the applicant's discussion of seismic design parameters:

- 10 CFR Part 100, Subpart B, which is applicable to power reactor site applications on or after January 10, 1997, refers to 10 CFR 100.23 for seismic criteria. This section describes the criteria and nature of investigations required to obtain the geologic and seismic data necessary to determine the suitability of the proposed site and the plant design bases. In addition, 10 CFR 100.23 refers to Appendix S to 10 CFR Part 50 for the definition of the minimum SSE ground motion for use in design.

- 10 CFR Part 50, Appendix S, is applicable to applications for a design certification or combined license pursuant to 10 CFR Part 52. Appendix S requires that, for SSE ground motions, SSCs will remain functional and within applicable stress, strain, and deformation limits. The required safety functions of SSCs must be assured during and after the vibratory ground motion through design, testing, or qualification methods. The evaluation must take into account SSI effects and the expected duration of the vibratory motion. Appendix S also requires that the horizontal component of the SSE ground motion in the free field at the foundation level of the structures must be an appropriate response spectrum with a PGA of at least. 0.10g.

- 10 CFR 52.79(b) applies to a COL referencing an ESP and requires information sufficient to demonstrate that the design of the facility falls within the site characteristics and design parameters specified in the ESP.

- 10 CFR 52.79(d)(1) applies to a COL referencing a design certification and requires that COL applications include information sufficient to demonstrate that the characteristics of the site fall within the site parameters specified in the design certification.

In addition, the seismic design parameters should be consistent with appropriate sections from:

- Regulatory Guide 1.60, "Design Response Spectra for Seismic Design of Nuclear Power Plants," Revision 1, December 1973

- Regulatory Guide 1.61, "Damping Values for Seismic Design of Nuclear Power Plants," Revision 3, March 2007

- Regulatory Guide 1.208, "A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion," March 2007

Section 3.7.1 of NUREG-0800 provides specific guidance concerning the evaluation of seismic design parameters.

3.7.1.3 Technical Evaluation

3.7.1.3.1 Technical Information Presented by the Applicant

To support the technical basis for the LWA, the applicant incorporated by reference (IBR) the AP1000 DCD, Revision 15, Tier 1 Section 3.3, and Tier 2 Sections 2.5.2.3, 3.7.1, 3.7.2, and 3.8.5.

In addition, the applicant performed site-specific seismic analysis and provided the results in SSAR Appendix 2.5E, "AP1000 Vogtle Site Specific Seismic Evaluation Report, Revision 3."

3.7.1.3.1.1 AP1000 Standard Design

AP1000 DCD, Revision 15, Tier 2, FSAR Section 3.7.1, describes the CSDRS for the AP1000 design. These response spectra, as indicated in DCD FSAR Figures 3.7.1-1 and 3.7.1-2, are based on Regulatory Guide (RG) 1.60 amplified in the high-frequency region from 9 Hz to 25 Hz. The AP1000 CSDRS have peak ground accelerations (PGAs) of 0.30g in both the vertical and horizontal directions, which are applied at the foundation level in the free field for rock sites and at the finished grade for other generic soil conditions.

3.7.1.3.1.2 Vogtle Design Ground Motion Response Spectra

In SSAR Section 2.5.2, the applicant described its approach for developing the GMRS using the performance-based method described in RG 1.208. The Vogtle site-specific GMRS are defined at the free ground surface in the free field, which is defined as the finished grade level (Plant elevation 220 feet).

In SSAR Appendix 2.5E, Figures 3-4 and 3-5, the applicant compared the Vogtle GMRS to the AP1000, Revision 15, CSDRS. The free-field GMRS PGAs at the finished grade level are approximately 0.26g in the horizontal direction and 0.23g in the vertical direction and are bounded by the AP1000 CSDRS free-field PGA of 0.30.

SSAR Appendix 2.5E, Figures 3-4 and 3-5, indicate that the Vogtle site-specific GMRS exceed the AP1000 CSDRS in the approximate frequency ranges of 0.4–0.7 Hz and 7–60 Hz for the horizontal direction and 0.5–0.6 Hz and 12–50 Hz for the vertical direction. As a result of these exceedances, the applicant performed a site-specific soil-structure interaction (SSI) analysis to demonstrate either the suitability of the AP1000 standard design (Revision 15) or to justify the adequacy of the mudmat, the waterproofing membrane, and the NI structure stability. The applicant described these analyses in SSAR Appendix 2.5. FSER Section 3.7.2 describes the staff's review of these SSI analyses.

In SSAR Appendix 2.5E, Section 3.0, the applicant described its approach for developing the site-specific foundation input response spectra (FIRS) for Vogtle Units 3 and 4. The Vogtle FIRS are free-field outcrop spectra (determined using the entire soil column from bedrock to the free surface) at the foundation basemat elevation (i.e., 40 feet below the finished grade level). In SSAR Appendix 2.5E, Section 3.0, the applicant defined the Vogtle FIRS at 5-percent equipment damping, which is consistent with requirements in DCD FSAR, Tier 2, Section 2.5.2.3.

For the purpose of performing site-specific SSI calculations, the applicant chose to use the 5-percent damped spectrum as input to the three deterministic SSI soil profiles determined from the site-specific probabilistic site response analysis at the median or best estimate, 14th percentile or lower bound, and 84th percentile or upper bound levels. For each profile, the applicant computed the surface and corresponding in-column spectra for use in the three deterministic SSI calculations. The applicant determined the corresponding in-column spectra for each case at an elevation in the profile which is the same as the FIRS outcrop and which represents the free-field particle motions at that depth. For each of the three SSI cases, the applicant generated three enveloping time histories (two horizontal and one vertical) to envelop the in-column spectra at 40 feet below the finished grade level. The applicant then used these in-column time histories as input to the SSI cases at 40 feet below the finished grade.

3.7.1.3.1.3 Percentage of Critical Damping Values

For seismic analysis of Category I structures, the applicant used values of critical damping consistent with RG 1.61, "Damping Values for Seismic Design of Nuclear Power Plants." The applicant assumed the critical damping value for reinforced concrete to be 7 percent and the maximum critical damping value for free-field soil layers to be less than 15 percent.

3.7.1.3.1.4 Supporting Media for Seismic Category I Structures

In SSAR Appendix 2.5E, Section 2.0, the applicant described the Vogtle site characteristics. The subsurface materials for the Vogtle site consist of approximately 90 feet of loose to dense sands, 70–80 feet of very hard, slightly sandy clay (i.e., Blue Bluff Marl), 900 feet of dense sands, and Triassic sandstone at 1049 feet. The applicant will excavate the upper 90 feet of soil and replace it with approximately 50 feet of compacted granular fill materials from the top of Blue Bluff Marl to the free ground surface. The fill material will be taken from borrow materials available locally. SSAR Appendix 2.5E, Section 2.0, states that the location of the water table is expected to be at least 15 feet below the bottom of the basemat of the NI. This is consistent with the applicant's proprosed site characteristic value of 165 feet MSL for the highest ground water elevation at the site, and the proposed elevation of the bottom of the AP1000 nuclear island basemat (180 feet MSL). The SSI analysis relied on the ground water table to be 15 feet below the basemat elevation.

3.7.1.3.2 NRC Staff's Technical Evaluation

The scope of the staff's review of SSAR Appendix 2.5E is limited to those sections that support the applicant's LWA request to install a mudmat with an embedded waterproofing membrane. To this end, the staff evaluated the applicant's technical basis for developing appropriate seismic design parameters for (1) comparing with the AP1000, Revision 15, CSDRS, (2) satisfying regulatory requirements, and (3) using appropriate input motions to the site-specific SSI analyses. The staff's evaluation of the applicant's seismic design parameters was performed in accordance with SRP Section 3.7.1.

The applicant used the site-specific seismic design parameters (e.g., GMRS, FIRS, and associated randomized soil profiles) to support SSI analyses which evaluated the effects of NI dynamic response. In addition, the applicant performed SSI analyses to demonstrate that a basemat sliding coefficient of friction of 0.45 between the mudmat and the supporting soils, would prevent the NI structure from sliding against the supporting soils under the SSE seismic loads.

3.7.1.3.2.1 Design Ground Motion Response Spectra

As stated previously, SSAR Appendix 2.5E, Figures 3-4 and 3-5, indicate that the Vogtle site-specific GMRS exceed the AP1000, Revision 15, CSDRS in the approximate frequency ranges of (0.4–0.7 Hz) and (7–60 Hz) for the horizontal direction and (0.5–0.6 Hz) and (12-50 Hz) for the vertical direction. As a result of these exceedances, the applicant performed a site-specific SSI analysis either to demonstrate suitability of the AP1000, Revision 15, standard design or to justify the adequacy of the mudmat, the waterproofing membrane, and the NI structure stability. The applicant described these analyses in SSAR Appendix 2.5E, "AP1000 Vogtle Site Specific Seismic Evaluation Report, Revision 3." FSER Section 3.7.2 describes the staff's review of these SSI analyses.

The staff reviewed the applicant's method for developing the site-specific FIRS and reviewed the applicant's methods for developing spectrum compatible time histories, randomized soil profiles, artificial shear wave velocity profiles, and degradation curves for Vogtle.

The staff's review found that (1) the process used to generate randomized shear wave velocity profiles and (2) the procedures used to generate the mean uniform hazard spectra at the free-ground surface at the top of the backfill satisfied the standard guidance described in RG 1.208 and in SRP Section 3.7. However, the staff found that the procedures used to generate the corresponding "outcrop" motions at the 40-foot depth (bottom of the NI foundation) were not in accordance with SRP Section 3.7. The motions included the effects of the downcoming waves in the calculation and were inconsistent with the need to generate the outcrop motions at a free-ground surface. To address the inconsistency in generating outcrop motions, the applicant compared the surface motions used as input to the SSI calculations for the best estimate, lower bound, and upper bound site-specific profiles using the FIRS outcrop motion at the 40-foot horizon (SSAR Appendix 2.5E, Section 3.0, Figures 3-6 through 3-8). The staff reviewed these comparisons and found that the applicant's approach to generating the SSI input motions from the FIRS motion resulted in conservative horizontal and vertical motion. Therefore, in the case of Vogtle Units 3 and 4, the staff accepts the applicant's approach to generating the FIRS outcrop motion and corresponding time-histories for use in site-specific SSI analyses.

The staff reviewed the applicant's compliance with the 10 CFR Part 50, Appendix S, requirement that the horizontal component of the SSE ground motion in the free field at foundation level be an appropriate response spectrum with a PGA of at least 0.10g. SSAR Appendix 2.5E (Figures 3-4 and 3-5) demonstrates that the Vogtle FIRS PGAs at the bottom of the NI foundation are approximately 0.26g in the horizontal direction and 0.23g in the vertical direction and thus are greater than the 0.10g regulatory requirement. On the basis of this comparison, the staff finds that the applicant has satisfied the Appendix S requirement.

3.7.1.3.2.2 Percentage of Critical Damping Values

As part of the detailed review of the applicant's SSI analysis, the staff reviewed the applicant's critical damping values used in the SSI analysis of seismic Category I structures (i.e., 7 percent for reinforced concrete and less than 15 percent for soil) and found them to be consistent with RG 1.61.

3.7.1.3.2.3 Supporting Media for Seismic Category I Structures

The staff reviewed the applicant's description of supporting media for the NI, including foundation embedment depth, depth of soil over bedrock, soil layering characteristics, highest groundwater elevation, dimensions of the foundation, and soil properties in SSAR, Section 2.5.4, and Appendix 2.5E. The staff finds the 40 foot embedment and dimensions of the foundation to be consistent with the AP1000, Revision 15, NI. Additionally, the staff finds that the SSI modeling assumptions relating to depth of soil over bedrock, soil properties, soil layering characteristics and groundwater elevation are acceptable based on conformance to the criteria discussed in SRP Section 3.7.1.

The staff reviewed the ESP-calculated best-estimate soil shear wave velocity profile, described in SSAR Appendix 2.5E, Section 4.0, and found that the shear wave velocity through the backfill soil was approximately 500 fps at the ground surface, greater than 1,000 fps at the bottom of the basemat, and about 2,800 fps at approximately 700 feet below grade. The staff finds that the 1,000 fps shear wave velocity at the bottom of the basemat meets the SRP Section 3.7.1.3 criterion for minimum shear wave velocity of the supporting foundation material.

3.7.1.4 Conclusion

On the basis of its review of the applicant's submittal, the staff concludes that the applicant has adequately developed seismic design parameters (e.g., GMRS, FIRS, and associated randomized soil profiles) for use in comparing to the AP1000, Revision 15, CSDRS, satisfying regulatory requirements, and performing a site-specific two-dimensional SSI analysis to evaluate foundation stability and basemat bearing pressures.

The staff's conclusions are based on the following five findings:

(1) The free-field GMRS PGAs at the finished grade level are approximately 0.26g in the horizontal direction and 0.23g in the vertical direction and are bounded by the DCD, Revision 15, SSE free-field PGA of 0.30.

(2) Although the applicant's method for developing the FIRS (at 40 feet below grade as outcrop motion) was not consistent with SRP Section 3.7, the method resulted in conservative seismic demand.

(3) The FIRS in the free field satisfied the minimum PGA value of 0.10g and is suitably broad banded.

(4) The critical damping values used in SSI analysis were consistent withdamping values used in RG 1.61.

(5) The 1,000 fps shear wave velocity at the bottom of the basemat meets the SRP Section 3.7.1.3 criterion for minimum shear wave velocity of the supporting foundation material.

Therefore, the staff finds that with respect to the LWA request, the applicant has met the applicable requirements of 10 CFR 52.79(b), 10 CFR 52.79(d)(1), and 10 CFR Part 50, Appendix S in that the applicant adequately demonstrated (1) that the relevant portions of the design of the facility falls within the site characteristics and design parameters specified in the ESP and AP1000 certified design (Revision 15) and (2) that the horizontal component of the SSE ground motion in the free-field at the foundation elevation is an appropriate response spectrum with a PGA of at least 0.10g.

3.7.2 Seismic System Analysis

3.7.2.1 Introduction

SSAR Section 3.0, Figures 3-4 and 3-5, indicate that the Vogtle GMRS exceed the AP1000 CSDRS in the approximate frequency ranges of (0.4–0.7 Hz) and (7–60 Hz) for the horizontal direction and (0.5–0.6 Hz) and (12–50 Hz) for the vertical direction. As a result of these exceedances, the applicant performed site-specific analyses to demonstrate the suitability of the AP1000, Revision 15, certified design.

The staff reviewed the applicant's site-specific two-dimensional SSI analyses to ascertain the appropriateness of the model(s) for estimating the maximum horizontal and vertical inertial loads on the NI resulting from SSE loading. These inertial loads are used to compute factors of safety for sliding and overturning and to compute maximum foundation bearing pressures anticipated to develop from the seismic motions. The staff focused its review on computer model descriptions, analysis assumptions, shear wave velocity profiles, and sensitivity studies on backfill properties. The staff did not evaluate in-structure response of the NI because it was not needed for the LWA request.

3.7.2.2 Regulatory Basis

The staff relied on the following applicable regulatory requirements in its review of the applicant's discussion of seismic systems analysis:

- 10 CFR Part 50, General Design Criterion (GDC) 2, requires that the design basis reflect appropriate consideration of the most severe earthquakes that have been historically reported for the site and surrounding area with sufficient margin for the limited accuracy, quantity, and period of time in which historical data have been accumulated.

- 10 CFR Part 100, Subpart B of 10 CFR Part 100, which is applicable to power reactor site applications on or after January 10, 1997, refers to 10 CFR 100.23 for seismic criteria. This section describes the criteria and nature of investigations required to obtain the geologic and seismic data necessary to determine the suitability of the proposed site and the plant design bases. This section also indicates that Appendix S to 10 CFR Part 50 contains applications to engineering design.

- 10 CFR Part 50, Appendix S, is applicable to applications for a design certification or combined license pursuant to 10 CFR Part 52. Appendix S requires that, for SSE ground motions, SSCs will remain functional and within applicable stress, strain, and

deformation limits. The required safety functions of SSCs must be assured during and after the vibratory ground motion through design, testing, or qualification methods. The evaluation must take into account SSI effects and the expected duration of the vibratory motion. Appendix S also requires that the horizontal component of the SSE ground motion in the free field at the foundation level of the structures must be an appropriate response spectrum with a PGA of at least 0.10g.

In addition, the seismic systems analysis should be consistent with appropriate sections from:

- Regulatory Guide 1.60, "Design Response Spectra for Seismic Design of Nuclear Power Plants," Revision 1, December 1973

- Regulatory Guide 1.92, "Combining Modal Responses and Spatial Components in Seismic Response Analysis," Revision 2, July 2006

Section 3.7.2 of NUREG-0800 provides specific guidance concerning the evaluation of seismic analysis methods.

3.7.2.3 Technical Evaluation

3.7.2.3.1 Technical Information Provided by the Applicant

3.7.2.3.1.1 Seismic Model Description

Structural Model

SSAR Appendix 2.5E, Section 4.0, describes the applicant's seismic analysis performed using the dynamic analysis computer code, "System for Analysis of Soil-Structure Interaction" (SASSI). The NI seismic analysis models used two-dimensional SASSI stick models to represent the AP1000 auxiliary shield building (ASB), the steel containment vessel (SCV), and the containment internal structure (CIS). These models made conservative assumptions with respect to the structural configuration of the auxiliary shield building. The applicant modeled the reinforced concrete of the ASB and CIS with linear elastic constitutive models. The applicant used guidance provided in FEMA 356 to reduce the concrete modulus of elasticity by 20 percent to account for reduced stiffness under moderate seismic loading conditions.

To account for the SSI effects on the NI response, the NI SSI model includes adjacent buildings such as the annex, radwaste, and turbine buildings, which are idealized by either lumped masses (radwaste and turbine buildings) or as a two-dimensional stick model (annex building).

Soil Model

The soil adjacent to the NI foundation is modeled by 8 uniform layers, with a horizontal spacing of approximately 5 feet. Soil elements are used to connect the foundation elements to the adjacent soil layers. The soil below the NI foundation is modeled with 81 elements to a depth of 1050 feet.

Ground Motion Input

The control motion input for the SSI analyses is the FIRS outcrop motion located at the NI foundation elevation. The applicant developed the FIRS outcrop motion from the three ESP soil profiles shown in SSAR Section 4.0, Figure 4.1-2. The results of the probabilistic site response analyses define these lower bound, best-estimate, and upper bound soil profiles. The enveloping of results from the three deterministic SSI analyses is intended to account for uncertainties in soils at the site as well as variability of wave-field effects assumed for the SSI analysis.

The applicant also developed a separate FIRS outcrop motion using the three sensitivity (SEN) soil profiles shown in SSAR Section 5.0, Figure 5.0-1. The SEN soil profiles assumed a slightly greater soil shear wave velocity in the NI backfill to account for variations in backfill compaction. The applicant performed these additional two-dimensional analyses to determine sensitivity in calculated response to properties of the backfill materials.

3.7.2.3.1.2 Soil-Structure Interaction Analyses

SSAR Appendix 2.5E, Section 5.0, describes the applicant's SSI analyses. The applicant used these analyses to determine the maximum horizontal and vertical inertial loads on the NI resulting from SSE loading. The SSAR defines the SSI model which used the ESP soil profiles as the ESP model. Similarly, the SSAR defined the SSI model which used the SEN soil profiles as the SEN model.

Sensitivity Studies

The applicant performed three sensitivity studies to address uncertainties in backfill soil modeling and its effects on NI response calculations. These sensitivity studies compared the effects of (1) variable compaction of the entire backfill soil adjacent to the NI, (2) modeling simplifications for the backfill excavation geometry, and (3) variable compaction of backfill soil within a 5-foot zone adjacent to the NI while the backfill outside of this zone remain unvaried.

SSAR Appendix 2.5E, Section 5.0, describes the applicant's approach to and results from sensitivity studies on variable compaction of the backfill soil. These calculations used the SEN SSI model and assumed slightly higher shear wave velocities for the NI backfill. The applicant compared the results of the SEN and ESP SSI models at the six key locations of the NI structure, provided in SSAR Appendix 2.5E, Section 5.0, Table 5.1-1, and found that the soil backfill, with a slightly higher shear wave velocity, will not significantly affect the NI dynamic response.

SSAR Appendix 2.5E, Appendix A, describes the applicant's approach to performing sensitivity studies on backfill excavation geometry. In the ESP model, the soil adjacent to the NI is essentially modeled in one dimension (i.e., horizontal layers of infinite extent) and does not

consider construction issues such as lateral extent and sloping excavation. The applicant developed two separate two-dimensional SASSI models, one with the backfill excavation explicitly modeled and one without. The applicant compared the analysis results from these models at the six critical locations of the NI structure and found that while there were minor differences at some locations, the overall effect on NI response is small.

SSAR Appendix 2.5E, Section 5.3, describes the applicant's approach to, and results from, sensitivity studies on variable compaction of backfill soil within a 5-foot zone adjacent to the NI. This study estimated the effects of potential reduced compaction immediately adjacent to the NI due to construction effects associated with the MSE wall planned for use as a temporary excavation support system. The applicant analyzed the reduced compaction by varying the soil shear wave velocity of the backfill in the 5-foot zone behind the MSE wall. The applicant compared the analysis results from these models at the six critical locations of the NI structure and found that while there were minor differences at some locations, the overall effect on the NI response is small.

3.7.2.3.2 NRC Staff's Technical Evaluation

This section of the SER provides the staff's evaluation of the seismic system analysis. The staff's review of this section is limited to the analysis required to approve the applicant's LWA request. As such, the staff reviewed the applicant's methods for performing two-dimensional SSI analysis and determining seismic forces to evaluate foundation stability and dynamic bearing pressures on soils.

3.7.2.3.2.1 Two-Dimensional Versus Three-Dimensional Seismic Analysis

SSAR Appendix 2.5E, Section 4.0 describes the applicant's approach to performing site-specific analyses. The applicant performed two-dimensional seismic analyses to evaluate seismic stability (i.e., sliding and overturning) and to compute maximum bearing pressures beneath the NI. To evaluate the sliding stability evaluation and estimate bearing pressure demand/capacity evaluations only, the staff accepted the use of these two-dimensional seismic analyses. Since applicant's NI seismic stability evaluations are considered approximate and since the calculated factors of safety from the two-dimensional analyses were found to be large for an embedded facility, the staff considered the use of the simplified two-dimensional analyses to be appropriate. The staff did not consider increased refinement in the analyses to be necessary for these calculations.

However, for development of in-structure response spectra (ISRS) and calculation of maximum seismic element force needed for structural and equipment design, the Staff considers that more refined SSI models are required. The basis for the staff's position is that the two-dimensional SSI calculations do not properly account for (1) effective radiation damping, (2) frequency-dependent impedance functions, (3) out-of-plane effects (e.g., torsion, coupled modes), or (4) vertical responses associated with irregular structural configurations. All of these can have significant impact on computed design response. It is the judgment of the staff that the two-dimensional SSI calculations may underestimate seismic demand. The staff will review in-structure response as part of the COL review of Vogtle FSAR Section 3.7.

3.7.2.3.2.2 Nuclear Island Backfill Soil Sensitivity Calculations

The staff reviewed the applicant's two-dimensional SSI model and found that the modeling approach was acceptable and performed in accordance with guidance in SRP Section 3.7.2. However, the staff found that the applicant essentially modeled the backfill soil adjacent to the NI in one dimension (i.e., infinite horizontal layers), and the model does not consider construction issues such as lateral extent and sloping excavation. To understand whether or not the lateral extent of the backfill excavation has a significant effect on SSI calculations, the staff issued RAI 2.5.2-25 requesting the applicant to compare the soil model response using both a two-dimensional SASSI and one-dimensional SHAKE, and a two-dimensional SASSI structural model response with backfill soil modeled as both infinite uniform layers and uniform layers with lateral boundaries.

In response to RAI 2.5.2-25, the applicant compared the motion response of a one-dimensional SHAKE analysis to a two-dimensional SASSI analysis. SSAR Appendix 2.5E, Figures 2.5.2-55a and 55b, show response comparisons for motions at the ground surface, at the base rock, and at the 40-foot horizon.

The staff reviewed the comparison of the one-dimensional SHAKE and two-dimensional SASSI model vibratory motion responses and found the differences between them to be small.

In response to RAI 2.5.2-25, the applicant also developed two 2-dimensional SASSI models which included the NI and adjacent buildings (SSAR Appendix 2.5E, Appendix A). The first model, "2D-AP-d5," did not account for the lateral extent of the NI. The applicant developed the second model, "Bathtub Model-d5," to represent the east-west cross-section of the Vogtle excavation (SSAR Appendix 2.5E, Figure A-1). The applicant used the same time histories for both analyses and then compared the responses at the six critical locations of the NI structure. Figures A-2 through A-13 illustrates response comparisons for several NI locations.

The staff reviewed the six key NI locations referenced in SSAR Appendix 2.5E, Section 5.0, Table 5.1-1 and agrees with the applicant that these six locations correspond to areas of the most significant safety-related equipment or locations of maximum NI displacement resulting from an SSE event. Therefore, these locations are acceptable to the staff for comparing seismic responses.

1. NI at Reactor Vessel Support Elevation
2. Auxiliary Shield Building at Control Room Floor
3. ASB Auxiliary Building Roof Area
4. ASB Shield Building Roof Area
5. Steel Containment Vessel near Polar Crane
6. Containment Internal Structure at Operating Deck

The staff reviewed the response comparisons of the two-dimensional SASSI models, 2D-AP-d5 and Bathtub Model-d5, and finds that the difference in in-structure response is relatively small. The results indicate that the influence of the backfill excavation geometry on NI dynamic response is insignificant. Therefore, the staff finds the applicant's approach acceptable.

3.7.2.3.2.3 Mechanically Stabilized Earth Backfill Soil Sensitivity

SSAR Section 2.5.4.5.7 describes the details of MSE wall design. Although most of the compaction of the backfill soil behind the MSE will be accomplished with heavy, self-propelled equipment, the applicant stated that the compaction of the zone adjacent to the wall (approximately 5 feet) will be done using smaller sized compactors with thinner lifts. Because of the potential for lower compaction in this zone, the staff was concerned that the resulting drop in shear wave velocity would affect the NI response. To clarify this issue, the staff issued RAI Appendix 2.5E-2 requesting that the applicant describe the effects of variable compactions behind the MSE wall on SSI calculations.

In response to RAI Appendix 2.5E-2, the applicant performed sensitivity studies on the effects of MSE wall backfill using two 2-dimensional SASSI models which are described in Section 5.3 of SSAR Appendix 2.5E. The first SASSI model assumed a backfill shear wave velocity of 515-909 fps with no difference in shear wave velocity in the 5-foot zone adjacent to the MSE wall. The second SSI model assumed the same backfill shear wave velocity as the first model, but the 5-foot zone had a reduced shear wave velocity of 421–755 fps. Section 5.3, Figures 5.3-1 through 5.3-19, of SSAR Appendix 2.5E show the results of these calculations. The analysis results indicate that the effect of reduced backfill compaction (resulting in lower shear wave velocities) on the seismic response at the six critical locations of the NI structure is small.

Based on a review of these results, the staff concurs with the applicant's conclusion that the potentially reduced shear wave velocity of the backfill directly behind the MSE wall does not significantly affect the NI building response for the Vogtle site. On the basis of these findings and the applicant's responses, the staff considers RAI Appendix 2.5E-2 resolved.

3.7.2.3.2.4 Soil-Structure Interaction Models

The staff reviewed the applicant's approach for developing two-dimensional models, described in SSAR Appendix 2.5E, for the purpose of site-specific SSI analysis. On the basis of its review of the backfill soil and MSE wall sensitivity calculations as discussed above, the staff finds the applicant's approach to modeling the Vogtle site soil conditions and AP1000 NI (Revision 15) acceptable for the purpose of calculating seismic demands for assessing foundation stability and dynamic bearing pressures.

The applicant provided the magnitudes of peak results of the seismic shear forces from the SSI model, which are summarized in FSER Table 3.7.2-1, in response to RAI 3.8.5-4. The applicant, in SSAR Appendix 2.5E, Section 6.1, describes the use of these values in performing stability evaluations.

The staff calculated the maximum seismic shear forces and obtained values consistent with the applicant's values in FSER Table 3.7.2-1. Therefore, the staff finds the applicant's maximum seismic shear forces to be acceptable for use in calculating foundation stability and bearing pressures.

Table 3.7.2-1 Vogtle Maximum Seismic Shear Forces

Reaction	Vogtle Lower Bound	Vogtle Best Estimate	Vogtle Upper Bound
Seismic Shear NS	78.3 E3 kips	82.5 E3 kips	89.0 E3 kips
Seismic Shear EW	88.9 E3 kips	89.8 E3 kips	95.8 E3 kips

3.7.2.4 Conclusion

On the basis of the review of the applicant's submittal, the staff concludes that the applicant has adequately performed site-specific seismic analysis for the purpose of determining the maximum horizontal and vertical inertial loads on the NI for use in stability and bearing capacity evaluations. The calculated loads referenced above (FSER Table 3.7.2-1) are acceptable.

The staff's above conclusions are based on the following three findings:

(1) The applicant demonstrated that the effect of excavation geometry (i.e., lateral extent of soil backfill) on the NI SSI response is minimal.

(2) The effect of higher shear wave velocity for backfill soil on the NI SSI response is minimal.

(3) The effect of reduced compaction in the 5-foot zone behind the MSE wall on the NI SSI is minimal.

The staff finds that with respect to the LWA request, the applicant has met the applicable requirements of 10 CFR Part 50, Appendix A (GDC 2), and 10 CFR Part 50, Appendix S, in that the applicant's evaluation accounted for the SSI effects and the expected duration of the vibratory ground motion.

3.8.5 Foundations

3.8.5.1 Introduction

As part of its review of the applicant's LWA request, the staff reviewed the use of the mudmat, which is located beneath the nuclear island (NI) basemat, and the waterproofing membrane, which is located between the two halves of the mudmat. Both are within the scope of the applicant's LWA request. The staff also reviewed the sliding stability of the NI structure during the SSE to ensure that the horizontal seismic shear force can be transferred safely through the mudmat and the waterproofing membrane without sliding to the supporting soils and that the NI structure will not slide relative to its supporting soils. The staff also reviewed the overturning stability of the NI structure during the SSE event and found reasonable assurance that the NI structure will not break into the ground (the supporting soils) during the SSE event.

3.8.5.2 Regulatory Basis

The NRC staff used the following applicable regulatory requirements in its review of the applicant's discussion of foundations:

- 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 1, as they relate to safety-related structures being designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed

- GDC 2, as it relates to the design of the safety-related structures that are capable of withstanding the most severe natural phenomena, such as wind, tornadoes, floods, earthquakes, and the appropriate combination of all loads, and still perform their safety functions

- Appendix B to 10 CFR Part 50, as it relates to the quality assurance criteria for nuclear power plants

- 10 CFR 52.80(a), which requires that a COL application contain the proposed inspections, tests, and analyses, including those applicable to emergency planning, 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 COL, the provisions of the Atomic Energy Act, and NRC regulations.

Section 3.8.5 of NUREG-0800 provides specific guidance concerning the evaluation of foundation design.

3.8.5.3 Technical Evaluation

3.8.5.3.1 Technical Information Presented by the Applicant

In SSAR Section 3.8.5, the applicant described the scope of the LWA request which includes construction of MSE retaining walls, a mudmat, and the waterproofing membrane between the two halves of the mudmat.

SSAR Section 3.8.5.1 describes the process for constructing MSE retaining walls to serve as formworks for the outer walls of the NI structure. The MSE wall will be founded on a concrete strip footing that is independent of the NI structure. The wall will be approximately 40 feet high and will be backfilled with engineered fill. Because the MSE wall only serves as a formwork and is not categorized as a seismic Category I structure, it does not require a review under SRP Section 3.8. SSAR 2.5.4 provides details of the MSE wall.

SSAR Section 3.8.5 describes the installation of a concrete mudmat, which will be placed within the confines of the MSE wall. The mudmat will consist of two 6-inch layers of concrete placed on engineered fill, as described in SSAR Section 2.5.4. An elastomeric spray-on waterproofing membrane will be sandwiched between these layers to provide protection from external flooding. The waterproofing membrane will be sprayed or brushed onto the entire mudmat surface as well as the MSE wall inner face. Before the installation, the applicant will develop a qualification program to evaluate the chemical and physical properties of the waterproofing membrane material. In addition, the applicant has proposed a site-specific ITAAC, shown in Table 3.8.5-1, to confirm that the waterproofing membrane can provide a coefficient of friction of 0.7 to prevent sliding of the upper portion of the mudmat from the lower portion of the mudmat during an SSE.

Table 3.8.5-1 Waterproof Membrane Inspections, Tests, Analyses, and Acceptance Criteria (SSAR Table 3.8.5.1-1)

Waterproof Membrane Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1) The friction coefficient to resist sliding is 0.7 or higher	Testing will be performed to confirm that the mudmat-waterproofing-mudmat interface beneath the Nuclear Island basemat has a minimum coefficient of friction to resist sliding of 0.7.	A report exists and documents that the as-built waterproof system (mudmat-waterproofing-mudmat interface) has a minimum coefficient of friction of 0.7 as demonstrated through material qualification testing.

3.8.5.3.2 NRC Staff's Technical Evaluation

The staff's review of this section is limited to the analysis and design required to approve the applicant's LWA request.

3.8.5.3.2.1 Waterproofing Membrane

In SSAR 3.8, the applicant proposed to use an elastomeric waterproof membrane for providing external flood protection for the NI foundation. The applicant stated that it will specify the final thickness of the membrane based on the physical properties of the selected material, but it is expected to be approximately 0.080–0.120 inches thick. SSAR Section 2.5.4.5.3 provides further details of the waterproofing membrane.

During its initial review of SSAR Section 3.8, the staff found insufficient information with respect to the waterproof membrane material. The staff issued RAI 3.8.5-3 which requested the applicant to do the following:

a) Provide chemical and structural (mechanical) properties of the waterproof membrane.

b) Describe whether the waterproof membrane has been used in structures in which a minimum 0.7 coefficient of friction between the waterproofing membrane and concrete was achieved.

c) If no data indicate that a minimum 0.7 coefficient of friction between the waterproofing membrane and concrete exists, provide the basis for the adequacy of the design assumption that the upper portion of the mudmat will not move relative to the lower portion of the mudmat during earthquakes.

d) Describe the qualification and test programs and explain how they can be used to demonstrate that the waterproofing membrane meets the waterproofing and friction requirements stated in Section 3.8.5.1.1.

In response to RAI 3.8.5-3(a), the applicant provided the intended waterproof membrane product datasheet (Sterling Lloyd, Intergitank® Structural Waterproofing Membrane). This data sheet states that the membrane material is a liquid-applied, fully reactive elastomeric membrane which cures rapidly and is available in both spray and hand grades. Typical applications include tunnels, storage tanks and silos, canals and culverts, and low-level radiation tanking. Table 3.8.5-2 identifies several relevant properties of the membrane material.

Table 3.8.5-2 Relevant Properties of Waterproofing Membrane Material

Property	Value
Typical Tensile Strength	1711 psi (11.8 MPa)
Typical Elongation at Break	>130%
Typical Tear Strength	400 lb/in (70N/mm)
Heat Aging at 70 °C for 1 Year (equivalent to 32 years aging at 20 °C)	No significant change in tensile strength or elongation at break
Resistance to Water Pressure (19.7 ft (6m) head of water)	No leak

In response to RAI 3.8.5-3(b), the applicant provided a test report (Sterling Lloyd TR 621). This test report describes a simplified test for evaluating the coefficient of friction between the membrane material and concrete blocks of various surface textures (smooth, slightly rough). This test report also demonstrated that the static coefficient of friction ranged from 0.40 (slightly textured membrane/slightly rough concrete surface) to 0.81 (slightly textured membrane surface/smooth concrete surface).

In response to RAI 3.8.5-3(c), the applicant stated that the assumption that the upper and lower portions of the mudmat will not move relative to one another is based on the results from Sterling Lloyd TR 621, which showed that a coefficient of friction of 0.7 (or greater) is achievable.

In response to RAI 3.8.5-3(d), the applicant stated that it will conduct qualification and test programs to demonstrate that the waterproof membrane meets the waterproofing and friction requirements stated in SSAR Section 3.8.5.1.1. To this end, the applicant proposed in ESP SSAR Section 3.8.5.1, Table 3.8.5.1-1, "Waterproof Membrane Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)," to perform testing to confirm that the mudmat-waterproofing-mudmat interface has a minimum coefficient of friction of 0.7 prior to installation of the waterproof membrane.

The staff finds that the report provided by the applicant (i.e., Sterling Lloyd TR621) is based on friction testing using materials (i.e., cement block and elastomeric spray-on waterproofing) whose relevant properties are substantially similar to those proposed by the applicant for the design of the waterproof membrane described in SSAR Section 3.8.

Based on the above, the staff finds that there is sufficient technical information to conclude: (1) that the proposed waterproof membrane material can achieve a friction coefficient of 0.7; and (2) that the ITAAC to document the as-built waterproof system (mudmat-waterproofing-mudmat interface) has a minimum coefficient of friction of 0.7, as demonstrated through material qualification testing, is reasonable and verifiable.

Therefore, the staff considers RAI 3.8.5-3 resolved.

On the basis of the above discussion and the inclusion of the waterproof membrane ITAAC, the staff concludes that the applicant's proposed use of the waterproofing membrane for VEGP Units 3 and 4 is acceptable.

3.8.5.3.2.2 Stability Analyses

In SSAR Appendix 2.5E, Chapter 6, the applicant described the methods for evaluating the site-specific sliding stability and overturning stability of the AP1000 NI structure.

3.8.5.3.2.3 Sliding Stability

The applicant assumed a coefficient of friction of 0.45 between the basemat and the supporting soil. To further the staff's understanding of this assumption, the staff issued RAI 3.8.5-4 which requested that the applicant address the following:

a) For stability analysis during earthquakes, state whether the bottom of the mudmat is allowed to move relative to the supporting soils or not. If relative movement is predicted, state the maximum value of the horizontal movement during the SSE and the basis for accepting that amount of movement. If relative movement is not predicted, state the maximum magnitude of the horizontal force generated in the nuclear island structure during the SSE, and the magnitude of frictional force provided at the interface between the mudmat and the supporting soils.

b) If the magnitude of frictional force provided at the interface between the mudmat and the supporting soils is less than the maximum magnitude of the horizontal force generated in the nuclear island structure during the SSE, state the magnitude of forces due to the passive earth pressure on one side and the active earth pressure on the opposite side of the embedded nuclear island walls generated through the rotation of the nuclear island structure, and describe how these horizontal forces are in equilibrium so that the bottom of the mudmat will not move relative to its supporting soils. At that equilibrium stage, state: (1) the rotational angle of the nuclear island structure and the horizontal displacement at the top surface of the soils adjacent to the nuclear island structure during the SSE; and (2) whether or not buoyancy force due to ground water and vertical seismic forces were subtracted from the total weight of the nuclear island.

c) Describe how the shear loads (or stresses) in different regions of the upper portion of the mudmat are transferred through the waterproof membrane to the lower portion of the mudmat. State the maximum shear load (or stress) in the mudmat and the shear capacity of the waterproof membrane and the mudmat, and describe how these values were derived or obtained.

In response to RAI 3.8.5-4(a), the applicant stated that its stability analysis assumed that there is no relative movement at the bottom of the mudmat relative to the supporting soils. Furthermore, the applicant provided the maximum seismic shear force and the friction force between the mudmat and the supporting soil for the upper bound, best-estimate, and lower bound SSI cases in the north-south (NS) and east-west (EW) directions during the SSE (summarized in SER Table 3.8.5-3). Because the applicant provided the requested information, the staff considers RAI 3.8.5-4(a) resolved.

Table 3.8.5-3 Vogtle Maximum Seismic Shear and Friction Forces

Reaction	Vogtle Lower Bound	Vogtle Best Estimate	Vogtle Upper Bound
Seismic Shear NS	78.3 E3 kips	82.5 E3 kips	89.0 E3 kips
Seismic Shear EW	88.9 E3 kips	89.8 E3 kips	95.8 E3 kips
Friction Force	117.3 E3 kips	116.7 E3 kips	116.4 E3 kips

In response to RAI 3.8.5-4(b), the applicant stated that in all cases (see Table 3.8.5-3) the available friction forces exceed the maximum seismic shear forces.

The staff calculated the maximum seismic shear force and the friction force and obtained values close to the applicant's values listed in Table 3.8.5-3. Therefore, the staff considers RAI 3.8.5-4(b) resolved and agrees with the applicant's conclusion that the NI structure will not slide against its supporting soil during the SSE.

With respect to the shear strength of the mudmat, the applicant responded in RAI 3.8.5-4(c) that the shear strength of the mudmat is about 100 psi, based on American Concrete Institute (ACI) code calculations, because the minimum specified concrete compressive strength for the mudmat is 2500 psi. The staff agrees with the applicant's assessment of the shear strength for the mudmat. The applicant obtained an average shear stress of 25.1 psi by using the highest friction force of 117.3x103 kips, as listed in Table 3.8.5-3, divided by the footprint area of the NI structure as the required shear stress to be transferred through the mudmat and the waterproofing membrane. The staff considers the applicant's shear stress calculation of 25.1 psi to be conservative because it used the largest friction force of 117.3x103 kips instead of the largest seismic shear force of 95.8x103 kips. Therefore, the staff concludes that the

mudmat, which possesses a shear strength of 100 psi, can safely transfer the required 25.1 psi shear stress through it.

With respect to the shear strength of the waterproofing membrane, the staff agrees with the applicant's statement that the waterproofing membrane, which possesses a tensile strength of 1700 psi, likely possesses a shear strength greater than 25.1 psi. Based on the soil conditions at the Vogtle site, the mudmat material strength, and the waterproofing membrane strength, the staff concludes that the NI structure can safely transfer horizontal seismic shear force through the mudmat and the waterproofing membrane, without sliding, to the supporting soils. Furthermore, the NI structure will not slide horizontally relative to its supporting soils during the SSE.

3.8.5.3.2.4 Overturning Stability

In SSAR Section 2.5.4.10.1, the applicant provided the site-specific dynamic bearing capacity of 42 ksf for soils at the Vogtle site. SSAR Appendix 2.5E, Chapter 7.0, summarizes the maximum dynamic bearing pressures on soils from the site-specific two-dimensional SSI analyses. The analyses results indicate that no structure will be overturned, and the maximum dynamic bearing pressures for the NI, radwaste, annex, and turbine buildings are 17.95 ksf, 1.68 ksf, 7.20 ksf, and 2.54 ksf, respectively, during the SSE. The minimum factor of safety with respect to a failure of the dynamic bearing capacity during the SSE is 2.34 (42 ksf divided by 17.95). The staff considers this minimum factor of safety to be adequate and concludes that the NI structure will not break into the ground (the supporting soils) during the SSE.

3.8.5.4 Conclusion

Based on its review of the applicant's submittal and responses to RAIs, the staff concludes that the applicant has demonstrated that the design of the MSE walls, the mudmat, and the waterproofing membrane, as stated in the LWA request, is adequate and can be constructed. The staff's conclusion is based on the following findings:

(1) The MSE walls are not seismic Category I structures, and they only serve as formworks for the outer walls of the NI foundation.

(2) Both the mudmat and the waterproofing membrane have sufficient shear strength to transfer the required shear stress, without sliding at interfaces, to the supporting soils.

(3) The waterproof membrane ITAAC is adequate for confirming that the mudmat-waterproofing-mudmat interface beneath the Nuclear Island basemat has a minimum coefficient of friction to resist sliding of 0.7.

(4) The soil condition at the Vogtle site is capable of preventing the NI structure, including the mudmat, from sliding horizontally relative to the ground (the supporting soils) and from breaking into the ground vertically during the SSE.

The staff finds that the applicant has met the applicable requirements of 10 CFR 52.80(a), 10 CFR Part 50, Appendix A (GDC 1 and 2), and 10 CFR Part 50, Appendix B in that the applicant adequately demonstrated: (1) that the COL application contains 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 COL, the provisions of the Atomic Energy Act, and NRC regulations; and (2) that the NI mudmat and waterproofing membrane are designed to resist an SSE event.

11.0 RADIOLOGICAL EFFLUENT RELEASE DOSE CONSEQUENCES FROM NORMAL OPERATIONS

11.1 Introduction

Because the original SSAR submitted by the applicant did not contain a Chapter 11 gaseous and liquid radiological dose analysis, the NRC staff evaluated Environmental Report (ER) Chapter 5, Section 5.4 of the ESP application, Revision 1. Subsequently, the NRC staff informed the applicant, in a RAI dated February 16, 2007, that the SSAR did not comply with 10 CFR 52.17(a)(1) and 10 CFR 100.21(c)(1). By letter dated May 3, 2007, the applicant provided its response to the NRC staff's RAI. The applicant submitted Revision 2 of the ESP application, including SSAR Chapter 11, "Radioactive Waste Management." Chapter 11, Sections 11.2 and 11.3, contain the analysis for the gaseous and liquid radioactive effluents.

11.2 Regulatory Evaluation

The acceptance criteria for addressing radiological doses to members of the public from radiological effluents due to postulated normal plant operations are based on meeting the relevant requirements of 10 CFR 52.17 and 10 CFR Part 100. The NRC staff considered the following regulatory requirements in reviewing the applicant's discussion and analysis of radiological doses to members of the public from radiological effluents due to postulated normal plant operations:

- 10 CFR 52.17(a), which requires that the application contain a description of the anticipated maximum levels of radiological and thermal effluents each proposed facility will produce.

- 10 CFR 100.21(c), which requires that site atmospheric dispersion characteristics be evaluated and dispersion parameters established such that (1) radiological effluent release limits associated with normal operation from the type of facility to be located at the site can be met for any individual located offsite; (2) radiological dose consequences of postulated accidents shall meet the criteria set forth in 10 CFR 50.34(a)(1) for the type of facility proposed to be located at the site.

The information assembled in compliance with the above regulatory requirements would be necessary, at the COL or CP stage, to assess whether the proposed facility will control, monitor, and maintain radioactive gaseous and liquid effluents from the proposed facility within the regulatory limits (including the referenced dose standards in 40 CFR Part 190) specified in 10 CFR Part 20 as well as maintain radiological effluents at as low as reasonably achievable (ALARA) levels, in accordance with the dose objective of Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion 'As Low As is Reasonably Achievable' for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents", to 10 CFR Part 50. Table 11.2-1 provides a quantitative summary of the above standards.

To the extent applicable under the above-cited regulatory requirements, the applicant applied the NRC-endorsed analytical methodologies and parameters found in RG 1.109, Revision 1, issued October 1977, and RG 1.111, Revision 1, issued July 1977. When independently

assessing the accuracy of the information presented by the applicant in SSAR Chapter 11, the NRC staff applied the same above-cited analytical methodologies and parameters.

Table 11.2-1 - NRC Staff's Summary of 10 CFR Part 50 Appendix I Dose Objectives and 40 CFR Part 190 Environmental Dose Standards

Regulation	Type of Effluent	Pathway	Organ	Dose Limit (mrem/yr per unit)
10 CFR Part 50, Appendix I *	Liquid	all	total body	3
		all	any organ	10
	Gaseous	all	total body	5
		all	skin	15
	Radioiodines & Particulates	all	any organ	15
	Gaseous	gamma air dose	n/a	10***
		beta air dose	n/a	20***
40 CFR Part 190 **	all	all	total body	25#
	all	all	thyroid	75#
	all	all	any other organs	25#

Notes:

* Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion 'As Low As Is Reasonably Achievable' for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents," to 10 CFR Part 50,"Domestic Licensing of Production and Utilization Facilities," defines dose objectives for the maximally exposed individual (MEI).

** Dose limits are defined for any real member of the public. Under NRC requirements, this standard is implemented under 10 CFR Part 20.1301(e).

*** Air doses are expressed in mrad/year instead of mrem/year.

40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations." dose limits are for the entire site and apply to all operating units.

11.3 Technical Evaluation

The applicant provided estimates of radiological impacts on members of the public from gaseous and liquid effluents that would be generated as a normal byproduct of nuclear power operations. This included a description of the exposure pathways by which radiation and radioactive effluents could be transmitted to members of the public within a 50-mile (80 Km) radius from the site. The estimates of the maximum doses to the public are based on the AP1000 reactor's normal operational effluent releases, as discussed in Westinghouse Electric Company, LLC, AP1000 Design Control Document, Revision 15, November 11, 2005. The applicant evaluated the impact of these doses by comparing them to applicable regulatory limits.

The applicant also provided a list of fission and activation products that may be released in liquid and gaseous effluents from the two proposed units. The applicant evaluated the impacts from effluent releases and direct radiation by considering the probable pathways to individuals, populations, and biota near the proposed new units. The applicant also calculated the highest dose from the major exposure pathways for a given specific receptor. In addition, the applicant estimated the dose to the maximally exposed individual (MEI) from both the liquid and gaseous effluent release pathways, and calculated a collective whole body dose for the population within 50 miles (80 km) of the Vogtle site. The NRC staff's analysis of the gaseous and liquid radioactive effluents is provided in the following sections 11.3.1 and 11.3.2.

11.3.1 Gaseous Effluents

The applicant provided an analysis describing the exposure pathways by which radiation and radioactive effluents could be transmitted from the new units to individuals living near the plant, and estimated the maximum doses to the public.

The applicant calculated the total body and individual organ dose to a hypothetical maximally-exposed member of the public from gaseous effluents using radiological exposure models based on RG 1.109, the GASPAR II computer program (NUREG/CR-4653, "GASPAR II - Technical Reference and User Guide," March 1987), and RG 1.111. Section 2.3.5 of the SSAR discusses the derivation of the atmospheric dispersion parameters, and presents specific values for the dispersion and deposition parameters used in the applicant's radiological dose assessment.

The applicant calculated the gaseous pathway doses to the MEI at the nearest site boundary, residence, garden, and meat animal. The applicant did not include the milk consumption pathway for the maximally-exposed individual because the current land use census found no milk producing animals within 5 miles of the facility. The applicant did, however, include milk consumption for the population dose calculation. The applicant estimated the site boundary dose for noble gas plume immersion, ground shine from deposited radioactive iodine and particulate radionuclides, and inhalation of radio-iodine, and particulate radionuclides (including tritium and carbon-14). The applicant also estimated the dose for the current MEI receptor based on plume and ground plane exposure, inhalation, and ingestion of cow meat and garden vegetables.

In Table 11.3-3 of the SSAR, the applicant provided an estimate of the radiological releases associated with gaseous effluents that may occur during normal operation of the plant. The

applicant obtained estimates of gaseous radioactive effluent releases from Table 11.3-3 of the NRC staff approved DCD for the AP1000.

These gaseous effluent releases are used to estimate doses at the site boundary and to the MEI. Tables 11.3-1, 11.3-2, and 11.3-4 of the SSAR include other calculation input data, including regional milk, meat and vegetable production rates, atmospheric dispersion and ground deposition factors, receptor locations, and the assumed consumption rates of food products by the MEI.

As shown in Tables 11.3-5 and 11.3-6 of the SSAR, the applicant calculated the gaseous pathway doses to the MEI for the site boundary, the nearest residence and garden and meat animal. The results show for the site boundary a gamma annual air dose of 0.0067 milliGray (mGy) or 0.67 millirad (mrad), a beta annual air dose of 0.028 mGy or 2.8 mrads; a total annual body dose of 0.0056 milliSieverts (mSv) or 0.56 millirem (mrem) and an annual skin dose of 0.022 mSv or 2.2 mrem. Table 11.3-6 of the SSAR also lists the maximum annual organ dose (thyroid) of 0.059 mSv or 5.9 mrem for the child.

Using the GASPAR II code and the applicant's input data, the NRC staff performed an independent evaluation of the applicant's gaseous effluent pathway doses, and the NRC staff calculations achieved results similar to that of the applicant. Therefore, the NRC staff finds that the applicant's calculated doses are correct and appropriate per the applicable dose criteria listed in SER Table 11.2-1.

The applicant also compared the MEI doses with the exposure criteria of 40 CFR Part 190, as would be required of the applicant at the COL stage, per 10 CFR 20.1301(e). The applicant's results are presented in Table 11.3-7 of the SSAR and included the sum of doses from the two proposed units and the two existing units. For the total site, the applicant's results were less than the maximum doses specified in 40 CFR Part 190.10(a) of 25 mrem/yr whole body, 75 mrem/yr thyroid, and 25 mrem/yr any other organ (Table 11.2-1):

- 2.4 mrem/yr (0.024 mSv) for the whole body,
- 12 mrem/yr (0.12 mSv) for the thyroid, and
- 8.9 mrem/yr (0.089 mSv) to bone.

As such, the NRC staff find that the applicant's results would comply with the requirements of 40 CFR Part 190 and 10 CFR Part 20.1301(e).

Based on the above, the NRC staff concludes that the applicant has provided a bounding assessment for gaseous effluents, demonstrating its capability to comply with the regulatory requirements in 10 CFR Part 20 and Appendix I to 10 CFR Part 50 given the atmospheric dispersion parameters set forth in Section 2.3.5 of the NRC staff's SER.

11.3.2 Liquid Effluents

If built, the postulated two new units at the Vogtle site would release liquid effluents into the Savannah River through a newly constructed discharge structure. The applicant calculated liquid pathway doses for several pathways, including eating fish caught in the Savannah River, drinking Savannah River water, shoreline exposure, and exposure from swimming and boating. The applicant excluded crop irrigation and livestock watering because the results of the most recent land use censuses described in the 2005 Radiological Environmental Operating Report for Vogtle Electric Generating Plant, Units 1 and 2, confirmed that the Savannah River is not used for these purposes within 100 miles downstream of the site.

In its response to the NRC staff's RAI dated May 3, 2007, the applicant provided a description of all required model assumptions and input parameters needed to run LADTAP II computer codes; justification for excluding potential exposure pathways; and its basis for using a dilution factor.

Using radiological exposure models based on RG 1.109 and the LADTAP II computer program (NUREG/CR-4013, "LADTAP II - Technical Reference and User Guide," April 1986), the applicant calculated the estimated doses to a hypothetical MEI of the public and to the population within 50 miles (80 Km) from the postulated liquid effluents discharged.

In Table 11.2-3 of the SSAR, the applicant listed the estimated radiological source terms associated with liquid effluents that may be released from normal operation of the plant. The applicant obtained these estimates of liquid radioactive effluent from the NRC staff-approved AP1000 DCD, Table 11.2-7. Tables 11.2-1 and 11.2-2 of the SSAR include other liquid pathway parameters used as input to the dose calculation, including effluent discharge flow rate, site-specific dilution factors, transit time to receptor and consumption factors rates for fish and water, and recreational usage data for the Savannah River. The analysis assumed direct releases into the Savannah River without dilution by the discharge flow of the plant. The liquid effluent release parameters shown in Tables 11.2-1, 11.2-2, and 11.2-3 were then used to calculate the annual liquid pathway doses to the MEI (SSAR Table 11.2-4). The applicant calculated a maximum annual dose to the total body of 0.00017 mSv (0.017 mrem) and a maximum annual dose to the liver of 0.00021 mSv (0.021 mrem). The applicant compared the MEI doses with the 10 CFR Part 50, Appendix I criteria in Table 11.2-5 of the SSAR. The NRC staff reviewed these calculated doses and found that the applicant's analysis would satisfy, at the COL stage, 10 CFR Part 50, Appendix I, Section II.A dose requirements for the MEI.

The applicant also analyzed whether the above-discussed data would comply with the exposure criteria of 40 CFR Part 190, as would be required to be demonstrated by the applicant at the COL stage, per 10 CFR 20.1301(e). The applicant's results are presented in SSAR Tables 11.2-6 and 11.2-7 for the MEI; the applicant's results are less than the maximum doses specified in 40 CFR Part 190.10(a) of 25 mrem/yr whole body, 75 mrem/yr thyroid, and 25 mrem/yr any other organ (Table 11.2-1). Therefore, the NRC staff determined that the applicant's analysis would meet the requirements of 40 CFR Part 190 and 10 CFR 20.1301(e).

The NRC staff performed an independent assessment and determined that the applicant's results represent conservative upper bound estimates for three reasons:

- First, the applicant assumed the drinking of Savannah River water when no such use has been shown to exist within 100 miles downstream of the site.
- Second, the applicant ignored the dilution from the plant discharge water.
- Third, the applicant used a low estimate of annual average river flow.

Table 11.3-1 below shows the comparison of important input values between the applicant's and the NRC staff's analyses. Table 11.3-2 compares the resulting dose estimates between the applicant's and the NRC staff's analyses. These tables show that the assumptions and parameters used by the applicant result in about an order of magnitude higher total body and maximum organ doses when compared to the NRC staff's independent assessment.

The NRC staff concludes that the applicant has provided a bounding assessment demonstrating its capability to comply in the future, at the COL stage, with the regulatory requirements in 10 CFR Part 20 and Appendix I, to 10 CFR Part 50.

Table 11.3-1 - Comparison of Input Parameters

Pathways and Parameters	Application	NRC Staff's Analysis
Drinking water pathway	Yes	No*
Fish ingestion pathway	Yes	Yes
Recreational use of river	Yes	Yes
Annual average river flow (ft3/sec)	9,229	10,362**
Plant discharge flow (ft3/sec)	0	10.7***

*The current land use census does not identify any withdrawal of Savannah River water for drinking or irrigation for 100 miles downstream of the site.

**Average of annual mean stream flow calculated from 50 years of data for Burtons Ferry, Environmental Report (ER) Table 2.3.1-9.

***Taken from ER Table 3.3-1 and assuming single unit discharge.

Table 11.3-2 - Comparison of Maximum Individual Doses (mrem/yr)

Organ/Body	Application	NRC Staff's Analysis
Skin	7.2 E-05	6.5 E-05
Bone	1.2 E-02	1.0 E-02
Liver	2.1 E-02	1.2 E-02
Total Body	1.7 E-02	1.0 E-03
Thyroid	1.5 E-02	1.0 E-03
Kidney	1.2 E-02	4.0 E-03
Lung	8.9 E-03	1.5 E-03
GI-Tract and Lower Large Intestine	8.6 E-03	3.9 E-04

11.4 Conclusion

As set forth above, the NRC staff has independently confirmed the adequacy of the applicant's dose consequence calculations from normal operations. The applicant provided adequate information to give reasonable assurances that it will control and maintain radioactive gaseous and liquid effluents from the proposed facility within the regulatory limits specified in 10 CFR Part 20, as well as maintain radiological effluents at ALARA levels, in accordance with Appendix I to 10 CFR Part 50. Based upon the foregoing, the NRC staff concludes that the postulated radiological doses to members of the public from radiological gaseous and liquid effluents resulting from the normal operation of one or more new nuclear power plants constructed on the proposed site would not pose an undue risk to the health and safety of the public. Therefore, the NRC staff concludes that, with respect to radiological effluent release dose consequences from normal operations, that the proposed site is acceptable for the applicant's chosen type of nuclear plant, and that the application meets the relevant requirements of 10 CFR 52.17 and 10 CFR Part 100.

13.0 CONDUCT OF OPERATIONS

13.3 Emergency Planning

The NRC evaluates emergency plans for nuclear power reactors to determine whether there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. An ESP application, pursuant to 10 CFR 52.17(b), must identify any physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans. The applicant may also propose major features of emergency plans, as described in Supplement 2 to NRC guidance document NUREG-0654/ FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" (hereafter referred to as "Supplement 2"),[12] issued April 1996, or may propose complete and integrated emergency plans. In addition, for the major features option, the applicant must describe the contacts and arrangements it has made with Federal, State, and local government agencies with emergency planning responsibilities. For complete and integrated emergency plans, the applicant must make good faith efforts to obtain from the same government agencies various certifications, which are discussed in Section 13.3.2 of this SER.

The ESP applicant, or Southern Nuclear Operating Company (SNC), acting on behalf of itself and the owners of the VEGP site (identified in Section 1.1 of Part 1 of the SSAR, and known as co-owners), stated that it has been authorized to act as agent for the owners to apply for an ESP for the VEGP site. SNC is the licensed operator of the existing generating facilities at the VEGP site (i.e., nuclear reactor Units 1 and 2).

In Section 13.3 of Part 2, "Emergency Planning," of the SSAR, and in Part 5, "Emergency Plan" (hereafter referred to as the "ESP Plan"), the applicant has proposed a complete and integrated emergency plan pursuant to 10 CFR 52.17(b)(2)(ii). The applicant developed the ESP Plan using the current VEGP Emergency Plan (hereafter referred to as the "VEGP Plan"). Since the proposed ESP site footprint consists of a portion of the existing VEGP site and is located immediately adjacent to VEGP Units 1 and 2, little distinction exists between the VEGP site and the ESP site for purposes of emergency planning. The ESP application takes advantage of the emergency planning resources, capabilities, and organization that currently exist at the VEGP site.

As described below, the staff, in consultation with the Federal Emergency Management Agency (FEMA),[13] has reviewed the ESP application (which includes the applicant's onsite emergency plan, i.e., the ESP Plan), the radiological emergency response plans (RERPs) for the States of South Carolina and Georgia, the RERPs for the affected counties, responses to requests for additional information (RAIs), response to the preliminary Safety Evaluation Report open

---

12 NUREG-0654/FEMA-REP-1 and Supplement 2 are joint NRC and FEMA guidance documents. NUREG-0654 is the NRC document designation, and FEMA-REP-1 is the FEMA document designation.

13 FEMA is an agency within the Department of Homeland Security (DHS).

items,[14] and generally available reference materials in accordance with NRC Review Standard (RS)-002, issued May 2004. (See also NRC Regulatory Issue Summary (RIS) 2004-07, "Release of Final Review Standard (RS)-002, 'Processing Applications for Early Site Permits.'")

FEMA has reviewed the emergency plans for the States of Georgia and South Carolina, the local government plans for Burke County in Georgia, and Aiken, Allendale, and Barnwell Counties in South Carolina, and the applicant's responses to RAIs. On March 2, 2007, and June 5, 2007, FEMA provided its findings and determinations. The staff has reviewed the FEMA reports, which are reflected below in the applicable SER sections.

The applicant has elected to present a complete and integrated emergency plan, pursuant to 10 CFR 52.17(b)(2)(ii). As stated in Section 13.3 of the ESP application, the applicant developed a set of inspections, tests, analyses, and acceptance criteria (ITAAC), and included it in the ESP Plan to address some elements of the emergency plan that have not been completed during the ESP application stage (i.e., before construction of the proposed Units 3 and 4). For a combined license (COL) application submitted pursuant to Subpart C, "Combined Licenses," of 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," 10 CFR 52.80(a) requires the inclusion of emergency planning ITAAC.[15] Section 52.17(b)(3) is the comparable requirement in Subpart A, "Early Site Permits," of 10 CFR Part 52 to include emergency planning ITAAC in an ESP application. Thus, the use of emergency planning ITAAC in the VEGP ESP application is necessary to accomplish the applicant's stated purpose. SER Sections 13.3.5 and 13.3.6 include the proposed ITAAC for VEGP Units 3 and 4, respectively, and the applicable SER sections discuss the use of the ITAAC.

The applicant seeks a finding by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency, pursuant to 10 CFR 50.47(a)(1). In the context of an ESP application submitted pursuant to 10 CFR Part 52, which includes proposed complete and integrated emergency plans, the NRC finding of reasonable assurance is a predictive conclusion that is conditioned on the ability of a subsequent COL holder – who has referenced the ESP – to adopt the ESP emergency plan and meet all of the prescribed (ESP ITAAC) acceptance criteria, as well as any other emergency planning permit conditions, consistent with the applicable regulations and COL requirements. The staff's evaluation addresses, in order, the following three basic components of such a submission (the SER section where each is discussed and the relevant regulation is also identified):

- physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans (SER Section 13.3.1, 10 CFR 52.17(b)(1))

---

14 By letter dated October 4, 2006, the applicant provided emergency planning information that supplemented its initial application, which was submitted by letter dated August 15, 2006. By letter dated March 15, 2007, the NRC requested additional information (i.e., RAI letter No. 5), and the applicant provided RAI responses by letter dated April 16, 2007. By letter dated October 15, 2007, the applicant provided its response to preliminary Safety Evaluation Report open items. The applicant provided additional information in its letters dated February 12, 2008, February 27, 2008, and March 14, 2008.

15 The proposed complete and integrated emergency plans (with ITAAC) allowed in an ESP application by 10 CFR 52.17(b)(2)(ii) are essentially the same as those required (for the same site) in a COL application by 10 CFR 52.77, "Contents of Applications; General Information," 10 CFR 52.79, "Contents of Applications; Technical Information in Final Safety Analysis Report," and 10 CFR 52.80, "Contents of Applications; Additional Technical Information."

- contacts and arrangements with local, State, and Federal governmental agencies with emergency planning responsibilities, and good faith efforts to obtain various certifications (SER Section 13.3.2, 10 CFR 52.17(b)(4))

- proposed complete and integrated emergency plans, including necessary ITAAC (SER Section 13.3.3, 10 CFR 52.17(b)(2)(ii), (b)(3))

In SSAR Part 2, Section 13.3, "Emergency Planning," the applicant identified 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," as applicable to the proposed emergency plans. The staff agrees that these regulations, which constitute the core regulatory basis for emergency planning and preparedness at a nuclear power plant, apply to complete and integrated emergency plans submitted in an ESP application pursuant to Subpart A of 10 CFR Part 52. The Regulatory Basis subsections of this SER identify additional regulations that may apply and are considered in the staff's review.

The staff's evaluation and findings, described throughout Section 13.3 of this SER, address the applicant's proposed complete and integrated emergency plans and parallel the planning standards and evaluation criteria in NUREG-0654/FEMA-REP-1, issued November 1980, and the March 2002 addenda. The staff also reviewed the application against the generic emergency planning ITAAC provided in Table C.II.1-B1 of Regulatory Guide (RG) 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," issued June 2007, and applicable sections of Supplement 2 (pursuant to Section 13.3, "Emergency Planning") of RS-002.

As discussed above, the proposed complete and integrated emergency plans (with ITAAC) allowed in an ESP application by 10 CFR 52.17(b)(2)(ii) are essentially the same as those required (for the same site) in a COL application by 10 CFR 52.77, 10 CFR 52.79, and 10 CFR 52.80. Thus, the generic ITAAC in Table C.II.1-B1 of RG 1.206 are applicable to both an ESP application (with complete and integrated emergency plans) and a COL application, which reflects the original intent of the staff when it created the generic ITAAC table.[16]

13.3.1 Significant Impediments to the Development of Emergency Plans

13.3.1.1 Regulatory Basis

In its review of the application, the staff considered the regulatory requirements of 10 CFR 52.17(b)(1), which mandate that the applicant for an ESP identify physical characteristics unique to the proposed site, such as egress limitations from the area surrounding the site, that could pose a significant impediment to the development of emergency plans. The staff also considered 10 CFR 52.18, "Standards for Review of Applications," which requires consultation with FEMA to determine whether the information required by 10 CFR 52.17(b)(1) demonstrates that no significant impediment to the development of emergency plans exists. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information in an ESP application.

---

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

Supplement 2 defines a significant impediment as a physical characteristic or combination of physical characteristics that would pose major difficulties for an evacuation. Such unique physical characteristics may be identified by a preliminary analysis of the time for evacuating various sectors and distances within the 10-mile plume exposure emergency planning zone (EPZ) for transient and permanent populations. Such an analysis should note major difficulties for an evacuation (e.g., significant traffic-related delays).

According to RS-002, the applicant should address factors such as the availability of adequate shelter facilities, local building practices and land use (e.g., outdoor recreation facilities, including camps, beaches, hunting, or fishing areas), and the presence of large institutional or other special needs populations (e.g., schools, hospitals, nursing homes, prisons) when identifying significant impediments to the development of emergency plans. Any evacuation time estimate (ETE) or other identification of physical impediments should consider the latest population census numbers and the most recent local conditions.

13.3.1.2 Technical Evaluation

In Part 2 of SSAR, Section 13.3, "Emergency Planning," the applicant stated that it used the existing VEGP Emergency Plan (i.e., VEGP Plan) to develop the proposed emergency plan (i.e., ESP Plan). The ESP Plan contains the proposed complete and integrated VEGP Emergency Plan, submitted pursuant to 10 CFR 50.17(b)(2)(ii). In the preface to the ESP Plan, the applicant stated that the ESP Plan will apply to existing VEGP Units 1 and 2, as well as to the proposed Westinghouse AP1000 units (i.e., new VEGP Units 3 and 4), and to its environs as specified by the EPZs described in the ESP Plan. As discussed in more detail in this SER, the staff finds that the ESP application accounts for, and takes full advantage of, the current emergency planning resources, capabilities, and organization at the VEGP site.

In RAI 13.3-6, the staff asked the applicant to identify which revision of the VEGP Emergency Plan for Units 1 and 2 is relevant for purposes of the ESP Plan review, including the extent to which the review of the ESP Plan should rely on information in the existing VEGP Plan, and to clarify whether the ESP Plan is intended as a revision of the VEGP Plan. In addition, the staff asked the applicant to describe the manner in which the ESP Plan (including Table B-1, "Minimum Staffing for Power Operation," and technical support center (TSC) location) will become effective for the VEGP site (i.e., transition plan), in regard to construction and operation of Units 3 and 4, withdrawal of the current Unit 1 and 2 plan, and coordination with offsite agencies and organizations. (RAI 13.3-6 and Table B-1 are addressed further in SER Section 13.3.3.2.2.)

In its response, the applicant stated that the proposed ESP Plan is based on Revision 43 of the VEGP Plan, except for ESP Plan Section D, "Emergency Classification System," which is based on proposed Revision 42 of the VEGP Plan. Revision 42 incorporates the guidance contained in Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels [EALs]." (SER Sections 13.3.2.2, 13.3.3.1, and 13.3.3.2.4 discuss NEI 99-01, "Methodology for Development of Emergency Action Levels"). The ESP Plan is intended to be a revision of the existing VEGP Plan when it is implemented, and ultimately to be in effect for all four units. SNC expects to revise the existing corporate emergency implementing procedures (EIPs) and emergency operations facility (EOF) procedures to provide for an additional two units at the VEGP site. SNC will submit a revision to the latest revision of the VEGP emergency plan in accordance with the provisions of 10 CFR 50.54(q) for the VEGP Units 1 and 2. For VEGP Units 1 and 2, the use of the 10 CFR 50.54(q) process, along with the ITAAC schedule required

by 10 CFR 52.99(a), will provide for the orderly development, implementation, and transition of the applicant's emergency plans.

In SSAR Section 13.3.1, the applicant concluded that there are no physical characteristics unique to the VEGP site that pose a significant impediment to the development of the proposed emergency plans for the VEGP. **[J.8, J.10.l, J.10.m].**[17] This conclusion is based on the SNC consideration of the general description of the site and the area population used in a recently developed (April 2006) ETE for the VEGP 10-mile plume exposure pathway EPZ. This April 2006 ETE is included as Enclosure 10, "Evacuation Time Estimate for the Vogtle Electric Generating Plant," of the application. ESP Plan Section J, "Protective Response," and SER Section 13.3.3.2.10 discuss the ETE in more detail.

As part of the existing VEGP Emergency Plan, Georgia Power Company (GPC) has a memorandum of agreement with the U.S. Department of Energy, Savannah River Operations Office (DOE-SR), for emergency response within the Savannah River Site (SRS), which provides that DOE-SR will be responsible for all emergency planning for the area included in the VEGP EPZ that lies within the boundaries of the SRS. This memorandum of agreement will continue in effect for the VEGP site when the additional Units 3 and 4 are built, as discussed in SER Section 13.3.2. The SRS is located adjacent to the VEGP site on the South Carolina side of the Savannah River, and the major portion of the EPZ in South Carolina is within the SRS, as described in Section 1.2, "Emergency Planning Zone," and shown in Figure 2, "VEGP EPZ Boundary and Protective Action Zones," of the April 2006 ETE. SSAR Section 2.1.3, "Population Distribution," states that the SRS will remain a Government-controlled facility in perpetuity.

SSAR Section 2.1.1, "Site Location and Description," states that the proposed Units 3 and 4 will be built on the existing 3169-acre VEGP site, and that the exclusion area boundary (EAB) will be the same as the EAB for the existing VEGP units. SSAR Section 2.2.2.1, "Industrial Facilities," states that the exclusion area for VEGP Units 1 and 2 is the same as that for the new units and has an irregular shape, which generally conforms to the site's boundary lines. ESP Plan, Figure ii, "Vogtle Electric Generating Plant Site Plan," shows the site and the locations of existing and proposed buildings on the site. The ESP site footprint consists of a portion of the VEGP site and is located near the existing VEGP Units 1 and 2. Units 3 and 4 will be located in the power block area shown in SSAR Figure 1-4, "Site Layout – New Development." Therefore, the boundary of the ESP site is entirely within the boundary of the existing VEGP site.

SSAR Section 13.3.1 also states that with the exception of the existing VEGP Units 1 and 2, and the GPC combustion turbine plant, Plant Wilson, there are no commercial, industrial, institutional, recreational, or residential structures within the proposed four-unit site area. In addition, the site is located in a sparsely populated section of eastern Georgia near the Savannah River, and the area near the site is lowlands and not used for commercial or industrial purposes, other than agriculturally or forestry related commercial enterprises. Land within approximately 10 miles of the site is primarily forested with limited agriculture and some rural housing. Several paved county roads traverse the area.

---

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

ESP Plan Appendix 6, "Evacuation Time Estimates for the Vogtle Electric Generating Plant Plume Exposure Pathway Emergency Planning Zone," states that Innovative Emergency Management, Inc. (IEM) conducted the ETE analysis using 2006 population data and projected 2010 population data and that the methods used to obtain population data and to estimate the ETEs are documented in the IEM April 2006 report "Evacuation Time Estimates for the Vogtle Electric Generating Plant." IEM used PTV Vision VISUM, a computer simulation model, to perform the ETEs. The ETE report was submitted as part of the VEGP application.

SSAR Section 2.1.3 provides population projections for the area surrounding the VEGP site through 2070. For purposes of emergency planning associated with the ESP, the staff examined the population projections for the 20-year period of the ESP, focusing on the period between the years 2006 and 2030, for which the application provided population values. For the 10-mile EPZ, SSAR Section 13.3.1.2 states that the resident and transient population is 3767. A table in SSAR Section 2.1.3 indicates that the projected population for 2030 is 4406. The staff calculated that this indicates an increase of 639 over a 24-year period (i.e., 2006 to 2030), which reflects an increase of approximately 0.71 percent per year over that time period. Further, SSAR Section 2.2.2.1 states that the "Burke County Comprehensive Plan: 2010," Part 1, shows a relatively slow, stable population growth pattern for the county. The 10-mile EPZ area in Georgia is located almost entirely within Burke County. Section 1.2, "Emergency Planning Zone," states that Burke County has the largest resident population within the EPZ and that this population is small and dispersed. In addition, SSAR Section 2.2.2.1 states that currently no major increases are expected in industrial, military, or transportation facilities within a 25-mile radius of the VEGP site except for the development of the site for VEGP Units 3 and 4.

The staff has not identified any significant differences between the emergency planning elements proposed in the SSAR and the existing VEGP Emergency Plan elements relied on in the SSAR. The staff finds that, for purposes of identifying physical characteristics that could pose a significant impediment to developing emergency plans for the proposed two additional reactors at the VEGP site, there is little distinction between the existing VEGP site and the ESP site. Because the existing VEGP site includes the ESP site, the staff finds that the applicant's use of the 2006 ETE for the VEGP site in the ESP application is acceptable and appropriate.

13.3.1.3 Conclusion

As discussed above, the applicant has shown through use of the ETE that no physical characteristics unique to the proposed ESP site pose a significant impediment to the development of emergency plans. On the basis of its review, as described above, the NRC staff concludes that the information the applicant provided is consistent with the guidelines in RS-002 and Supplement 2. The staff finds that there are no physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 52.17(b)(1) and 10 CFR 52.18.

13.3.2 Contacts and Arrangements with Local, State, and Federal Agencies

13.3.2.1 Regulatory Basis

In SSAR Section 13.3, the applicant stated that Part 5 of the ESP application presents a proposed complete and integrated emergency plan (i.e., ESP Plan), in accordance with 10 CFR 52.17(b)(2)(ii). As stated in 10 CFR 52.17(b)(4), the requirements for obtaining governmental agency certifications apply to proposed complete and integrated emergency plans submitted under the option set forth in 10 CFR 52.17(b)(2)(ii).

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(4), which mandate, in part, that the applicant shall make good faith efforts to obtain certifications from local, State, and Federal governmental agencies with emergency planning responsibilities that (1) the proposed emergency plans are practicable; (2) these agencies are committed to participating in any further development of the plans, including any required field demonstrations; and (3) these agencies are committed to executing their responsibilities under the plans in the event of an emergency. In addition, the application must contain any certifications that have been obtained. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of the emergency planning information given in an ESP application.

13.3.2.2 Technical Evaluation

In Section 13.3 of Part 2 of the SSAR, the applicant stated that it developed the emergency plan using the VEGP Plan, Revisions 42 and 43, and the guidance contained in NUREG-0654/ FEMA-REP-1, NEI 99-01, NEI 07-01 ("Methodology for Development of Emergency Action Levels – Advanced Passive Light Water Reactors," Revision 0, dated February 28, 2007), and Supplement 2 to NUREG-0654/FEMA-REP-1. SSAR Section 13.3.5, "Contacts and Arrangements," states that SNC currently maintains letters of agreement or contracts with State and local government agencies, the DOE-SR, medical support facilities, and independent industry support organizations, in support of emergency planning at the VEGP for the existing Units 1 and 2. In addition, Table 13.3-3, "Agency Agreements and Points of Contact," identifies the agencies with which SNC maintains current letters of agreement or contracts, including the point of contact for each agency, with the exception of local radio and television companies. Agreements with local radio and television companies will be transferred to the respective State and/or local emergency plans. The applicant provided the agreements in Enclosure 11, "Letters of Agreement with Local Agencies," of the application.
SSAR Section 13.3.5 states that, in support of the ESP application, SNC contacted each agency by letter (i.e., supplemental letters of agreement), notifying them of the proposed addition of two new AP1000 reactors at the VEGP site and the revised emergency plan for VEGP. In addition, SSAR Section 13.3.5 states that the executed supplemental letters of agreement requested that the agencies concur that the ESP Plan is practicable and commit to continued participation in any further development of the VEGP site emergency plan, including field demonstrations under the plan. Together, the executed supplemental letters of agreement and existing letters of agreement provide certification from the agencies that (1) the proposed ESP Plan is practicable; (2) the agencies are committed to participating in any further development of the proposed ESP Plan, including any required field demonstrations; and (3) the agencies are committed to executing their responsibilities under the ESP Plan in the event of an emergency. Enclosure 11 of the application provides copies of the existing letters of agreement

and contracts. Appendix 13.3A to SSAR Part 2 contains copies of the supplemental letters of agreement.

The supplemental letters of agreement state the applicant's intent to revise the existing VEGP Plan to include provisions for the addition of two new reactors at the VEGP site. The letters also request the agencies' concurrence that the proposed emergency plan is practicable and that they commit to participation in any further development of emergency plans, including any required field demonstrations. The supplemental letters of agreement were executed with all of the agencies between April and July 2006, by way of a signed and returned copy (duplicate original) from the identified official within each agency.

The staff reviewed the letters of agreement and contracts, as well as the supplemental letters of agreement. In addition, the staff reviewed the FEMA findings related to these letters of agreement and contracts and discusses them throughout SER Section 13.3.3, along with the staff's review of these documents.

13.3.2.3 Conclusion

As discussed above, the applicant has provided the required certifications from local, State, and Federal agencies with emergency planning responsibilities. On the basis of its review of the certifications and FEMA findings, as described above, the NRC staff concludes that the information provided is consistent with the guidelines in RS-002 and Supplement 2. The staff finds that the letters of agreement and contracts in the application adequately establish certification by governmental agencies relating to their support of the VEGP site and the proposed Units 3 and 4. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 52.17(b)(4).

13.3.3 Complete and Integrated Emergency Plans

13.3.3.1 Regulatory Basis

In SSAR Section 13.3, the applicant stated that Part 5 of the ESP application presents a proposed complete and integrated emergency plan (i.e., ESP Plan), in accordance with 10 CFR 52.17(b)(2)(ii). Further, the ESP Plan is designed to comply with 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50 and was developed using the current VEGP Plan (Revisions 42 and 43) and the guidance contained in NUREG-0654/FEMA-REP-1, NEI 99-01, NEI 07-01, and Supplement 2 to NUREG-0654/FEMA-REP-1. In addition, the ESP Plan includes a set of ITAAC to address those elements of the emergency plan that cannot be completed during the ESP application phase.

The staff reviewed the proposed complete and integrated emergency plan in accordance with the applicable regulatory requirements in 10 CFR 52.17(b), 10 CFR 52.18, 10 CFR 50.47, and Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(ii), an applicant for an ESP may propose complete and integrate emergency plans for NRC review and approval, in consultation with FEMA. In accordance with 10 CFR 52.17(b)(3), for complete and integrated emergency plans submitted pursuant to 10 CFR 52.17(b)(2)(ii), the applicant must include proposed ITAAC that the holder of a COL referencing the ESP shall perform. As required by 10 CFR 52.17(b)(4), the applicant should make good faith efforts to obtain certifications from the local, State, and Federal agencies with emergency planning responsibilities and include those certifications in the application. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine

whether the proposed complete and integrated emergency plans provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. The planning standards and evaluation criteria for the preparation and evaluation of complete and integrated emergency plans appear in NUREG-0654/FEMA-REP-1.

13.3.3.2 Technical Evaluation

The following subsections describe the staff's technical evaluation of the information provided in the ESP application, consisting of SSAR Section 13.3 (SSAR Part 2) and the proposed ESP Plan (Part 5, "Emergency Plan"). The preface to the ESP Plan states that the VEGP Emergency Plan (i.e., ESP Plan) is designed to accommodate the unique features of the two unit designs used at the site. A common ESP Plan is supported by Annex V1, which contains the parts of the emergency plan that are unique to Units 1 and 2, and Annex V2, which contains the parts of the emergency plan that are unique to the proposed Units 3 and 4. Each segment of the emergency plan is supported by appendices that contain supporting information. SER Section 13.3.1.2 addresses the relationship between the ESP Plan and the VEGP Plan, including implementation of the ESP Plan for all four nuclear units at the VEGP site. The staff's review and findings in this SER apply only to VEGP Units 3 and 4. The changes to the emergency plan for Units 1 and 2 should be addressed in accordance with 10 CFR 50.54(q).

The section designations of the basic planning areas in both the ESP Plan and VEGP Plan generally correspond to the alphabetical planning standard designations in Section II of NUREG-0654/FEMA-REP-1 (i.e., planning standards A through P), and the alphanumerical subsection designations in the ESP Plan are consistent with those in the VEGP Plan. This portion of the safety evaluation adheres to the format of Section II of NUREG-0654/ FEMA-REP-1. Each of the planning standards is listed and followed by a summary of the applicable portions of the ESP Plan related to that specific standard. The staff reviewed portions of the emergency response plans for the States of South Carolina and Georgia and the counties of Burke, Aiken, Barnwell, and Allendale, for understanding and content in relation to consistency with various sections of the ESP Plan that address offsite response. FEMA performed the offsite (i.e., State and local) reviews, pursuant to the applicable regulations, and under the June 17, 1993, "Memorandum of Understanding Between Federal Emergency Management Agency and Nuclear Regulatory Commission," which describes the respective emergency planning responsibilities of and the areas of cooperation between FEMA and the NRC. (See also Appendix A, "Memorandum of Understanding Between Federal Emergency Management Administration and Nuclear Regulatory Commission," to 44 CFR Part 353, "Fee for Services in Support, Review, and Approval of State and Local Government or Licensee Radiological Emergency Plans and Preparedness.")

SSAR Figure 13.3-2, "VEGP Site Map," shows that the ESP site footprint for the new Units 3 and 4, which includes the power block area and location of the Units 3 and 4 cooling towers, is located near the existing VEGP Units 1 and 2. The boundary of the ESP site is entirely within the existing VEGP site EAB. Thus, for the purpose of evaluating the adequacy of the ESP Plan, little distinction exists between the VEGP site and ESP site.

13.3.3.2.1 Assignment of Responsibility—Organization Control (10 CFR 50.47(b)(1); NUREG-0654/FEMA-REP-1, planning standard A)

The regulation, as reflected in the planning standard, requires that primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the EPZs have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

In ESP Plan Section A, "Assignment of Responsibility," the applicant described the responsibilities of the applicant and various local, State, and Federal agencies, as well as private sector organizations, that are part of the emergency response organization (ERO) for the VEGP site and may be needed to respond to an emergency at the VEGP site. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan compared to NUREG-0654/ FEMA-REP-1, planning standard A, "Assignment of Responsibility (Organization Control)." Planning standard A provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(1).

[A.1.a] In ESP Plan Section A, the applicant stated that the organizations intended to be part of the overall response include the applicant, the States of Georgia and South Carolina, the counties of Burke, Aiken, Barnwell, and Allendale, and DOE-SR. The Burke County EMA, Burke County Hospital in Waynesboro, Georgia (also referred to as Burke County Medical Center or Burke Medical Center), and Doctors Hospital in Augusta, Georgia, will provide medical support. Private sector organizations include Bechtel, which will provide engineering and construction services, and Westinghouse, which will provide general services related to NSSS operations. Additional assistance will be available from other electric utility companies, pursuant to various agreements.

[A.1.a, C.1.b] In ESP Plan Section A.9, "Federal Government," the applicant stated that the resources of the Federal agencies, appropriate to the emergency condition, will be made available in accordance with the National Response Plan (NRP). The agencies include the NRC, Department of Homeland Security (DHS), DOE, FEMA, Environmental Protection Agency (EPA), Department of Health and Human Services (HHS), DOT, and Department of Agriculture (USDA). **[A.1.c, A.1.d, B.6]** The interrelationships among the EROs are shown in Figure A-1, "Formal Interfaces among Emergency Response Organizations," and the specific individuals (by title) who will be in charge of emergency response are listed in Table A-1, "Responsible Individuals of Primary Response [Organizations]."

[A.1.b] ESP Plan Section A.10, "Concept of Operations," states that, consistent with the emergency classification system described in ESP Plan Section D (addressed in SER Section 13.3.3.2.4), the emergency preparedness program for the VEGP site will call for the coordinated response of several organizations. The VEGP site will be responsible for maintaining an effective emergency plan and preparedness through the maintenance of formal procedures for implementing the plan, training personnel, maintaining equipment, and maintaining a continuing relationship with various governmental agencies and private organizations. The application included Unit 3 ITAAC 9.1, which states that the licensee has submitted detailed emergency implementing procedures (EIPs) for the onsite emergency plan

no less than 180 days prior to fuel load. In RAI 13.3-46.e, the staff asked the applicant to explain why there is no Unit 4 ITAAC 9.1 comparable to the **Unit 3 ITAAC 9.1**.

In its response, the applicant stated that the implementing procedures will be identical for Units 3 and 4; therefore, verification that the implementing procedures have been submitted under the Unit 3 ITAAC means that no additional ITAAC are required for Unit 4. While various aspects of detailed implementing procedures could be common to Units 3 and 4, the staff does not agree that all of the implementing procedures for Unit 3 will be identical to those for Unit 4 (e.g., unit-specific EALs or instrumentation setpoints). The applicant must either explain why Unit 3 **ITAAC 9.1** will demonstrate the sufficiency of the ITAAC in relation to Unit 4, or supplement Table V2A4-1 with comparable Unit 4 ITAAC. In the Safety Evaluation Report with open items, the staff identified the resolution of this issue as Open Item 13.3-1. SER Sections 13.3.3.2.2, 13.3.3.2.4, 13.3.3.2.8, 13.3.3.2.9, 13.3.3.2.10, and 13.3.3.2.16 discuss in detail the submission of detailed implementing procedures for VEGP. (See also SER Section 13.3.3.2.9, regarding **Unit 3 ITAAC 6.1 through 6.7**, and SER Section 13.3.3.2.14, regarding **Unit 3 ITAAC 8.1**.) The staff reviewed the applicant's response in its submittal dated October 15, 2007 – which included a revised Table V2A4-1 that added a **Unit 4 ITAAC 9.1** (identical to that for Unit 3) for the submission of detailed emergency implementing procedures that will be used for Unit 4 – and finds it acceptable. Therefore, Open Item 13.3-1 is resolved.

[A.1.d, B.4] ESP Plan Section A.10 also states that the emergency director will be the key individual in the VEGP site ERO and will have nondelegable responsibilities. One of these duties will be deciding to notify the authorities responsible for offsite emergency measures and the NRC.

[A.1.d] The staff also looked at ESP Plan Section B.2, "Emergency Response Organization," which identifies the emergency director as the specific individual who will be in charge of emergency response for the licensee. (See SER Section 13.3.3.2.2.) The emergency director has the authority, management ability, and knowledge to assume the overall responsibility for directing site staff in an emergency. Initially, the shift manager, or the shift supervisor, if the shift manager cannot be located expeditiously, will fill this position. The responsibility for emergency direction will be transferred to the nuclear plant general manager, or an alternate, after the general manager or the alternate receives an appropriate briefing and becomes familiar with the current status of events.

[A.1.b, A.4] As reflected in the list of activities in ESP Plan Section B.2, and as discussed in SER Section 13.3.3.2.2, it is the responsibility of the emergency director to provide overall management of emergency services related to the procurement of materials, equipment, and supplies; documentation; accountability; and security functions. The emergency director will oversee the activation and staffing of emergency response facilities (ERFs) for the duration of an emergency and may request additional support as necessary. (Facility activation is also addressed in ESP Plan Section H and SER Section 13.3.3.2.8.) The ESP Plan describes specific duties and responsibilities.

[A.1.b, A.4, B.6, B.7, H.2, H.4] The staff reviewed Appendix 7, "Emergency Operations Facility," to the ESP Plan. In Appendix 7, the applicant stated that the appendix provides the framework for operations of the EOF for SNC and is an integral part of the site-specific emergency plan. The appendix describes the mechanism for obtaining and providing additional emergency response support and resources to SNC sites in the event of an emergency. It specifies that offsite support personnel and equipment will be dispatched to the site operational support center (OSC) or TSC upon request from the emergency director. The corporate ERO

will provide offsite emergency response support and resources on a 24-hour, 7-day-per-week basis until the emergency has been terminated. Appendix 7 is also addressed in ESP Plan Sections B, H, and O, which are discussed in SER Sections 13.3.3.2.2, 13.3.3.2.8, and 13.3.3.2.15, respectively. The discussions include additional staff evaluation of the EOF concept of operations and its relationship to the total emergency response effort.

[A.1.b] The emergency director will initiate the activation of the ERO by contacting the States of Georgia and South Carolina, the counties within the plume exposure pathway EPZ, the SRS, and the NRC. [A.1.e] These organizations can be contacted on a 24-hour, 7-day-per-week basis. The State and local agencies have continuously staffed communication links for the purpose of receiving notification of a radiological emergency, and the SRS is a continuously operating facility that can be contacted at all times. The Federal agencies can be notified by contacting the NRC on the emergency notification system (ENS) line, which is a dedicated communication link. The staff reviewed other sections of the application that deal with the availability of 24-hour emergency communications and response, and discusses those reviews in SER Sections 13.3.3.2.2, 13.3.3.2.5, 13.3.3.2.6, 13.3.3.2.8, and 13.3.3.2.12.

[A.1.b] The State of Georgia and Burke County responses follow the Georgia Radiological Emergency Plan (hereafter referred to as "GA REP")[18] and its associated Annex D, "Plant Vogtle." The State of South Carolina and county (i.e., Aiken, Barnwell, and Allendale Counties) responses are in accordance with the South Carolina Operational Radiological Emergency Response Plan (SCORERP) and the respective county emergency operations plans and its associated Annex Q2, "Fixed Nuclear Facility [i.e., Vogtle] Radiological Emergency Response Plan."

[A.1.b] In ESP Plan Section A.2, "State of Georgia," the applicant stated that the Georgia Office of Homeland Security – Georgia Emergency Management Agency (OHS-GEMA, Georgia EMA, or GEMA) is assigned responsibility for overall direction and coordination of emergency and disaster planning and operations in the State of Georgia.[19] GEMA has developed the Georgia Emergency Operations Plan (hereafter referred to as "GEOP"), which is an emergency operations plan for all natural disasters, accidents, and incidents, including radiological emergencies at fixed nuclear facilities (FNFs). Integral to the GEOP is the GA REP, which is used for planning for and responding to radiological emergencies. The GEOP and GA REP contain details concerning assignment of responsibilities.

[A.1.b, A.1.d, A.2.a] ESP Plan Section A.3, "Burke County, Georgia," states that all of the area within the VEGP plume exposure pathway EPZ in the State of Georgia falls within Burke County. The responsibility for overall radiological emergency response planning for Burke County rests with the Chairman of the Burke County Board of Commissioners. It is the Chairman's responsibility to initiate actions and provide direction and control at a level

---

18 The GA REP consists of two distinct planning elements. The first is the Base Plan, which contains planning information of a generic, nonspecific nature, such as legal authorities, organization, administration, and concept of operation. The second consists of Plan Annexes, which contain detailed, specific information about a particular facility or particular incident situation. GA REP-Annex D has been developed for VEGP.

19 Pursuant to the Governor's Executive Order (08.25.04.01), issued August 25, 2004, establishing the Homeland Security Central Command, the Director of Homeland Security has authority to coordinate and control the State's response to emergencies. All State boards, departments, agencies, associations, institutions, and authorities shall provide any personnel, equipment, information, or any other requested assistance (reference http://www.gov.state.ga.us/ExOrders/08_25_04_01.pdf, visited March 24, 2007).

consistent with the specific incident. Agencies within Burke County that have a primary role in radiological emergency planning and response include the EMA and the Sheriff's Department. Annex D to the GA REP contains details concerning assignment of responsibilities for the Burke County response.

[A.1.b, A.2.a] ESP Plan Section A.4, "State of South Carolina," states that the South Carolina Emergency Management Division (SCEMD) in the Office of the Adjutant General has responsibility for South Carolina's emergency preparedness, response, recovery, and mitigation activities. SCEMD has developed the South Carolina Emergency Operations Plan – Base Plan (SCEOP), which establishes the policies and procedures by which South Carolina will coordinate State and Federal response to disasters impacting South Carolina. SCEOP Attachment A, Annex 25, "Radiological Hazards," assigns responsibilities for radiological hazards in South Carolina. Integral to the SCEOP is SCORERP, which prescribes planning objectives, tasks, and responsibilities to departments and agencies of State and local governments for radiological events at nuclear facilities. **[A.1.d]** Details concerning assignment of responsibilities are contained in the SCEOP and SCORERP.

[A.1.a, A.1.b] ESP Plan Section A.5, "Aiken, Barnwell, and Allendale Counties, South Carolina," states that most of the plume exposure pathway EPZ within South Carolina falls within the site boundary of the SRS. The DOE-SR consists of lands owned or leased by the Federal Government. Thus, DOE-SR is responsible for the direction and control of all emergency response actions on the SRS. DOE-SR will provide the necessary response within the SRS reservation, in accordance with the SRS emergency plan. DOE will exercise overall responsibility, jurisdiction, and authority for conducting on-plant response operations to protect the health and safety of SRS personnel. DOE will provide for emergency notification and, as needed, evacuation, monitoring, decontamination, and immediate lifesaving medical treatment of non-SRS personnel on plant, as well as provide access control for SRS areas. DOE will provide initial radiological monitoring and assessment support to the State of South Carolina under the DOE Radiological Assistance Program (RAP). This includes projected release dispersion information and offsite radiological monitoring and assessment assistance. SRS will also coordinate public affairs activities with the State of South Carolina, SNC, and GPC.

ESP Plan Appendix 5, "Memorandum of Agreement with DOE-Savannah River," provides the agreement between DOE-SR and SNC, which states that DOE is responsible for the protection of all persons and for the direction and control of all emergency response actions on SRS for emergencies occurring at or affecting SRS, including emergencies originating at VEGP. Under this agreement, DOE-SR will promptly notify all persons on SRS within the VEGP plume exposure pathway EPZ, perform radiological monitoring at SRS as requested by SNC or the State of South Carolina, and provide monitoring results to SNC and to the States of South Carolina and Georgia. **[A.1.a]** Limited portions of Aiken, Barnwell, and Allendale Counties are outside of the SRS but within the plume exposure pathway EPZ of the VEGP site. The respective counties are responsible for planning and response within these areas.

[A.1] The staff finds that the applicant has identified the appropriate organizations (including identification by title of the specific individual in charge of emergency response) that are intended to be part of the overall response organization and has specified the concepts of operations and relationship of the organizations to the total effort. The interrelationships are illustrated in a block diagram, and each organization is capable of providing 24-hour-per-day emergency response, including 24-hour-per-day staffing of communications links for the necessary organizations. **[A.4]** In addition, the staff finds that the applicant's organization will be capable of continuous (24-hour) operations for a protracted period, and the emergency

director has been identified as the individual who will be responsible for providing the necessary technical, administrative, and material support (i.e., assuring continuity of resources) for the duration of the emergency.

[A.3, B.8, B.9] ESP Plan Appendix 2, "Letters of Agreement," lists the letters of agreement with the principal offsite EROs and agencies, which are maintained on file with the VEGP site emergency preparedness coordinator (EPC). The individual letters of agreement provide the basic concept of operation for the organization/agency and supplement the response functions addressed by existing laws, regulations, or executive orders. Written agreements relating to the various concepts of operations developed between support agencies and organizations are also addressed in ESP Plan Section B, "VEGP Emergency Response Organization," and discussed in SER Section 13.3.3.2.2. **[A.3]** The staff finds that the applicant has provided adequate written agreements that refer to the concept of operations developed between Federal, State, and local agencies, and other support organizations having an emergency response role within the EPZs.

State and Local Emergency Plans [A.1, A.2, A.3, A.4]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard A of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard A are adequate. The following summarizes the FEMA findings for planning standard A.

a. State of Georgia

[A.1.a, A.1.b] Section I, "Base Plan" (Subsection IV, "Concept of Operations"), of the GEOP describes local, State, and Federal Government responsibilities during an emergency. GEOP Section II, "Emergency Support Functions (ESF)," consists of 15 ESF annexes, which identify the primary organization, including the supporting local, State, and Federal agencies that would respond to a radiological emergency. This section describes the expected interactions between local, State, and Federal response agencies for each ESF, as well as the roles and responsibilities of each agency. In addition, the ESF annexes describe specific actions that will be taken during the mitigation/preparedness and response/recovery phases.

GEOP Appendix D, "Summary of Agency/Organizational Emergency Responsibilities," describes ESFs and resources for 46 organizations. In addition, GEOP Appendix E, "Georgia Voluntary Organizations Active in Disaster (VOAD) – State Associations and Private Sector Support," lists 24 voluntary organizations that are active in disaster response in the State of Georgia and 8 State associations and private sector organizations.

[A.1.c] In Section VI, "Concept of Operation," of the GA REP–Base Plan, Figures 1, 2, and 3 show (in block diagrams) the organization and operational relationship of local and State government organizations. Figure 1, "State Government Operating in a Declared Radiological Emergency," includes the coordination and operational links between the Governor, State Disaster Coordinator, Department of Natural Resources (DNR) Radiation Emergency Coordinator, Environmental Protection Division (EPD), GEMA, Georgia State Patrol, Department of Motor Vehicle Safety, Georgia Technology Authority, DOT, Department of Human Resources, USDA, Department of Administrative Services, Georgia Forestry Commission, and other State agencies.

Figure 2, "Typical Organization of the Radiological Emergency Response Team," shows the DNR Radiation Emergency Coordinator and includes personnel in the areas of environmental radiological surveillance, technical assessment and laboratory support, and health physics support. Figure 3, "Operational Relationships Among County Response Organizations," includes the operational and coordination links between the nuclear power plant, GEMA, local elected (Burke County) officials, and county emergency management. In addition, Figure 3 shows an operational link between county emergency management and the following local agencies and organizations:

- Fire Department
- Sheriff's Department
- Board of Education
- Department of Family and Children Services (DFCS)
- County Health Department
- Municipal Public Works
- County Public Works
- local hospital
- volunteer organizations

[A.3] GA REP-Base Plan, Appendix 2, lists "The Southern Agreement for Mutual State Radiation Assistance Activation Procedure" (SMRAP). GA REP-Annex D lists letters of agreement and memoranda of understanding with SNC, Burke County Hospital, Columbia-Augusta Medical Center, State of Georgia/State of South Carolina GEMA, SCEMD standard operating procedure (SOP) for Activation of the VEGP NOAA weather radio (i.e., NWR), and State of Georgia GEMA, and Burke County EMA SOP for Activation of the Plant Vogtle Siren System.

[A.1.b] The general concept of operation for development and implementation of the GA REP, as well as supporting site-specific annexes, is essentially the same as for any other emergency or disaster response planning conducted by the State of Georgia. While emergency operations are initiated at the local jurisdiction, GEOP Section IV states that all local and State operations will be in compliance with the NRP and the National Incident Management System legislation. For disasters resulting in a Presidential Declaration, GEMA will process requests for State assistance and request assistance from FEMA. Together, the GEOP and GA REP-Base Plan identify the operational role for each response organization and sub-organization that are intended to be part of the overall response and describe the concept of operations and its relationship to the total effort.

As the framework for operations, should an emergency or disaster strike anywhere in the State of Georgia, the GEOP provides for coordinated planning and action by all State agencies in response to peacetime emergencies. The State of Georgia Executive Order, which was signed by the Governor on February 14, 2006, and included in the GEOP, assigns primary and support responsibilities for emergency and disaster services to State agencies, based on their usual (or normal) functions and/or special capabilities. **[A.1.d, A.2.a]** The Executive Order authorizes the Director of GEMA to exercise overall direction, control, and coordination of emergency and disaster planning and operations. GEOP Section V, "Direction and Control," describes the responsibilities of GEMA and other State agencies and organizations and states that the GEMA Director shall be responsible for the program of emergency management in the State, subject to the direction and control of the Governor. The GEMA Director will assume responsibility for direction and coordination of ESFs at the State Operations Center (SOC) in Atlanta, Georgia.

At the discretion of the GEMA Director, and in concurrence with the Governor, a designated alternate SOC may become operational. In addition, the GEMA Director shall coordinate emergency management activities of all agencies/organizations within the State and serve as a liaison with other States and the Federal Government.

[A.2.a] GEOP Section IV.C, "State Government," states that State services and resources are supplements to local governments and are identified in the ESFs. State agencies and organizations serve as primary and support agencies/organizations for functional responsibilities. GEOP Section III, Appendix C, "Chart of Primary and Support Agencies," identifies responsibilities by functional area and the State organization that will fulfill those responsibilities. Appendix D, "Summary of Agency/Organizational Emergency Responsibilities," also identifies responsibilities and assets of State and non-State organizations that can assist the 15 ESF functions during a declared emergency. In addition, GA REP-Base Plan, Section IV, "Concept of Operation," lists agencies and their responsibilities. Appendix 1 provides a concise summary table of agency responsibilities.

[A.1.d] Section II, "Authority and Legal Aspects," of the GA REP-Base Plan states that the Governor is authorized and empowered under Section 38-3-22 of the Official Code of Georgia Annotated (OCGA) to have general direction and control of GEMA, and in the event of disaster or emergency beyond local control, may assume direct operational control over all or any part of the emergency management functions within the State. **[A.1.a, A.1.b]** Section IV, "Responsibilities," of the GA REP-Base Plan describes the responsibilities for local, State, and Federal agencies, and course of action during an emergency. DNR is assigned primary responsibility for implementation and administration of the State radiological emergency response function, which includes interaction with appropriate local, State, and Federal agencies and with private organizations to direct all necessary radiation control actions.

[A.2.b] In addition to the State of Georgia Executive Order (discussed above), the legal bases for the authorities reflected in the GEOP and GA REP are provided in GEOP Appendix G, "Authorities and References," which lists 27 various references to State and Federal laws, statutes, and regulations governing emergency disaster planning and response. The Georgia State laws and acts are also summarized in Section II of the GA REP-Base Plan. They include the following:

- Georgia Radiation Control Act, OCGA Section 38-3-22
- Immunity from Liability, OCGA Section 38-3-35
- Georgia Radiation Control Act, OCGA Section 31-13-1-10
- Georgia Water Quality Control Act of 1974, OCGA Section 12-5-47
- Georgia Air Quality Control Act, OCGA Section 12-9-1
- Georgia Transportation of Hazardous Materials Act, OCGA Section 46-11-1

[A.1.e] GEOP ESF Annex 2, "Communications," states that the GEMA communications center serves as the 24-hour State warning point for receiving and disseminating alerts and warnings to other State agencies, local governments, and the public. GEMA maintains agreements and contracts to ensure equipment and system maintenance on a 24-hour-per-day basis.
GA REP-Base Plan, Section VI.C, "Notification," states that GEMA can be contacted through one of its 24-hour emergency numbers or toll-free numbers. Assistance may also be obtained through the DNR-EPD 24-hour emergency number. (The SOP, "Resource Contacts," provides site-specific telephone numbers and procedures for notifying FNFs.)

GA REP-Base Plan, Section VI.E, "Emergency Communications," states that the primary method for initial notification will be the Emergency Notification Network (ENN), telephone, or radio from the facility operator (or on-scene personnel) to the responsible local and State agencies. Systems that are currently in place include, but are not limited to, a direct telephone line between the facility operator and the GEMA communications center (both of which are staffed on a 24-hour basis) and commercial telephone service for calls from the facility operator to the DNR 24-hour number (which is staffed after working hours by persons who can contact an on-call coordinator by either telephone or pager).

GA REP-Annex D, Section A, "Notification Methods and Procedures," states that in the event of a radiological emergency at Plant Vogtle, the plant emergency director (or his designee) will notify local and State authorities utilizing the ENN,[20] in accordance with current procedures. The ENN terminal, which is located within the GEMA communications center, is staffed 24 hours a day, 7 days a week. In the event the ENN is not operational, the GEMA communications center will be notified by commercial telephone at the 24-hour-a-day number, as depicted in the GEMA REP SOP, "Resource Contacts." (SER Section 13.3.3.2.5 also discusses communication links.)

[A.4] The GEOP Section I, "Introduction," states that the GEMA Director, on behalf of the Governor, will determine the level and duration of resource commitment. The Governor will declare a State of Emergency and may request a Presidential Declaration when appropriate. GEOP Section V states that State agency heads have the responsibility to appoint a primary and alternate emergency coordinator, with the authority to commit agency personnel and resources in emergencies and disasters.

GA REP-Annex D, "Plant Vogtle," states that during a radiological emergency at an FNF, State assistance will probably be needed since local capabilities are limited. The State response element can operate on a 24-hour basis, both from the FEOC in Waynesboro, Georgia, and from the SOC in Atlanta, Georgia. This capability for around-the-clock operation is based on current staffing in principal State response agencies, using a 12-hour shift. It is anticipated that augmentation from appropriate Federal agencies would be needed to assist in radiological monitoring and assessment operations after 24 hours. Accordingly, an early State request for Federal assistance would be based on the seriousness of the situation and the estimated duration of the emergency.

b. Burke County, Georgia

[A.1.a, A.1.b] The Burke County Emergency Management Radiological Plan, Section IV, "Concept of Operations," describes the coordination among all responsible departments and agencies. In addition, Section IV describes the roles of the listed agencies and organizations and states that the Burke County EMA will maintain coordination with officials for the VEGP and representatives from all local and State departments and agencies that are involved in emergency planning and operations related to an incident at the nuclear power plant. Section V.F, "Departments/Agencies, Roles and Notification," identifies the local departments that interface with the Burke County EMA and staff the EOC during a radiological emergency.

---

20 The ENN is a dedicated circuit with terminals located at the utility, the local emergency operations center (EOC), the GEMA Forward Emergency Operations Center (FEOC), and SOC – all of which are staffed on a 24-hour basis – and at the SRS and designated locations in South Carolina (see SER Section 13.3.3.2.6.d).

[A.1.c] Burke County Plan, Attachment B, "Operational Relationship among County Response Organizations," provides an organization chart, which shows the operational and coordination links between county organizations in the EOC. This chart includes the coordination and operational links between the Vogtle plant, OHS-GEMA, the county EMA, local elected officials, emergency medical services (EMS), fire departments, sheriff's department, board of education, municipal police, county coroner, DFCS, local hospital, county health department, municipal public works, county public works, and the county agent.

[A.1.d, A.2.a] Burke County Plan, Section V, "Responsibilities," states that the responsibility for overall radiological emergency response planning, training, and operations in Burke County rests with the Chairman, Burke County Board of Commissioners. This responsibility includes initiating action in the event of a nuclear incident and providing direction and control at the local level. The Burke County EMA Director will be responsible for coordinating emergency operations at the local level and keeping local government officials advised of the status of the situation. The EMA Director will coordinate emergency operations and support with GEMA and the GEMA Area 3 Field Coordinator, State support agencies, and officials from the nuclear power plant. Section V describes key agency and organization responsibilities. **[A.2.b]** The legal basis for the county's authority is listed in Section III, "Authority—Legal Basis."

[A.1.e] Burke County Plan, Attachment F, "Communications," states that 24-hour operations and communications will be provided. In addition, the Burke County EMA can be contacted 24 hours a day through regular telephone, the GEMA statewide radio network, Burke County Sheriffs Department/Intrastate Coordinating Channel (ICC) radio network, Burke County EMA radio network, State Fire Mutual Air Radio Network, State hospital emergency administrative radio (HEAR)/EMS, and ENN (by GEMA). The county EOC is co-located with the sheriffs department, which provides 24-hour communications coverage. **[A.4]** Attachment A, "Implementation," states that the EMA Director will develop and maintain a 12-hour shift roster for key staff. Department/agency personnel will be assigned to shifts and/or operate on day-to-day shift schedules.

[A.3] The Burke County EMA currently has an April 2, 2004, letter of agreement, and April 17, 2006, letter of agreement with SNC, in regard to the county's concept of operations in support of the VEGP site. (The application includes these letters, and SER Section 13.3.2 discusses them.)

c. State of South Carolina

[A.1.a, A.1.b] SCORERP Section IV, "Concept of Operations," discusses general activation steps and organizations involved in a response. Section V, "Organization and Assignment of Responsibilities," lists the various ESF groups, Federal agencies, local governments, and organizations including their responsibilities in an emergency. Annex H, "Interstate and Federal Agency Response Support," identifies documents and describes the concept of operations associated with expected interstate regional assistance and Federal agency response procedures. In addition, Annex H outlines the procedures for State/Federal interface and cooperation in the event of an incident at an FNF.

The SCORERP lists SCEMD as the lead State agency for coordinating the State's offsite response to an incident at an FNF, and designates the Department of Health and Environmental Control (DHEC) as the lead State radiation emergency response agency. In addition, it describes DHEC responsibilities and the responsibilities of other State and Federal agencies.

Appendix 2 and Annex H provide additional details regarding agency interrelations. The SCEOP also describes ESF responsibilities during an emergency.

[A.1.c] SCORERP Figure 1 provides a radiological emergency response (RER) organization chart (block diagram), which illustrates the interrelationships (i.e., direction and control, and coordination) between the Governor, State Emergency Operations Center (SEOC) and State Emergency Response Teams (SERTs), State ESF, local governments and adjacent States, the NRC and FEMA, and public information organizations.

[A.1.d] SCORERP Section IV states that under the Governor's direction, the total and combined efforts of State and local governments will be utilized to mitigate the effects of offsite radiological hazards resulting from an FNF accident. Section III.A of SCEOP Annex 25 restates this. SCEOP Section III.F and Annex 25 Section III.B designate the SCEMD director as the lead for coordinating departments, agencies, and organizations in emergency response activities involving radiological hazards.

[A.2.a] SCEOP Section IV.C.6 and Annexes 1–19 and SCORERP Section V identify the key positions and list the ESFs and responsible agencies (including their primary responsibilities). SCEOP Table 3 and SCORERP Appendix 2 detail the agencies and ESFs (in table format), including their primary and support functions. SCORERP Section V describes State agencies and their radiological emergency responsibilities. Finally, SCORERP Appendix 2 provides a table that lists the functional areas and identifies the responsible agencies. **[A.3]** Supplemental letters of agreement were provided on December 28, 2006, to the Chemical and Nuclear Preparedness and Protection Division, DHS, Atlanta Field Office, with cover letters dated April 17, 2006. These letters are not included in the State plan but are in the utility's plan.

[A.2.b] SCEOP Section IX.A lists the State laws and regulations associated with State emergency response. Section IX.B lists the Federal regulations. SCEOP Section III.F and Annex 25 (Section III.B) designate the SCEMD Director as the lead for coordinating departments, agencies, and organizations in emergency response activities involving radiological hazards.

[A.1.e] SCORERP Section IV.A states that all radiological EROs will be prepared to react on a 24-hour basis and will be capable of continuous operations for a protracted period. Annex A, "Alert and Notification Procedures," states that alert telephone numbers and designated representatives for State, Federal, and contiguous State agencies appear in the SCEMD telephone directory. SCEOP Section V.A states that the State warning point has 24-hour radio, special telephone operations, and operation of the emergency alert system (EAS). **[A.4]** In addition, SCEOP Section III.A of Annex 25 states the following:

Under the Governor's direction, the total and combined efforts of state and local governments will be utilized to mitigate the effects of off-site radiological hazards resulting from an FNF accident. All radiological EROs will be prepared to react on a 24-hour basis, and will be capable of continuous operations for a protracted period. Directors of State agencies, departments, and commissions are responsible for ensuring that their agencies' RER responsibilities are accomplished. Designated county officials are responsible for emergency response within their jurisdictions.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[A.1.a, A.1.b, A.1.c] Annex Q2 of each county plan references the SCORERP for State and Federal support and, in Section 1.F, lists various local and private organizations. Section IV.B lists county agencies and their basic responsibilities, and an annex to the county plans provides detailed actions and responsibilities for each agency. Section IV lists responsibilities during radiological incidents, and Appendix 1 (Tab A) shows primary and support responsibilities. The county plans reference the State plan in regard to the use of State and Federal resources to support the counties. **[A.1.d]** Section IV.B describes the direction and control for the counties. **[A.2.a, A.3]** Section IV.B.4 of the county plans identifies the key positions, lists support services, and refers to the appropriate plan annex for detailed responsibilities and functions. Appendix 1 (Tab A) displays the functions, agencies, and the primary and support responsibilities.

[A.1.e, A.4] Section IV.D.2 of the county plans states that, based on the emergency classification, local government and State radiological response forces will react on a continuous 24-hour basis. In addition, Section IV.C.4 states that the county warning point provides 24-hour emergency response through the 911 Communications Center. **[A.2.b]** Section I.B lists legislative acts and county ordinances, which provide the legal basis for county emergency response.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for assignment of responsibility, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard A of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(1), and Sections III and IV.A of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.2 Onsite Emergency Organizations (10 CFR 50.47(b)(2); NUREG-0654/FEMA-REP-1, planning standard B)

The regulation, as reflected in the planning standard, requires that the on-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available, and the interfaces among various onsite response activities and offsite support and response activities are specified.

In ESP Plan, Section B, "VEGP Emergency Response Organization," the applicant described the organizational structure that would be available to respond to an emergency at the VEGP site. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard B, "Onsite Emergency Organization." Planning standard B provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(2).

[B.1] In ESP Plan Section B, the applicant stated that, initially, personnel normally employed at the site will staff the VEGP onsite ERO. An organizational chart for the ESP Plan is shown in Figure B-1, "Site Organization Chart." [B.6, B.7] If necessary, this staff will be augmented

substantially by the addition of SNC personnel and by personnel from other organizations. The organizational structure in ESP Plan Figure B-1 represents the pool of management personnel available onsite during normal working hours. Approximately 700 persons are stationed at Units 1 and 2 during the standard workday, and approximately 650 persons will be stationed at Units 3 and 4 during the standard workday. The normal operating crew for each unit includes a shift supervisor, licensed plant operators, and non-licensed plant operators. A shift manager is also on shift during operation, and personnel from the chemistry and health physics, maintenance, and security departments are also on site continuously.

[B.2] ESP Plan Section B states that the emergency director will be the key individual in the VEGP site ERO and has the responsibility to classify an event in accordance with the emergency classification system (discussed in SER Section 13.3.3.2.4). Classification of an event into one of the four emergency categories (i.e., notification of unusual event, alert, site area emergency, or general emergency) activates the VEGP site ERO. The emergency director will normally be located in either the TSC or control room, at his discretion, and is responsible for the management of the emergency response. The site-specific emergency plan and emergency plan implementing procedures (EPIPs) describe the specific duties and responsibilities. **[B.4]** One of the emergency director's nondelegable responsibilities is the decision to notify and recommend protective action to authorities responsible for offsite emergency measures and the NRC. ESP Plan Section B.2.1.1, "Emergency Director," lists the responsibilities that the emergency director may not delegate.

The emergency director has the authority to assume the overall responsibility for directing site staff in an emergency situation. ESP Plan Section B.2, "Emergency Response Organization," lists the activities that the emergency director will manage for the duration of the emergency. Initially, this position will be filled by the shift manager, or the shift supervisor if the shift manager cannot be located expeditiously. The responsibility for emergency direction will be transferred to the nuclear plant general manager or an alternate after the manager or alternate receives an appropriate briefing and becomes familiar with the current status of events. The emergency director may operate from the control room or TSC at his discretion. The emergency director may act as the TSC manager during the early phases of emergency response until the [EOF] is activated. SNC intends that the emergency director function will be transferred from the control room as soon as practicable. **[B.3]** Plant and corporate personnel who may be designated as emergency directors are listed in ESP Plan Table B-2, "Emergency Response Organization Assignments." Table B-2 lists the nuclear plant general manager as the primary emergency director and provides seven alternates.

[B.1, B.2, B.3, B.4] The staff finds that the applicant has adequately specified the onsite emergency organization of plant staff personnel for all shifts and its relation to the responsibilities and duties of the normal shift complement. In addition, the applicant has designated an individual as emergency coordinator (i.e., the emergency director), who is on shift at all times and has the authority and responsibility to immediately and unilaterally initiate any emergency actions, including providing protective action recommendations (PARs) to authorities responsible for implementing offsite emergency measures. The staff also finds that the application identifies an appropriate line of succession for the emergency director, including identifying the specific conditions for higher level utility officials to assume this function.

[B.5] ESP Plan Section B provides additional descriptions of the emergency duties of the normal shift complement, a discussion of the manner in which emergency assignments are to be made, a listing of additional support personnel on whom the site can rely, and a description of the relationships between onsite and offsite response activities. The extent to which the ERO

is activated depends on the severity of the situation. In ESP Plan Section B.2, the applicant stated that a security-related emergency may delay the ordering of facility activation, in order to protect plant personnel from the security threat. The emergency director will make the decision to delay activation of the facilities. ESP Plan Section H, "Emergency Facilities and Equipment," and SER Section 13.3.3.2.8 also address facility activation.

In ESP Plan Table B-1, "Minimum Staffing for Power Operation," the applicant summarizes the personnel available on shift and lists the specific positions or titles and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. Table B-1 also provides a summary of personnel available on shift and those who would be available for staff augmentation within 75 minutes of ERO notification. In RAIs 13.3-8.a and 13.3-8.b, the staff asked the applicant to explain differences between ESP Plan Table B-1 and Table B-1 of NUREG-0654/FEMA-REP-1, as they relate to the staff augmentation time, and address various other details associated with Table B-1. The staff also asked the applicant to explain whether the application is requesting approval to change the augmentation times for Units 1 and 2, and how this change would relate to a decrease in effectiveness (pursuant to 10 CFR 50.54(q)) for the existing Unit 1 and 2 emergency plan.

In its response, the applicant stated that SNC intends to augment its emergency response staff within 75 minutes of the determination of a need to augment the staff, and that the 75 minutes is a combination of the allowable 15 minutes for notification and allowable 60 minutes for the emergency response staff to respond and activate the associated emergency response centers; and thus, 75 minutes is consistent with the wording in (ESP Plan) Section H.3 and Section I.5.[21] SNC intends that the proposed emergency plan will be in effect for Units 1 and 2 when it is put into effect, and indicates that it will submit a licensing action concerning the emergency plan for Units 1 and 2 approximately 1 year before the scheduled full participation exercise associated with Unit 3. The applicant also referenced RAI 13.3-6 (discussed in SER Section 13.3.1.2), which indicates that the "licensing action" for Units 1 and 2 is intended to be the submission of a revision to the VEGP Plan, pursuant to the provisions of 10 CFR 50.54(q). In RAI 13.3-8.b, concerning the applicant's requested extension of the current Unit 1 and 2 staff augmentation time from 60 to 75 minutes in ESP Plan Table B-1, the staff stated the following in footnote 2:

Any proposed changes related to VEGP Units 1 and 2 should be in accordance with 10 CFR 50.54(q) and submitted in accordance with applicable processes, as a licensing action associated with those units, including appropriate justification, as specified in the "Smart Application Template for Requesting Emergency Plan Changes Related to On-shift Staffing Levels and Augmentation Times," ADAMS Accession No. ML042530011 ["Smart Application"]. Additional guidance can be found in RIS 2005-002, "Clarifying the Process for Making Emergency Plan Changes," ADAMS Accession No. ML042580404.

As discussed above, in response to RAI 13.3-6 and RAI 13.3-8.b, the applicant stated that revisions to the VEGP Plan will be in accordance with 10 CFR 50.54(q) and submitted as a licensing action – the timing of which is related to the scheduled full participation exercise and fuel load for Unit 3 – and that it will implement the ESP Plan in accordance with NEI 06-01.

---

[21] ESP Plan Section H.3, "Activation and Staffing of Emergency Facilities," states that the TSC will be activated and operational within about an hour of the initial notification, and the OSC will be operational within about an hour of initial notification. Section I.5, "Field Monitoring," states that it is estimated that teams will be in the field and performing monitoring tasks within about one hour of the determination of the need for field monitoring.

(SER Section 13.3.1.2 discusses NEI 06-01.) Therefore, this SER does not include an evaluation of shift augmentation times for VEGP Units 1 and 2, which will be evaluated separately when the licensee submits an appropriate licensing action request.

In regard to the staff augmentation time difference between ESP Plan Table B-1 (75 minutes) and Table B-1 of NUREG-0654/FEMA-REP-1 (60 minutes), the applicant did not adequately explain – in its response to the RAIs – the basis for the 15 minute difference. The applicant addressed separately the applicability of the proposed increased augmentation time for Units 1 and 2, stating that SNC will submit a future licensing action for these units approximately one year prior to the Unit 3 exercise. The applicant did not submit a revised ESP Plan Table B-1 reflecting this distinction, in that Table B-1 still included all four reactor units. As described below, and in the Safety Evaluation Report with open items, the staff identified the submission of an adequate basis for the 75-minute augmentation time in ESP Plan Table B-1, for Units 3 and 4, as Open Item 13.3-2.

The staff reviewed the applicant's response in its submittal dated October 15, 2007 (provided below), which supplemented its April 16, 2007, response to RAI 13.3-8.a and RAI 13.3-8.b.

The 75 minutes referenced in the ESP Plan Table B-1 is intended to clarify the current commitment in the existing emergency plan for VEGP Units 1 and 2 which states "60 minutes from notification". Notification timeframes are not expected to exceed 15 minutes from declaration of the emergency. Therefore, physical response times in the existing and proposed plans are consistent. The inclusion of the timeframe associated with notification into the physical response time serves to clarify the commitment to staff facilities within the specified timeframe. This approach is consistent with available guidance for activation of emergency response facilities within "about an hour." The augmentation process remains capable of ensuring augmentation of the initial response staff in accordance with existing activation requirements. The augmentation of the on-shift staff during an actual emergency remains sufficient to ensure that the planning standard will be met.

Simply stated, the applicant's responses define the total allowable time to augment staff as a 15-minute notification time, plus a 60-minute physical response time beyond the initiation of notification of the ERO. The applicant states that this approach is allowable, consistent with available guidance and in accordance with existing activation requirements, yet does not identify any specific regulation or guidance supporting this approach. Further, the proposed 75-minute augmentation time in ESP Plan Table B-1 does not adequately provide a justification for an alternative approach to regulatory guidance through reference to the existing emergency plan for VEGP Units 1 and 2.

The existing emergency plan for VEGP Units 1 and 2 (Revision 43) does state in Section B.2, "Emergency Organization," that "Table B-1 provides a summary of personnel available on shift and those who would be available within 60 min of notification." The applicant thus interprets "within 60 min of notification" as allowing 15 minutes (for notification) in addition to the 60 minutes (for physical response). Further, the comparable Section B.2, "Emergency Response Organization," in the application states that "Table B-1 provides a summary of personnel available on shift and those who would be available within 75 minutes of ERO notification" – apparently intended to reflect the clarifying interpretation of the Units 1 and 2 statement of "within 60 min of notification."

The staff does not agree with the applicant's position relating to the availability of 60 minutes for staff augmentation following the initial notification of the ERO, as this would constitute an

unacceptable alternative approach for guidance relating to augmentation times for the minimum on-shift staffing levels in Table B-1 of NUREG-0654/FEMA-REP-1. Such a change would have to be addressed as described above, relating to the 10 CFR 50.54(q) process and the Smart Application.

The staff considered the adequacy of the shift staffing numbers in the proposed ESP Plan Table B-1 for Units 3 and 4, in relation to the intended purpose of the applicable requirement in 10 CFR 50.47(b)(2), which requires (in part) the availability of timely augmentation of response capabilities. Related guidance includes evaluation criterion B.5 of NUREG-0654/FEMA-REP-1, which states that the licensee must be able to augment the minimum on-shift staffing capabilities within a short period after declaration of an emergency, as indicated in Table B-1. The 60-minute augmentation time would begin at the declaration of the emergency, and not after a 15-minute notification timeframe, as proposed by the applicant. In addition, NUREG-0696, "Functional Criteria for Emergency Response Facilities," issued February 1981, provides additional guidance for emergency response facility activation (e.g., the TSC should achieve full functional operation within 30 minutes), yet does not specify a time frame for staff augmentation. Finally, Supplement 1 to NUREG-0737, "Clarification of TMI Action Plan Requirements," issued January 1983, states that the staffing levels in table 2 (which is identical to Table B-1 of NUREG-0654/FEMA-REP-1) are only goals, and are not strict requirements.

The staff also considered the proposed addition of new on-shift personnel associated with the addition of Units 3 and 4, in relation to the purpose of the requirement to have the availability of timely augmentation of response capabilities. The goal is to satisfy the number of staff that would be available on-site for each of the major functional areas; consistent with Table B-1 of NUREG-0654/FEMA-REP-1 (the minimum staffing requirements in Table B-1 are per site, not per reactor). The staff compared Table B-1 of NUREG-0654/FEMA-REP-1 (for each position, major functional area, and total number) against ESP Plan Table B-1, and found that the proposed staff numbers for some of the major functional areas in ESP Plan Table B-1 did not meet the minimum staffing specified in Table B-1 of NUREG-0654/FEMA-REP-1. In addition, as discussed above, the 75-minute staff augmentation time in ESP Plan Table B-1 is inconsistent with Table B-1 of NUREG-0654/FEMA-REP-1.

In a letter dated February 12, 2008, the applicant revised its response for Open Item 13.3-2 by providing a revised ESP Plan Table B-1, which replaced the 75-minute staff augmentation time with 60 minutes. In addition, the applicant revised the proposed staff numbers for some of the major functional areas in ESP Plan Table B-1, to be consistent with Table B-1 of NUREG-0654/FEMA-REP-1. The staff reviewed the applicant's revised ESP Plan Table B-1, and finds that it meets the minimum staffing (including staff augmentation time) provisions in Table B-1 of NUREG-0654/ FEMA-REP-1 for Units 3 and 4. Therefore, Open Item 13.3-2 is resolved.

[A.1.b, A.1.e, A.4, B.5, B.6, B.7, H.2, H.4] In ESP Plan Section B.2, "Emergency Response Organization," the applicant stated that Appendix 7 describes the corporate resources and operation. In addition, Figure B-2, "Response Organization for Alert," and Figure B-3, "Site Area or General Emergency ERO," identify Appendix 7 in relation to EOF staff and management. Appendix 7, which outlines the function of the EOF, is an integral part of the SNC site-specific emergency plans. As such, it delineates the actions to be taken by SNC corporate staff in the event of an emergency at any SNC site, including the VEGP site, and states that the corporate emergency organization will provide offsite emergency response support and resources to SNC sites 24 hours per day until the emergency has been terminated.

[B.5, B.6, B.7, H.2, H.4] ESP Plan Appendix 7, Section A7B, "EOF Organization," also states that in order to augment (provide) additional staff that may be needed in the unlikely event of a multisite accident, SNC will reactivate its ERO notification system. When the EOF is activated, all EOF staff pagers are activated, and all EOF personnel are expected to report to the EOF. Personnel who are not needed to augment positions are briefed and dismissed with a standby status. Table A7-1, "Corporate Emergency Response Organization Assignments," lists the numerous emergency positions and indicates that their respective corporate staff assignments are designated in procedure NMP-EP-001. (The submission of detailed emergency implementing procedures for VEGP Units 3 and 4 is addressed in Units 3 and 4 ITAAC 9.1, and is discussed further in SER Sections 13.3.3.2.1, 13.3.3.2.4, 13.3.3.2.8, 13.3.3.2.9, 13.3.3.2.10, and 13.3.3.2.16.) **[A.1.c, B.6]** In Figure A7-1, "EOF Organization," the applicant provided a block diagram of the corporate (EOF) positions that are used to meet augmentation requirements for EOF direction and notification/communication under the control of the EOF manager. Finally, Section A7F, "Offsite Support," identifies additional offsite resources that may be available to support an emergency response effort at the VEGP site. Appendix 7 is also addressed in ESP Plan Sections A, H, and O, which are discussed in SER Sections 13.3.3.2.1, 13.3.3.2.8, and 13.3.3.2.15, respectively.

[B.1, B.5, B.7] The staff finds that this information adequately describes the onsite emergency organization and its relation to the responsibilities and duties of the normal staff complement and specifies the positions or titles and major tasks, including corporate augmentation, to be performed by the persons to be assigned to the functional areas of emergency activity (see ESP Plan Table B-1). **[B.2]** The staff finds that the applicant has adequately designated the emergency director as the emergency coordinator who has the authority and responsibility to initiate emergency actions, including recommending protective action to authorities responsible for implementing offsite emergency measures. **[B.3, B.4]** The staff also finds that the organizational structure reflected in Table B-2 provides an adequate line of succession for the emergency director position, and VEGP Plan Section B.2.1.1 clearly specifies the emergency director's responsibilities, which may not be delegated.

[A.1.c, B.6] Figure A-1, "Formal Interfaces among Emergency Response Organizations," illustrates (in a block diagram) the various interfaces between and among the onsite functional areas of emergency activities, local services support, and State and local government response organizations. Figure B-1, "Site Organization Chart," Figure B-2, "Response Organization for Alert," and Figure B-3, "Site Area or General Emergency ERO," show additional onsite interfaces. The staff finds that this information 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 organizations. In addition, it includes the interfaces with the TSC, OSC, and EOF.

[B.7.d, G.1-G.5, H.2] In ESP Plan Appendix 8, "Vogtle Electric Generating Plant Emergency Communications Plan," also known as the Vogtle Emergency Communications Plan, the applicant describes the public education and information organization and program for the periodic dissemination of emergency planning instructional materials to residents and transients in the plume exposure pathway EPZ. Appendix 8 also describes information flow to the public during an emergency at VEGP. Upon activation, the emergency news center (ENC) – also referred to as the joint media center, joint public information center, or joint information center (JIC) by offsite agency emergency plans – will become the primary source of utility emergency communications response. (Facility activation is addressed in ESP Plan Section H and discussed in SER Section 13.3.3.2.8. The ENC is also addressed in ESP Plan Sections G and H, which are discussed in SER Sections 13.3.3.2.7 and 13.3.3.2.8, respectively.)

The ENC will be operated as a joint information center where the utility, the States, SRS, the Federal agencies, and counties will coordinate information, issue news releases, make announcements, and participate jointly in news briefings. GPC Corporate Communication/SNC Corporate Communication (the utility) is responsible for coordinating and issuing all news announcements related to plant emergency conditions at VEGP. State and county emergency management agencies and DOE-SR are responsible for issuing public announcements related to offsite conditions, including recommended protective actions.

[G.4.c] Rumor control will be coordinated from the ENC. The SNC news writer, along with a technical assistant, will collect and assemble plant information and communicate this information to the public information director and the company spokesperson. Until the ENC has been activated, the emergency response center in Atlanta, Georgia, is the official company location for the coordination and issuance of news announcements and responses to news media inquiries.

[B.8] ESP Plan Section A.8, "Private Sector Organizations," states that GPC/SNC has established an agreement with Bechtel to obtain engineering and construction services that may be needed following an accident. The plan also states that Bechtel's assistance will not be needed during the early stages of the emergency response but is more likely to be requested during recovery activities. SNC has also established an agreement with Westinghouse to obtain general services related to NSSS operations during and following an accident. Westinghouse will provide a capability to respond on a 24-hour, 7-day-per-week basis. In addition, SNC is a signatory to two comprehensive agreements among electric utility companies, the Nuclear Power Plant Emergency Response Voluntary Assistance Agreement, and the Voluntary Assistance Agreement by and among Electric Utilities Involved in Transportation of Nuclear Materials. The staff reviewed other application sections that deal with the availability of 24-hour emergency communications and response, and discusses those reviews in SER Sections 13.3.3.2.1, 13.3.3.2.5, 13.3.3.2.6, 13.3.3.2.8, and 13.3.3.2.12.

[A.3, B.8, B.9] The services to be provided by local agencies for handling emergencies are addressed in ESP Plan Section A.7, "Medical Support," and ESP Plan Section B.2.3.2, "Medical Assistance." The VEGP site has established agreements with the Burke County EMA to provide ambulance service for the transportation of injured personnel, including people who may be radioactively contaminated, to hospital facilities for treatment. The staff reviewed the April 2, 2004, letter of agreement with the Burke County EMA, in which the county agency confirmed its responsibility to respond to all calls involving fire, rescue, sickness or injury, including casualties arising from radiation accidents at VEGP. The staff also reviewed the April 17, 2006, supplemental letter of agreement with the Burke County EMA, in which the agency further committed to continued participation in any future development of the VEGP Plan in support of Units 3 and 4.

[A.3, B.8, B.9] The applicant further states in ESP Plan Section A.7 that agreements with Radiation Management Consultants (RMC), Burke County Hospital in Waynesboro, Georgia, and Doctors Hospital in Augusta, Georgia, have been established for treatment of injured and contaminated individuals. This assistance will be requested whenever necessary, in accordance with plant procedures. Enclosure 11 of the application includes copies of these agreements, and ESP Plan Appendix 2 lists the letters of agreements. In RAI 13.3-1, the staff asked the applicant to provide a letter of agreement for RMC that was current at the time of the application, and has not expired. In its response to RAI 13.3-1, the applicant did not provide the requested letter for RMC. In the Safety Evaluation Report with open items, the staff identified

the receipt of this letter as Open Item 13.3-3. The staff reviewed the applicant's response in its submittal dated October 15, 2007, which included a current, unexpired letter of agreement for RMC, and finds it acceptable. Therefore, Open Item 13.3-3 is resolved.

The staff reviewed the existing letters of agreements and the supplemental letters of agreement contained in Appendix 13.3A of Section 13.3 of the ESP application. Collectively, these agreements identify the local agency services, including support from police, ambulance, medical, hospital, and firefighting organizations, and delineate the respective authorities and responsibilities. Accordingly, the staff finds that the information given in SSAR Section 13.3 and the existing and supplemental letters of agreement adequately identify the services to be provided by local agencies for handling emergencies, and include copies of the arrangements and agreements reached with contractor, private, and local support agencies.

Conclusion

On the basis of its review of the onsite emergency plans, as described above for onsite emergency organization, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard B of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(2), and Sections III, IV.A, and IV.C of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.3 Emergency Response Support and Resources (10 CFR 50.47(b)(3); NUREG-0654/FEMA-REP-1, planning standard C)

The regulation, as reflected in the planning standard, requires that arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee's near-site EOF have been made, and other organizations capable of augmenting the planned response have been identified.

In ESP Plan, Section C, "Emergency Response Support and [Resources]," the applicant addressed the responsibilities and concept of operations for the various organizations that would support the VEGP site, including Units 3 and 4, in an emergency. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard C, "Emergency Response Support and Resources." Planning standard C provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(3).

[C.1.a] In ESP Plan Section C.2, "Federal Government Support," the applicant stated that the emergency director will manage requests for Federal assistance, as needed, and that these requests will usually be channeled through the GEMA. In addition, ESP Plan Section B.2, "Emergency Response Organization," which lists the basic activities that the emergency director will manage, states that the emergency director's nondelegable responsibilities include requesting Federal assistance.

[C.1.b] In the event of an incident in which Federal assistance is needed to supplement county and State emergency response capabilities, the principal points of contact for State government are FEMA, DOE, and EPA. The Federal Government's role consists of providing technical and/or logistical resource support at the request of State emergency management. Federal emergency response consists of technical and nontechnical components. The NRC and FEMA jointly coordinate Federal emergency response actions, with the NRC coordinating technical aspects and FEMA coordinating nontechnical aspects of Federal response.

[C.1.a, A.1.d] ESP Plan Section A.10, "Concept of Operation," states that the emergency director will be the key individual in the VEGP site ERO and that he will initiate the activation of the ERO by contacting the States of Georgia and South Carolina, the counties within the plume exposure pathway EPZ, SRS, and the NRC. SRS operates continuously and can be contacted at all times. The emergency director can request assistance from Federal agencies by contacting the NRC on a dedicated communication link (i.e., the ENS). ESP Plan, Section B.2.1.1, "Emergency Director," lists activities that the emergency director is authorized to manage for the duration of the emergency. These include requesting Federal assistance, which is one of the responsibilities that may not be delegated.

[C.1.b] ESP Plan Section C.2 states that, within several hours of notification, Federal response personnel will begin arriving at, or near, the VEGP site. The NRC and FEMA are expected to have representatives at the VEGP site within about 3 hours after receiving notification, and DOE can provide assistance within about 2 hours.

[A.1.a, C.1.b] ESP Plan Section A.9 states that the resources of the Federal agencies appropriate to the emergency condition will be made available in accordance with the NRP. **[C.1.a]** The NRP specifically authorizes the emergency director to request Federal assistance on behalf of the VEGP site. In addition to the NRC, other Federal agencies that may provide assistance include DHS, DOE, FEMA, EPA, HHS, DOT, and USDA.

[A.1.a, C.1.b] In ESP Plan Section C.2, the applicant describes the Federal response resources that may be employed during an emergency at VEGP. The Federal Response Center (FRC) will coordinate and exchange information among various Federal agencies during an emergency at the site. The Federal Radiological Monitoring and Assessment Center (FRMAC) will coordinate Federal monitoring and assessment assistance with State and local governments. Upon activation of the Federal Radiological Emergency Response Plan (FRERP), DOE will provide telecommunications support to those Federal agencies assisting in offsite radiological monitoring. **[C.1.c, C.4]** DOE has written agreements with all telephone companies to provide additional telephone communications, including satellite capability, within 24 to 48 hours. This capability will supplement communications among the FRC, FRMAC, EOF, and the Georgia and South Carolina EOCs.

[C.1.c] ESP Plan Section C.2 states that airfields in the plant vicinity that may be used to support the Federal response, as well as that of other response groups, include a commercial airport with scheduled service and nearby municipal airports that can accommodate small aircraft. Bush Field (Augusta, Georgia) is the closest major airport able to provide services for large aircraft. The field is a scheduled commercial air carrier facility capable of handling large multiengine jet aircraft. It is also a military air headquarters for the U.S. Army, operating out of Fort Gordon, Georgia. Daniel Field (Augusta, Georgia) and Aiken Municipal (Aiken, South Carolina) are capable of servicing and maintaining medium-size jet and propeller aircraft. The Burke County Airport (Waynesboro, Georgia), the nearest airport to the site, is used only by small general aviation aircraft.

[C.1.c] ESP Plan Section C.3, "VEGP Site Support," states that the VEGP site will provide space, telephone communications, and administrative services for NRC and FEMA personnel at the TSC and EOF. The TSC can accommodate five NRC representatives, and the EOF can accommodate nine representatives from the NRC and one from FEMA. NRC representatives may also be present in the control room. ENS telephones and commercial telephones will be available in the control room, TSC, and EOF. Health Physics Network (HPN) telephones will be available in the TSC and the EOF. ESP Plan Section F, "Emergency Communications," which is discussed in SER Section 13.3.3.2.6, provides additional information regarding available communication capabilities.

[C.2.a] ESP Plan Section C.1, "State and Local Government Support," states that representatives from the States of Georgia and South Carolina will be dispatched to the EOF and the ENC. **[C.2.b]** If requested, the VEGP site will send representatives to the offsite Government centers listed in Table C-1, "State and County Emergency Operation Centers (EOCs)."

[C.3] ESP Plan, Section C.4, "Other Support," states that the VEGP onsite laboratory will be equipped to analyze all normal in-plant samples. The equipment will include an ion chromatograph, gamma spectrometer, and other analytical support equipment. Field samples will be scanned with field instrumentation and will then be taken to the site for laboratory analyses. If necessary, samples will be transported to the GPC environmental laboratory in Smyrna, Georgia, or to Plant Hatch for analyses. GPC corporate personnel will collect environmental samples and send them to Plant Hatch or the GPC environmental laboratory. In-plant samples, such as effluent and air samples, will be analyzed using a gamma spectrometer located in the counting room. **[C.4]** Additional assistance, consisting of engineering, health physics, and general support, will be available from the following four private organizations:

- SNC, Birmingham, Alabama
- Southern Company Services, Inc. (SCS), Birmingham, Alabama
- Westinghouse Electric Company, LLC (WEC), Pittsburgh, Pennsylvania
- Institute of Nuclear Power Operations (INPO), Atlanta, Georgia

[C.4] As a member of the Institute of Nuclear Power Operators (INPO), SNC receives the INPO emergency response manual. This manual identifies the number of personnel that various organizations (utilities, service companies, and reactor vendors) could reasonably be expected to make available in response to a request for emergency support. In addition, several offsite GPC and SNC departments may be involved in the emergency response effort. These departments will, as appropriate, develop separate nuclear emergency response plans and procedures governing their emergency functions. Coordination of these plans to ensure a consistent, integrated response is the responsibility of the corporate emergency planning section. These specific plans will include the following:

- Corporate Emergency Plan, controlled by the SNC Emergency Planning Section
- Emergency Communication Plan, controlled by SNC Public Affairs
- VEGP Security Plan, controlled by the Manager, Nuclear Security
- VEGP Fire Protection Plan, controlled by engineering support

[C.4] SER Sections 13.3.3.2.1, 13.3.3.2.2, 13.3.3.2.12, and 13.3.3.2.16 provide additional information pertaining to letters of agreement with nuclear and other facilities, organizations, and individuals that can be relied on to assist in an emergency.

State and Local Emergency Plans [C.1.a, C.1.b, C.1.c, C.2.a, C.3, C.4]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard C of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard C are adequate. The following summarizes the FEMA findings for planning standard C.

a. State of Georgia

[C.1.a] Section IV.C.2 of the GEOP states that the Governor may declare a State of Emergency to activate necessary State resources and may request a Presidential Declaration. If the emergency or disaster exceeds the State's capacity, the Governor may request assistance through the Emergency Management Assistance Compact. Upon a Presidential Declaration, State-requested assistance will be provided through Federal ESFs. **[C.1.b, C.1.c]** In addition, Section IV.D.1 of the GEOP states that Federal assistance will supplement State and local efforts. Federal assistance made available to relieve the effects of an emergency or disaster will be channeled through and coordinated by the Governor (or the Governor's designated authorized representative).

[C.2.a] GA REP-Base Plan, Section VI.D, "Evaluation and Response," states that upon notification of a general emergency, site area emergency, or an alert classification at a nuclear facility, a primary response team will be dispatched to an FEOC near the site. The FEOC is located in the Burke County EOC. This action will place field monitoring teams close to the plant and within radio contact with the FEOC. While the GA REP does not state that a representative will be sent to the EOF (located in Birmingham, Alabama), the current practice is that both GEMA and DNR will have representatives at the EOF.

[C.3] GA REP-Base Plan, Section VI.D.5, states that DNR has a contract with the Georgia Institute of Technology (Georgia Tech), which operates a fully equipped fixed radiochemistry laboratory. During an emergency, the DNR mobile radiation laboratory can respond within 4 hours, and the primary response team can respond to the site by air within 2 hours. Environmental samples can be sent by air to either the State's mobile radiation laboratory or Georgia Tech's laboratory in Atlanta. Ambient radiation monitoring and air sampling stations are also located near the site.

[C.3] Section D.6, "Radiological Laboratories," of the GA REP-Annex D, states that the DNR-EPD environmental radiation program laboratory will be the primary laboratory for analysis of radioactivity in the environment. This laboratory is equipped with Ge(Li) and NaI detectors, automatic and manual alpha/beta analyzers, a liquid scintillation system, an alpha spectrometer, and environmental thermoluminescent dosimeter (TLD) readers/annealer. In addition, a mobile radiation laboratory is available, which has a multichannel analyzer (with intrinsic germanium detector), alpha/beta analyzer, and liquid scintillation counter. Other laboratories with similar capabilities include the Georgia Tech Environmental Resource Center – Georgia Institute Center, DOE, and EPA. Both the mobile radiation laboratory and the DNR-EPD environmental radiation program laboratory are Georgia State assets and are available 24 hours a day.

[C.4] GA REP-Base Plan, Appendix 2, SMRAP, describes how participating States (including Georgia)[22] handle requests for assistance. GA REP-Base Plan Annex D includes letters of agreement for medical and radiation protection support with Burke County Hospital, Columbia-Augusta Medical Center, and SNC. The Oak Ridge Hospital of the Methodist Church (ORHMC) in Oak Ridge, Tennessee, is also available. The Burke County Ambulance Service has agreed to transport accident victims to the medical facilities, and the University Ambulance Service in Augusta may be called if additional ambulances are needed. In addition, if an accident requires the immediate transport of a victim for a considerable distance, the State will request assistance from the Military Assistance to Safety and Traffic (MAST), located at Fort Stewart near Savannah, Georgia.

b. Burke County, Georgia

[C.2.a] GA REP-Burke County Plan, Attachment A, "Implementation," states that, when necessary, the EMA Director will dispatch a representative to the VEGP EOF to coordinate initial offsite response activities and serve in a liaison capacity. [C.4] Attachment A also identifies the Burke County Hospital in Waynesboro and Doctor's Hospital in Augusta as medical facilities that can care for offsite victims of an incident at VEGP. GA REP-Annex D, Section F, "Medical/ Public Health Support," discusses these facilities further.

c. State of South Carolina

[C.1.a] SCEOP Section III states that if it becomes necessary to request outside assistance, the request will be coordinated through the SCEMD Director and the Governor. SCORERP Annex H, Section III.C.4, states that the Governor, acting directly or through a designee, is specifically authorized to request Federal assistance in the event of an incident at an FNF. **[C.1.b]** SCORERP Annex H (Appendix 1, Section II) describes the Federal resources that the State should expect, as part of the FRERP.[23] In addition, South Carolina Technical Radiological Emergency Response Plan (SCTRERP) Section C, Table 1, "SRS Travel Times," states that for FNFs in South Carolina, the FRERP designates SRS as the primary responder. In addition, approximate travel times are shown, with VEGP located within the SRS 1-hour response time radius.

[C.1.c] SCTRERP Sections B.IV and B.XII state that DHEC (located in Columbia, South Carolina) has limited resources to support other emergency personnel or members of the public. These resources include various supplies and equipment, including three sets of maps that show the environs of each FNF in the State. The maps show the location of the facility, evacuation routes, relocation and personnel assembly areas, and monitoring and sampling locations. In addition, the maps show features such as dairy farms, water treatment plants, airports and airstrips, hospitals, schools, and industrial plants.

[C.2.a] SCORERP-Part 5, Sections IV.B.2.B and IV.B.2.C, state that a technical representative from DHEC will be dispatched to the EOF and that a representative from SCEMD will be sent to the EOF. In addition, if the decision is made to activate the FEOC, the State will dispatch emergency response team personnel to establish the FEOC.

---

22 South Carolina Technical Radiological Emergency Response Plan (SCTRERP), Section B.IV.A, identifies Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia as signatories to SMRAP.

23 The Nuclear Radiological Annex of the NRP supersedes the FRERP

[C.3] SCTRERP Section B.IV.D states that DHEC maintains a mobile radiological laboratory, equipped with radio communications on the statewide DHEC network, and has emergency response supplies and instrumentation. The mobile lab can be dispatched to an accident site to perform radiological monitoring and field sample analyses, and has the capability to detect and measure radioiodine concentrations and other radionuclides in the environment, as described in SCTRERP Appendix II, "Environmental Monitoring, Sampling, and Laboratory Analysis Capability." Appendix II, Section III.C, states that environmental samples will be transported to the radiological laboratory in Columbia or to the mobile lab deployed in the field at the discretion of the Nuclear Response and Emergency Environmental Surveillance Section (NREES) field director or the environmental surveillance coordinator. (See also SER Section 13.3.3.2.8.c.)

[C.4] SCORERP Section V discusses various local, State, Federal, and support agencies and companies that can be relied on for assistance in an emergency. Letters of agreement with the State of South Carolina are provided in Appendices 6 through 12 and include the following entities:

- State of North Carolina
- State of Georgia
- Progress Energy Carolinas, Inc.
- South Carolina Electric & Gas Company
- Duke Energy Corporation
- GPC
- DOE-SR

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[C.1.c] Section VI.B of the county plans includes specific information regarding communication systems and frequencies; Sections VI.A and VI.B list additional special resources available to support Federal response. **[C.2.a]** Section II.G.2 of the county plans states that VEGP and DHEC (Bureau of Radiological Health (BRH or DHEC/BRH)) will furnish technological RER support. **[C.4]** Section I.F of the county plans lists the principal organizations that are part of the overall response organization for EPZs; these include Federal, State, county, and private sector agencies and organizations.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for emergency response support and resources, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard C of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(3) and Sections III, IV.A, IV.B, IV.C, IV.D, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.4 Emergency Classification System (10 CFR 50.47(b)(4); NUREG-0654/FEMA-REP-1, planning standard D)

The regulation, as reflected in the planning standard, requires that a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and that State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

In ESP Plan Section D, "Emergency Classification System," the applicant addressed the emergency classification and action level scheme that will apply to VEGP Units 3 and 4. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/ FEMA-REP-1, planning standard D, "Emergency Classification System." Planning standard D provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(4).

The staff also considered the requirements in Sections IV.B and IV.C of Appendix E to 10 CFR Part 50, which require four emergency classes, consisting of notification of unusual events, alert, site area emergency, and general emergency. In addition, the applicant must describe emergency action levels (EALs) that are based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. The initial EALs must be discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC.

The staff examined the structure of the applicant's proposed emergency classification and action level scheme, the bases for the various emergency declarations, and the extent to which this scheme reflects the AP1000 advanced LWR technology. From the applicant's description, the staff was able to summarize the emergency classification process in the following five general steps:

1. *Initiating Condition* – The emergency classification process begins when an initiating condition (IC) is observed. An IC is a predetermined subset of plant conditions, grouped into six recognition categories (identified below), which indicates either that the potential exists for a radiological emergency or that such an emergency has occurred. The ICs lead to a classification implementing procedure.

2. *Implementing Procedure* – The classification implementing procedure contains the associated threshold values (TVs) for each IC.

3. *Threshold Value* – When a TV is met, an EAL is met.

4. *Emergency Action Level* – When an EAL is met, the event is classified and declared at the appropriate level (i.e., one of the four emergency classification levels (ECLs)).

5. *Emergency Classification Level* – When an event is classified (and an ECL is declared), the seriousness of the event has been determined, and preplanned actions can be taken by onsite and corporate emergency response personnel and by offsite authorities and organizations. (SER Sections 13.3.3.2.9 and 13.3.3.2.10 discuss onsite and offsite actions in more detail.)

In 10 CFR Part 50, Appendix E, Section IV.C, the Commission specifies the following:

> Emergency action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, such as the pressure in containment and the response of the Emergency Core Cooling System) for notification of offsite agencies shall be described.... The emergency classes defined shall include: (1) notification of unusual events, (2) alert, (3) site area emergency, and (4) general emergency. These classes are further discussed in NUREG-0654; FEMA-REP-1.

[D.1] In ESP Plan Section D, the applicant stated that its emergency plan contains an emergency classification system based on four emergency classes – notification of unusual event, alert, site area emergency, and general emergency. [D.3, D.4] The described emergency classes and the EALs that determine them are agreed on by SNC, the State, and local authorities; officials from these organizations will review the classes annually. The staff finds that these classes are consistent with those in Appendix E to 10 CFR Part 50 and the four classes of EALs in Appendix 1, "Emergency Action Level Guidelines for Nuclear Power Plants," to NUREG-0654/FEMA-REP-1.

[D.1, D.2] In ESP Plan Section D.1, "Classification of Emergencies," the applicant stated that the SNC classification scheme is based on NEI 99-01. In NRC RG 1.101, Revision 4, "Emergency Planning and Preparedness for Nuclear Power Reactors," issued July 2003, the staff endorsed the guidance contained in NEI 99-01 and Revision 2 of NUMARC/NESP-007, "Methodology for Development of Emergency Action Levels," as providing acceptable alternatives to the methods described in Appendix 1 to NUREG-0654/FEMA-REP-1, for developing EALs required by 10 CFR 50.47(b)(4) and Sections IV.B and IV.C of Appendix E to 10 CFR Part 50.[24]

[D.2] In ESP Plan Section D.1, the applicant stated that the ICs lead each plant to a classification implementing procedure, which contains the TVs for each IC. Each IC has specific conditions associated with it that are termed TVs. When an IC is observed and the criteria of its associated TVs are met, an EAL is met, and the event is then classified and declared at the appropriate level. The SNC classification procedures are written to classify events based on meeting the IC and a TV for an EAL. The procedures consider each VEGP unit independently. The staff's summary of the emergency classification process appears above. (The submission of detailed emergency implementing procedures for VEGP Units 3 and 4 is addressed in **Units 3 and 4 ITAAC 9.1**, and further discussed in SER Sections 13.3.3.2.1, 13.3.3.2.2, 13.3.3.2.8, 13.3.3.2.9, 13.3.3.2.10, and 13.3.3.2.16.)

During events, the IC and a TV are monitored, and if conditions meet another higher EAL, that higher emergency classification is declared and appropriate notifications made. **[J.10.c]** Notifications are made on a site-by-site basis. If two or more units are in concurrent classifications, the highest classification would be used for the notification, and the other unit classifications noted on the notification form. (Public notifications are also addressed in ESP

---

[24] RG 1.101 provides guidance to licensees and applicants on methods acceptable to the NRC staff for complying with the NRC's regulations for emergency response plans and preparedness at nuclear power reactors. RGs are not substitutes for regulations, and compliance with them is not required. Licensees and applicants may propose means other than those specified by RG 1.101 for meeting applicable regulations, including the development of EALs.

Plan Section E, "Notification Methods and Procedures," and Section J, "Protective Response," and discussed in SER Sections 13.3.3.2.5 and 13.3.3.2.10, respectively.) **[D.2]** To facilitate the expeditious classification of emergencies, the applicant grouped the ICs that may result in an emergency classification into the following six recognition categories:

- radiological (hot and cold)
- fission product barriers (hot)
- system malfunctions (hot)
- system malfunctions (cold)
- independent spent fuel storage installation (hot and cold)
- hazards (hot and cold)

The hot and cold designations reflect operational modes 1 through 6, defined in the technical specifications, and defueled status. Within each category, subcategories and specific ICs are identified. The detailed IC matrices are shown in the tables in Annex V1, Section D.2, "Classification Process," for Units 1 and 2, and in Annex V2, Section D.2, "Emergency Class Description and Resources," for Units 3 and 4. **[D.2]** In addition, Table V2A2-1, "VEGP Units 3 and 4 SSAR Transient Table," provides FSAR postulated transients (accidents) for various systems and identifies the corresponding emergency levels. **[D.2]** ESP Plan Section D.2, "Classification Process," identifies the "Classification Emergency Plan Implementing Procedure" as that which will be used to classify the emergency condition upon recognition of an off-normal condition relative to an IC.

[D.1] Unit 3 ITAAC 1.1.1 states that the parameters specified in Table Annex V2 H-1, Post Accident Monitoring Variables, are retrievable in the control room, TSC and EOF, and the ranges of values of these parameters that can be displayed encompass the values specified in the emergency classification and EAL scheme. **Unit 4 ITAAC 1.1.1** limits the ability to retrieve the parameters specified in Table Annex V2 H-1 to the control room. In Section V2H.4.3, "Process Monitoring," the applicant stated that process variables will be monitored through the qualified data processing system, which is a subsystem of the protection and monitoring system, and will provide safety-related display of selected parameters in the control room.

[A.1.b, B.2] At all times, when conditions arise that are not explicitly included in the EAL scheme, the emergency director has discretion to declare an event based on his knowledge of the emergency classes and judgment of the situation or condition. Once an emergency classification is made, it cannot be downgraded to a lower classification. All the actions associated with the emergency classification level must be completed, and then the event can be terminated. At termination, on an event-specific basis, the site can either enter normal operating conditions or enter a recovery condition with a recovery organization established for turnover from the ERO.

The proposed reactor technology for VEGP Units 3 and 4 is the Westinghouse AP1000 design (see SER Section 13.3.1.2). The design certification for the AP1000 is provided in Appendix D, "Design Certification Rule for the AP1000 Design," to 10 CFR Part 52. The VEGP application is a first-of-a-kind use of the AP1000 design in an ESP and presents an EAL scheme for an advanced passive LWR that has not previously been submitted to the NRC for evaluation, either for endorsement in a regulatory guide or as part of a license application.

The applicant submitted the VEGP application to the NRC on August 15, 2006. On September 19, 2006, the NRC notified SNC that while the application was acceptable for

docketing, it did not contain all of the information necessary for approval of complete and integrated emergency plans. Specifically, the application lacked the identification of, and basis for, EALs. On March 1, 2007, the applicant submitted supplemental EAL information, which consisted of a proposed set of EALs and their associated bases for VEGP Units 3 and 4. The applicant stated that these EALs are based on NEI 07-01. The applicant explained that the VEGP Unit 3 and 4 EALs were the same as those in the NEI 07-01 guidelines (with various exceptions) and that NEI submitted NEI 07-01 to the NRC (for endorsement by RG 1.101) on March 1, 2007. [25]

As discussed above, the applicant stated in ESP Plan Section D.1 that the SNC classification scheme is based on NEI 99-01. In RAI 13.3-3.a (see RAI letter No. 5, dated March 15, 2007), the staff asked the applicant to explain why NEI 99-01 may be used as the basis for the AP1000 EALs – given that NEI 99-01 states in its Executive Summary that the document's generic guidance is not considered to be applicable to advanced LWR designs, and that the AP1000 is an advanced LWR design. In its April 16, 2007, response, the applicant stated that subsequent to the ESP application submittal, the industry developed a set of draft EALs for advanced passive LWRs and that these EALs had been submitted (on March 1, 2007) by NEI to the NRC for endorsement as NEI 07-01. In addition, on March 1, 2007, SNC submitted a set of EALs specific to Units 3 and 4 and based on NEI 07-01,[26] and revised the ESP application to clarify the distinction of the appropriate guidance document for Units 1 and 2 versus Units 3 and 4. Finally, the applicant submitted a revised ESP emergency plan with Revision 2 of the ESP application on May 8, 2007.

In RAI 13.3-3.b, the staff asked the applicant to explain how NEI 07-01 applies to the VEGP application and how it is used in relation to NEI 99-01. The applicant responded that the proposed VEGP Unit 3 and 4 EALs are identical to those in NEI 07-01, Revision 0, with the exception of the elimination of information pertaining to the ESBWR design[27] and the inclusion of appropriate site-specific information. NEI 07-01 will relate to Units 3 and 4, and NEI 99-01 will relate to Units 1 and 2.[28]

As discussed above, NEI submitted NEI 07-01 for NRC endorsement on March 1, 2007. On the same day, the applicant supplemented the ESP application with its separate submission of Units 3 and 4 EALs, based on the guidelines in NEI 07-01. For the VEGP application, the proposed Units 3 and 4 EALs were submitted approximately 6½ months after the initial application. By then, the staff was well into its technical review, which was consistent with the established application review schedule. Separately, the NRC began its formal endorsement

---

25 NEI 07-01, which was subsequently revised by NEI and submitted to NRC on September 21, 2007, is currently under review. NEI may change the document's *NEI 07-01* designation, as a result of future revisions during the NRC's concurrence review process.

26 SNC Letter AR-07-0404, "Vogtle Early Site Permit Application, Supplemental Information Concerning Emergency Action Levels and Generic Communications," March 1, 2007.

27 *ESBWR* is the General Electric Co. Economic Simplified Boiling Water Reactor, which is an advanced LWR design currently under design certification review by the NRC.

28 On December 30, 2005, SNC requested prior NRC approval for VEGP Units 1 and 2 EAL changes, in support of a conversion from its current EAL scheme to one based on NEI 99-01 (see NRC safety evaluation report, ADAMS Accession ML071070319).

review of NEI 07-01. Given the applicant's late submission of the proposed EALs, the staff's review of the Units 3 and 4 EALs for compliance with the applicable guidance and requirements was delayed. In the Safety Evaluation Report with open items, the staff identified the review and acceptance of the application's EALs for Units 3 and 4 as Open Item 13.3-4.

The staff reviewed the applicant's response to Open Item 13.3-4 in its submittal dated October 15, 2007, which added **Unit 3 ITAAC 1.1.2** and stated that a revised set of EALs for Units 3 and 4 will be provided with Revision 3 of the ESP Application. In its letter dated February 12, 2008, SNC made various revisions to the Units 3 and 4 ITAAC tables, including revising **Unit 3 ITAAC 1.1.2** and added **Unit 4 ITACC 1.1.2**, which both state that an analysis of the EAL technical bases will be performed to verify as-built, site-specific implementation of the EAL scheme, and that the EAL scheme is consistent with Regulatory Guide 1.101 (see SER Sections 13.3.5 and 13.3.6, respectively).

In RAI 13.3-3.b, the staff also asked the applicant how it would incorporate significant changes to NEI 07-01 that may result from the NRC's endorsement review into the EALs for Units 3 and 4. The applicant responded that SNC intends to revise the VEGP Unit 3 and 4 EALs as NEI 07-01 is revised. The applicant would then submit revisions to the ESP Plan or EAL submittal package following NRC endorsement of an approved change to NEI 07-01. Following the issuance of the ESP, SNC would change the ESP Plan in accordance with 10 CFR 50.54(q). Consistent with the applicant's stated intention, the staff has identified as **Permit Conditions 2 and 3** (listed below), the revision of the VEGP EALs for Units 3 and 4, respectively, to reflect the final revision of NEI 07-01. **Permit Conditions 2 and 3** address the extent to which the EALs would reflect the current NEI 07-01 revision at the time the COL application is submitted by an applicant for a COL referencing this ESP.

In RAI 13.3-3.d, the staff asked the applicant to identify specific areas for which EALs cannot be fully developed and submitted before construction of the plant, and therefore must be addressed as ITAAC. In its response, the applicant stated that it identified the areas for which the EALs cannot be fully developed in the March 1, 2007, EAL submittal (i.e., SNC Letter AR-07-0404) and that it expects all areas that are not yet fully developed to be developed before a COL is issued. Thus, no ITAAC are required, and SNC will submit revisions to the EAL scheme as the design details are completed. Consistent with the applicant's stated intention, the staff has identified as **Permit Conditions 4 and 5** (listed below), the submission – by an applicant for a COL referencing this ESP – of a fully developed EAL scheme for Units 3 and 4, respectively, that reflect the completed AP1000 design details, subject to allowable ITAAC.

The staff does not agree with the statements that all (EAL) areas that are not yet fully developed will be developed before a COL is issued, and that no (EAL) ITAAC are required. Numerous EALs require site-specific setpoints, instrument readings, and various thresholds that are dependent upon the as-built reactor. As such, the staff expects that EAL-related ITAAC (in some form) would carry forward from the ESP into the COL, and would be resolved (i.e., the acceptance criteria met) as the reactors are constructed – and prior to fuel load. Thus, all EAL areas would not be fully developed before a COL is issued. Irrespective of this, the addition of **Units 3 and 4 ITAAC 1.1.2** (discussed above) would encompass all as-built, site-specific EAL-related features that are not yet resolved when a COL application (referencing this ESP) is tendered.

The development of a complete EAL scheme is an essential element of review, in relation to the staff's finding of reasonable assurance pursuant to 10 CFR 50.47(a). As such, the staff has identified as **Permit Conditions 6 and 7** (listed below), the completion – by an applicant for a

COL referencing this ESP – of a fully developed set of EALs for Units 3 and 4, respectively, which are based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring, and which have been discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC (see Section IV.B of Appendix E to 10 CFR Part 50). The COL applicant shall include the full set of EALs in the COL application. **Permit Conditions 6 and 7** are subject to the respective **Units 3 and 4 ITAAC 1.1.2**, which permits a limited set of as-built, site-specific EALs to be addressed by and carried forward in the COL as ITAAC. Subject to **Permit Conditions 2 through 7**, the staff finds that SNC's response to Open Item 13.3-4 and subsequent ITAAC revisions are acceptable; and therefore, Open Item 13.3-4 is resolved. (See also SER Section 13.3.4, "Conclusion.")

Permit Conditions

2. An applicant for a combined license (COL) referencing this early site permit shall revise the EALs for Unit 3 to reflect the final revision of NEI 07-01.

3. An applicant for a combined license (COL) referencing this early site permit shall revise the EALs for Unit 4 to reflect the final revision of NEI 07-01.

4. An applicant for a combined license (COL) referencing this early site permit shall submit a fully developed EAL scheme for Unit 3 that reflects the completed AP1000 design details, subject to allowable ITAAC.

5. An applicant for a combined license (COL) referencing this early site permit shall submit a fully developed EAL scheme for Unit 4 that reflects the completed AP1000 design details, subject to allowable ITAAC.

6. An applicant for a combined license (COL) referencing this early site permit shall complete a fully developed set of EALs for Unit 3, which are based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring, and which have been discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC, and shall include the full set of EALs in the COL application. If the EALs are not fully developed, the COL application shall contain appropriate ITAAC for the fully developed set of EALs for Unit 3.

7. An applicant for a combined license (COL) referencing this early site permit shall complete a fully developed set of EALs for Unit 4, which are based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring, and which have been discussed and agreed on by the applicant or licensee and State and local governmental authorities, and approved by the NRC, and shall include the full set of EALs in the COL application. If the EALs are not fully developed, the COL application shall contain appropriate ITAAC for the fully developed set of EALs for Unit 4.

State and Local Emergency Plans [D.3, D.4]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard D of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard D are adequate. The following summarizes the FEMA findings for planning standard D.

a. State of Georgia

[D.3] GA REP-Base Plan, Section VI.G.2, "Incident Assessment," states that it is the policy of the State of Georgia to make precautionary protective action decisions based on in-plant data provided by the facility operator whenever possible. In addition, GA REP-Base Plan, Section VI.G.1, "Emergency Classification and PAGs," states that incidents at fixed nuclear power facilities are classified as one of four separate emergency classifications (i.e., notification of unusual event, alert, site area emergency, and general emergency). **[D.4]** The tables included in Section VI.G.1 outline the conditions under which the facility operator may declare each of the four emergency classes and the resulting offsite response actions to be performed by State and/or local agencies. This emergency classification and action level scheme is consistent with that established by the applicant.

b. Burke County, Georgia

[D.3] GA REP-Burke County Plan, Section IV.4, states that incidents will be reported by class, as defined in NUREG-0654/FEMA-REP-1, Revision 1, and includes a general description of the four emergency classes, which are consistent with those established by the applicant. In addition, Attachment A states that the Burke County EMA Director will initiate emergency operations, including activation of the EAS, consistent with the accident/incident classification. **[D.4]** Consistent with the four classifications, Section IV.A.4 provides a general description of response actions for local responders, and Section IV.B.5 describes detailed response activities.

c. State of South Carolina

[D.3] SCORERP Section IV.A.2 states that, in conformance with NUREG-0654, radiological accidents can be categorized into one of the four ECLs, which are consistent with those of the applicant. **[D.4]** SCTRERP Section B.III, "Emergency Plan Mobilization," and Appendix I, "Protective Action Guides," further discuss ECLs and response actions. Section IV.A.3 states that the ECL determines the degree of licensee, local, and State response, as outlined in Appendix 3, "Emergency Classification Levels." In addition, offsite response will be initiated by State and local forces, as recommended by DHEC and/or the FNF.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[D.3] The county plans state that VEGP has the responsibility for classifying the emergency, in accordance with NUREG-0654, and that State and local emergency management officials will review and certify their agreement with the VEGP EALs annually. Each plan also lists the State and county EALs, which are in agreement with the applicant's EALs. **[D.4]** Section IV.D of the county plans provides detailed State and local emergency actions to be taken, corresponding to the applicant's four emergency classes.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for the emergency classification system, and subject to **Permit Conditions 2 through 7**, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard D of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(4), and Sections III, IV.B, and IV.C of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.5 Notification Methods and Procedures (10 CFR 50.47(b)(5); NUREG-0654/FEMA-REP-1, planning standard E)

The regulation, as reflected in the planning standard, requires that procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations, the content of initial and follow-up messages to response organizations and the public has been established, and the means to provide early notification and clear instruction to the populace within the plume exposure pathway EPZ have been established.

In ESP Plan Section E, "Notification Methods and Procedures," the applicant addressed the specific methods and sequencing of notifications that will be covered in the appropriate implementing procedures for VEGP Units 3 and 4 in an emergency. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard E, "Notification Methods and Procedures." Planning standard E provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(5).

[E.1, E.2, J.1, J.2, J.4, J.5] In ESP Plan Section E.1, "Notification of VEGP Personnel," the applicant stated that the emergency director is responsible for assigning an event to the appropriate emergency class and then notifying onsite and offsite personnel. The primary means for notification of personnel within the protected area is the public address system. Upon declaration of an emergency, the emergency director will order an announcement of the emergency to site personnel. The supervisor of nuclear security will be responsible for notifying the unaffected site units, Plant Wilson, the training center, the visitor's center, and recreation park staff. All visitors at the visitor's center will leave the site if directed by the emergency director or if a site area emergency or general emergency is declared. Security will activate the site siren to notify personnel on site, who are outside the protected area, of an evacuation order.

The security department will also be responsible for evacuating all visitors and nonessential personnel from the Plant Vogtle Recreational Park[29] and for verifying the evacuation of all

[29] The Plant Vogtle Recreational Park property, which is owned by Georgia Power Company and located approximately 1 mile southwest of the Vogtle site, is addressed in the Vogtle emergency plan. For purposes of evacuation, persons in the park are considered part of the Vogtle site population.

nonessential personnel from the unaffected site units, Plant Vogtle, Plant Wilson, the training center, and the remaining areas inside the owner-controlled area (OCA). Visitors within the protected area are escorted by a permanently badged individual. This individual is responsible for informing visitors of emergencies and for taking action to evacuate visitors from the site, as necessary.

Before they receive a work assignment, plant and contractor personnel will be trained in actions to be taken in an emergency. The training will include instructions on the methods of personnel notification and the required personnel actions in an emergency. The corporate staff is notified in accordance with EIPs. The corporate duty manager is notified by the Vogtle duty manager, who receives notification from the emergency director. The notification procedure includes notification of offsite ERO personnel. ERO members will be notified by means of an auto-dialer system that is activated by onshift personnel. In addition to those personnel recalled, operations, maintenance, and security personnel required to report will be contacted by onshift personnel from their own respective departments. Warning and evacuating onsite personnel is also addressed in ESP Plan Section J and in SER Section 13.3.3.2.10.

[E.3, E.4, E.7, J.10.c] In ESP Plan Section E.2, "Notification of State and Local Response Personnel," the applicant stated that the emergency director is responsible for the completion of the initial message form (shown in Figure E-1, "Example of initial emergency message for State and local response agencies") and for the notification of the offsite State and county agencies within 15 minutes of the declaration of an emergency. The agencies will be responsible for notifying appropriate response personnel in accordance with their emergency plans and procedures. The ENN, a dedicated telephone system, will normally be used for these notifications. ESP Plan Section F, "Emergency Communications," describes the ENN and backup means of communication (see SER Section 13.3.3.2.6). Figure E-1 presents the sample initial message form for notifying these response centers. This form has been developed in conjunction with appropriate offsite agencies. The initial notification concept is presented in Table E-1, "Initial Notification System—Normal Working Hours," Table E-2, "Initial Notification System—Backshift Hours," and Figure E-1.

[E.1] All notification messages must be verified. When the ENN is used, verification is accomplished by roll call. This is a suitable mechanism, since the ENN is a multiparty, dedicated telephone line. When commercial telephone or radio is used for notification, the called party will contact the site to verify the validity of the message or use the authentication system provided by the SCEMD.

The staff further examined the ability of the applicant to contact the State and local organizations on a 24-hour, 7-day-per-week basis and discusses this in SER Sections 13.3.3.2.1 and 13.3.3.2.6. Public notifications are also addressed in ESP Plan Section J and SER Section 13.3.3.2.10. The staff reviewed other application sections that deal with the availability of 24-hour emergency communications and response, and discusses those reviews in SER Sections 13.3.3.2.1, 13.3.3.2.2, 13.3.3.2.6, 13.3.3.2.8, and 13.3.3.2.12.

[E.1] The staff finds that the applicant has established procedures that describe mutually agreeable bases for notification of response organizations and that those procedures are consistent with the emergency classification and action level scheme in Appendix 1 to NUREG-0654/FEMA-REP-1. These procedures are further described in SER Section 13.3.3.2.4 and are reflected in Figures E-1 and E-2, "Example of NRC Event Notification Worksheet," which would be modified to add the Unit 3 and 4 designations. **[E.3]** In addition, the staff finds that the contents of the initial emergency messages to be sent from the plant

contain information about the class of the emergency, whether a release is taking place, the potentially affected population and areas, and whether protective measures may be necessary.

The emergency director is responsible for ordering notification calls to the DOE-SR operations center by the ENN and to the NRC operations center by the ENS, or commercial telephone as backup, within a prescribed time following the declaration of an emergency. Examples of the type of initial emergency message form used to provide the initial notification to the DOE-SR operations center and the NRC operations center event notification form used for NRC notification are shown in Figures E-1 and E-2, respectively. **[E.2]** The establishment of adequate procedures for alerting, notifying, and mobilizing emergency response personnel will be determined upon receipt of those procedures, pursuant to **Units 3 and 4 ITAAC 9.1**, and through review of their use during an exercise, pursuant to **Units 3 and 4 ITAAC 8.1**.

[E.4, E.6] In ESP Plan Section E.4, "Notification of the Public," the applicant stated that it is the responsibility of SNC to provide adequate means for notifying the public or to be assured that such means are provided. In an emergency, State and local agencies are responsible for activating the alert notification system. Administrative and physical means have been established for providing early initial warning and subsequent clear instructions to the populace within the plume exposure pathway EPZ. The alert notification system, except for SRS, is described in Appendix 3, "Means for Providing Prompt Alerting and Notification of the Public," to the ESP Plan. **[E.5]** This system has the capability to complete the initial alert notification of residents within the plume exposure pathway EPZ in about 15 minutes. **[E.4]** Follow-up messages can be delivered to the public by commercial broadcast. If an emergency is declared at the site, DOE-SR has agreed to provide for the prompt notification of all persons at SRS within the VEGP plume exposure pathway EPZ. The staff reviewed Appendix 5, "Memorandum of Agreement with DOE – Savannah River," to the application and discusses the notification methods and procedures associated with DOE-SR in more detail in SER Sections 13.3.3.2.1 and 13.3.3.2.6. **[E.6]** The staff finds that the applicant has established administrative and physical means for notifying and providing prompt instructions to the public within the 10-mile plume exposure pathway EPZ.

[E.1, E.3] The site will provide offsite authorities with supporting information for their messages to the public. Such messages, consistent with the emergency classification scheme, will instruct the public in regard to specific protective actions to be taken by occupants of affected areas. **[E.4, E.7]** The emergency director is responsible for the completion of a follow-up emergency message (see also Figure E-1). The appropriate support coordinator will ensure that the emergency communicator(s) periodically provide follow-up messages to the appropriate offsite Federal, State, and local authorities. **[E.4]** As reflected in Figure E-1, the staff finds that the applicant has made provisions for follow-up messages from the facility to offsite authorities, which contain the appropriate information to support the timely and necessary offsite response. **[E.7]** In addition, as reflected in Figures E-1 and E-2, the staff finds that the applicant has provided adequate supporting information for the written messages intended for the public.

State and Local Emergency Plans [E.1, E.2, E.5, E.6, E.7]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard E of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard E are adequate. The following summarizes the FEMA findings for planning standard E.

a. State of Georgia

[E.1, E.2] GEOP ESF Annex 2 describes emergency telecommunications systems and support and the receipt and dissemination of emergency notifications associated with any large-scale emergency in the State. Section D of GA REP-Annex D lists key local, State, and Federal agency organizations (including telephone numbers); secondary radio systems will be used if the telephone system is unavailable. Section A of Annex D describes the process for notifying various State agencies and activation of the State EOC. Section A.7 states that State radiological program directors in adjacent States will be notified by the most expeditious means possible as soon as practical following a radiological emergency. Information reported (i.e., notification) will be in accordance with the emergency notification form format adopted by the States of Georgia, North Carolina, and South Carolina, and GPC, Duke Power Company, Carolina Power and Light Company, South Carolina Electric and Gas Company, and SRS Operations. The authenticity of messages will be verified using the ENN (in accordance with published procedure) and commercial telephone callback. (Notification and communication links are also addressed in GA REP-Base Plan Section VI.E and SER Section 13.3.3.2.1.)

GA REP-Base Plan, Section VI.G.3.b, "Public Notification," states that the methods for informing the public in affected area(s) surrounding nuclear facilities are described in the site-specific annexes to the Base Plan. These methods include but are not limited to activation of the prompt notification system (PNS), a system of tone alert radios within the 10-mile EPZ, activation of sirens (Vogtle only), broadcast of emergency information by local electronic media, and door-to-door backup notification by law enforcement personnel. The site-specific annexes also address methods for notifying transient populations.

[E.5, E.6] GEOP ESF Annex 2 describes the warning strategy for notification from the GEMA communications center to the general public about emergency conditions. GEMA will serve as the 24-hour State warning point for receiving and disseminating alerts and warnings to other State agencies, local governments, and the public. **[E.7]** GEMA will disseminate understandable warning messages, which include actions that should be taken. Subsequent advisories will be sent through local and State communication networks to alert local governments and county warning points to changing conditions. GEMA SOP 3-5, "Activation of the Vogtle Electric Generating Plant Prompt Notification System," lists EAS messages and public information. GEMA staff will request that one of the pre-scripted messages, which will specify the desired message by color code and script name, be broadcast on the NWR. The color codes correspond to messages that include instructions to stand by, shelter, or evacuate, as well as an all-clear and test message.

[E.5, E.6] Section A of GEOP ESF-Annex D states that the general populace will be notified by local and State government of an incident or emergency situation (in accordance with the requirements of NUREG-0654/FEMA-REP-1) and that the affected population within the 10-mile EPZ will be notified promptly in accordance with GEMA SOP 3-5, which describes the notification system and lists messages and public information. The VEGP public notification system is a composite system, consisting of the NWR and VEGP siren system. The NWR is capable of providing an alerting signal and an instructional message; responsibilities and procedures for activating the NWR are addressed in the "Agreement for Operation of a NOAA Weather Radio Transmitter by a Cooperator." The VEGP siren system complements the public notification system with 47 rotating electronic sirens that are strategically located throughout the 10-mile EPZ. The VEGP siren system may be activated by either the State of Georgia or Burke County and would usually be activated following a request from the State, in conjunction with activation of the NWR.

b. Burke County, Georgia

[E.1] Burke County Plan Attachment G, "Notification and Warning," states in Section D that the VEGP emergency director will notify State and local authorities through the ENN. If the ENN is inoperable, the Burke County EOC will be notified through its 24-hour telephone number. The Burke County EMA radio network will serve as a backup channel between the VEGP EOF and the Burke County EOC. **[E.2]** Attachment A, "Implementation," states that the EMA director will initiate emergency operations in accordance with the incident classification and, if appropriate, activate the EOC and notify emergency response personnel by telephone, radio, pagers, and/or personal contact. The staff will report to the EOC and initiate emergency response activities, consistent with the incident classification. These activities may include recommending protective measures for the health and safety of the affected population. (See also Attachments C and F and Plan Section V.F.) (The county EOC is further discussed in SER Section 13.3.3.2.8.b.)

[E.5] Burke County Plan Section IV.B states that if protective actions are required or the situation warrants, GEMA will activate the PNS, in accordance with GEMA SOP 3-5, and advise the population of actions required. After the PNS has been activated, the EAS (local radio station) will be activated and will provide the public with periodic updates on the emergency status. **[E.7]** Attachment J, "Emergency Information," describes the specific information that will be provided to the public (including transients), which includes alert warnings, emergency information, and specific instructions. The VEGP emergency public brochure will also be made available. (County responsibilities for coordinating emergency operations are discussed in SER Section 13.3.3.2.1.b.)

[E.6] Attachment G states that there is an ENS in the 10-mile EPZ, consisting of tone-alert radio receivers in households and businesses and outdoor sirens. The system will be used to alert the population of a problem at VEGP and to instruct it to turn on radios or televisions for emergency information and instructions. The PNS will provide both an alert signal and an informational (or instructional) message to those within the 10-mile EPZ, within 15 minutes from when GEMA (or Burke County EMA) decides an incident at VEGP warrants activation of the system. Attachment G also addresses notification and evacuation of hunters, fishermen, other sportsmen, and handicapped persons within the 10-mile EPZ.

c. State of South Carolina

[E.1, E.2] SCORERP Section IV.3 states that the ECL determines the degree of licensee, State, and local response, as outlined in Appendix 3, "Emergency Classification Levels." Appendix 3 describes licensee, State, and local actions based on the four ECLs (notification of unusual event, alert, site area emergency, and general emergency). Appendix 1, "FNF Notification Checklist," to Annex A describes the notification and verification process and includes Figure 1, "Emergency Notification Form: Nuclear Facility to State/Local Government," and Figure 2, "Warning Message: SCEMD to State Government." In addition, SCORERP Annex A states that nuclear power plant licensees, in conjunction with State and local emergency management organizations, have established mutually agreeable measures for prompt notification of emergencies, consistent with the ECL scheme discussed in SCORERP Section IV.B.1 and Appendix 3. These measures are designed to provide offsite decision-makers with information on the class of emergency, whether a release is taking place, the potentially affected population and areas, and whether protective actions may be necessary.

[E.5] SCORERP Section IV.B states that to ensure public understanding of emergency protective action instructions, the SCEMD public information officer (PIO) will publish and transmit, immediately upon completion of an EAS message broadcast, a follow-on emergency news release to participating media stations and the South Carolina educational television network (SCETV), which will contain familiar landmark descriptions of all zones where protective actions are required. SCORERP Annex C, "Emergency Public Information Procedures," describes the need to provide direction and control in the dissemination of official statements, information (news releases), and EAS messages by the State during an FNF incident.

[E.6] SCORERP-Part 5 Section IV.B states that alert and notification procedures are designed to inform and instruct the populace in the EPZs and to notify Federal, State, and local RER forces. In the event of an incident at VEGP, the primary means for notifying offsite response forces is the ENN, which is a dedicated ring-down telephone system. Commercial telephone lines and the local government radio (LGR) provide a backup to the ENN. A fixed siren system, NWR, tone-alert radios, and drive-through route alerting are used to alert the public within the 10-mile EPZ. Emergency protective action instructions for the public will be broadcast over the EAS. SCORERP-Part 5, Annex A, "Alert and Notification," describes the siren system and other aspects of alert and notification of the public.

[E.7] SCORERP Section IV.B states that, once the decision is made to activate the siren system and EAS, the State will coordinate siren sounding and EAS activation with participating radio stations (see SCORERP, site-specific section Part 5, "Vogtle Electric Generating Plant"). To ensure public understanding of emergency PARs, the SCEMD PIO will publish and transmit, immediately upon completion of an EAS message broadcast, a follow-on emergency news release to participating media stations and SCETV, which will contain familiar landmark descriptions of all zones where protective actions are required. Descriptions of such landmarks in the VEGP 10-mile EPZ are contained in SCORERP-Part 5, and sample EAS messages are in SCORERP Annex C, Appendix 2. Annex C also describes briefings and frequency, message content, and rumor control.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[E.1] VEGP will provide initial warnings and ECL changes to the county warning point, using the ENN (with commercial telephone as a backup). The State and county warning points, which are staffed on a 24-hour basis, will receive these messages simultaneously. **[E.2]** Each county has procedures in place, which use the county warning points as the initial point of contact. The warning points have procedures that describe verification of incoming messages and identify which personnel and agencies should be contacted.

[E.5] Emergency public information will be issued by the South Carolina spokesperson from the ENC in Waynesboro, Georgia, in coordination with the State, SRS, risk counties, and the licensee. **[E.6, E.7]** Section IV.B of the county plans states that the design objective for warning the population will be to (1) provide both an alert signal to the population throughout sector G-10 (with an informational or instructional message) within 15 minutes after the decision to activate the PNS, and (2) ensure 100-percent coverage of the population within the entire 10-mile EPZ. A special follow-up notification will be made within 45 minutes of the initial notification.

Appendix 2, "Procedures for Alerting and Notifying Residents and Warning Teams of the 10-Mile EPZ," of the counties' plans describes procedures, organizations, and facilities used to alert and notify the populace in the 10-mile EPZ of an emergency at VEGP. In addition, it describes the organizations and personnel involved, including the equipment and backup

means for alerting the general population and any transients. Follow-up emergency action messages will be formulated and coordinated by the respective State EOCs and relayed by the State PIO organization at the ENC.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for notification methods and procedures, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard E of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(5) and Sections III and IV.D of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.6 Emergency Communications (10 CFR 50.47(b)(6); NUREG-0654/FEMA-REP-1, planning standard F)

The regulation, as reflected in the planning standard, requires that provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.

In ESP Plan Section F, "Emergency Communications," the applicant described the communication capabilities between the VEGP site and the States of Georgia and South Carolina and affected counties. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard F, "Emergency Communications." Planning standard F provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(6).

In ESP Plan Section F, the applicant stated that the primary means of communication between the site and the States of Georgia and South Carolina, the affected counties, and the SRS is the ENN, which is a dedicated telephone system that is available on a 24-hour, 7-day-per-week basis. The ENN has multiple drops in the EOC for both States, which are staffed on a 24-hour basis. ENN extensions are in the control room, TSC, and EOF, and commercial telephones provide backup communications capabilities. There is also an administrative decision line (ADL) that connects the EOF, SRS operations center, both State EOCs, and the three South Carolina counties. This line is used primarily for decisions on protective actions. In addition, telephone links and alternates exist, including 24-hour-per-day staffing of communications links that initiate emergency response actions.

The communication links are shown in ESP Plan Table F-1, "Emergency Response Communications Summary." The staff reviewed other application sections that deal with the availability of 24-hour emergency communications and response, and discusses those reviews in SER Sections 13.3.3.2.1, 13.3.3.2.2, 13.3.3.2.5, 13.3.3.2.8, and 13.3.3.2.12. **[F.1.a]** The staff finds that provisions exist for 24-hour-per-day notification and activation of the State and local emergency response network.

[F.1] At the ESP site, the emergency director will be in charge of communications with the States, counties, and the SRS. ESP plan Section B.2.1.1, "Emergency Director," states that

one of the activities that the emergency director will manage for the duration of the emergency is directing the notification of the site, SNC and GPC personnel and notifying and maintaining open communications with offsite authorities regarding all aspects of emergency response. The State of South Carolina emergency preparedness director will be responsible for communication at the State EOC with the site, the SRS, and contiguous State and local governments. ESP Plan Table A-1, "Responsible Individuals of Primary Response," lists the individuals in charge of emergency response, which include the State Disaster Coordinator for Georgia; the chairman for the Burke County Board of Commissioners; the chairman of the county council for the three South Carolina counties; and the Manager, DOE-SR, for the SRS, located at the SRS operations center. **[F.1.b]** The staff finds that adequate provisions exist for communications with contiguous State and local governments within the EPZs.

[F.1.f] The application included **Unit 3 and 4 ITAAC 3.2**, which state that communications are established from the control room, TSC, and EOF to the NRC headquarters and regional office EOCs, and an access port for ERDS is provided. The primary means of communications between the ESP site and the NRC is the ENS, which is located in the control room, TSC, and EOF. The NRC Region II office in Atlanta, Georgia, may also be connected on the ENS through the NRC in Rockville, Maryland. In addition, the HPN telephone will be available in the TSC and EOF, and the emergency response data system (ERDS), will allow for transmission of plant parameter information to the NRC. The ERDS provides for the automated transmission of a limited data set of selected critical plant parameters. Commercial telephone lines and SNC communications serve as backup to the ENS and HPN. Communications with other Federal EROs will be by telephone. The staff is aware that the notification and communications capability of the NRC Region II office in Atlanta, Georgia, and NRC Headquarters incident response center in Rockville, Maryland, are available on a 24-hour, 7-day-per-week basis and can support the VEGP site. SER Section 13.3.3.2.3 discusses the assistance available from Federal agencies, including coordination and communications among those agencies and with the State and local agencies and VEGP site. **[F.1.c, F.1.f]** Thus, the staff finds that adequate provisions exist for communications with Federal EROs and between the VEGP site and the NRC.

[F.1.a-e] In ESP Plan Section F.5, "Communications among VEGP Emergency Response Facilities," the applicant stated that communications among the control room, TSC, OSC, and EOF will entail the use of dedicated telephone circuits, normal plant telephones, and radio over the plant network. The radio system will also be used for communications with the radiological monitoring teams. In addition, ESP Plan Section F.5 lists the specific communications available at each of the applicant's facilities. **Unit 3 ITAAC 3.1** states that communications are established between the control room, OSC, TSC, and EOF; between the control room, TSC, and [listed offsite agencies]; and between the [proposed common] TSC and radiological monitoring teams. **Unit 4 ITAAC 3.1** is the same, except for communications between the TSC and offsite agencies, which has already been established by **Unit 3 ITAAC 3.1**.

[F.1.d, F.1.f] In ESP Plan Section F.9, "VEGP Radiological Monitoring Teams," the applicant stated that in-plant monitoring teams will communicate with the health physics (HP) or OSC communicator at least every half hour and that field monitoring teams will communicate with the EOF or TSC communicator. Multiple radio frequencies will be used for communications with monitoring teams. Transmitters and antennas are located throughout the OCA for field monitoring teams and the in-plant monitoring teams. The field monitoring team radio covers the entire plume exposure pathway EPZ. Remote stations for communicating with the field monitoring teams are located in the TSC and EOF.

[F.1.e] As described in ESP Plan Section E and discussed in SER Section 13.3.3.2.5, onsite personnel at the ESP site will be notified through a combination of public address system announcements, tone signals, and proceduralized telephone calls. After normal working hours, site personnel not on site at the time of the emergency will be notified by beeper (for plant management) or by telephone call using an auto-dialer system.

[F.2] In ESP Plan Section F.6, "Medical Support Facility Communications," the applicant stated that communications with Columbia Doctors Hospital and the Burke County Hospital are by commercial telephone. Radio contact through the Burke County EOC serves as a backup. The Burke County ambulance service is equipped with a radio for communications with the hospitals. The ambulance service and hospitals within the State are interconnected in a statewide hospital radio network. The site is able to communicate with the ambulances by contacting the hospitals, which have radio communications with the ambulances. The staff finds that a coordinated communication link exists for fixed and mobile medical support facilities.

[F.3, H.10, N.2.a] In ESP Plan Section F.8, "Communications Systems Tests," the applicant stated that communication channels with the State, counties, SRS, and the NRC are tested monthly from the control room, TSC, and EOF. Communications systems that link the control room, TSC, EOF, State EOCs and GEMA FEOC, county EOCs, and SRS EOC are tested quarterly. The system for communicating between the TSC, EOF, and the site field monitoring teams is tested quarterly.

Communications procedures and systems are tested biennially during a communications drill. This drill is normally conducted during the biennial exercise. The ERDS computers are tested quarterly. **[H.10, N.2.a]** In ESP Plan Sections H and N (discussed in SER Sections 13.3.3.2.8 and 13.3.3.2.14, respectively), the applicant further addressed the operational checks and testing of emergency equipment and instruments, which include emergency communications systems. The staff finds that the applicant has adequately provided for periodic testing of the entire emergency communications system.

State and Local Emergency Plans [F.1.a-e, F.2, F.3]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard F of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard F are adequate. The following summarizes the FEMA findings for planning standard F.

a. State of Georgia

[F.1.a, F.1.b] GEOP ESF Annex 2 states that the GEMA communications center serves as the 24-hour State warning point for receiving and disseminating alerts and warnings to other State agencies, local governments, and the public. GEMA coordinates with appropriate agencies and organizations to ensure operational readiness before, during, and after an emergency or disaster. This preparation includes maintaining agreements and contracts to ensure equipment and system maintenance on a 24-hour basis. **[F.3]** Alternate communication systems are maintained and tested weekly or monthly. **[F.1.c]** During an incident, GEMA will maintain channels of communication with local and Federal governments to ensure optimal information flow.

[F.1.c] GEOP ESF Annex 2, Section II.B, "Federal Response," states that when required, the Federal Government will implement the NRP to provide communications support to State and/or local jurisdictions. FEMA operates the Federal National Alert Radio System (FNARS) and has portable radios and a mobile emergency response system that can augment State communication resources. During or in anticipation of an emergency, FEMA is authorized to establish temporary communications and can make these resources available to local and State personnel or other appropriate persons.

[F.1.a, F.1.b] GA REP-Base Plan, Section VI.E, states that when the DNR-EPD radiation emergency coordinator receives a notification call, the coordinator will immediately contact the appropriate radiological response team member by telephone, pager, or Southern LINC radio. (The Southern LINC is a radio/telephone system on the VEGP network.) The private telephone numbers of team members are available to the 24-hour dispatcher for use in notifications. The telephone numbers will be updated quarterly, and all other telephone numbers will be verified during the annual emergency plan review. After alerting and dispatching the response team, the radiation emergency coordinator will notify the appropriate State and Federal agencies by telephone. **[F.1.b, F.1.d]** State DNR field units will be able to communicate with the VEGP EOF on Southern LINC radio or cellular telephone. DNR-EPD personnel will be able to communicate with the FEOC, Burke County EOC, and other State agency units by radio on the ICC and DNR statewide repeater system. The Southern LINC portable radio system may be used for communications between GEMA, DNR-EPD, and Burke County EMA.

[F.1.d, F.1.e] GA REP-Annex D, Sections A and B, state that communications between VEGP and the SOC will be by ENN and/or telephone. In an emergency at VEGP, the plant's emergency director (or designee) will notify local and State authorities using the ENN, which is located within the GEMA communications center and is staffed 24 hours a day, 7 days a week. The ENN is a dedicated circuit with terminals located at the utility, at the local EOC, GEMA SOC, and FEOC (all are staffed 24 hours), and at the SRS and designated locations in South Carolina (see SER Section 13.3.3.2.6.d). GEMA will notify DNR-EPD and other State agencies. State radiological program directors in adjacent States will be notified as soon as practical following a radiological emergency, and this notification will serve to request necessary assistance through the SMRAP agreement. If a State response element is dispatched to the FEOC, that element will establish communications with the plant and the SOC by ENN or telephone.

[F.2] GA REP-Annex D, Section F, "Medical/Public Health Support," states that all ambulance services and hospitals within the State are interconnected in a statewide hospital communications network, which also provides communications between hospitals and with local sheriff's departments. Cellular telephones are identified as backup communications. In addition, local EOCs are able to communicate with medical support providers and local hospitals to coordinate assistance for treatment and radiological monitoring through land-based telephones, radio systems, and the local cellular system.

[F.3] GA REP-Base Plan, Section VII.A.2, "Fixed Nuclear Facility Exercises/Drills," states that ongoing program activities involving radiological surveillance and emergency preparedness functions carried out by State agencies test and utilize communications equipment on a continuing basis and that drills involving communications and notification are always incorporated as an element of the annual exercise at the FNF. GA REP-Annex D, Section B, also states that, with few exceptions, communications equipment is used daily by the agencies that would be involved in emergency activities. For example, commercial telephones and law enforcement and fire response radio nets are not covered by the periodic testing scheme

because of their daily use. The ENN is tested monthly under the licensee's communication testing procedures, and the test results are reported to the NRC.

b. Burke County, Georgia

[F.1.a, F.1.b, F.1.d] Burke County Plan Attachment F states that the primary means of communication among local governments and their department/agency personnel within the 10-mile EPZ are telephone and the radio network link that each department/agency has with the EMA EOC. **[F.2]** Attachment E, "EOC, Emergency Equipment and Service Support," states that common communications for statewide hospital/medical services are also available. If the primary communication links are unavailable, the GEMA statewide radio network and/or sheriff's ICC radio network are available. **[F.1.c]** In accordance with the GEOP, GEMA will assume operational control and will coordinate the response activities of all State and Federal agencies, thus eliminating any requirement for direct contact between Burke County EMA and Federal response agencies. **[F.1.e]** In addition, Attachment A describes how the EMA director will notify personnel of an emergency condition if the Burke County EOC is activated. Attachment C contains private telephone numbers, including pagers and radio channels, and is available to the dispatchers in support of notifications. (The Burke County communication capabilities, including responsibilities and methods of activation of emergency personnel, are also discussed in SER Sections 13.3.3.2.1.b and 13.3.3.2.5.b.)

[F.3] Attachment F also states that the requirements for testing of the EMA and sheriff's/ICC radio networks are minimal because the systems are in daily use, which results in immediate detection of malfunctions and subsequent repair. This also applies to all other Burke County EMA radio networks, which include municipal police, fire departments, hospital/emergency medical service, and city/county public works departments. Attachment K, "Training and Exercises," states that communication drills between Burke County EMA and GEMA will be conducted monthly and that drills between the Burke County EMA and VEGP will be held at least annually.

c. State of South Carolina

[F.1.a, F.1.b, F.1.c] SCORERP Section V.A.4 states that State agencies will provide for a 24-hour notification system with the licensee, the SERT, and the affected counties. In addition, the State will maintain communication with FEMA Region IV and with contiguous States. **[F.1.b, F.2]** SCORERP Section IV.B.10, "Communications," lists the following State radio network communication systems that are available at the SEOC and support communications between primary RER agencies:

- SCEMD lowband very high frequency (VHF) LGR
- South Carolina Department of Public Services/Highway Patrol radio
- Civil Air Patrol highband VHF
- South Carolina DNR highband VHF
- Civil Air Patrol high frequency
- Forestry highband VHF
- Radio Amateur Civil Emergency Services
- SC Law Enforcement Division (SLED) regional and highband VHF
- Palmetto trunk radio

[F.1.b] Communications with the State of Georgia are possible through the following means:

- FNARS
- National Warning System (NAWAS)
- Catawba nuclear station ADL
- Vogtle/SRS ENN
- commercial, satellite, and cellular telephones

[F.1.c] During an FNF incident, communications with Federal response organizations will be conducted using commercial telephones, the FNARS, NAWAS, and SCEMD LGR network. An SCEMD vehicle, equipped with mobile radios and a satellite radiotelephone, will deploy to the JIC as soon as the SEOC is established and will provide backup communication with the SEOC/JIC. **[F.1.d]** Once the VEGP EOF is established, communications will be maintained with the SEOC through the ENN, commercial telephones, SCEMD LGR, and Southern LINC.

[F.1.e] Immediately upon notification of an ECL, the state warning point will relay that notification to the DHEC duty officer, who will verify the ECL and any PARs by callback to the FNF. Subsequent to DHEC contact with the FNF, ECL confirmation will be provided to the SCEMD duty officer (after hours), chief of response and operations, and the SCEMD director. The SCEMD director will determine the requirements for further State and local government response. Organizations to be notified by the state warning point for each ECL are listed in SCORERP Appendix 1, "Supporting Plans and Responsible Organizations." **[F.1.b]** Alert telephone numbers and designated representatives for South Carolina and contiguous State and Federal agencies appear in the SCEMD telephone directory.

[F.3] SCORERP-Part 5, Section IV.B.10.c, states that communications with local governments in the 10-mile EPZ will be tested monthly and with Federal EROs quarterly. Communications between the VEGP site, the State and local EOCs, and field assessment teams will be tested annually.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[F.1.a, F.1.e] Section IV.C of the county plans states that upon declaration of an emergency at VEGP, initial warning and any changes in emergency classifications will be provided to the county warning point by VEGP directly using the ENN, with commercial telephone as a backup. **[F.1.d]** The ENN is a dedicated telephone system connecting the VEGP with the State warning point, SCEMD (SEOC), State of Georgia, SRS, and county EOCs. The ENN is also used for protective action decision-making and to discuss activation of the NWR/EAS public notification system. The State and county warning points are staffed on a 24-hour basis. The primary county communications capabilities include the sheriff's office and department of public safety radio frequencies.

[F.1.b] The communications officer for the county is responsible for coordinating communication activities during a disaster and establishing and maintaining the county emergency radio networks to include communications with municipalities and adjacent counties. The primary and backup systems are VHF, ultra high frequency, and LGR (with telephone device for the deaf), Internet routing information system, mobile communication center, commercial telephone, and Southern LINC. In addition, there is a radio system located in the county EOC that can be used to communicate with other county EOCs or with the State EOC. **[F.2]** Section VI.B of the county plans states that the hospital and EMS can communicate with all other emergency response agencies using radios.

[F.1.e] The county warning point dispatcher will notify the emergency management director, who will then notify key EOC staff and either place them on standby or mobilize them to activate the ERO. Annex B of the county base plans states that when alerted by appropriate authority, the communications officer will notify the emergency communications staff and assist the warning officer in alerting other necessary emergency staff. Appendix 2 to the county plans contains a list of key personnel to be contacted.

[F.1.c] The State of South Carolina secures Federal assistance and support through FEMA and through letters of agreement with other State and Federal agencies. Offsite Federal support will be requested only by the State, and Federal agency communications will be coordinated through the State. **[F.3]** Communications between VEGP, the counties, and SCEMD will be tested monthly, and the drills will include the transmission and understanding of emergency messages.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for emergency communications, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard F of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(6) and Sections III, IV.D, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.7 Public Education and Information (10 CFR 50.47(b)(7); NUREG-0654/FEMA-REP-1, planning standard G)

The regulation, as reflected in the planning standard, requires that information be made available periodically to the public concerning notification methods and initial actions it should take in an emergency (e.g., listening to a local broadcast station and remaining indoors), that the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) be established in advance, and that procedures for coordinating dissemination of information to the public be established.

In ESP Plan Section G, "Public Information and Education," the applicant provided a general description of the public education and information program for the VEGP site. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard G, "Public Education and Information." Planning standard G provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(7).

[G.1-G.5, G.4.c, J.10.c] In ESP Plan Section G, the applicant stated that the detailed planning for public information actions during an emergency, including rumor control, is contained in ESP Plan Appendix 8. (Public alerting and notification during an emergency are addressed in ESP Plan Section J and discussed in SER Section 13.3.3.2.10.) **[G.1, B.7.d]** In addition, GPC and SNC, in coordination with State and local officials, will provide information to the public at least annually regarding how it will be notified and what actions it should take in an emergency. All

materials used to provide emergency planning information to the public (information brochures, advertisements, signs and notices, etc.) will be reviewed annually by GPC and SNC. **[G.2]** All materials will be updated, as necessary, and printed material distributed annually.

[G.1, G.2] The means for disseminating this information include information on siren poles, signs, notices in public areas, and publications distributed at least annually. Information is distributed annually to residents in the plume exposure pathway EPZ through the use of emergency information communication publications. In addition, ESP Plan Section G lists numerous subjects that are addressed in the various publications, including but not limited to the following:

- educational information on radiation
- contact for additional information
- protective measures
- special needs of the handicapped

[G.2] SNC operates a visitor's center on site, which is staffed with public information personnel who provide education programs to the community and any other visitors. These programs typically focus on plant operational concepts, plant safety considerations, and radiation. In ESP Plan Section G.1, "Information for Transients," the applicant stated that signs and notices providing information to transients are placed in public recreation areas, as well as other public places in the plume EPZ, such as siren poles, the VEGP visitor's center, and commercial establishments (e.g., motels, restaurants, and gas stations). This material will include the following information:

- how people will be warned of an emergency
- what to do if warned of an emergency
- a list of radio and television stations that will provide more information

[G.2] Finally, a Vogtle emergency information brochure will be made available within the EPZ to transients at commercial establishments, churches, motels, hunting clubs, the Creek and Cawden Plantations, the VEGP visitor's center, and through residents whose land is used by nonresidents (e.g., the occasional nonresident hunter). Outside the EPZ, the brochure will be made available to timber company offices for distribution to their employees who enter the EPZ on company business and to the Waynesboro office of the Agricultural Stabilization and Conservation Service for distribution to farmers who farm, but do not reside, in the EPZ.

The staff reviewed the various emergency information communication publications, including the 2006 Plant Vogtle Emergency Information Calendar. The staff finds that the applicant has adequately provided for the dissemination of information to the public regarding how it will be notified and what its actions should be in an emergency, including the establishment of a public information program that provides the permanent and transient adult population within the 10-mile plume exposure EPZ with an adequate opportunity to become aware of the information annually.

[G.3.a, B.7.d, H.2] In ESP Plan Section G.2, "Emergency News Center Operations," the applicant stated that the ENC will be the principal point of contact with the news media during an emergency. **[G.3.b]** The ENC will accommodate public information representatives from SNC and GPC and local, State, and Federal response agencies. News releases and media briefings will be coordinated to the maximum extent possible. GPC will utilize the corporate

headquarters building in Atlanta, Georgia, to serve as a temporary information center until the ENC in Waynesboro (Burke County Office Park) is activated. Once activated, the ENC becomes the principal location for dissemination of information about the emergency. The facility, located approximately 15 miles from the plant, can accommodate a large number of reporters. While the ENC is referred to as the joint media center in offsite agency emergency plans, both titles refer to the same facility.

The staff finds the location of the ENC acceptable because it is near the VEGP site and outside of the 10-mile plume exposure pathway EPZ. In general, a licensee has the option but is not required to establish the EOF as its location for dissemination of information to the public during an emergency. As the applicant stated in ESP Plan Annex 7, Section A7D, "Emergency Facilities and Equipment," SNC maintains a common EOF in Birmingham, Alabama, that serves as the EOF for all SNC sites, including the VEGP site. The staff finds that the VEGP ENC location is appropriate. The ENC is also addressed in ESP Plan Sections B and H, which are discussed in SER Sections 13.3.3.2.2 and 13.3.3.2.8, respectively.

[G.4.a, B.7.d] Principal GPC and SNC contacts for the media will be the public information director and the designated company spokesperson. The company spokesperson position is filled by individuals who, under normal operations, hold supervisory positions on the SNC corporate or plant staff and are technically and professionally qualified to perform this function. The company spokesperson has access to all information and telephone contact with the emergency director. He briefs the media on plant status and company emergency activities, and technical briefers are available to provide general and background information to reporters at the ENC. In addition, press kits are available at the ENC and corporate headquarters in Atlanta, Georgia, and an emergency Web page has been developed on the GPC Internet site, which will be activated in the event of an emergency. The Web page includes plant schematics, background information, and directions to the ENC. News releases about the event would also be available there.

[G.4.b, B.7.d] GPC and SNC will provide timely and accurate information to local, State, and Federal agencies and will seek reciprocal information from these agencies. Efforts will be made to coordinate periodic press briefings and to issue public statements in conjunction with these government agencies. A joint public information center operation at the ENC will provide ample opportunity for all parties represented to review all information before its public release.

[G.4.c] Rumors will be controlled by providing timely, accurate, and consistent information to the public and by having a single source of information. To dispel rumors in an emergency, a rumor control network will be activated. News media will be monitored to detect and respond to misinformation. The public will be instructed to listen to radio or TV. Offsite information is the responsibility of offsite agencies; however, rumor control will be coordinated between the States, SNC, and GPC. The States, SNC, and GPC provide information jointly to the rumor control desk at the ENC. Specific policies and practices for addressing rumors are presented in ESP Plan Appendix 8. The staff finds that the applicant has established coordinated arrangements, which are adequate for dealing with rumors.

[G.5] In ESP Plan Section G.5, "Media Education," the applicant stated that GPC will offer an annual program to acquaint the news media with the method for obtaining information about overall emergency preparedness at VEGP. Training will include information about the plant, radiation, and the role of the ENC. This program was also described in ESP Plan Appendix 8, Section P.2, "News Media Training." The staff reviewed ESP Plan Appendix 8 and finds that it is consistent with the applicant's descriptions in ESP Plan Section G. The ENC and Appendix 8

are also addressed in ESP Plan Sections B and H, which are discussed in SER Sections 13.3.3.2.2 and 13.3.3.2.8, respectively.

State and Local Emergency Plans [G.1, G.2, G.3.a, G.4, G.5]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard G of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard G are adequate. The following summarizes the FEMA findings for planning standard G.

a. State of Georgia

[G.3.a, G.4.b] GA REP-Annex D, Section C, "Public Affairs," states that when the SOC in Atlanta has been activated, only the public affairs director (or designee) will be authorized to issue news releases. Before its release, all information will be coordinated to the fullest extent practicable with the utility (i.e., SNC) and State of South Carolina. If subsequent activation of the State FEOC should be required, that facility will assume the primary command and control role for the State, including all public affairs activities. If a joint media center is established among the States of Georgia and South Carolina, Burke County EMA, and the utility, all public affairs activities will be coordinated there by the designated GEMA public affairs director. The near-site joint media center will be in the Burke County Office Park in Waynesboro, Georgia. In the event that the SOC or FEOC is not activated (e.g., for a minor incident), news releases may be handled by either the DNR-EPD radiation emergency coordinator or DNR PIO, in conjunction with the public affairs office.

[G.4.a, G.4.b] GA REP-Base Plan, Section VI.I, "Public Affairs," states that the GEMA director is the sole releasing authority for news releases and other information to the news media and public after the Governor has declared a state of emergency. All news releases (or other information) must be coordinated with all appropriate agencies. The State must coordinate with the utility. Each public affairs officer must restrict his releases to information concerning his jurisdiction, and a county public affairs officer must restrict his information to that concerning his county. GA REP-Annex D, Section C.1, "Control Over News Releases," states that when the SOC has been activated, only the public affairs director (or designee) will be authorized to issue news releases. Before its release, all information will be coordinated with the utility and the State of South Carolina. If subsequent activation of the State FEOC is required, that facility will assume the primary command and control role for the State, including all public affairs activities.

[G.4.c] GEOP ESF Annex 15, "External Affairs," states that the function includes a provision for ensuring that information on actions to be taken by local and State governments and the public is clear, concise, and accurate. Every effort shall be made to prevent and counter rumors and inaccurate information. The appropriate local, State, and congressional officials will be notified of the status of response and recovery activities and will be assisted with constituent inquiries. **[G.1, G.2, G.4.c, G.5]** News media training, and the dissemination of emergency information to the public, including rumor control, are addressed in Attachment J, "Emergency Information," of the Burke County Plan (discussed below).

b. Burke County, Georgia

[G.1] Burke County Plan Attachment J states that emergency information is classified into two broad categories. The first is pre-emergency information used to educate the citizens about

Plant Vogtle and, in general, the protective actions to take if there is an accident at the plant. The second is actual emergency information issued in response to a confirmed incident, which provides the public with specific information regarding necessary protective actions. **[G.2]** Working jointly, the utility PIOs and GEMA and Burke County EMA public affairs officers will coordinate the preparation of emergency information material to be distributed (at least annually) to residents in the 10-mile EPZ. The information will address topics such as the nature of radiation, where to obtain more detailed information, notification procedures, protective actions, identification of evacuation zones and routes, and location of reception and care centers. The material will be mailed and/or delivered by SNC personnel to each household, including to handicapped persons who have been issued tone-activated radios.

[G.2] Transients in the Burke County portion of the EPZ will be informed through the use of posted signs at strategic locations within the EPZ, such as commercial establishments, gas stations, churches, public recreation areas, the VEGP visitor's center, and the Augusta office of the Agricultural Stabilization and Conservation Service. The Vogtle emergency public brochure will also be available within the EPZ to transients at commercial establishments, churches, motels, hunting clubs, the VEGP visitor's center, and through residents whose land is used by nonresidents (e.g., the occasional hunter). The brochure will also be provided to timber company offices outside the 10-mile EPZ, for distribution to employees who enter the EPZ, and to the Agricultural Stabilization and Conservation Service for distribution to farmers who farm, but do not reside, in the EPZ.

[G.3.a, G.4.a, G.4.b] Attachment J further states that in the event of an incident at the plant that threatens the offsite population, the designated point of contact for the news media is the Joint Media Center, located at Burke County Office Park in Waynesboro, Georgia. From this location, the public affairs and PIOs from State, local EMA, and the utility will carefully coordinate, approve, and disseminate information regarding the incident through regularly scheduled press conference releases. These news releases will be generated by a PIO located in the FEOC. Technical content and emergency instructions from local and State input will be approved for release by signature from the FEOC chief and the radiation emergency coordinator. Coordination with the County PIO representative and/or EMA director and the utility will also occur before the information is released. Should the incident occur before ENC activation, this sequence of events will transpire at the SOC in Atlanta, Georgia. To facilitate dissemination of accurate information to the public, written messages keyed to specific types of incidents will be prepared in advance of an actual emergency. These pre-scripted messages will include instructions regarding sheltering, evacuation, and other protective actions. Copies of the messages will be included in a package for the EMA director and PIOs and will be disseminated to the public through EAS (local radio station) broadcast, when appropriate. All EAS messages will be coordinated with the State and utility before their release.

[G.4.c] Rumor control measures will be initiated through a coordinated effort by officials from the State, local EMA, and the utility at the joint media center. A telephone number provided for public use will enable concerned citizens to receive accurate and reliable information. Coordination will be maintained with the broadcast media to keep the public advised of the emergency situation. **[G.5]** Attachment J to Section D states that the news media will be invited to participate in the VEGP emergency exercises to acquaint the media with emergency planning, organization, and execution of emergency response operations. A training and orientation program will be conducted annually to keep media personnel informed of their roles during an actual emergency. (SER Section 13.3.3.2.15 discusses this training in more detail.)

c. State of South Carolina

[G.1] SCORERP Annex C, "Emergency Public Information Procedures" (Appendix 1), states that DHS and FNF public information organizations will provide the following staff, information, and materials in support of program activities:

- identification of possible types of incidents
- means of public alert and notification
- actions for self-protection
- sources of additional information
- information relating to local, State, and FNF response plans
- information relating to special population segments
- annual media workshops [G.5]
- State-prepared and other publications

[G.2] Section IV.G of Appendix 1 states that information will be disseminated to the transient population by providing educational materials at appropriate locations, including facility visitors centers, motel/hotel lobbies, train stations, parks, campgrounds, and recreation and other public areas. The responsibility for reviewing, auditing, and information content is delegated to the licensee.

[G.4.a] SCORERP Annex C states that if the SEOC is activated as a result of an FNF incident, the Governor's press secretary (or designee) will address issues regarding public safety and State response. Unless announced otherwise, the press secretary will assume responsibility for coordination of State emergency public information. Only the press secretary or public information director will be authorized to issue news releases on behalf of the State. The State public information coordinator will coordinate public information and EAS activities at the SEOC and will communicate/coordinate with the public information director at the JIC. (Annex C, Section V.D.5, lists the JIC location as the Burke County Office Park in Waynesboro, Georgia.) Public information releases originating from the SEOC will be coordinated with, and approved by, the Governor's press secretary (or designated representative).

[G.3.a, G.4.b] SCORERP Annex C, Section III.B, "Coordination," states that designated spokespersons of Federal, State, and local governments and the affected facility will coordinate JIC policy, scheduling of formal media briefings, and the preparation of joint news releases. Statements of releases will be coordinated with the designated spokespersons of other principal organizations. Formally scheduled briefings will provide the media with periodic updates. Additional information will be released as it becomes available or as needed to clarify misinformation and rumors. Annex C, Section IV.A.1, states that the SCEMD public information director will be the designated representative.

[G.4.c] SCORERP Annex C, Section III.C, "Rumor Control," states that rumor control helps ensure that misinformation is corrected and that a line of direct communication is established with the public. Detection of rumors (or inaccurate/incomplete information) may occur through interactions with utility and/or State rumor-gathering activities, State and local agencies and their EOCs, JIC operations, reception/shelter facilities, media, or Internet, or directly with the public. The State responds to rumors by gathering accurate and timely information, by coordinating it with all responding sources, and by using media and person-to-person communication to disseminate accurate and timely information.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[G.1, G.2] Section IV.E, "Public Information," of the county plans references the SCORERP (discussed above) for the dissemination of information to the public during an emergency at VEGP. The counties will provide for the preparation and prompt dissemination of official information, instructions, and directions to the public before, during, and after disasters. **[G.3.a]** Appendix 2.II.D, "Public Information," of the Aiken and Barnwell County Plans states that emergency public information will be issued by the South Carolina spokesperson from the ENC in Waynesboro, Georgia, and will be in coordination with the State of South Carolina, SRS, risk counties, and GPC.

[G.4.a, G.4.b, G.4.c] The counties rely on the State and its resources for all public information. Section IV.E of the county plans instructs the county PIO to issue press releases and conduct timely news conferences. If a JIC is needed, the counties will coordinate with other public information agencies/representatives to ensure information consistency. The PIO is responsible for monitoring the accuracy of media reports (e.g., relating to rumor control) and will support the efforts to collect, process, report, and communicate essential information. [G.5] Annual workshops for the news media will be conducted by the State and the FNF.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for public education and information, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard G of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(7), and Sections III, IV.B, IV.D, IV.E, and IV.F of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.8 Emergency Facilities and Equipment (10 CFR 50.47(b)(8); NUREG-0654/FEMA-REP-1, planning standard H)

The regulation, as reflected in the planning standard, requires that adequate emergency facilities and equipment to support the emergency response be provided and maintained.

In ESP Plan Section H, "Emergency Facilities and Equipment," the applicant described the ERFs and the equipment that will be used for accident assessment and monitoring functions following the declaration of an emergency. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard H, "Emergency Facilities and Equipment." Planning standard H provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(8).

[H.1] In Section H, the applicant stated that following the declaration of an emergency, response activity will be coordinated at a number of ERFs, which include the TSC, OSC, EOF, and ENC. In ESP Plan Section H.1.1, "Technical Support Center (TSC)," the applicant stated that the TSC will be established consistent with NUREG-0696, and as described in Section H.1, "Emergency

Facilities." The TSC will be located in the lower level of an administration building sited between the Unit 2 and 3 power blocks within the VEGP site protected area, as shown in Figure ii, "Vogtle Electric Generating Plant Site Plan." **Unit 3 ITAAC 5.1.1** states that the TSC has at least 2175 square feet of floor space. The TSC will be designed to withstand plant design-basis earthquakes and high winds. The layout of the proposed TSC is shown in Figure H-1, "VEGP TSC Layout." The TSC manager will direct operations at this facility.

The TSC will be common to all four VEGP units and will accommodate the required personnel to support an event at any (or all) of the four VEGP units. In addition, **Unit 3 ITAAC 5.1.4** states that the TSC is located within the [VEGP] protected area, and no major security barriers exist between the TSC and the control room. **Unit 3 ITAAC 5.1.5** states that the OSC is located adjacent to the passage from the annex building to the control room. Support facilities will be located within the TSC to support long-term operation of the TSC. Technical and operational data and information will be available for all units within the TSC. ESP Plan Section H lists the various documents and records that will be maintained in the TSC and will be needed to respond to an emergency.

The applicant has proposed a common TSC for Units 1 through 4. The common TSC will be located in the lower level of an administration building, sited between the Unit 2 and 3 power blocks within the VEGP site protected area. In contrast, the AP1000 certified design (see Appendix D to 10 CFR Part 52) provides that each reactor (i.e., Units 3 and 4) will have a separate TSC in the annex building. The staff did not address the difference in the TSC location between the proposed common TSC and the certified design. Therefore, a COL applicant that references both the AP1000 certified design and the Vogtle Units 3 and 4 ESP, must resolve the difference in TSC location. The staff has identified as **Permit Condition 8** (listed below), the resolution of the difference between the Vogtle Units 3 and 4 common TSC, and the TSC location specified in the AP1000 certified design.

Permit Condition

8. An applicant for a combined license (COL) referencing this early site permit shall resolve the difference between the VEGP Units 3 and 4 common Technical Support Center (TSC), and the TSC location specified in the AP1000 certified design.

In regard to the applicant's proposed common TSC location, the staff considered the applicable guidance in NUREG-0696, which states the following in Section 2.2, "Location":

> The onsite TSC is to provide facilities near the control room for detailed analyses of plant conditions during abnormal conditions or emergencies by trained and competent technical staff. During recent events at nuclear power plants, telephone communications between the facilities were ineffective in providing all of the necessary management interaction and technical information exchange. This demonstrates the need for face-to-face communications between TSC and control room personnel. To accomplish this, the TSC shall be as close as possible to the control room, preferably located within the same building. The walking time from the TSC to the control room shall not exceed 2 minutes. This close location will facilitate face-to-face interaction between control room personnel and the senior plant manager working in the TSC. This proximity also will provide access to information in the control room that is not available in the TSC data system.

Provisions shall be made for the safe and timely movement of personnel between the TSC and the control room under emergency conditions. These provisions shall include consideration of the effects of direct radiation and airborne radioactivity from in-plant sources on personnel traveling between the two facilities. Anti-contamination clothing, respiratory protection, and other protective gear may be used to help protect personnel in transit. The 2-minute travel time between the TSC and the control room does not include time required to put on any necessary radiological protective gear, but it does include the time required to clear any security checkpoints. There should be no major security barriers between these two facilities other than access control stations for the TSC and control room.

The staff had previously considered the "2 minute walking time" criterion associated with the TSC location as part of the development of the emergency planning ITAAC addressed in SECY-05-0197.[30] In relation to the TSC location, ITAAC acceptance criterion 5.1.2 of SECY-05-0197 includes the statement that "[t]he COL applicant will adopt design certification criteria, if applicable, or otherwise specify TSC location." The equivalent ITAAC acceptance criterion 8.1.2 of the SRP (Table 14.3.10-1) and RG 1.206 (Table C.II.1-B1) added a statement that "[a]dvanced communication capabilities may be used to satisfy the two minute travel time."

The staff evaluated various factors in determining the appropriateness and acceptability of providing flexibility relating to the 2-minute walking time between the TSC and control room in the guidance document, including the advances in communication technologies since NUREG-0696 was published in 1981. 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 rooms presents distinct advantages. These advantages 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 during 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 (addressed in **Unit 3 ITAAC 8.1**).

ESP Plan Section H.1.1 also states that the TSC will provide plant management and technical support personnel (including five NRC personnel) with a facility from which they can assist plant operating personnel located in the control rooms during an emergency. The emergency director and NRC director will be located next to each other to ensure proper communications. Unit 3 **ITAAC 5.1.2** states that communication equipment is installed in the TSC and OSC, and voice transmission and reception are accomplished. **[I.5]** The TSC will be 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. **Unit 3 ITAAC 5.1.3** states that the plant parameters listed in Table Annex V2H-1, Post Accident Monitoring Values, can be retrieved and displayed in the TSC. In addition, the TSC will have ready access to plant records. The TSC structure and ventilation system will be designed to ensure that TSC personnel are protected from radiological hazards.

---

30 SECY-05-0197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria," October 28, 2005. (See also the associated February 22, 2006, Staff Requirements Memorandum.)

Unit 3 ITAAC 5.1.6 states that the TSC ventilation system includes a high-efficient particulate air (HEPA) and charcoal filter, and radiation monitors are installed. The ventilation system will be designed to maintain exposures to occupants at or below 5 rem whole body, 30 rem to the thyroid, and 75 rem skin dose for 30-day occupancy. The TSC ventilation system will be operated in accordance with EIPs and will be manually controlled from the TSC. (The submission of detailed emergency implementing procedures for VEGP Units 3 and 4 is addressed in **Units 3 and 4 ITAAC 9.1**, and in SER Sections 13.3.3.2.1, 13.3.3.2.2, 13.3.3.2.4, 13.3.3.2.9, 13.3.3.2.10, and 13.3.3.2.16.) Portable radiation monitors will be available for personnel in transit from the TSC to other areas, and portable air breathing apparatus and anticontamination clothing will also be provided in the TSC.

In addition, **Unit 3 ITAAC 5.1.7** states that a reliable and backup electrical power supply is available for the TSC. Lighting will be powered by the normal and redundant electrical supply system. An emergency battery-operated lighting system will be installed. Power for vital information systems will be provided by redundant power supplies including a battery-backed uninterruptible power supply system.

[H.4] In ESP Plan Section H.3, "Activation and Staffing of Emergency Facilities," the applicant stated that during the initial stages of an emergency, activities at VEGP are directed from the applicable control room. For a notification of unusual event, no other facilities need be activated. For security-related events, the activation of emergency facilities may be delayed, as described in ESP Plan Section B, which is discussed in SER Section 13.3.3.2.2. (Facility activation is also addressed in ESP Plan Section A and in SER Section 13.3.3.2.1.) Upon declaration of an alert or higher level classification, the TSC will be activated and will be operational within about an hour of the initial notification. (The staffing of the TSC, in regard to onshift staff augmentation time, is discussed in SER Section 13.3.3.2.2.)

Activation of the appropriate OSC will be initiated at an alert or higher level classification, and the OSC will be operational within about an hour of initial notification. **Unit 3 ITAAC 5.1.5** states that the OSC is located adjacent to the passage from the annex building to the control room. The description of the OSC for existing Units 1 and 2 appears in Section V1H.1.2, "Operations Support Center (OSC)," of Annex V1, and the description of the OSCs for proposed Units 3 and 4 appears in Section V2H.1, "Emergency Facilities," of Annex V2. **[H.2, H.9, H.11]** In Table A4-4, "OSC Emergency Equipment (Typical)," the applicant listed the available supplies in the OSC.

[A.1.b, A.4, B.6, B.7, F.1.a, H.2, H.4] In ESP Plan Section H.1.3, "Emergency Operations Facility," the applicant stated that the EOF is described in Appendix 7. Figure A7-2, "EOF Layout," shows that the EOF consists of several rooms and identifies the location of various emergency response functional areas. The staff reviewed Appendix 7 and finds that it describes the applicant's existing EOF, including the facility's ability to support an emergency associated with VEGP Units 3 and 4. In addition, the staff verified that Appendix 7, supplemented by the various descriptions of the EOF in the VEGP Plan, describes the EOF emergency preparedness and response activities, consistent with NUREG-0696. Specifically, the staff finds that the applicant adequately addressed the following EOF requirements:

- function
- location, structure, and habitability
- staffing and training
- size

- radiological monitoring
- communications
- instrumentation, data system equipment, and power supplies
- technical data and data system
- records availability and management

The EOF and Appendix 7 are also addressed in ESP Plan Sections A, B, and O, which are discussed in SER Sections 13.3.3.2.1, 13.3.3.2.2, and 13.3.3.2.15, respectively.

[H.2] Evaluation and coordination of licensee activities, including how the licensee will provide information to Federal, State, and local authorities, is further addressed in ESP Plan Sections C, F, and G, which are discussed in SER Sections 13.3.3.2.3, 13.3.3.2.6, and 13.3.3.2.7, respectively. **[H.4]** Provisions for the timely activation and staffing of all facilities is discussed in ESP Plan Sections A, B, and I, which are discussed in SER Sections 13.3.3.2.1, 13.3.3.2.2, and 13.3.3.2.9, respectively.

[A.1.b, A.4, B.6, B.7.d, G.1-G.5, H.2, H.4] In ESP Plan Section H.2, "News Center Facilities," the applicant stated that Appendix 8 describes the ENC. In Section A8G.2, "Alert," of Appendix 8, the applicant stated that at the alert level, initial notification will take place, and the public information director will formally activate the emergency communications plan. In addition, the director will activate the ENC and dispatch staff accordingly. VEGP is designed to provide for 24-hour-per-day emergency communications staff coverage in the event of an emergency at the site. The ENC is also addressed in ESP Plan Sections B and G, which are discussed in SER Sections 13.3.3.2.2 and 13.3.3.2.7, respectively.

[H.5, H.6] In ESP Plan Section H.4, "Plant Monitoring and Data Handling Systems," the applicant stated that a description of plant monitoring and data handling systems for existing Units 1 and 2 appears in Annex V1 and a description of plant monitoring and data handling systems for proposed Units 3 and 4 appears in Annex V2. [H.5.a, H.8] In Annex V1, Section V1H.4.1.1, "Meteorological (Applicable for all four VEGP units)," and Annex V2, Section V2H.4.1.1, "Meteorological (Applies to all four units)," the applicant provided information about the meteorological monitoring program in place at the VEGP site, and stated that the methodology to calculate offsite radiological consequences of accidental releases of airborne radioactivity is described in ESP Plan Section I, "Accident Assessment," which is discussed in SER Section 13.3.3.2.9. **[H.6.a]** In ESP Plan Section H.5, "Out-of-Plant Monitoring," the applicant identified Bush Field in Augusta, Georgia, as an additional source of offsite meteorological data. The NWS maintains an automated observation station at the airport which can provide data on windspeed, wind direction, cloud cover, and ceiling height. Information from this automated observation station, as well as forecast information, can be obtained from the NWS in Columbia, South Carolina. The staff finds that the applicant has adequately identified onsite monitoring systems that will be used to initiate emergency measures and the provisions to acquire data from, or to gain emergency access to, offsite monitoring and analysis equipment.

[H.7, H.10] In ESP Plan Section H.5.2, "Radiological Monitoring," the applicant stated that VEGP will have sufficient portable equipment and trained personnel to field three field monitoring teams. Each team will include two people who will obtain an emergency monitoring kit. The kits will include dosimeters, a two-way radio, meters for measuring gamma and beta/gamma dose rates, and air samplers for collecting particulates and iodines. The particulate filter is used in the field primarily to clean the sample so that any activity on the

cartridge (silver zeolite or the equivalent) will be iodine. The cartridge is then counted in the field to provide an estimate of airborne iodine concentration. VEGP monitoring teams will remain on the Georgia side of the Savannah River. Radiological monitoring on the South Carolina side of the Savannah River will be conducted by personnel from SRS or the State of South Carolina. These field monitoring teams will be equipped with equipment similar to that used by the VEGP teams. **[H.12]** Results of the offsite monitoring activities will be provided to the TSC until the dose assessment activities are transferred from the TSC to the EOF.

[H.7, H.10] ESP Plan Section H.6, "Emergency Kits," states that emergency kits are located in the TSC, the OSCs, the health physics control points, the EOF, and other plant locations. An ambulance kit will be carried by the VEGP health physics technician who accompanies the ambulance. Procedures require an inspection and operational check of equipment in these kits on a quarterly basis and after each use. Equipment in these kits is calibrated in accordance with the suppliers' recommendations. A set of spares of certain equipment is also maintained to replace inoperative or out-of-calibration equipment. In Annex V1 (Section V1H.1.2) and Annex V2 (Section V2H.1), the applicant stated that emergency kits containing radiation monitoring equipment, first aid and decontamination supplies, breathing apparatus, portable lighting, and hand-held radios are stored in the OSC. **[H.11, F.1.f]** A listing of the typical contents of each kit and the spares is included in Appendix 4. In ESP Plan Sections F and N (discussed in SER Sections 13.3.3.2.6 and 13.3.3.2.14, respectively), the applicant addressed the method for operational checks and tests of emergency equipment and instruments, which include emergency communications systems.

[H.7, H.10] The staff finds that the applicant has provided for adequate offsite radiological monitoring equipment in the vicinity of the nuclear facility, including sufficient reserves of instruments and equipment to replace those that are removed for calibration or repair. In addition, the applicant has identified emergency kits by general category (e.g., protective equipment, communications equipment, radiological monitoring equipment, and emergency supplies) in Table A4-3, "Emergency Field Monitoring Kits (3) (Typical)," of Appendix 4.

[H.6.c, H.12] In ESP Plan Section H.5.3, "Laboratory Facility," the applicant stated that VEGP has laboratory facilities for analysis of radioactive samples. The major pieces of equipment include a solid-state gamma spectrometer and a beta/gamma gas proportional counter. The GPC environmental laboratory located in Smyrna, Georgia, has the capability to perform isotopic analyses of drinking water, river water, milk, vegetation, sediment, and biological samples, as well as tritium and gross-beta analysis. In addition, this laboratory will handle the processing of environmental TLDs. Backup laboratory facilities are available at Plant Hatch. This backup capability could be used if facilities in VEGP are unavailable. **[H.12]** The staff finds that the applicant has established a central point for the receipt and analysis of all field monitoring data and coordination of sample media.

State and Local Emergency Plans [H.3, H.4, H.7, H.10, H.11, H.12]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard H of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard H are adequate. The following summarizes the FEMA findings for planning standard H.

a. State of Georgia

[H.3] GEOP Section V.A states that the GEMA director assumes responsibility for direction and coordination of ESFs at the SOC in Atlanta, Georgia. In addition, the State may establish an FEOC, mobile communications vehicle, and/or a mobile command post at or near an emergency or disaster site. If a local jurisdiction is unable to perform its responsibilities, the GEMA director may provide assistance. **[H.4]** GEOP Section V.A.7 states that upon escalation of an emergency or disaster, the GEMA director may require partial or full activation of the SOC, with representation of primary and/or support agencies and organizations. The SOC is the primary coordination point for State response. GA REP-Annex D, Section D.2, states that the SOC will be activated in accordance with procedures contained in the GEOP and GA REP-Base Plan, Section VI. (The SOC and FEOC are discussed further in SER Section 13.3.3.2.1.a, and activation and staffing of the SOC in SER Section 13.3.3.2.6.a.)

[H.7] GA REP-Annex D, Section D.4, "Inventories of Radiological Instruments," states that primary sources of radiological equipment in State government are the DNR-EPD environmental radiation program and radioactive materials program and GEMA. Portable instrument resources are also available from the Georgia Tech Nuclear Research Center. The DNR-EPD radiation program has access to portable hand-held beta-gamma type detectors, low-volume air samplers, pocket dosimeters, and portable alpha detection devices. The DNR-EPD radioactive materials program has access to beta-gamma detecting devices. GEMA maintains 13 field-monitoring kits, 8 of which are maintained in the six risk counties. Five of the kits are maintained in a calibrated status on ready reserve at GEMA headquarters. The Georgia Tech Nuclear Research Center and the Office of Radiological Safety have portable radiological detection equipment, including numerous hand-held survey meters and air samplers, that could be used in an emergency.

GA REP-Base Plan, Section VI.D.5, states that for FNFs for which plans have been developed, ambient radiation monitoring stations are currently in place, and some air sampling stations are situated nearby. In the event of a release of radioactive material from any of the facilities, information concerning radiological conditions could be obtained from these stations. Air samples could be changed by local emergency response personnel before the arrival of the State's primary response team. (See also SER Section 13.3.3.2.3.a.)

[H.10] GA REP-Annex D, Section D.7, states that most equipment and supplies to be used during a radiological emergency are also used routinely in support of radiological environmental surveillance activities, radioactive material inspections, and non-radiological emergency response planning. As such, the operation and performance of equipment and supplies are checked frequently. All DNR-EPD portable radiological instruments are calibrated at least annually and after each repair, and operational checks are performed daily when equipment is in use. Radiological laboratory instruments and other equipment are calibrated at a frequency recommended by the supplier. **[H.11]** Appendix A of DNR-EPD emergency response procedure 1.0, "Off-Site Field Monitoring Operations," provides an inventory of emergency kits.

[H.12] GA REP-Base Plan, Section VI.G.2.b, "Field Monitoring," states that offsite radiological field monitoring activities are conducted by the DNR RER team, in close cooperation with local agencies and the facility operator, to refine offsite dose projections and to provide a means of assessing the adequacy of protective measures. A field team coordinator, who will normally be located in the FEOC, directs the field monitoring activities. The field team coordinator will coordinate field monitoring activities with facility personnel to avoid unnecessary duplication of

efforts and to ensure the maximum utilization of available personnel and equipment. In addition, Section VI.G.2.c, "Laboratory Radiological Analysis," states that the laboratory analysis during the plume passage phase will determine the amount and isotopic composition in air samples collected by field monitoring teams. These analyses will be performed by environmental radiation laboratory staff, operating in the DNR-EPD mobile radiation laboratory, which will normally be located adjacent to the FEOC.

GA REP-Annex D, Section E.1.d, "Radiological Assessment," states that the control of field monitoring activities, including dispatch of field teams, receipt of field monitoring data, receipt of laboratory data, and analysis of field monitoring data, will be coordinated at the FEOC. The 10-mile and 50-mile EPZ maps will be used at the FEOC to record field monitoring data, in addition to data recording forms. The 10- and 50-mile EPZ maps and Georgia DOT maps will be used to dispatch and control field teams and will be available to the field teams.

b. Burke County, Georgia

[H.3] Burke County Plan Attachment E, "EOC, Emergency Equipment and Service Support," states that the Burke County EOC is located in Waynesboro, Georgia, and that it provides adequate space and communications and supporting equipment to allow local governments and the GEMA FEOC (co-located with the EOC) to conduct sustained operations during an emergency. **[H.4]** EOC activation and staffing is addressed in Burke County Plan Attachment A and in SER Section 13.3.3.2.5.b.

[H.7, H.10, H.11, H.12] Attachment E states that additional radiological monitoring and protective equipment for support is available from various State agencies and that locally held radiological monitoring equipment is exchanged for refurbishment annually. An inventory of equipment, vehicles, and communication support systems housed in or located at the EOC is maintained by the Burke County EMA. In addition, all government and volunteer agencies maintain an inventory list of equipment and supplies necessary for day-to-day activities and sustained emergency operations.

c. State of South Carolina

[H.3, H.4] SCORERP-Part 5, Section IV.B, states that direction and control of emergency response forces will emanate from the SEOC, which is located in West Columbia, South Carolina, and will be activated when the State is notified of an "alert" ECL. An alternate State EOC is located in the State Department of Public Safety headquarters in Blythewood, South Carolina. Activation and staffing of the SEOC are described in SCEOP Section IV.G.5, which states that the SEOC will be activated and staffed in accordance with the SEOC SOP. Upon notification that the SEOC is being activated, members of the SERT will report to the SEOC. The primary agency designated for a particular ESF is responsible for ensuring that support agencies are informed and that their actions are coordinated. (SEOC activation and staffing are further discussed in SER Sections 13.3.3.2.1.c and 13.3.3.2.5.c.)

[H.7] SCTRERP Appendix IV, "Emergency Equipment and Supplies," states that the Bureau of Land and Waste Management (BLWM) maintains appropriate levels of portable radiation monitoring instruments, laboratory counting instruments, field sampling equipment, and supplies to conduct the operations of its normal radiological health activities. In addition, SCEMD has pre-positioned survey meters, portal monitors, and personal dosimetry in the FNF risk and host counties throughout the State. In the event of an incident at an FNF, the State will activate its dosimetry redistribution plan to support the threatened area. If needed to monitor a large

number of evacuees, all portal monitors can be rapidly transported to any county. Monitoring/ decontamination teams will check members of the general public and emergency workers for radioactive contamination. SCORERP Appendix 4, "Radiological Emergency Response Equipment," lists the available equipment and location. (Radiological monitoring and dosimetry use is further discussed in SER Section 13.3.3.2.11.c. The availability and use of potassium iodide (KI) is discussed in SER Section 13.3.3.2.10.c.)

[H.10, H.11] South Carolina calibrates its equipment in accordance with manufacturers' recommendations and requires that personnel check instrument operation before use. The State dosimetry and instrument redistribution plan provides for sufficient instruments for response. SCTRERP Appendix IV lists DHEC emergency kit equipment, which includes survey instruments, dosimeters, and communications equipment, and describes quarterly inspections and inventory, monthly (or after each use) operational checks, and annual calibration.

[H.12] SCTRERP Appendix II states that BLWM, in coordination with the Division of Radiological Environmental Monitoring, will establish a central point during emergency operations for the receipt and analysis of field monitoring data and for coordination of environmental biological sample collection. When the FEOC is operational, all field monitoring data will be transmitted to the BLWM representative at the FEOC. When the FEOC has not been activated, but the mobile radiological laboratory has been deployed to the incident, all field monitoring data will be transmitted to the mobile lab. (The handling of environmental sample media is further discussed in SER Section 13.3.3.2.3.c.)

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[H.3, H.4] Section VI.A.1 of the county plans describes the county EOC location, which will provide space and communications capabilities for State and Federal liaison personnel. The county base plans also describe the EOC, including activation levels, personnel response, and chain of command. The county EMA director may order a partial or full EOC activation, depending on the emergency. The county warning point dispatcher will follow procedure and notify the oncall emergency services/emergency management staff. The county base plans detail the ESFs that should be present, which will depend on the activation level. Listings of positions, agencies, and support organizations including telephone numbers are contained in the county base plan appendices.

[H.7] Section IV.Q, "Equipment," of Annex Q2 of the county plans states that radiation detection equipment, assigned to the county monitoring station in SCORERP Appendix 4, may be used for monitoring purposes, under the guidelines of DHEC/BRH. The counties do not have any offsite radiological monitoring equipment to set up near the nuclear facility. In-place monitoring and sampling stations have been established by DHEC/BRH, as outlined in the SCTRERP. In addition, DHEC/BRH provides monitoring service and has the following supplies available at the DHEC central office:

- radiation monitoring equipment (e.g., dosimetry, survey meters, and air samplers)
- protective clothing
- sampling equipment for water, air, milk, vegetation, soil, etc.
- decontamination supplies and equipment
- up-to-date maps showing monitoring/sampling locations, hospitals, etc.

[H.10] Each county emergency service is responsible for operationally checking its equipment quarterly and after each use. Calibration of the equipment will be at intervals recommended by the SCEMD. **[H.11]** Annex Q2, Section IV.Q.7, of the county plans identifies the available emergency kits, and references the SCTRERP. **[H.12]** Section IV.M, "Radiological Monitoring and Decontamination," of Annex Q2 of the county plans states that DHEC will handle the receipt and analysis of all field monitoring data and the coordination of sample media, as outlined in the SCTRERP. (See also SER Section 13.3.3.2.8.c.)

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for emergency facilities and equipment, and subject to Permit Condition 8, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard H of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(8) and Sections III, IV.E, and VI of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.9 Accident Assessment (10 CFR 50.47(b)(9); NUREG-0654/FEMA-REP-1, planning standard I)

The regulation, as reflected in the planning standard, requires the use of adequate methods, systems, and equipment for assessing and monitoring the actual or potential offsite consequences of a radiological emergency condition.

In ESP Plan Section I, "Accident Assessment," the applicant described the methods, systems, and equipment available for assessing and monitoring actual or potential consequences of a radiological emergency. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard I, "Accident Assessment." Planning standard I provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(9).

[I.1] In ESP Plan Section I.1, "Plant Parameters," the applicant stated that ESP Plan Section D presents plant system and effluent parameter values characteristic of the spectrum of off-normal conditions and accidents and the manner in which these values are used to classify an emergency. (See SER Section 13.3.3.2.4 for a discussion of the emergency classification and action level scheme.) Emergency response procedures and EIPs include methods for quickly assessing plant system and effluent parameter values and classifying the emergency condition. (The submission of detailed emergency implementing procedures is addressed in **Units 3 and 4 ITAAC 9.1**, and in SER Sections 13.3.3.2.1, 13.3.3.2.2, 13.3.3.2.4, 13.3.3.2.8, 13.3.3.2.10, and 13.3.3.2.16.) Additional information on plant instrumentation is provided in Section H.4, "Plant Monitoring and Data Handling Systems," of Annex V1 for Units 1 and 2 and Annex V2 for Units 3 and 4. **[I.2]** Initial assessment actions are the responsibility of the shift manager and/or the shift supervisor, using available shift personnel. Subsequent assessment actions are managed by the emergency director with assistance from the control room, TSC, EOF, and emergency teams, as necessary.

[I.1] In ESP Plan Section I.2, "Radiological Monitors," the applicant stated that in-plant radiological measurements provide information to help assess emergency conditions. The containment high-range radiation monitor and containment hydrogen monitor are used to provide an early indication of the quantity of radioactivity available for release from the containment. Emergency procedures include a correlation between the monitor reading and the extent of core damage. Data required to evaluate core conditions and coolant chemistry conditions will be obtained through chemistry procedures. Samples can be obtained from the reactor coolant system, the containment sump, and the containment atmosphere and are used for all radiochemical analyses.

In addition to the onsite capabilities for radiological assessment, AREVA ANP has agreed to provide backup analysis of samples with a high radioactivity level. Chemistry personnel will collect the sample in the sampling cask and transport it to the loading area. Documentation will be completed and the transport cask shipped to AREVA ANP. **[I.2] Unit 3 ITAAC 6.1** states that a test of the emergency plan will be conducted by performing a drill to verity the capability to perform accident assessment. Table V2A3-1 provides the specific acceptance criteria, which use the selected monitoring parameters listed in Table Annex V2H-1.

[I.1, I.2] The staff finds that the applicant has adequately identified plant system and effluent parameter values characteristic of a spectrum of off-normal conditions and accidents, and has the onsite capability and resources to provide initial values and continuing assessment throughout the course of an accident.

[I.3, I.6] In ESP Plan Section I.3, "Determination of Release Rate," the applicant stated that the source term or release rate is determined using the process and effluent radiation monitoring systems and measured or estimated flow rates for releases via monitored effluent release paths. **Unit 3 ITAAC 6.2** states that the emergency implementing procedures and ODCM correctly calculate source terms and magnitudes of postulated releases. **[I.6]** If instrumentation is off scale or inoperable, direct measurements with portable survey instruments will be used for determination and verified by field monitoring team samples.

[I.6, I.8] Unit 3 ITAAC 6.5 stated that the EIP and ODCM estimate release rates and doses when monitors are offscale or inoperable. In RAI 13.3-9, the staff asked the applicant to explain why **Unit 3 ITAAC 6.5** combines two generic ITAAC from Table C.II.2-B1 of NRC Draft Regulatory Guide DG-1145, "Combined License Applications for Nuclear Power Plant (LWR Edition)," September 2006 (subsequently changed to Table C.II.1-B1 of RG 1.206, Revision 0). The applicant responded that the numbering scheme and content of Table V2A3-1, "Unit 3 Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)," are consistent with those of Table 13.3-1, "Emergency Planning – Inspections, Tests, Analyses & Acceptance Criteria (EP ITAAC) – Combined License (COL) Applications – Subpart C to 10 CFR Part 52," of SECY-05-0197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria."

[I.6, I.8] This response is incorrect, in that the numbering scheme and content of Table V2A3-1 are not consistent with those of Table 13.3-1. While EP ITAAC "Program Element" 6.5 in Table V2A3-1 is consistent with SECY-05-0197 (reflecting evaluation criterion I.8 of NUREG-0654/ FEMA-REP-1 and "EP Program Element" 8.7 of DG-1145), the corresponding Table V2A3-1 entries for the two columns entitled (1) Inspections, Tests, Analyses, and (2) Acceptance Criteria are not consistent. Instead, these two columns reflect acceptance criterion 8.5 of the ITAAC table in DG-1145. (DG-1145 supplemented the table in SECY-05-0197 with additional,

allowable generic ITAAC. The original, smaller set of generic ITAAC from SECY-05-0197 is identified in DG-1145 with asterisks and bold text.) Generic ITAAC 8.5 was added in DG-1145 to reflect evaluation criterion I.6 of NUREG-0654/FEMAREP-1. (The applicant addressed I.6 in ESP Plan Section I.3, which is discussed above.) In the Safety Evaluation Report with open items, the staff identified as Open Item 13.3-5, the revision of **Unit 3 ITAAC 6.5** to accurately reflect the corresponding allowable generic ITAAC (consistent with Table C.II.1-B1 of RG 1.206). The staff reviewed the applicant's response in its submittal dated October 15, 2007 – which revised **Units 3 and 4 ITAAC 6.5** to reflect the corresponding ITAAC in RG 1.206 – and finds it acceptable. Therefore, Open Item 13.3-5 is resolved.

[I.4, I.10] In ESP Plan Section 1.4, "Dose Assessment System," the applicant stated that computer dose calculation systems will be located in both the TSC and EOF for offsite dose assessment purposes. These systems will support the Meteorological Information and Dose Assessment (MIDAS) code, a VEGP-specific version of a dose assessment computer code, which calculates the dispersion of the released material as it travels downwind and then estimates the resulting concentrations of this material. In RAI 13.3-47.b, the staff asked the applicant if these system capabilities will also be available in the control room(s) for use by onshift personnel. The applicant responded that MIDAS resides on a computer platform and is included in the VEGP information network. The ability to use the MIDAS software will be maintained in the control room. As shown in Table B-1 (see SER Section 13.3.3.2.2), the responsibility for performing offsite dose assessment will be assigned to the onshift HP/Chemistry Shared Foreman. While this function is intended to be performed in the TSC, it may be performed in the control room.

Initial dose projections can be made within 15 minutes of a radiological release and subsequent dose projections approximately every 15-30 minutes, depending on the variability of meteorological conditions and/or radioactive releases. MIDAS is a personal computer based program for rapidly assessing the radiological impact of accidents at nuclear power plants. It calculates total effective dose equivalent (TEDE), thyroid doses, and skin doses at various fixed downwind distances. Source term information is derived from plant effluent monitors, reactor coolant system or containment samples, field monitoring teams, or default accident scenario.

Unit 3 ITAAC 6.3 states that the emergency implementing procedures and ODCM calculate the relationship between effluent monitor readings, and onsite and offsite exposures and contamination. **[I.4, I.10]** The staff finds that the applicant has adequately established the relationship between effluent monitor readings and onsite and offsite exposures and contamination for various meteorological conditions, which includes relating the various measured parameters to dose rates for key isotopes and gross radioactivity measurements.

[I.5] Actual meteorological data and release rate data are obtained from the plant computer and information systems and entered into the dose projection computer. Minimum meteorological data to be obtained include wind speed, wind direction, and a stability indicator (either vertical temperature difference or standard deviation of the horizontal wind direction). Plant-specific default values are part of the program for use when meteorological or release rate data are not available. The computer will calculate dispersion, dose, and plume arrival times. Dose calculations are based on dose conversion factors from EPA 400-R-92-001.[31] Default release

[31] EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," May 1992.

rates are available for possible accidents if measured source term data are not available or if bounding calculations are desired.

[I.5] Meteorological data, which are obtained and used as input to the dose model, are further described in ESP Plan Section H and discussed in SER Section 13.3.3.2.8. Data from the primary meteorological monitoring system can be accessed directly from the control room, TSC, and EOF and are also available to NRC personnel and State representatives at the VEGP site. Data are also available to NRC personnel via ERDS. Meteorological data are delivered to the State via the notification form. If the primary instruments are unavailable, the backup meteorological tower is equipped with instruments at the 10-meter level to provide parameters relevant to atmospheric dispersion calculations. If both the primary and backup meteorological systems are unavailable, meteorological data will be obtained by commercial telephone directly from the NWS in Columbia, South Carolina. NWS Columbia has access to information from the automated weather station at Bush Field in Augusta, Georgia. These data will be available to NRC and State personnel via the notification form. Forecast changes in wind direction will be used in determining expected changes in plume trajectory. These forecast changes in plume trajectory may be used to expand the areas for which protective actions are recommended. [J.7] ESP Plan Section J, "Protective Response," addresses PARs to State and local officials and is discussed in SER Section 13.3.3.2.10.

Unit 3 ITAAC 6.4 and Unit 4 ITAAC 6.4 state that a test will be performed to verify the ability to access meteorological information in the TSC and control room, and list various parameters that will be displayed. (The specific acceptance criteria for Units 3 and 4 are provided in Table V2A3-1 and Table V2A4-1, respectively.) **[I.5]** The staff finds that the applicant has sufficient capability of acquiring and evaluating the necessary meteorological information, and has made adequate provisions for access to this information by the EOF, TSC, control room, the NRC, and the State(s).

[I.8] If significant windspeed or stability class changes are expected, the effect of the expected changes on dose projections will be analyzed utilizing the dose assessment model. In cases where weather forecasts predict precipitation, this information will be used in reference to adverse weather ETEs, as appropriate. When precipitation is predicted or occurring in the area of the plume, the potential for significantly increased rates of radioactivity deposition will be considered by increasing the scope of environmental sampling, as required to quantify the effects of this potentially increased deposition.

[I.10] The VEGP staff will calculate the 50-mile ingestion pathway doses from the deposition of specific radionuclides. The VEGP field monitoring team will collect sufficient environmental data to characterize the initial deposition of activity, the peak activity in pasture grass and milk, and total intake of I-131, Cs-137, Sr-90, and Sr-89. The samples will be analyzed at the VEGP site and the environmental laboratory in Smyrna, Georgia, or at the Plant Hatch laboratory. The analysis results will be compared with the preventive and emergency protective action guidelines (PAGs), and the associated doses will be determined.

[I.10] The dose assessment computer program will be used to calculate the projected deposition of radionuclides and associated doses in the ingestion pathway based on release data and meteorological conditions. These estimates will be compared to the preventive and emergency PAGs. The results of all analyses will be provided to the States of Georgia and South Carolina by the dose assessment manager. Each State is responsible for implementing protective measures based on PAGs and other criteria, consistent with U.S. Food and Drug

Administration (FDA) recommendations regarding contamination of human food and animal feed.[32] Unit 3 ITAAC 6.6 states that the EIPs and the ODCM estimate an integrated dose.

[I.7, I.8, I.9] In ESP Plan Section I.5, "Field Monitoring," the applicant stated that the emergency director or a designee can deploy up to three teams for field monitoring. These teams, which are available for field monitoring within the plume exposure pathway EPZ, are described in ESP Plan Section H and discussed in SER Section 13.3.3.2.8. Initially, the emergency director can activate at least one team from onshift personnel. Once the emergency facilities are activated, the emergency director can request additional monitoring teams from support personnel located at the OSC. Field monitoring teams will be dispatched from the EOF, TSC, or OSC, as appropriate. Before the teams leave for the field, the dose assessment manager, or designee, will direct and brief them on the initial survey and sample locations, suggested travel routes, meteorological conditions, and team identification name or number for communication purposes. It is estimated that teams will be in the field and performing monitoring tasks within about 1 hour of the determination of the need for field monitoring. The implementing procedures contain additional field monitoring team formation and dispatch details.

Pre-selected radiological sampling and monitoring locations, designated in implementing procedures, are shown in Figure iii, "VEGP 10-Mile EPZ." Field monitoring teams may be directed to perform sampling at these and other locations by the dose assessment staff at the EOF. In-transit dose rate measurements will be made. The teams may take airborne and dose rate measurements near the expected plume centerline. If the dose rate exceeds 100 mrem/h, off-centerline measurements will be made. On the basis of dose rates, the teams will be directed to sweep the plume to identify the centerline or maximum dose rate.

[I.9] The emergency monitoring kits contain a portable air sampler, silver zeolite cartridges, and counters to provide the capability to detect and measure radioiodine concentrations in the air as low as $10^{-7}\mu$Ci/cc. The list of equipment carried by the field teams is described in Table A4-3, "Emergency Field Monitoring Kits (3) (Typical)," of ESP Plan Appendix 4. Implementing procedures will describe the sampling and measuring techniques for air samples. The total sample volume and the limiting background count rate allow for a lowest limit of detection of at least $10^{-7}\mu$Ci/cc. The cartridges can be counted in the field without interference from noble gas (background count rate below 300 counts per minute (cpm) on an HP-210 probe or equivalent). The cartridge and air particulate filter will be returned to the laboratory at the plant for isotopic analysis if the field analysis reading is 100 cpm above background on an HP-210 probe or equivalent.

[I.11] Depending on wind direction and/or the severity of the incident, additional field monitoring teams may be provided by DNR, South Carolina DHEC, DOE-SR, or other divisions of DOE. These teams and data transfer will be coordinated using existing communication links. (The details are provided in ESP Plan Section F and discussed further in SER Section 13.3.3.2.6.) The State and VEGP field monitoring teams will be coordinated from the EOF by the dose assessment manager to assure a fully coordinated effort. DOE-SR will direct the field monitoring teams of SRS, depending on the wind direction, and will make their monitoring data available to VEGP and State and local representatives at the EOF. The dose assessment team at the EOF will collate field monitoring data for VEGP dose projection purposes. This information will be available to the State and local representatives at the EOF and to DOE-SR.

---

[32] See EPA 400-R-92-001, Chapter 3, "Protective Action Guides for the Intermediate Phase (Food and Water)," which provides FDA recommendations.

The staff finds that the applicant has made adequate arrangements to locate and track the airborne radioactive plume, using facility, Federal, and State resources.

[I.7] In ESP Plan Section I.6, "Environmental Samples," the applicant stated that in addition to direct monitoring and air sampling, the assessment program includes an emergency environmental sampling program, in which routine types of environmental samples (water, air, soil, and vegetation) are collected and analyzed in the laboratory for detailed radionuclide data. The GPC environmental laboratory, located in Smyrna, Georgia, has the capability to perform isotopic analyses of drinking water, river water, milk, vegetation, sediment, and biological samples, as well as tritium and gross beta analysis. Fixed environmental sampling and monitoring locations are described in implementing procedures and are shown in Figure iii.

[I.8] The normal environmental sample analysis is performed at the GPC environmental laboratory in Smyrna, Georgia. During and/or subsequent to emergency conditions, the routine environmental monitoring program will be modified to collect and analyze additional samples from existing stations. The dose assessment manager will coordinate sampling and analysis activities for those areas that may have been affected by a release from the plant. Sample results will be transmitted back to the dose assessment manager by the analyzing organization. **[I.10]** Data from fixed monitoring stations (TLDs and air samplers) will be used to estimate population dose. The samples from fixed monitoring stations will be collected after termination of a radioactive release and analyzed. The results will then be reduced in a manner that will assist in defining the trajectory, radioactivity, and impact of the released plume.

[I.7] The staff finds that the applicant has adequately described the capability and resources for field monitoring within the 10-mile plume exposure EPZ. **[I.8, I.9]** In addition, the applicant has the methods, equipment, and expertise to make rapid assessments of actual or potential radiological hazards, including the capability to detect and measure radioiodine concentrations in air in the 10-mile plume exposure EPZ as low as $10^{-7}\mu$Ci/cc under field conditions.

In RAI 13.3-46.e, the staff asked the applicant to explain why there were no **Unit 4 ITAAC 6.1 through 6.7** comparable to **Unit 3 ITAAC 6.1 through 6.7**. In its response, the applicant provided comparable criteria for **Unit 4 ITAAC 6.4**, which includes the display of meteorological parameters in the separate control rooms for Units 3 and 4. However, the applicant stated that criteria 6.1-6.3 and 6.5-6.7 were verified through the Unit 3 ITAAC and are not required to be repeated for Unit 4. The staff agrees that common equipment and capabilities can be adequately demonstrated through the Unit 3 ITAAC; however, equipment and capabilities that are specific to the unit require unit-specific ITAAC. **Unit 3 ITAAC 6.1–6.3 and 6.5–6.7** include what appear to be unit-specific characteristics, such as EALs (6.1, A.1), source terms (6.2), effluent monitor readings (6.3), monitors (6.5), and EIPs (6.7).

The applicant must either explain why these **Unit 3 ITAAC criteria 6.1-6.3 and 6.5-6.7** will demonstrate the sufficiency of the ITAAC in relation to Unit 4 (i.e., describe why these are site-specific and reflect both Unit 3 and Unit 4), or supplement Table V2A4-1 with comparable Unit 4 ITAAC; as done for ITAAC 6.4. (The completion of the Unit 3 ITAAC, which demonstrates that the acceptance criteria have been met – to the extent that they apply to equipment and systems common to Unit 4 – would not have to be repeated as part of the Unit 4 ITAAC; only those capabilities specific to Unit 4.) In the Safety Evaluation Report with open items, the staff identified the resolution of this issue as Open Item 13.3-6. (See also SER Sections 13.3.3.2.1 and 13.3.3.2.14, regarding **Unit 3 ITAAC 9.1** and **Unit 3 ITAAC 8.1**, respectively.) The staff reviewed the applicant's response in its submittal dated October 15,

2007 – which supplements Table V2A4-1 with comparable **Unit 4 ITAAC** – and finds it acceptable. Therefore, Open item 13.3-6 is resolved.

State and Local Emergency Plans [I.7, I.8, I.9, I.10, I.11]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard I of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard I are adequate. The following summarizes the FEMA findings for planning standard I.

a. State of Georgia

[I.7, I.8] GA REP–Annex D, Section E.1, "Accident Response and Assessment," states that because the capability of local personnel for initial assessment and monitoring is limited, a State response element may be dispatched by aircraft directly to the FEOC. This response element will arrive on site within flight time plus approximately 30 minutes for initial mobilization. The GEMA mobile communications vehicle and mobile laboratory will arrive within driving time plus 30 minutes for initial mobilization. In the event of an incident that does not require rapid assessment capability, the State response element will normally be deployed by surface transportation. Radiological assessment operations will be the responsibility of a primary team consisting of technically qualified personnel from DNR-EPD.

[I.7, I.8, I.9, I.10] GA REP–Annex D, Sections E.1.h through E.1.j and E.2, describe the capabilities and resources for field monitoring in relation to TLD stations, air sampling capabilities, and the sampling and interdiction of milk and other food products. Additional capabilities and resources for field monitoring, including methods, equipment and expertise, are described in SER Section 13.3.3.2.8.a.

[I.11] GA REP–Base Plan, Section VI.G.2.a, "Dose Projections," states that DNR currently has two dose projection models available for use – MIDAS and the Radiological Assessment System for Consequence Analysis (RASCAL). Both models will calculate the TEDE, committed effective dose equivalent, and committed dose equivalent (CDE) for a variety of (radioactivity) release scenarios. Based on assessments performed by the DNR RER team, the State radiation emergency coordinator will recommend the appropriate protective measures to the State disaster coordinator and local officials.

b. Burke County, Georgia

[I.7, I.8] Field monitoring capability and resources for the assessment of actual or potential radiological releases are the responsibility of the State.

c. State of South Carolina

[I.7, I.11] SCORERP Section IV.B.7, "Radiological Monitoring/Exposure Control," states that DHEC will coordinate radiological monitoring operations under the auspices of ESF 10, "Hazardous Materials," as delineated in SCEOP Annex 10. DHEC will deploy radiological monitoring field teams with equipment and the expertise necessary to detect and measure airborne radiation and radioactive particulate deposition on the ground. Field data gathered will be compared with information and recommendations from the FNF to locate the radioactive plume and project or determine potential dose to the general public and emergency workers.

Support from SRS, which has been designated as the primary responder under FRERP, is discussed further in SER Section 13.3.3.2.3.c.

[I.8] SCTRERP Section A.1 states that NREES (located within DHEC) is charged with the responsibility to develop, maintain, and coordinate the SCTRERP in support of the SCORERP objectives and concepts (Organizational Chart A-4). SCTRERP Section B describes the general notification processes, and Section C.VI describes the notification methods. Section B.I states that the primary responsibilities of NREES are to provide technical assistance in evaluating the actual and potential consequence of an incident and to provide PARs. To carry out these major responsibilities, NREES will employ field monitoring teams, environmental sampling teams, mobile and fixed laboratory facilities, health physicists, advisors, and emergency coordinators.

SCTRERP Appendix III, Sections II and III, specify the actions that the BLWM will take to assess the impact of an actual (radiological) release. By measuring contamination levels or concentrations of radioisotopes in air and water, doses can be calculated for comparison with PAGs. SCTRERP Appendix II, Section III, describes the receipt and analysis of field monitoring data. The BLWM, in coordination with the Division of Radiological Environmental Monitoring, will establish a central point during emergency operations for the receipt and analysis of field monitoring data and the coordination of collected environmental biological samples. Appendix IV lists the monitoring and communication equipment and supplies that are available for field teams and laboratories.

[I.9, I.10] The means for relating the various measured parameters to dose rates for key isotopes and gross radioactivity measurements are described in SCTRERP Appendix I, "Protective Action Guides"; Appendix II, "Environmental Monitoring, Sampling, and Laboratory Analysis Capability"; and Appendix III, "Environmental and Health Effects Assessment Plan." In addition, SCORERP Annex F, "Radiological Exposure Control," and Annex G, "Ingestion Pathway Emergency Planning Zone (IPZ)," discuss PAGs and the State's response (see also SER Section 13.3.3.2.10.c), and SCTRERP Section B.XII, "Maps," states that DHEC has maps showing the environs of each FNF in the State. (These maps are also discussed in SER Sections 13.3.3.2.3.c, 13.3.3.2.9.d, and 13.3.3.2.10.c.)

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[I.7, I.8] DHEC will handle the receipt and analysis of all field monitoring data and the coordination of sample media, as outlined in the STRERP. Annex Q2, Section IV.M.2, of the county plans states that DHEC will coordinate the monitoring and technical assessment of the 50-mile EPZ. In addition, Section IV.Q states that DHEC provides monitoring service and has various equipment available at the DHEC central office. This equipment consists of radiation sampling and monitoring equipment, protective clothing and dosimetry, decontamination supplies and equipment, and up-to-date maps showing the environs of each nuclear facility. These maps, which are also available in the mobile lab, show locations for monitoring and sampling, hospitals, landing strips, etc. (The mobile radiological laboratory's capabilities and resources are further described in SER Sections 13.3.3.2.3.c, 13.3.3.2.6.c, and 13.3.3.2.8.c.)

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for accident assessment, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning

standard I of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(9), and Sections III, IV.A, IV.B, IV.C, IV.D, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.10 Protective Response (10 CFR 50.47(b)(10); NUREG-0654/FEMA-REP-1, planning standard J)

The regulation, as reflected in the planning standard, requires that a range of protective actions have been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of KI, as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.

In ESP Plan Section J, "Protective Response," the applicant described the protective actions that have been developed to limit radiation exposure of plant personnel and the public following an accident at the VEGP site. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard J, "Protective Response." Planning standard J provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(10).

[J.1, J.3, J.4] In ESP Plan Section J.1, "Protective Response for Onsite Personnel," the applicant stated that protective response for onsite personnel (including visitors and contractor personnel) depends on alerting, assembly and accountability, site dismissal, monitoring, and decontamination. In addition, ESP Plan Section E describes the methods to be used to alert onsite personnel of emergency conditions; these are discussed in SER Section 13.3.3.2.5. A security-related emergency may preclude the ordering of assembly and accountability in order to protect plant personnel from the security threat. The decision not to order assembly and accountability will be made by the emergency director. **Units 3 and 4 ITAAC 7.1** state that a test of the onsite warning and communication capability EIPs, including PAGs, assembly and accountability, and site dismissal will be performed during a drill. Various objectives are also provided as specific acceptance criteria. (The specific acceptance criteria for Units 3 and 4 are provided in Table V2A3-1 and Table V2A4-1, respectively.)

[J.5] Upon activation of the plant emergency alarm, plant personnel assigned specific emergency responsibilities proceed to their designated emergency response location. Emergency response personnel in the protected area enter their ERF (TSC, OSC, or control room) using electronic badge identification to record the entry. The security computer system performs an initial accountability of all persons in the protected area. Thereafter, the ERF managers of the control room, TSC, and OSC are responsible for periodically assuring that accountabilities in their facilities are being maintained. Assignment logs and required periodic communications between emergency response teams maintain accountability.

[J.1, J.2] Noninvolved plant personnel, visitors, and contractors located within the protected area leave the protected area upon hearing the emergency alarm and report to their designated

assembly areas. As these individuals exit the protected area, they record their exit using electronic badge identification. The security department accounts for each person inside the protected area at the start of an emergency by using the security computer system. **[J.5]** This method accounts for all individuals inside the protected area within about 30 minutes of the emergency declaration page announcement. Accountability reports are made periodically to the emergency director by the security department. If protected area accountability reveals a missing person, the emergency director assembles a search and rescue team per emergency response procedures. (The submission of detailed implementing procedures is addressed in **Units 3 and 4 ITAAC 9.1**, and further discussed in SER Sections 13.3.3.2.1, 13.3.3.2.2, 13.3.3.2.4, 13.3.3.2.8, 13.3.3.2.9, and 13.3.3.2.16.) Likely areas are searched until the missing individual is located.

[J.2] Site dismissal, with or without monitoring, of noninvolved personnel on site (if feasible) is ordered by the emergency director whenever a site area or general emergency is declared. If there has been no radioactive release and a release is not projected, the emergency director may elect to order a "site dismissal with no monitoring" rather than with monitoring. For a site dismissal with no monitoring, noninvolved personnel are sent home instead of to reception centers.

[J.2] If site dismissal with monitoring is necessary, the emergency director will notify the Burke County EMA and request setup of a reception center to receive VEGP noninvolved personnel. The route selected to the reception center is based on meteorological and/or radiological conditions. The location of the reception center is shown in (Preface) Figure iv, "VEGP and Savannah River Site 50-Mile Ingestion Pathway EPZ." **[J.1]** Personnel on site will be notified by public address, site siren, or other communication of the dismissal of noninvolved personnel to the applicable reception center and of the specified route. Security will dispatch officers to search areas outside the protected area to ensure that all noninvolved personnel have left the OCA.

[J.3] Upon site dismissal to a reception center, noninvolved personnel will be monitored for contamination to determine gross contamination in accordance with the Burke County emergency operations plan. **[J.4]** Contaminated personnel will undergo a decontamination process in accordance with standard health physics procedures. Those personnel who are not contaminated will be released upon clearance of their vehicles. Vehicles will be monitored for contamination in the designated parking areas. Contaminated vehicles will be decontaminated in accordance with the Burke County emergency operations plan. Contaminated articles and clothing and waste material will be collected and placed in containers or bags for disposal and/or processing at the site. **[J.6.a, J.6.b]** The staff reviewed ESP Plan Table J-1, "Use of Equipment and Supplies," and finds that it adequately identifies various and sufficient respiratory and protective clothing available for individuals remaining or arriving on site during the emergency and also identifies the onsite locations and describes the criteria for issuance and means of distribution.

[J.3, J.4] When an alert is declared and site dismissal with no monitoring is anticipated, personnel who have left the protected area are monitored by portal monitors. If necessary, decontamination is completed using the plant decontamination facilities located in the control building or other appropriate location. When site dismissal with monitoring is expected and release of radioactivity has occurred, monitoring is performed by Burke County emergency workers at an established reception center. Should decontamination be necessary, the reception center establishes a field decontamination area, using materials from emergency kits

located in the vicinity of the reception center. Decontamination and waste disposal are completed in accordance with the Burke County emergency operations plan.

[J.6.c] A supply of KI is stored in the TSC (for TSC and control room use), OSC, main control point, or health physics room. The health physics supervisor will direct the issuance of KI when the projected thyroid exposure is greater than 25 rem. The health physics supervisor will direct radiological survey personnel to distribute KI and record the name and social security number of those individuals who are issued KI. The KI will be issued in 130-mg doses daily for at least 3 days but not more than 10 days. It will be issued immediately before exposure or not longer than 4 hours after exposure. At the time KI is distributed, an iodine sensitivity check will be made by querying each individual concerning known reactions to iodine. Individuals who have experienced reactions to iodine will be excused from duties requiring issuance of KI.

[J.1, J.2, J.3, J.4, J.5, J.6] The staff finds that the applicant has adequately provided for the protection of onsite individuals. This includes the description of the means and time required to warn, advise, and account for onsite individuals; provisions for evacuation routes and transportation for onsite individuals to suitable offsite locations, including radiological monitoring and decontamination of people evacuated from the site; and provisions for individuals remaining (or arriving) on site during the emergency, which include respiratory protection, protective clothing, and thyroid protection in the form of KI.

[J.7] VEGP is responsible for ensuring that timely recommendations for protective actions reach appropriate State and local officials. These officials, who are then responsible for alerting the public and ordering shelter and/or evacuation, if necessary, are described in ESP Plan Section A, "Assignment of Responsibility," and discussed in SER Section 13.3.3.2.1. **[J.10.c]** The means used by VEGP to alert local and State agencies and the means used by local and State agencies to alert the public are described in ESP Plan Section E and Appendix 3. The staff reviewed Appendix 3 and finds that it contains a detailed and comprehensive overview of the means for prompt alerting and notification of the public within the 10-mile plume exposure pathway EPZ. Additional information on the means for notifying all segments of the transient and resident population is provided in ESP Plan Sections D, E, and G. These sections are discussed in SER Sections 13.3.3.2.4, 13.3.3.2.5, and 13.3.3.2.7, respectively. In Appendix 3, the applicant also provided the locations and design coverage contours of the 47 rotating electronic sirens in Figure A3-1, "60 and 50 dBC Design Coverage Contours."

[J.7, J.10.m] In ESP Plan Section J.2, "Protective Response for the Public," the applicant stated that the emergency director is responsible for providing PARs to State and local officials as part of initial notifications and follow-up communications. These recommendations are based on assessment actions, which are described in ESP Plan Section I and discussed in SER Section 13.3.3.2.9. Using available information on plant conditions, projected dose estimates, and any available monitoring data, the emergency director recommends whether the public should be advised to seek shelter or evacuate. State and local officials will evaluate other factors that influence protective actions. The mechanism for communicating these recommendations is described in ESP Plan Section E and discussed in SER Section 13.3.3.2.5. These recommendations are based on the EPA PAGs, as shown in Table J-2, "Protective Action Recommendations." Table J-3, "Sheltering Guidance," provides information to the emergency director on the expected protection afforded by residential units.

In addition, implementing procedures provide guidance on PARs in the absence of any release of radioactivity. **[J.4]** Site dismissal of noninvolved station personnel and evacuation and/or sheltering of the general public is recommended for a general emergency even though there

has not been a release of radioactivity from the plant. **[J.7]** The staff finds that the applicant has established an adequate mechanism for recommending protective actions to the appropriate State and local authorities, which include EALs corresponding to projected dose to the population at risk. (EALs are addressed in ESP Plan Section D and in SER Section 13.3.3.2.4.)

[J.9] The GEMA (in coordination with the Georgia DNR) and SCEMD (in coordination with the South Carolina DHEC) are responsible for deciding protective measures for affected offsite areas within their jurisdictions. State officials will consider the potential risks of implementing protective actions against the reduction of radiological risk achieved by the protective action.

[J.8, J.10.l, J.10.m] Determination of the benefit of evacuation must take into account the time needed to complete the evacuation. Table J-4, "Evacuation Time Estimates," summarizes the total evacuation times for various areas, zones, and weather conditions. ESP Plan Appendix 6 includes more detail on how these estimates were developed and presents information on evacuation routes, evacuation areas, relocation centers, shelter areas, and the population distribution by evacuation areas and sectors. **[J.10.b]** Maps showing the population distribution around VEGP, including evacuation areas and sector format, are provided in ESP Plan Figure v, "2006 Permanent Population within the VEGP Plume EPZ," and Figure vi, "Transient and Special Facility Population within the VEGP Plume EPZ." The ETE is discussed in SER Section 13.3.1.

In RAI 13.3-38, the staff asked the applicant to explain and resolve apparent discrepancies between the ETE and Burke County plan regarding the location of the Lord's House of Praise Christian School (a "special facility"), in relation to the VEGP 10-mile plume exposure pathway EPZ. In addition, the staff asked the applicant to address the need for changes/corrections to the existing State and county emergency plans, as well as the school's emergency evacuation plan, to address whether the students would be evacuated by county buses or by the school's own transportation resources.

The applicant responded that the school does have independent general emergency plans, as a requirement for licensing as a certified school. After notification of a radiological emergency requiring evacuation of the zone where the school is located, if the school is unable to evacuate with its private transportation vehicles, the Burke County EMA will request the Burke County Board of Education to dispatch sufficient buses to the school to transport the occupants to the designated local reception center. In addition, the applicant stated that GEMA is updating the Burke County Emergency Plan in response to a request from the Burke County EMA, to include the Lord's House of Praise Christian School as a legitimate school just inside the 10-mile EPZ boundary. The update and changes will go through review and approval by the Burke County EMA Director. In the Safety Evaluation Report with open items, the staff identified the updating of the Burke County Emergency Plan, and its review and approval by the Burke County EMA Director, as Open Item 13.3-7. The staff reviewed the applicant's response in its submittal dated October 15, 2007, which provided the updated and approved Burke County Emergency Plan (Plant Vogtle Annex D, April 2007), which includes the Lord's House of Praise Christian School, and finds it acceptable. Therefore, Open Item 13.3-7 is resolved.

[J.8, J.10.l, J.10.m] In RAI 13.3-21, the staff asked the applicant to provide information regarding the State and local resources that will be used to evacuate residents who do not own autos and specify the time required to mobilize these resources. The applicant responded that this population group would use privately owned vehicles of friends or relatives to evacuate. This response is inconsistent with the Burke County Emergency Management Radiological Plan, which states in paragraph D of Attachment H, "Evacuation and Sheltering," that privately

owned vehicles will be the primary mode of transportation if evacuation is directed, and that county school buses, traveling their regular routes, will transport those individuals lacking personal transportation. In the Safety Evaluation Report with open items, the staff identified the apparent inconsistency of the use of buses to evacuate non-auto-owning residents as Open Item 13.3-8. The staff reviewed the applicant's response in its submittal dated October 15, 2007 – which described how this population (20 individuals) is considered in the ETE, and the vehicles available from the Burke County Transit Authority (8 vans, 12 ambulances, and 100 school buses) for their evacuation – and finds it acceptable. Therefore, Open Item 13.3-8 is resolved.

In RAI 13.3-22, the staff asked the applicant to address sportsmen population numbers and to explain why the ETE did not mention the Yuchi Wildlife Management Area (WMA). In its response, the applicant did not explain how it derived the sportsmen population numbers for zones G-10 and H-10 (200 each), other than that those were the numbers used in the emergency plan appendices (stated in the applicant's response to RAI 13.3-16.e). In addition, the applicant did not address sportsmen associated with the Yuchi WMA. In the Safety Evaluation Report with open items, the staff identified the clarification of the sportsmen population numbers and Yuchi WMA, as it relates to the ETE, as Open Item 13.3-9.

The staff reviewed the applicant's response in its submittal dated October 15, 2007, which stated that hunters are included in the values for transient population. The values for transient population within the South Carolina portions of the VEGP EPZ (protective action zones G-10 and H-10) include hunters visiting the Cowden Plantation in Aiken County, boaters using Gray's Landing and the Barnwell Boat Landing, visitors to the St. Mary's Baptist Church, and visitors to the Creek Plantation area for horse auctions or shows. Peak population estimates for each of these areas were based on studies performed in support of the ETE update performed in 1985, which specifically addressed these areas. Assumptions utilized in the updated [April 2006 ETE] study are consistent with current usage of these areas. In regard to the ETE, the applicant stated that the maximum WMA usage for various hunting seasons was utilized in the development of the updated ETE. In addition, the applicant states that data obtained from the Georgia DNR shows that the 8-year average for the period 2000-2007 is 190 hunters – which represents the total number of hunters for the designated seasons. The staff finds this information acceptable, and Open Item 13.3-9 is resolved.

In RAI 13.3-30.b, the staff asked the applicant to discuss whether State and local agencies have reviewed and commented on the draft ETE. The applicant responded that a copy of the ETE has been provided to State and local agencies for their review. The staff compared ETE Table 11, "ETEs in Minutes," with the comparable Table J-4, "Evacuation Time Estimate Summary," of Revision 43 of the VEGP Plan and finds that the evacuation times for the various evacuation areas are inconsistent. As discussed below, portions of the VEGP Plan ETE are included in the county emergency operating procedures (EOPs), and site-specific annexes (e.g., Burke County Plan Attachment H, "Evacuation and Sheltering," regarding vehicle capacities on principal evacuation routes, and Table H-3, "EPZ Vehicle Totals"). While the specific evacuation times appear to have changed (been updated), as reflected in the April 2006 ETE, the extent to which these changes have been, or need to be, reflected in the State and county plans was unclear. In the Safety Evaluation Report with open items, the staff identified as Open Item 13.3-10, the need for the applicant to discuss State and local agencies' review and comment on the ETE, and the resolution of those comments. The staff reviewed the applicant's response in its submittal dated October 15, 2007 – which stated that State and local agencies have reviewed the updated ETE and did not find any significant impact to their current plans or procedures – and finds it acceptable. Therefore, Open Item 13.3-10 is resolved.

[J.10.a] If a decision is made to evacuate any part (or all) of the plume exposure pathway EPZ, the evacuation will be carried out in accordance with the emergency response plan of each affected county. The populace will be instructed to proceed by the appropriate evacuation route to predesignated reception centers/shelters. Reception centers/shelters for Georgia and South Carolina counties within the plume exposure pathway EPZ are listed in Table J-5, "Reception Centers/Shelters." The reception centers are also shown in ETE Figure 14, "VEGP EPZ Boundary, Evacuation Zones, and Reception Centers." The services to be provided in the reception centers include:

- registration
- screening for contamination
- decontamination, as needed
- information and assistance for family unification
- food and lodging
- first aid

Privately owned vehicles will be the primary mode of transportation if evacuation is directed. Individuals who do not have their own means of transportation have been advised to arrange their own transportation if possible. If this is not possible, individuals are instructed to stay tuned to the radio or television and listen for the phone number to call for transportation.

[J.10.d] Specially equipped vehicles will be dispatched directly to the homes of handicapped and/or nonambulatory individuals requiring special transportation. **[J.10.m]** Under certain conditions, sheltering inside the home may be the preferred recommended action. Area radio and television stations or tone alert radios will advise the public on taking this action, will provide instructions to the public, and will give the "all clear signal" when appropriate. The staff finds that the applicant has provided adequate plans to implement protective measures for the 10-mile plume exposure pathway EPZ. This includes maps showing evacuation routes and areas, preselected radiological sampling and monitoring points, and relocation/shelter centers. In addition, the applicant has established the necessary means for notifying all segments of the transient and resident population, including the bases for the choice of recommended protective actions from the 10-mile plume exposure pathway EPZ during emergency conditions.

State and Local Emergency Plans [J.2, J.9, J.10, J.11, J.12]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard J of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard J are adequate. The following summarizes the FEMA findings for planning standard J.

a. State of Georgia

[J.2, J.10.a, J.10.g, J.10.j] GEOP ESF-5, "Emergency Management," states that GEMA will monitor conditions that have the potential to require evacuation within the State and will assist with coordination of evacuation, routing to shelters, personnel, transportation, and public information to deal effectively with the situation. GA REP-Base Plan, Section IV.G.3.c, states that to aid in the evacuation of the general public from the affected areas, predesignated evacuation routes have been established. Along these routes, traffic control points have been

established to maintain traffic flow. Evacuation routes and traffic control points are presented in the site-specific annex to the GA REP-Base Plan (i.e., GA REP-Annex D for Plant Vogtle).

GA REP-Annex D, Section E.2.d, states that areas affected by a radiological release will be evacuated by the most expedient methods available. Evacuation routes will normally be the major thoroughfares close to VEGP. Resources available to assist in the evacuation include local emergency management and law enforcement personnel and Georgia Departments of Safety and Transportation personnel. **[J.10.h]** The Burke County High School reception center/shelter (i.e., host area relocation center) is discussed in SER Section 13.3.3.2.10.b.

Annex D shows the major road networks around the facility, which are expected to be the principal evacuation routes, and Section I, "Local Plans," describes the evacuation plans and includes relevant maps. **[J.10.k, J.10.l]** Should an evacuation route be impeded, the State emergency coordinator will designate alternate routes after consultation with local officials, State DOT officials, and representatives of the Department of Public Safety. GA REP-Base Plan, Section IV.B.5, states that the DOT will provide required heavy equipment and personnel.

[J.10.l, J.10.j] GA REP-Annex D, Section E.2.g, states that if an evacuation is necessary, the boundaries of the evacuated area will be controlled to prevent unauthorized access, primarily by the use of roadblocks on major thoroughfares. Personnel from local emergency management, law enforcement, and the State Department of Public Safety will establish these roadblocks. If required, radiological survey teams will be assigned to the roadblocks and will conduct necessary surveys of personnel and equipment leaving the controlled area. The survey team lead will be authorized to release (or retain) personnel and equipment based on survey results. (Projected traffic capacities of evacuation routes and control of access to evacuated areas are discussed in SER Section 13.3.3.2.10.b.)

[J.9] GA REP-Base Plan, Section VI.G, "Incident Assessment and Protective Response," establishes the guidelines for protective action measures and states that PAGs for the early phase of an incident are values of projected doses for both whole body and thyroid exposure. Section VI.G includes tables for the early and intermediate phases of an incident, including PAGs (that are consistent with those of the EPA) and the corresponding protective action (i.e., shelter, evacuate, administer KI). The PAGs are presented as ranges to permit flexibility in protective action decision-making to deal with situations such as institutionalized populations, adverse weather conditions, or other local constraints on the implementation of protective measures. **[J.11]** In addition, ingestion pathway PAGs are provided, which are consistent with FDA guidance. Section IV.B.2.h states that the Georgia State Patrol will assist in required public warnings or evacuation, including available ground and airborne means.

[J.10.b] GA REP-Base Plan, Section VI.G.3.a, "Protective Action Zones," states that the plume exposure EPZ is subdivided into protective zones (commonly referred to as "evacuation zones"). The zone descriptions for VEGP are found in the site-specific Annex D. GA REP-Annex D, Table E-1, lists each county in the 50-mile ingestion exposure EPZ (IPZ) for VEGP and includes the population distribution. **[J.10.c]** (The means for notifying all segments of the transient and resident population are addressed in SER Section 13.3.3.2.5.a.)

[J.10.e, J.10.f] GA REP-Base Plan, Section VI.G.1, states that a protective action for emergency workers includes the administration of stable iodine (i.e., KI) for a PAG projected thyroid dose of 25 rem or more. GA REP-Annex D, Section F.5, states that in the event of an accident that warrants offsite monitoring or other emergency duties, all State and local emergency workers, before entering the area of possible exposure, will report to the (Burke

County) FEOC for receipt of KI. The procedure for distribution of KI to emergency workers is outlined in a memorandum of understanding (MOU) between DNR-EPD and the DNR Division of Public Health. Since the State considers evacuation or sheltering to be a more effective measure for the general public, no dependence has been placed on the distribution of KI to the general public.

[J.10.m] GA REP-Base Plan, Section VI.G, states that incident assessment during the emergency or plume passage (early) phase of a radiological incident involves four separate but interrelated activities – offsite dose projection, radiological field monitoring, limited laboratory radiological analysis, and health physics/contamination control. Based on assessments performed by the RER team, the radiation emergency coordinator will recommend the appropriate protective measure to the State disaster coordinator and local officials. GA REP-Base Plan, Section VI.G.3, "Protective Actions," states that the primary offsite protective actions for the general public fall into two broad categories, evacuation and in-place sheltering. In-place sheltering will be considered only if anticipated radiation doses are well below PAG values (discussed above for the early phase of an emergency), or if evacuation would subject members of the public to larger radiation doses than if they were sheltered in place. Such a situation could occur if radioactive material released from the plant had already arrived, or if unusual environmental or safety conditions existed (e.g., severe weather or the case of institutionalized individuals). In addition, GA REP-Annex D, Section E.2.e (1), describes various passive and active measures that may be taken to minimize exposure while sheltered in place.

[J.10.d] GEOP ESF-8, "Public Health and Medical Services," Section III.B.2.b.v, states that the hospitals and long-term health care facilities (including nursing homes and assisted living centers) will receive assistance with patient evacuation and relocation. GA REP-Base Plan, Section VI.G.3.e, also states that local plans include the notification and, if necessary, evacuation of handicapped and/or mobility-impaired persons within the 10-mile EPZ.

[J.11] GEOP Appendix A, Section II.C, "Radiological Incidents/Nuclear Power Plant Accident," states that the ingestion exposure pathway is within a 50-mile IPZ of the nuclear power plant. The IPZ defines the area for which emergency plans are specifically needed to outline and describe actions necessary to protect the health and safety of the population in case of a facility accident. To mitigate or eliminate the effects of such an accident, protective measures are necessary. Response within the IPZ may include monitoring for contaminated water, food, and livestock, as well as environmental monitoring and (if needed) decontamination of people in the area. The duration of activities within the IPZ, referred to as the recovery phase, may range from hours to months to ensure that the environment and community are safe for the resumption of normal activities.

GA REP-Annex D, Section E.1.g (3), identifies the counties within the VEGP IPZ as Bulloch, Burke, Candler, Chatham, Columbia, Effingham, Emanuel, Glascock, Jefferson, Jenkins, McDuffie, Richmond, Screven, and Warren. (See also Figure E-1.) A description of generic (IPZ) operations is contained in GA REP-Annex F. Activities associated with the evaluation and (if necessary) interdiction of milk and food are described in GA REP-Annex D, Sections E.1.i and E.1.j, respectively. The evaluation of potentially affected land and water is addressed in Section E.2.f. (Sampling and interdiction of food products are also discussed in SER Section 13.3.3.2.9.a.)

[J.12] GEOP ESF-6, "Mass Care, Housing, and Human Services," states that the Georgia Department of Human Resources and the American Red Cross (ARC) will coordinate with

appropriate agencies and organizations to ensure operational readiness to provide mass care to disaster victims, including management of congregate shelters for the general population and bulk distribution of supplies. In addition, the Department of Human Resources and ARC will provide necessary emergency first aid services to supplement emergency health and medical services established by the county to meet victims' needs.

b. Burke County, Georgia

[J.9] Burke County Plan Attachment A, Section E, "Protective Actions," states that the decision to shelter or evacuate the population from an area affected by an incident at VEGP will be based on recommendations from a VEGP official and the judgment of county officials as to whether the situation poses an immediate threat to the citizens of Burke County. The decision may also be based on advice and guidance from GEMA and the Georgia DNR. **[J.10.e, J.10.f]** If the (radioactivity) release data from the facility indicates the potential for hazardous exposure to the thyroid, DNR may recommend that emergency workers entering the affected area take KI. The use of KI is also addressed in Burke County Plan Section V.E. (County authorities are discussed in SER Section 13.3.3.2.1.b.)

[J.10.a, J.10.b] Attachment D, "Affected Area," includes a VEGP 10-mile EPZ map (i.e., Map 1), which shows the Burke County evacuation zones, and Table D-2 shows the population distribution within each zone. (The geographical boundaries of the zones are provided in Table D-1.) **[J.10.h]** In addition, Attachment H includes Map 2, which shows the locations of the EOC/FEOC, boat landings, evacuation routes, traffic control points, hospital, news center, and reception center/shelter (i.e., Burke County High School, which is approximately 15 miles from the VEGP). Attachment I, "Reception and Care," describes the reception center/shelter features and functions. The specific locations, including global positioning system coordinates, are listed in Table H-1.

[J.10.c] Burke County Plan Section IV.B.5.d(2) states that GEMA will activate the PNS in accordance with SOP 3-5 and inform the public of the emergency status and recommend protective actions. Specific actions are described in Attachment A, "Implementation." Augmenting the PNS, and as necessary, public notification will be accomplished using vehicles equipped with sirens and/or public address systems, personnel making door-to-door contact, and boats traveling the affected waterways to warn sportsmen. Notifications are further discussed in SER Section 13.3.3.2.5.b. The county EMA director will coordinate impending activation with GEMA, either at the FEOC or at GEMA headquarters in Atlanta, Georgia. Coordination with NWR activation is discussed in SER Sections 13.3.3.2.1.a and 13.3.3.2.5.a.

[J.10.g] Attachment H, Section D, states that privately owned vehicles will be the primary mode of evacuation. County school buses and specially equipped vehicles will also be available. **[J.10.d]** Section D also addresses the evacuation of the handicapped. Attachment G states that notification and evacuation of handicapped persons living in the 10-mile EPZ are addressed in Burke County SOPs, which are maintained by the EMA Health Department and DFCS. Section E states that an evacuation confirmation process will determine that the entire population has left the affected area and will also assist those who are having difficulty evacuating. Section E describes the agencies involved in the confirmation, as well as the general process.

[J.2, J.10.l] Burke County Plan Attachment H, "Evacuation and Sheltering," states that the selected evacuation routes are adequate to move the population from any part of (or the entire) plume exposure pathway EPZ and channel the evacuees to the reception center and that there

are no physical barriers to the movement of evacuation traffic within the 10-mile EPZ. The principal routes have the capacity to carry approximately 550 vehicles per lane per hour in one direction at a safe, constant flow when weather and darkness are not factors. Nighttime and poor weather conditions could reduce this rate of traffic flow up to 30 percent. These numbers are based on a study of the road system designated for evacuation routes. (See Section E of Annex D.)

[J.10.I, J.10.j] Plan Section V.F.2 states that the Burke County Sheriff's Department will provide traffic control, including control of ingress and egress within the affected area and along evacuation routes. Table H2 in Attachment H lists the evacuation routes and traffic control points. Each traffic control point will be manned and/or roadblocks will be employed to channel evacuees out of the affected area and to deny access into the area. Route markers will be placed along the evacuation routes at critical intersections and at roadblock locations to assist traffic flow and increase movement time. [J.10.k] Attachment E, Section H, states that 24-hour wrecker service is available from the private sector (listings are maintained in the county EOC), the county public works department will provide equipment to maintain roadway clearance, and additional assistance can be requested from the Georgia DOT. **[J.10.l]** Attachment H, Table H-3, "EPZ Vehicle Totals," addresses the estimated vehicles within the 10-mile EPZ and provides the ETEs for the residential and transient population and VEGP workforce for various times of the week, and for fair and adverse weather conditions. ETEs for the 10-mile EPZ are also discussed in SER Section 13.3.1.

[J.12] Section V.F.5 describes the means for activation of the high school as a reception center, including providing space, security, facilities, buses for transportation, and manpower for shelter management. Section IV.B.5.d(12) states that reception and care service activities consistent with the Burke County EOP would include monitoring for contamination and decontamination of evacuees and vehicles if a release occurs. Evacuees would be registered and assigned to a shelter area. The reception center would also provide necessary health and other social services to the evacuees. Attachment I presents the details of registering and monitoring evacuees. The Burke County High School would provide adequate space and accommodations to process (e.g., monitor all potentially contaminated residents and transients within 10 to 12 hours after their arrival) and care for the entire 10-mile EPZ population, if necessary. Trained shelter managers and staff will be assigned to the reception center and shelter area to conduct operations necessary to receive, process, shelter, and care for evacuees.

c. State of South Carolina

[J.2] The coordination of evacuation with the South Carolina Highway Patrol is discussed in SER Section 13.3.3.2.10.d. The State of South Carolina is not responsible for evacuation routes and transportation for onsite individuals, as VEGP is located across the Savannah River from South Carolina, and there are no evacuation routes for onsite personnel within the State's boundaries.

[J.9] SCORERP Section IV.B.f states that as warranted by the ECL, DHEC will continuously assess the gravity of the situation by evaluation of the reported radiological release data from the impacted FNF, analysis of field environmental sampling data, and consultation with the NRC. Based on dose assessment data and/or the potential for plant conditions to deteriorate, DHEC will provide protective action recommendation (PARs) to the Governor (or SCEMD director). PARs will, in turn, be coordinated with each impacted county to obtain consensus. Once all with authority to make decisions agree, protective actions will be established by SCEMD and executed in accordance with procedures contained in FNF site-specific plans.

Based on comparisons of projected or actual dose measured and EPA PAGs, DHEC will promptly recommend to SCEMD and State government decisionmakers protective actions to shelter or evacuate the population. **[J.10.d, J.10.e, J.10.f]** If appropriate, the DHEC PARs will also include a recommendation to issue KI to emergency workers and mobility-impaired individuals and to commence monitoring and decontamination activities for evacuees. KI will be issued only if ordered by the DHEC Commissioner (or designee).

[J.10.e, J.10.f] SCORERP Annex F describes the DHEC responsibilities for the distribution of KI to the county health departments for pre-event distribution to the general public who reside within the 10-mile EPZ (including persons who are unable to readily evacuate a particular zone; see SCTRERP Section B.V.B). DHEC also maintains adequate quantities of KI for emergency issue to institutionalized individuals and to State and local government emergency workers. Annex F also describes the county EMA responsibilities relating to KI. (See SER Section 13.3.3.10.d.) KI tablets have been predistributed to the general population who reside in the VEGP 10-mile EPZ, and additional quantities of KI, stockpiled at DHEC and county public health departments, will be transported (on order) to school pickup points, reception centers, and shelters for emergency distribution. Information on the availability of KI and locations where it can be obtained is published annually in the VEGP emergency information brochure and calendar (see SER Section 13.3.3.2.7), which are distributed to all residents within the 10mile EPZ. SCORERP Appendix 2 provides general guidelines and information concerning KI use, and SCTRERP Section B.V.B describes the KI use policy. SCTRERP Appendixes I and IV describe KI distribution, storage, and dosage. SER Section 13.3.3.2.10.a also discusses KI.

[J.10.a] SCORERP-Part 5, Section IV.B, describes evacuation zones, landmarks, and boundaries. In addition, the table to Figure 1 describes the main evacuation routes for Aiken and Barnwell Counties (there are no persons within the Allendale County portion of the 10-mile EPZ). Maps showing evacuation routes, relocation and personnel assembly areas, and sampling and survey locations for the VEGP environs are discussed in SER Sections 13.3.3.2.3.c, 13.3.3.2.9.c and 13.3.3.2.9.d. **[J.10.b]** Figure 3 shows the population distribution, which totals approximately 54 persons.

[J.10.c] SCORERP-Part 5, Annex A, "Alert and Notification," establishes procedures for the prompt notification of the public within the VEGP 10-mile EPZ. The process consists of State and local coordination of fixed siren activation and EAS broadcast messages which contain protective action instructions based on decisions by government officials. The notification of the transient and resident population is discussed further in SER Sections 13.3.3.2.5.c and 13.3.3.2.7.c.

[J.10.d] Emergency transportation services are the primary responsibility of the affected county. Counties and municipal governments have plans for acquiring emergency transportation in the event of a radiological incident. The means for evacuating schools, jails, hospitals, nursing homes, the homebound, and those without private transportation are identified in the county plans. The affected counties will provide transportation to those evacuees who do not have transportation and confined persons who require special transportation. The counties may request additional assistance from the State. Special transportation needs are addressed in the county EOPs. (See also SER Section 13.3.3.2.10.d.)

[J.10.g, J.10.k] At a site area emergency ECL or as directed by the SEOC chief of operations, in coordination with local law enforcement agencies, the South Carolina Highway Patrol will occupy the traffic control points designated in the VEGP plan. In cooperation with the DNR, all lakes and waterways within the 10-mile EPZ will be cleared, and 2-mile road blocks from the

FNF will be established to restrict access to the facility (by road or water). SCORERP Section IV.B.4, "Evacuation," states that the South Carolina Department of Public Safety will coordinate evacuation operations under ESF 16, "Emergency Traffic Management," as described in SCEOP Annex 16.

ESF 16 will coordinate requests from local authorities when reinforcements are needed. The South Carolina DOT will coordinate transportation support operations under ESF 1, "Transportation," as described in SCEOP Annex 1. If county emergency transportation resources are insufficient to complete a required evacuation or provide other essential services during a radiological emergency, the county may request backup transportation support from the State. SCORERP Section IV.B.6, "Law Enforcement," states that during an FNF emergency, SLED will coordinate general law enforcement activities, including providing security for all evacuated areas, shelters, and reception centers. (See also SCEOP Annex 13, ESF 13.)

[J.10.l, J.10.j, J.10.k, J.10.l] Portions of the evacuation time study (i.e., ETE) for the VEGP 10-mile EPZ have been excerpted from the VEGP emergency evacuation plan and are included in the county EOPs and site-specific annexes. SCORERP-Part 5, Section IV.B.6, lists population densities and evacuation times. SCORERP Section IV.B.4 states that evacuation time studies for the 10-mile EPZ have been prepared by the utility for the FNF emergency plan. Portions of the study have been included in the county EOPs and site-specific annex to the State plan.

[J.10.m] SCORERP Annex F, Section V, "Radiological Exposure Control for the General Public," describes the reasoning behind protective action decisions and the overall mission. Rapid action will be needed to protect members of the general public during an incident involving a large release, or having the potential for a large release, of radioactive materials to the atmosphere. Consideration of all risks is important in determining the appropriate response recommendations, and some judgment will be necessary when considering the types of protective actions to be implemented and at what (projected radiation dose) level in an emergency situation. Protective actions should not expose individuals to greater risks than the risk avoided.

[J.10.h] SCORERP-Part 5, Section IV.B.6.i, states that all evacuees will be processed through the shelters or reception centers as outlined in Annex B and that temporary housing should be located at least 5 miles from the 10-mile EPZ outer boundary (i.e., 15 miles from the nuclear facility site). SCORERP Annex B, Section B (Appendix 1), lists the locations of reception centers and shelters in Aiken and Allendale Counties; Barnwell County has none. If a shelter is full, evacuees will be assigned to additional predesignated shelters. ESF 6 and the role of supporting organizations, such as the ARC, are discussed in SER Sections 13.3.3.2.10.a and 13.3.3.2.15.c.

[J.11] SCORERP Annex G describes ingestion pathway activities and states that following a radiological release, the impact on the IPZ will not be known until sample collection and analysis are completed. Once the samples have been analyzed, final protective measures will be determined and implemented. Preventive protective actions are taken to either avoid or reduce the contamination of food, milk, or water and to isolate food to prevent its introduction into commerce. All human consumption foodstuffs in the IPZ will be sampled for radioactive contamination. Additional information on sampling and priorities is available in SCTRERP Appendices I and II, DHEC SOPs.

The SCORERP, SCEOP, and SCTRERP outline responsibilities for protecting the public from ingesting contaminated food and water. Many State agencies share these responsibilities. DHEC takes the lead, and SCEMD is responsible for overall State coordination of nontechnical radiological resources. DHEC determines IPZ-related PARs and presents them to the Governor for approval and implementation. DHEC maintains annually updated records that include the locations of major food producers, processors, distributors, dairies, and surface water systems within the State's IPZ. In coordination with other State agencies, DHEC will develop procedures for utilizing this information to keep affected food producers, processors, and distributors informed about PARs and required post-incident response actions. (See also SER Section 3.3.3.2.9.c.)

[J.12] SCORERP-Part 5, Annex B, "Reception Centers and Shelters," outlines the procedures for the operation of reception centers and/or shelters in the event of an incident at VEGP, which requires evacuation of personnel from the 10-mile EPZ. The facilities will be staffed by ARC, county Department of Social Services, medical, DHEC, and radiological monitoring personnel to provide various services, including registration and lodging assignment, first aid and basic personal needs, and radiological monitoring/decontamination. SCORERP Annex F, Section VII, "Radiological Monitoring/Decontamination," states that reception centers for evacuees will serve as points where radiological contamination monitoring and decontamination will be conducted when ordered. Trained monitoring teams, under the supervision of the county radiological officer, will conduct the monitoring and decontamination (if necessary) and complete the associated records. DHEC will provide technical guidance and advice. Annex F contains monitoring and decontamination procedures and associated documentation forms.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[J.2] In regard to evacuation routes, the county sheriff will, in coordination with the South Carolina Highway Patrol and other law enforcement agencies, coordinate activities in accordance with the affected county EOP. **[J.10.c]** The means for notifying all segments of the transient and resident populations are discussed in SER Sections 13.3.3.2.5.c and 13.3.3.2.5.d. Alert and notification of the public, in support of implementing protective measures, are discussed in SER Sections 13.3.3.2.5.c and 13.3.3.2.5.d. **[J.10.d]** Appendix 4 or 5 of Annex Q2 to the Aiken, Barnwell, and Allendale County Plans states that there are no schools, hospitals, nursing homes, or industries located within the county's respective portion of the VEGP 10-mile EPZ.

[J.9] Section IV.L, "Protective Response," of the county plans states that the SCTRERP provides protective action guides and other criteria consistent with existing EPA guides. The counties provide the mechanism for implementing protective actions, such as sheltering and/or evacuation, for the county population in (and from) sectors recommended by DHEC/SCEMD and ordered by the Governor. Annex F, Section 3.A, states that in the event of a release (or threat of release) of radionuclides from an FNF, DHEC will assess the need for the initiation of radiological exposure control activities specified in Annex F and recommend them to SCEMD. SCEMD will instruct State departments and agencies, including county EMAs, to commence radiological exposure control operations (e.g., monitoring, decontamination, recording) and take protective action measures when advised. The ECLs that would initiate the implementation of protective measures are discussed in SER Sections 13.3.3.2.4.c and 13.3.3.2.4.d. **[J.10.e, J.10.f]** The decisions and methods for issuance of KI are discussed in SER Section 13.3.3.2.10.c.

[J.10.a, J.10.b, J.10.l, J.10.j, J.10.l, J.10.m] Section IV.L discusses evacuation and lists the sectors, population, and estimated evacuation times. Attachments 1 and 3 provide maps that show features such as population distributions, evacuation routes, traffic/access control points (and procedures), traffic capacities, and road conditions. **[J.10.k]** Appendix 3 of the county plans states that the responsibility for traffic control during an evacuation of the South Carolina portion of the VEGP 10-mile EPZ is the responsibility of the South Carolina Department of Public Safety, Highway Patrol. The Aiken County Sheriff's Office will staff traffic and access control points. Each traffic management location will be staffed and/or use roadblocks to direct evacuees out of the EPZ and to restrict unauthorized access into the affected area. Route markers will be placed along the evacuation route at critical locations to promote efficient traffic flow.

[J.10.g, J.10.j] Sections IV.J and IV.K of the county plans state that the South Carolina Highway Patrol will operate State traffic control points on roads leading into the EPZ from the county. Staffing of predetermined traffic control points will be assigned to county law enforcement. In the event of an evacuation, the limited populace within the 10-mile EPZ is expected to evacuate using available personal vehicles. If required for special cases, county resources will be made available. **[J.10.l]** Evacuation estimates have been computed to give local officials time data when evacuation decisions become necessary. Attachment 3, Tab A, to Annex Q2, "Traffic Capacities for Evacuation Routes," lists the ETEs for the routes.

[J.10.h] Aiken County will evacuate to South Aiken High School (primary) and/or Kennedy Middle School (backup), and Barnwell County will evacuate to Allendale-Fairfax High School (primary) and/or Allendale Elementary School (backup) in Allendale County. Both facilities are more than 15 miles from VEGP. [J.12] Annex Q2, Section G, of the county plans states that the county Department of Social Services will provide emergency workers to assist the ARC at the predesignated shelters. Evacuees will be directed through these shelters to be monitored and registered, and the counties will maintain monitoring records for evacuees and their vehicles. Monitors at the shelters will complete the dosimetry tracking form and forward the information to the radiological officer on a regular basis.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for protective response, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard J of NUREG-0654/ FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(10), and Sections III, IV.A, IV.B, IV.D, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.11 Radiological Exposure Control (10 CFR 50.47(b)(11); NUREG-0654/FEMA-REP-1, planning standard K)

The regulation, as reflected in the planning standard, requires that means for controlling radiological exposures in an emergency be established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity PAGs.

In ESP Plan Section K, "Radiological Exposure Control," the applicant described the emergency exposure limits for emergency workers, including decisions and efforts made to minimize exposures. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was the evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard K, "Radiological Exposure Control." Planning standard K provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(11).

[K.1, K.2] In ESP Plan Section K.1, "Emergency Exposure Guidelines," the applicant stated that equipment and facilities have been designed to assure adequate safety under normal and postulated accident conditions. Plant design has undergone an extensive as low as reasonably achievable (ALARA) review. Design features are considered for potential exposure, and changes are recommended to reduce potentially high doses. The post-accident sampling procedures have been, or will be, designed to provide adequate protection to personnel during the collection of grab samples. The effluent sampling procedures have been, or will be, written to ensure that no individual receives a dose in excess of regulatory criteria (i.e., 5 rem whole body, 25 rem thyroid, and 75 rem extremities). Plant procedures will specify designated sample points.

During an emergency, it may be necessary to authorize radiation exposures above the limits specified in 10 CFR Part 20, "Standards for Protection against Radiation." **[K.2]** The emergency director can authorize emergency exposures in excess of these limits but within the limits in Table K-1, "Emergency Worker Limits for Workers Performing Emergency Services." These higher exposures may be necessary to complete protective, corrective, or lifesaving actions. In all such situations, every reasonable effort will be made to minimize exposures. The emergency director, in consultation with health physics personnel, will make decisions as to appropriate exposures, considering the action required and relative risks. The staff reviewed ESP Plan Table K-1 and found that the guidelines for dose limits, activities, and conditions are consistent with those in Table 2-2, "Guidance on Dose Limits for Workers Performing Emergency Services," in EPA 400-R-92-001. The staff finds that the applicant has established onsite exposure guidelines that are consistent with the EPA emergency worker and lifesaving activity PAGs.

In ESP Plan Section K.2, "Onsite Radiation Protection Program," the applicant further stated that where possible, the normal radiation work permit (RWP) procedure will be used to control exposures. This procedure requires signature approval, prior knowledge of worker past exposures, and guidance on protective actions to be used in the course of the emergency work. If time and urgency do not allow this procedure to be followed, the health physics supervisor may approve emergency RWP controls. In all cases, the health physics staff briefs the emergency team on the hazards involved in the planned actions and protective actions to be taken, and a qualified health physics technician accompanies each team.

The dosimetry team will maintain a record of individual and collective exposure received during the emergency. After each entry into a radiologically controlled area, the dosimetry team will update exposure records at the control point or the OSC either through the dosimetry records computer system or manually. An individual's dose margin will be assessed by determining the difference between the updated exposure and current administrative limit; these margins are used to determine emergency assignments. The implementing procedures describe the operation of the manual system and activation of the dosimetry team.

The health physics supervisor will normally control the radiation dose within the limits authorized by routine station health physics procedures, and personnel radiation exposure records will include all emergency exposures. **[K.2]** The 10 CFR Part 20 limits will not be exceeded without the prior approval of the emergency director. **[K.3.a]** Emergency dosimetry will be available to each member of the ERO for both onsite and offsite organizations as required by the radiological conditions at the time. VEGP Plan, Appendix 4, "Emergency Equipment Lists," presents information on the types of dosimetry available in each emergency response facility and other locations, as well as other equipment (such as protective clothing, respirators, and KI) in support of radiological exposure control.

[K.3.b] Emergency response personnel will be made aware that self-reading dosimeters should be checked every 15 to 30 minutes during the emergency. There is the capability to read TLDs within 24 hours. They will also be read if the individual has received greater than a previously established value as determined by health physics procedures on the individual's direct reading dosimeter. In situations where exposures in excess of 10 CFR Part 20 limits are authorized, emergency team selection will be limited to volunteers who are fully aware of the risks involved for doses greater than 25 rem, and declared pregnant female employees will not be allowed to participate.

[K.6] Personnel exiting the radiation-controlled area will be monitored for contamination by stand-up monitoring booths or by a whole-body scan with a hand-held probe. The standard health physics contamination limits will be used for release of personnel. Plant areas that require access to facilitate recovery operations will be surveyed with portable instruments equipped with beta/gamma detectors. Personnel will wear appropriate protective clothing, as determined by this survey, to perform activities in these areas. **[K.6.c]** Recovery operations will necessitate more detailed surveys on an as-needed basis. The emergency health physics supervisor is responsible for permitting the return of onsite areas and equipment to normal use once monitoring and decontamination are completed.

In ESP Plan Section K.4, "Onsite Radiological Contamination Control," the applicant stated that the security department controls access during emergency conditions. Only authorized emergency response personnel are allowed to enter the protected area. Access to in-plant areas that are contaminated is controlled by barriers, signs, locked doors, or personnel stationed for that purpose. Emergency monitoring teams are responsible for determining the need for onsite access control and establishing the proper method through discussions with TSC personnel. Plant procedures used for determining contaminated areas will be used for determining the need for access control. Any food, tobacco, or potable liquids that are inside a radiation or contamination controlled area, regardless of the packaging, will be considered to be contaminated until surveyed or otherwise determined to be free of contamination. The plant health physics procedures will control these areas, and no eating, smoking, or drinking will be allowed. The emergency director or designee will arrange for supplies to be delivered.

[K.5, L.1] Standard health physics practices will govern the decontamination of personnel. The TSC manager, maintenance supervisor, operations supervisor, or health physics supervisor will determine how to conduct equipment and area decontamination. In ESP Plan, Section K.3, "Decontamination," the applicant stated that the plant administrative and health physics procedures delineate the action levels for determining the need for decontamination of personnel, equipment, and areas. Decontamination facilities are located adjacent to the health physics stations. Instrumentation to survey personnel during and after decontamination is located at the health physics station. The facility has vertical showering and normal wash sinks.

If decontamination activities are required, a controlled access area will be established by roping off the area. Supplies of clean clothing will be available. Personnel will be decontaminated through the use of water washes or other methods for extreme cases as described in plant health physics procedures. These procedures will apply to removal of radioisotopes from the skin. **[K.1, L.2, L.4, O.4.f & .h]** Medical personnel at Doctors Hospital or the Burke Medical Center, as described in Section L of the ESP Plan and discussed in SER Section 13.3.3.2.12, will handle decontamination of serious wounds.

Decontamination equipment for personnel is similar to that available in the decontamination emergency equipment kit (see VEGP ESP Plan, Appendix 4, "Emergency Equipment Lists"), except that the supply is greater and stronger cleaning solutions are available. The plant liquid radwaste system collects and processes waste generated through the use of the decontamination facilities. **[K.7]** ESP Plan Section L.3, "Offsite Support Services," and SER Section 13.3.3.2.12 address the capability for decontaminating relocated onsite personnel.

The staff finds that the applicant has provided an adequate onsite radiation protection program to be implemented during emergencies, which includes provisions for the use of dosimetry and establishment of the means for contamination control and for decontamination of both onsite and relocated onsite personnel.

State and Local Emergency Plans [K.3, K.4, K.5]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard K of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard K are adequate. The following summarizes the FEMA findings for planning standard K.

a. State of Georgia

[K.3.a, K.3.b] GA REP-Base Plan, Section VI.G.2.d, "Health Physics/Contamination Control," states that during response to a radiological incident, State and local officials will implement health physics and contamination control procedures to limit radiation exposures to the general public and emergency response personnel. Appendix 5, "List of Radiological Emergency Operations Procedures," to this plan lists the procedures, which cover exposure limits for emergency workers and distribution and administration of KI to emergency workers. **[K.5.a]** Depending on the isotopic composition of any released material and the overall severity of an incident, the radiation emergency coordinator may elect to use the guidance found in Tables 1 through 3 of Section VI.G.2 for exposure limits for emergency personnel and for contamination control. **[K.4]** While the radiation exposure limits in the procedures in Appendix 5 are administrative limits and may be exceeded for lifesaving purposes, or with written approval from the radiation emergency coordinator, exposures in excess of the limits in Table 1 will not be authorized.

GA REP-Annex D, Section E.3.b, "Dosimetry Evaluations," states that personnel engaged in emergency response activities that may lead to radiation exposures will be provided dosimetry. Survey meters and limiting area stay times are other methods that may be used to control exposure. If necessary, the evaluation of internal exposures will use bioassay techniques, which will be supported by other agencies and commercial labs. GA REP-Annex D, Section D,

"Manpower, Equipment and Instrument Resources," addresses available radiological equipment.

[K.5.a, K.5.b] GA REP-Annex D, Section E.3.d, "Personnel Contamination Control/ Decontamination," states that in situations where evacuees become contaminated, radiological survey and decontamination parties will be organized and dispatched to the location of the contaminated personnel and will accomplish the necessary decontamination. Members of the general public will be decontaminated to background (radiation) levels, if possible, and emergency response personnel to the levels in GA REP-Base Plan, Section VI.G, "Incident Assessment and Protective Response." Tables 2 and 3 in Section VI.G.2.d of the plan specify contamination limits for persons, animals, and surfaces. Trained State and local radiation monitors posted at appropriate locations will check for contamination of personnel who have been in the affected areas.

b. Burke County, Georgia

[K.3.a, K.3.b] Burke County Plan, Attachment A, Section E.4, "Radiological Exposure Control," states that personnel engaged in emergency response activities that may lead to radiation exposures will receive pocket dosimeters and TLDs. Those engaged in monitoring operations will use equipment to take direct radiation readings, as well as soil, vegetation, and air samples. All persons entering the affected areas will record exposures on exposure control forms and return them to the Burke County EMA radiation officer. A continuous 24-hour-per-day capability will be maintained to determine doses to emergency response personnel, including volunteers. **[K.5.a]** Exposure control and contamination guidelines will be in accordance with emergency response personnel PAGs. **[K.4]** Only the GEMA, upon recommendation from the DNR-EPD radiation emergency coordinator, can authorize exposures up to the PAG limits. Personnel dosimetry kits will contain criteria/instructions for decontamination procedures, including identification of the location for decontamination of personnel, equipment, and vehicles.

[K.5.a, K.5.b] Burke County Plan Section IV.B.5(12) states that if a release has occurred, evacuees will be monitored upon their arrival at the reception and care center. Equipment and trained personnel from local and State agencies will be assigned to the reception center to monitor evacuees. All potentially contaminated residents and transients from the EPZ will be monitored within 10 to 12 hours after their arrival. Contaminated evacuees will be processed through a decontamination area located in the gymnasium (shower area) of the Burke County High School. Vehicles will be surveyed for contamination and decontaminated at a designated site, if required. All local and State emergency workers returning from the affected area will report to the vehicle decontamination point.

Section V.F, "Departments/Agencies, Roles and Notification," states that the Burke County fire department will provide decontamination service in the affected areas and at a vehicle decontamination point near the reception center. The Burke County health department will perform radiation surveys of evacuees, decontaminate personnel, and identify health hazards in coordination with DNR-EPD and the Georgia Department of Agriculture and DNR. The Burke County Hospital is the primary facility for treating offsite victims of a radiological accident, including contaminated injuries. If a radiation accident victim requires more definitive care than that available at the primary or secondary medical facilities, the victim may be transported to ORHMC in Oak Ridge, Tennessee.

c. State of South Carolina

[K.3.a, K.3.b] The SEOC will provide incident assessment and dose projection information to affected counties and State RER agencies. County emergency management directors and State agency chiefs are responsible for monitoring the exposures received by their respective emergency workers and for ensuring that exposures do not exceed dose limits in SCORERP Annex F, Table B, "Guidance on Dose Limits for Workers Performing Emergency Services." All 10-mile EPZ emergency workers will receive personal dosimetry and KI, and they will periodically read and maintain a record of individual exposures. Throughout the incident, DHEC will monitor State and local emergency workers' exposure rates and accumulated doses, in order to provide timely protective action guidance.

In Section IV.A of SCORERP Annex F, the SCEMD is responsible for distribution of dosimetry, in coordination with risk and host county EMAs, as well as collecting dosimetry and records after an incident. Section III.D states that local governments will distribute dosimetry that has been pre-positioned by the State and that the county radiological officer will maintain permanent records of exposures and submit them daily to DHEC at the SEOC. SCORERP Section IV.D, "Dosimetry," states that before dispatch, all emergency workers with assignments inside the 10-mile EPZ will receive dosimetry and a 10-day supply of KI. Annex F to Section VII.B states that each risk county EMA will provide monitoring stations for emergency workers and that, following a mission, emergency workers must report to a monitoring station (or reception center monitoring point) to be monitored for contamination and, if necessary, be decontaminated. Each emergency worker will maintain individual exposure records, in accordance with Appendix 3 of Annex F, which provides instructions relating to dosimeter use, including reading the dosimeter every 15-30 minutes. DHEC is responsible for maintaining emergency worker and general public radiation exposure records.

[K.4] SCORERP Annex F, Section III, states that DHEC may authorize emergency workers to exceed PAG exposure levels. All others, including county and municipal employees serving as radiological emergency workers, will be authorized to exceed PAG levels in the following manner:

- The DHEC RER coordinator recommends exposure level limitations to the SCEMD director.
- The SCEMD director passes the recommendation to the county EMA director, who makes a recommendation to the chairman, county council/administrator/supervisor.
- The county authority, with DHEC consent, authorizes an emergency worker to exceed the general public PAG radiation limits.

[K.5.a, K.5.b] SCORERP Annex F, Section VII, "Radiological Monitoring/Decontamination," addresses action levels for determining the need for decontamination, including the means for decontamination. Section VII.E, "Contamination Action Levels," specifies action levels for determining the need for personnel and vehicle/equipment decontamination. Decontamination procedures for personnel, clothing, and vehicles are provided in Appendix 1 to Annex F, Sections VI, VII, and VIII, respectively. Monitoring and decontamination procedures for emergency workers, vehicles, and equipment are the same as those used for evacuees.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[K.3.a, K.3.b] Section IV.N, "Radiation Exposure Control," of the county plans states that emergency workers will be issued a direct-reading dosimeter and a permanent record TLD and that additional dosimetry is available at each county's emergency preparedness/management office. Each emergency worker is responsible for reading and recording his dose and submitting the accumulated dose number to his supervisor. **[K.4]** Exposure control, including authorization to exceed the EPA PAGs, will be in accordance with SCORERP Annex F and the guidelines in SCTRERP. County supervisors/service chiefs will closely monitor county personnel working in contaminated areas and will arrange for rotations to limit individual dose.

[K.5.a, K.5.b] Appendix 8, "Radiological Decontamination," to the Barnwell and Aiken County Plans (Appendix 9 to the Allendale County Plan) states that action levels for decontamination will be as outlined in SCTRERP, Appendix I. (See also SCORERP Section VII, discussed above.) The responsible county official will direct all county radiological monitoring teams, including the team at the local vehicle decontamination point. If necessary, the teams will perform decontamination as outlined in the county radiological monitoring and decontamination SOP. All decontamination will be in accordance with DHEC requirements.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for radiological exposure control, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard K of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(11), and Sections III, IV.A, IV.B, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.12 Medical and Public Health Support (10 CFR 50.47(b)(12); NUREG-0654/FEMA-REP-1, planning standard L)

The regulation, as reflected in the planning standard, requires that arrangements be made for medical services for contaminated injured individuals.

In ESP Plan Section L, "Medical and Public Health Support," the applicant described the provisions to assist personnel who may be injured, receive high radiation doses, or be externally contaminated. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. In this evaluation, the staff's primary focus was on its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard L, "Medical and Public Health Support." Planning standard L provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(12).

[K.1, L.2, O.4.f & .h] In ESP Plan Section L.1, "On-Site Capability," the applicant stated that it has arranged for assistance to personnel who are injured, who may have received high radiation doses, or who have been externally contaminated. Decontamination materials and portable first aid kits are available at strategic locations throughout the VEGP site, and on-shift personnel in the ERO are trained in first aid and decontamination procedures and are available on a 24-hour basis. Health physics technicians assigned to the first aid teams will direct and assist in decontamination of injured persons, as necessary. An onsite first aid and

decontamination area near the health physics stations is equipped with decontamination supplies and other specialized equipment. The staff reviewed other application sections that deal with the availability of 24-hour emergency communications and response and discusses those reviews in SER Sections 13.3.3.2.1, 13.3.3.2.2, 13.3.3.2.5, 13.3.3.2.6, and 13.3.3.2.8.

[K.5, L.1] The applicant provides training for both onsite and offsite personnel (e.g., plant, EMS, and hospital personnel) in the handling and treatment of injured/contaminated patients through Radiation Management Corporation (RMC). Section 13.3.3.2.15 of this report and the February 15, 2005, letter of agreement between RMC and SNC address this training. The VEGP training department conducts training sessions at least once per calendar year, and drills and exercises are an integral part of the program. SER Section 13.3.3.2.14 addresses medical emergency drills.

[L.1, L.3] In ESP Plan Section L.3, "Offsite Support Services," the applicant stated that it has arranged with Doctors Hospital in Augusta, Georgia, and Burke County Hospital (Burke Medical Center) in Waynesboro, Georgia, for the treatment of externally contaminated patients. To facilitate the handling and treatment of contaminated individuals, each hospital has a radiation emergency area with a separate entrance adjacent to the emergency room complex, specialized supplies, and equipment (including radiation survey instruments) for decontamination, exposure evaluation, and contamination control. The medical staff of the hospitals are trained to treat externally contaminated patients or individuals who have received high exposures according to a hospital procedure entitled "Decontamination and Treatment of the Radioactively Contaminated Patient." The applicant has made additional arrangements with local doctors to render medical assistance, both on site and off site, and to assume responsibility for the medical supervision of the patient. These doctors will be on emergency call at all times and will respond to an accident when called. (SER Section 13.3.3.2.11 also discusses the treatment of contaminated injured persons.)

[K.1, L.4, O.4.d, .f & .h] In ESP Plan Section L.2, "Medical Transportation," the applicant stated that it has arranged with the Burke County ambulance service (also known as Ambulance Service Burke County) for the transport of victims of radiological accidents to Doctors Hospital or Burke County Hospital. The staff review of the structure of the local ambulance service available to VEGP, which included an Internet search and an examination of existing local resources, found that the Ambulance Service Burke County is one of 12 ambulance services in Burke County, which are provided by Burke County EMA. The staff also reviewed the letters of agreement with Burke County EMA (dated April 2, 2004, and April 17, 2006), which are included in the application, and finds that they address (in part) the Burke County EMA commitment to provide ambulance service for calls involving casualties arising from a radiation accident at VEGP. In addition, the letters commit to continuing participation in any further development of the emergency plan in support of the proposed Units 3 and 4.

In addition to reviewing the letters of agreement with Burke County EMA, the staff examined additional letters of agreement with local and backup hospitals and other medical support organizations (discussed above). The staff found that the detailed descriptions of contacts, arrangements, and committed resources provide a substantial and adequate medical and public health support capability in support of the VEGP site, including the addition of VEGP Units 3 and 4. The emergency facilities have emergency plans, staff training programs, and adequate equipment and supplies for receiving and handling injured and/or radiologically contaminated patients from the VEGP site. These specific agencies and organizations include the following:

- Burke County EMA/Burke County Ambulance Service (Waynesboro, Georgia)

- Burke Medical Center (Waynesboro, Georgia)
- Doctors Hospital (Augusta, Georgia)
- Dr. B. Lamar Murray (Waynesboro, Georgia)
- Joseph M. Still Burn Centers, Inc. (Augusta, Georgia)
- Medical Specialists, Inc. (Waynesboro, Georgia)
- RMC, Inc. (Philadelphia, Pennsylvania)

State and Local Emergency Plans [L.1, L.3, L.4]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard L of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard L are adequate. The following summarizes the FEMA findings for planning standard L.

a. State of Georgia

[L.1, L.3] GA REP-Base Plan, Section VI.K, "Medical and Public Health Support," states that local medical facilities and agencies will furnish required medical and public health support, provided that they are prepared, equipped, and trained to provide the required support. In situations where radiological accidents occur and radiation injury or contamination is involved, many local hospitals or medical agencies do not have the capability to handle such victims. In these cases, victims will be sent to hospitals or medical agencies with the necessary capabilities. Appendix 3, "Medical Facilities with Capabilities of Caring for Radiation Accident Victims," lists the following facilities:

- Meadows Regional Medical Center (Vidalia, Georgia)
- Appling Health Care System (Baxley, Georgia)
- Early Memorial Hospital (Blakely, Georgia)
- Doctors Hospital (Augusta, Georgia) – secondary facility
- Burke County Hospital (Waynesboro, Georgia) – primary facility
- Southeast Alabama Medical Center (Dothan, Alabama)

GA REP-Annex D, Section F, "Medical/Public Health Support," states that agreements have been made with Burke County Medical Center and Doctors Hospital for the care of radiologically contaminated injured victims in the event of an incident at VEGP. Burke County Hospital and Doctors Hospital have a licensed bed capacity of 40 and 374, respectively. These two hospitals have the necessary equipment and protective clothing to treat contaminated injured persons. If needed to supervise treatment of contaminated injuries, each hospital has at least one medical doctor and one registered nurse who are available within 2 hours if needed to supervise treatment of contaminated injuries. The hospitals can treat up to 30 ambulatory patients within a 24-hour period. (Letters of agreement for such support exist between GEMA and both hospitals.) If victims require more definitive care than that available at these two facilities, they may be transported to the ORHMC. Section F.7 describes health system resources in contiguous States and at military facilities, which can be requested if the State of Georgia's resources are depleted or a particular required resource does not exist in the State.

[L.4] GA REP-Annex D, Section F.3, "Transportation of Accident Victims," states that the Burke County Ambulance Service has agreed to transport accident victims to the primary and secondary medical facilities. If additional ambulances are needed, University Ambulance

Service in Augusta, Georgia, may be called. If a victim must be immediately transported a considerable distance, the services of MAST facilities at Fort Stewart (near Savannah, Georgia) will be requested; response will be handled on an availability basis.

b. Burke County, Georgia

[L.1. L.4] Section C, "Response," of Burke County Plan Attachment A states that the primary medical facility for the care of offsite victims of an incident at VEGP, including the contaminated injured, will be Burke County Hospital. If the capacity of this facility is exceeded, the secondary medical facility is Doctors Hospital. If a radiation victim requires more definitive care than that available at these facilities, the victim may be transported to the ORHMC. Burke County Plan Section V.F.8 states that Burke County Hospital will provide various services to support an emergency response, including coordinating with emergency medical support personnel and vehicles, and if necessary, procuring additional medical practitioners and medical service support. Attachment K, "Training and Exercises," states in Section C that checklists have been prepared for local officials and departments/agency personnel to enhance the training program and further ensure emergency operational readiness; a checklist has also been prepared for EMS. (SER Section 13.3.3.2.15 discusses RER training.)

c. State of South Carolina

[L.1] SCORERP-Part 5, Annex C, "Medical and Public Health Support," states that letters of agreement have been obtained from local (primary and backup) hospitals that have the capability to receive and care for victims of radiological incidents. Appendices 1 and 2 contain specific letters of agreement for services by designated medical facilities (Burke County Medical Center and Doctors Hospital, respectively), and similar letters appear in the Aiken, Allendale, and Barnwell County emergency operations plans. **[L.3]** Appendix 3, "Medical Facilities for Receiving Victims of a Radiation Incident," to SCORERP, Annex E identifies medical facilities in the vicinity of commercial and DOE facilities that have the capability to treat radiologically contaminated/injured individuals. If a radiological accident exhausts the State's available medical facilities, backup support is available from the States of Georgia and North Carolina and from the Radiation Emergency Assistance Center Training Site in Oak Ridge, Tennessee. **[L.4]** Section IV of Annex C and SCORERP Annex E (Section IV) state that ESF 8 ("[Public] Health and Medical Services") organizational resources will coordinate and provide emergency transportation for contaminated, injured individuals from the affected areas around each nuclear power plant in the State. (See also GEOP ESF, Annex 8.)

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[L.1, L.4] Section IV.O, "Medical," of the county plans states that Doctors Hospital will treat contaminated victims of a radiological accident at VEGP. DHEC is responsible for training persons who will provide medical services to contaminated victims. Section K, "Transportation," states that designated ambulances of the county emergency medical service will transport contaminated victims and that personnel will take protective measures to prevent the spread of any contamination from the victim. Upon arrival at the medical facility and removal of the victim from the ambulance, the ambulance and its attendants will go through a decontamination station.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for medical and public health support, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard L of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(12) and Sections III, IV.A, IV.C, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.13 Recovery and Reentry Planning and Post-accident Operations (10 CFR 50.47(b)(13); NUREG-0654/FEMA-REP-1, planning standard M)

The regulation, as reflected in the planning standard, requires that general plans for recovery and reentry be developed.

In ESP Plan Section M, "Recovery and Reentry Planning and Post-Accident Operations," the applicant described the steps it will take once the emergency situation has ended to mitigate the consequences of the event and to minimize any effects on the health and safety of the public and emergency workers. The staff reviewed this section, as well as other relevant portions, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard M. Planning standard M provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(13).

[M.1] In ESP Plan Section M.1, "Commencement of Recovery Phase," the applicant stated that the emergency director will determine when the recovery phase begins. Before terminating the emergency, the director will observe the various guidelines (or conditions) listed in that section. The staff reviewed these general conditions, which include consideration of the reactor stability, plant radiation levels, and releases of radioactive material to the environment, and finds that they are reasonable and generally include the most significant aspects of the plant's condition that should be considered before ending the formal emergency phase. For example, the staff reviewed the condition associated with a site area emergency or general emergency. For these two classifications, before terminating the emergency and beginning the recovery phase, the emergency director would discuss the situation with plant management; applicable members of the VEGP ERO; and offsite authorities, including the NRC, Georgia EMA, Burke County EMA director, South Carolina EMD director, and SRS emergency staff.

In ESP Plan Section M.3, "Reentry Planning," the applicant further stated that if the accident situation involved a release of radioactivity, it would monitor appropriate areas of the plant and site to determine contamination and radiation levels and that it would identify and control access to these areas in accordance with normal plant procedures. When reentry to a radiation area is required for inspection of work, the activity will be preplanned, and plant radiation work practices and ALARA program principles will be followed. The staff finds this acceptable, in that the applicant has developed general plans and procedures for reentry and recovery and has described the means by which decisions to relax protective measures are reached. These decisions will consider both existing and potential conditions.

[M.3] Once the conditions of the termination guidelines have been satisfied, the emergency director will announce that the emergency is terminated and the plant is in a recovery mode. He

will direct that all elements of the ERO be advised of the change in status via the ENN, ENS, and other pertinent communications systems. At this time, the emergency director will designate a recovery manager to constitute the recovery organization. The staff finds this acceptable, in that it adequately provides for informing members of the response organization that a recovery operation is to be initiated and that changes in the organizational structure are possible.

[M.2] Initially, the recovery manager may direct operations from the EOF. The manager will structure the recovery organization to accomplish the general recovery objectives listed in ESP Plan Section M.2, "Recovery Operations," and will assign individuals to specific positions, depending on the nature and extent of damage to the plant. ESP Plan Figure M-1, "Recovery Organization," shows a representative organization for recovery operations. The staff reviewed Figure M-1 and the descriptions in ESP Plan Section M.2 of the roles of those holding key positions in the facility recovery organization and finds that the applicant has adequately described each position's authority and responsibilities. The staff also finds that the applicant included the appropriate technical personnel with responsibility for developing, evaluating, and directing recovery and reentry operations.

[M.4] In ESP Plan Section M.4, "Exposure Monitoring," the applicant stated that all personnel who require access to the plant or to radiation areas on site during the recovery phase will be issued dosimetry, as appropriate. The criteria for reading TLDs and assessing radiation dose will be in accordance with standard health physics practices. The results of the dosimeter readings, including integrated exposures (i.e., man-rems), will be reported to the recovery manager, the radcon/radwaste manager, and others in the plant organization who normally receive such reports.

[M.4] In ESP Plan Section M.4, the applicant also stated that the States of Georgia and South Carolina and SRS have the responsibility for determining population exposure of the public via plume exposure and ingestion pathways. [E.4.h-I] VEGP will provide radiological information including the estimated quantity of radioactivity released, isotopic composition of released material, and meteorological data to assist the governmental authorities in their determinations. By determining the affected population and by performing dose assessment calculations, including determination of the quantity of radioactivity released and release rate, VEGP personnel can estimate the population exposure, if necessary. Personnel can use data from monitoring stations (TLDs and air samplers) to confirm the exposure estimates.

The applicant referenced Appendix 6 to the ESP Plan, which addresses new ETEs for the VEGP (10-mile) plume exposure pathway in support of this application, in regard to determining the affected population. In RAI 13.3-11, the staff asked the applicant to explain the use of the ETE to determine the affected population for purposes of dose assessment and estimating the population exposure following a radioactive release. In addition, the staff asked the applicant to describe the method in the ESP Plan for periodically estimating total population exposure. The applicant responded that the MIDAS software had the ability and will be used to estimate population exposure, including total population exposure. The staff finds this acceptable. The applicant also stated that SNC will verify that the population numbers used in MIDAS are conservative compared to the updated ETE and, if necessary, will update the software to reflect the new population numbers. In the Safety Evaluation Report with open items, the staff identified the verification/updating of the MIDAS software by the applicant as Open Item 13.3-11. The staff reviewed the applicant's response in its submittal dated October 15, 2007 – which stated that the MIDAS code had been reviewed to determine the impact of the updated ETE,

and that no programming changes are required – and finds it acceptable. Therefore, Open Item 13.3-11 is resolved.

State and Local Emergency Plans [M.1, M.3, M.4]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard M of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard M are adequate. The following summarizes the FEMA findings for planning standard M.

a. State of Georgia

[M.1] GA REP-Base Plan, Section VI.H, "Recovery and Reentry Planning," notes that the State disaster coordinator will control recovery to normal operations, and the radiation emergency coordinator will provide technical advice. EROs with pre-accident emergency response roles will assist in recovery operations and reentry planning and execution. During recovery operations, the radiation emergency coordinator, in consultation with radiological technical personnel, will provide technical expertise concerning the need for continued radiological evaluation and radiation evaluation and control. The DNR-EPD will arrange for the necessary radioanalytical service through the recovery phase, either by utilizing DNR-EPD personnel and equipment resources, or contract services, or both. Reentry into the area will be permitted only after a thorough radiological evaluation of the area by DNR-EPD, which has a mobile and fixed radiological laboratory capability. DNR-EPD will request Federal resources to assist with these evaluations through the FRMAC.

[M.3] GA REP-Base Plan, Section VI.H, also states that the roles and responsibilities of the various agencies will be similar to, or compatible with, their pre-accident or accident roles. The organization of various State agencies in the recovery effort will be similar, if not identical to, the organization depicted in the GEOP. The GEOP prescribes the general organization, role, responsibilities, and operating procedures for all State agencies involved in emergency operations. During the recovery phase, the State disaster coordinator and support agency coordinators/managers will meet periodically to determine progress, review current operations, approve new or proposed operations, keep communication lines open, and disseminate information relevant to needed changes or modifications to response activities. Should a unique situation present itself in a recovery operation that would require changes to the current plan of operation, the State disaster coordinator would direct those changes and provide written notice of the changes to the various response agencies.

[M.4] GA REP-Base Plan, Section VI.G, "Incident Assessment and Protective Response," states that after plume passage, assessment activities will focus on determining the consequences of any radioactive materials that the release may have deposited. Included in these activities are assessments of radiation doses to the general public resulting from reentry into evacuated areas and ingestion/inhalation of deposited materials from the incorporation of radioactive materials in food products and water. Details of these assessment activities and protective measures, which may be implemented to reduce the potential impact of deposited radioactive materials on agricultural pathways, appear in GA REP-Annex F, "Ingestion Pathway." GA REP-Base Plan, Section VI.H, discusses reentry monitoring and protective measures. GA REP-Annex D lists site-specific locations that may be monitored or sampled.

GA REP-Annex D, Section E.1.e, "Correlation of Dose Projections and Actual Dose Measurements," states that as an incident progresses, the radiation emergency coordinator will evaluate the need for correlation of dose projections and actual dose measurements. As soon as field measurements are made, they can be compared with projected values, but only after sufficient data are gathered will a decision be made as to whether correlation (or scaling) factors should be developed for use in the emergency dose projections. Population dose estimates will be made using release rate and meteorological data for the release period and data from the licensee, DNR-EPD, and TLDs, as well as DOE aerial measurements (as such data become available). This activity will be coordinated with the FRERP, which identifies the responsible agencies that will be involved in long-term dose assessment activities after an accident.

b. Burke County, Georgia

[M.1] Burke County Plan, Section IV.B.5.d (13), states that members of the evacuated population will be returned to their homes when the affected area is safe for reentry, in accordance with procedures described in GA REP-Base Plan, Section VI.H.2, "Reentry." The activities and functions of city and county officials, departments, and agencies will provide (1) traffic control to assure an orderly return of evacuees to their homes, (2) transportation to return nonambulatory persons to their homes, (3) technical assistance for necessary decontamination of homes and property, and (4) guidance on food and water supplies for people and livestock. Attachment A states that reentry and recovery operations will be initiated only when plant officials verify that the emergency situation has been eliminated, and State officials, acting on their field data, ascertain that there is no longer a threat to the health and safety of persons living nearby. Local officials will maintain coordination with GEMA and make decisions in accordance with EPA PAGs.

c. State of South Carolina

[M.1, M.3] SCTRERP, Appendix VII, "Recovery and Re-entry," states that radiological monitoring, exposure evaluation, and decisions concerning recovery and reentry will be the responsibility of the BLWM, DHEC. Before recommending reentry, the BLWM will consult with the NRC, nuclear facility officials, local government, and other technical agencies. SCORERP, Section IV.D, "Post-Accident Recovery," further describes recovery authorities and actions, stating that SCEMD will recommend to the Governor when reentry can be initiated for specific evacuated areas. With the Governor's concurrence, SCEMD will notify the RER organizations and local governments that reentry can begin. Decisions to relax protective measures and allow recovery and reentry into an evacuated area require a continuous estimate of the radiological situation. The estimate and calculation are accomplished by the analysis of radiological monitoring data from air samples, milk, water, and direct radiation measurements. Reentry will be authorized when projected doses fall below 20 percent of the appropriate PAG and when surface contamination is reduced below the applicable limits.

[M.1] SCORERP Section IV.B.6, "Law Enforcement," states that during recovery operations, SLED, in cooperation with all State and local law enforcement agencies, DHEC, Clemson University Extension Service, and the State Department of Agriculture, will develop and implement plans for maintaining access control to all evacuated areas and for long-term or permanent access control to restricted areas. (This is discussed further in SCORERP Appendix 5, "EPZ Access Control Identification Procedures.") To further support recovery operations, SLED will assist with the development and implementation of plans to embargo (or restrict) transportation of contaminated food products and will assist special groups such as

farmers or other individuals performing missions involving maintenance and disposition of livestock and food products.

DHEC will continue to provide technical recommendations and accident assessment until the recovery phase is terminated and will coordinate closely with local governments throughout the post-accident recovery. Various media will disseminate extensive public information on recovery instructions, such as decontaminating foodstuffs, caring for livestock, and personal precautions. SCORERP Annex G describes specific activities associated with recovery and reentry. **[M.4]** SCTRERP Appendix III, "Environmental and Health Effects Assessment Plan," states that the total projected exposure resulting from actual (or projected) releases is the product of individual exposure and population affected. Sector population will be obtained from the SCORERP and the utility, with the use of the evacuation time study for the 10-mile EPZ evacuation zones.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[M.1] The counties will rely on DHEC for relaxation of protective measures, in accordance with the SCTRERP and its procedures. Notification to relax protective measures will come from the State EOC, and the counties will follow the procedures issued by the SCTRERP for general recovery plans.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for recovery and reentry planning and post-accident operations, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard M of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(13), and Sections III, IV.A, IV.B, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.14 Exercises and Drills (10 CFR 50.47(b)(14); NUREG-0654/FEMA-REP-1, planning standard N)

The regulation, as reflected in the planning standard, requires that periodic exercises be conducted to evaluate major portions of emergency response capabilities, periodic drills be conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills be corrected.

In ESP Plan Section N, "Exercises and Drills," the applicant described the conduct and frequency of emergency exercises and drills, including coordination between the VEGP site and offsite EROs. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard N, "Exercises and Drills." Planning standard N provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(14).

[N.1, N.2] In ESP Plan Section N, the applicant stated that emergency exercises and drills are conducted to test and evaluate the adequacy of emergency facilities, equipment, procedures, communication links, actions of emergency response personnel, and coordination between VEGP and offsite EROs. Some exercises and/or drills will be unannounced. **[N.1] Unit 3 ITAAC 8.1** states that "a full participation exercise (test) will be conducted within the specified time periods of 10 CFR Part 50, Appendix E." The specific acceptance criteria are provided in Table V2A3-1.

In RAI 13.3-46.h, the staff asked the applicant to provide a revised acceptance criterion 8.1.1 that identifies specific exercise objectives and associated acceptance criteria. In its response, the applicant provided a revised Table V2A3-1, which included numerous acceptance criteria for ITAAC 8.1. Many of these acceptance criteria used nonspecific language, such as stating that an action "should be" done rather than "is" done. Designating that an exercise action "should be" done allows for an acceptable outcome if nothing is done; that is, it implies that the action is optional. This nonspecific language is contrary to the intended purpose of ITAAC, in that meeting ITAAC acceptance criteria is not optional. The ITAAC should provide specific and objective goals, for which completion of the acceptance criteria is easily discernible. The staff had suggested revisions to the ITAAC 8.1 acceptance criteria 8.1.1: A.1.a, D.2.b, D.2.c, E.1.a, E.1.b, E.2.a, E.2.b, E.3.a, E.5.a, E.6.a, E.7.a, E.7.c, F.1.a, F.1.b, F.2.a, F.2.b, F.2.c, G.1.a, and G.1.b. In the Safety Evaluation Report with open items, the staff identified the revision of these acceptance criteria as Open Item 13.3-12. The staff reviewed the applicant's response in its submittal dated October 15, 2007, which made the suggested revisions, and finds it acceptable. Therefore, Open Item 13.3-12 is resolved.

In RAI 13.3-46.e, the staff asked the applicant to explain why there was no **Unit 4 ITAAC 8.1** comparable to the **Unit 3 ITAAC 8.1**. The applicant responded that since the Unit 3 exercise will be completed before fuel load for Unit 3, and the emergency plan elements for Unit 4 are identical to those for Unit 3, another full exercise is not required for Unit 4. The staff agrees that capabilities that are common to both Units 3 and 4 can be adequately demonstrated through the Unit 3 exercise; however, capabilities that are specific to a unit require unit-specific exercise evaluation. The proposed **Unit 3 ITAAC 8.1.1** includes, for example, acceptance criteria that would demonstrate performance associated with EAL parameters (see 8.1.1, A.1) and OSC activation (see 8.1.1, D.1), which are not totally common to Units 3 and 4 (i.e., they are not identical). The applicant must either explain why **Unit 3 ITAAC 8.1** will demonstrate the sufficiency of the ITAAC in relation to Unit 4, or supplement Table V2A4-1 with comparable Unit 4 ITAAC. In the Safety Evaluation Report with open items, the staff identified the resolution of this issue as Open Item 13.3-13. (See also SER Section 13.3.3.2.1, regarding **Unit 3 ITAAC 9.1**, and SER Section 13.3.3.2.9, regarding Unit 3 ITAAC 6.1 through 6.7.) The staff reviewed the applicant's response in its submittal dated October 15, 2007 – which provided comparable Unit 4 ITAAC in Table V2A4-1 – and finds it acceptable. Therefore, Open Item 13.3-13 is resolved.

Unit 3 ITAAC 8.1.2 states that onsite emergency response personnel are mobilized in sufficient number to fill the emergency positions identified in emergency plan Section B (VEGP Emergency Organization), and they successfully perform their assigned responsibilities, as outlined in criterion 8.1.1.D (Emergency Response Facilities). **Unit 3 ITAAC 8.1.3** states that the exercise is completed within the specified time periods of 10 CFR Part 50, Appendix E; offsite exercise objectives have been met; and there are [either] no uncorrected offsite deficiencies, or a license condition requires offsite deficiencies to be corrected prior to operation above 5% of rated power.

[N.1] Emergency preparedness exercises test integrated response capabilities and are conducted in accordance with NRC and FEMA guidance, as described below. Exercises are conducted every 2 calendar years and are designed to include the demonstration of response to a major portion of the basic elements of the emergency preparedness plans of the participating organizations. The planning and execution of the emergency exercise is coordinated with Federal, State, and local agencies, as appropriate.

Those exercises in which offsite response groups play a significant part include mobilization of Federal, State, and local personnel and resources adequate to verify the capability to respond to an accident situation. The exercise program for VEGP incorporates the following features:

- Scenarios are varied from year to year so that all major elements of the VEGP emergency preparedness program are tested within a 6-year period.
- VEGP starts an exercise between 6:00 p.m. and 4:00 a.m. once every 6 years.
- Since exercises are normally scheduled several months in advance, a variety of weather conditions is likely to occur.

[N.2] A drill is a supervised instruction period aimed at testing, developing, and maintaining skills in a particular operation. Drills may be incorporated into the biennial exercise; they will be supervised and evaluated by either a training instructor or designated controller/evaluator. The States of Georgia and South Carolina, including the counties of Burke, Aiken, Allendale, and Barnwell, will be permitted to participate in drills when requested by the State or county government.

[N.2] Drills shall be conducted (in the categories indicated below) to ensure that adequate emergency response capabilities are maintained in the interval between biennial exercises. At least one of these drills will be conducted during the calendar year when there is no biennial exercise and shall involve a combination of some of the principal functional areas of the onsite emergency response capabilities. The principal functional areas include activities such as command and control of emergency response, accident assessment, protective action decision-making, and plant system repair and corrective actions. Activation of all ERFs (TSC, OSC, and EOF) is not required during these drills. Supervised instruction, success paths, and accident management strategies may be included in these drills.

- Communication Drills – Communication drills will be conducted every 2 years (normally during the biennial exercise) to ensure that emergency communication channels between VEGP facilities, field monitoring teams, and offsite authorities are operable. In VEGP Section F.8, "Communications Systems Tests," the applicant described the testing of various communication channels, which are discussed in SER Section 13.3.3.2.6.
- Fire Drills – Quarterly fire drills are conducted in accordance with the respective FSAR and are scheduled so that each member of the fire brigade participates in at least two drills per year. An annual practice is conducted which requires extinguishing a fire.
- Medical Emergency Drills – A medical emergency drill involving a simulated contaminated person is conducted each calendar year and may be included as part of the biennial exercise. The simulated injured player is given initial treatment by the

VEGP first aid team and transported by ambulance to the hospital for subsequent treatment by the hospital staff.

- Radiological Monitoring Drills – Plant environs and radiological monitoring drills are conducted each calendar year perhaps as part of one of the semiannual health physics drills. A team is dispatched to obtain required measurements or samples, and the drill controller evaluates the proper use of survey instruments, recordkeeping, communications, and the collection of sample media (soil, air, water, and vegetation).

- Health Physics Drills – Semiannual health physics drills are conducted to simulate, as closely as possible, anticipated elevated airborne and liquid samples and radiation in the environment.

In ESP Plan Sections F and H (discussed in SER Sections 13.3.3.2.6 and 13.3.3.2.8, respectively), the applicant further addressed the operational checks and testing of emergency equipment and instruments, which include emergency communications systems.

[N.2] Drills will evaluate the proper response in accordance with EIPs. Use of sample techniques, survey techniques, monitoring methods, decontamination methods, and protective clothing and respirators will be demonstrated, as appropriate, during the drill, but these techniques and equipment may not be used throughout the drill (for example, field monitoring teams will not wear protective clothing). Exposure control considerations will also be exercised during the drill. Post-accident sampling under simulated accident conditions will be demonstrated each calendar year, and the post-accident analysis may be performed using available instrumentation or using laboratory equipment to demonstrate the methods employed under actual accident conditions.

[N.3] In VEGP Plan Section N.3, "Scenarios," the applicant stated that each drill and exercise is conducted in accordance with a scenario. The scenarios for the drills may be considerably less extensive than the scenario for the biennial exercise. The preparation of exercise scenarios is directed by the manager for training and the EPC, with assistance from other departments, and is coordinated with offsite authorities when they are participating in the exercise. The licensee and participating States submit a copy of the scenario to the NRC and FEMA, respectively.

[N.3] The exercise program is structured with sufficient flexibility to allow free play for decision-making processes, and free-play items may be included in the scenario to maintain player interest. The exercise scenario package identifies a specific accident sequence and includes messages that support the accident sequence. The exercise control organization receives general instructions concerning the deviation of plant personnel from procedural response and may restrict player action if the response would interfere with the time sequence or prevent demonstration of an exercise objective. [N.4, N.5] In VEGP Plan Section N.4, "Evaluations and Corrective Actions," the applicant stated that all drills and exercises are evaluated. For periodic drills, the process consists of the following steps:

- Drills will be evaluated by controllers/evaluators selected on the basis of expertise and availability.

- Improper or incorrect performance during the drill may be corrected by the controller/evaluator and the proper method pointed out or demonstrated.

- The exercise or drill controllers assemble the players at the conclusion of activities for critique. Players are encouraged to identify areas where improvements are required. The drill controllers also present their observations to the players.

- The site EPC submits a list of corrective actions, responsibilities, and schedule information to the general manager of the nuclear plant for approval.

- The EPC assigns action items and monitors the status of completion of corrective actions. Significant problems will be brought to the attention of appropriate plant management.

[N.4, N.5] Exercise evaluation and corrective action are carried out in similar fashion. Critiques with the players are conducted in each facility and coordinated by the controller/evaluator at that facility. Each controller/evaluator submits written reports to the exercise controller. An overall critique is presented to key players and to the control organization after the exercise. [N.5] The general manager of the nuclear plant approves the responsibilities for corrective actions and deadlines for completion. The site EPC monitors completion status. In addition to the internal critique and evaluation, Federal observers may observe, evaluate, and critique the biennial exercise. Corrective actions resulting from this critique, together with deadlines for completion, are assigned by the general manager of the nuclear plant. The general manager is periodically advised of the status of these open items. If VEGP fails to demonstrate with reasonable assurance that protective measures can and will be taken, a remedial exercise would be performed, as directed by the NRC.

The staff finds that the applicant has provided for an adequate exercise and drill program for the VEGP site, which includes the participation of local, State, and Federal personnel and resources. Exercise conduct will be consistent with NRC and FEMA rules, in that the program adequately addresses the areas of scope, participation, frequency, conditions, scenarios, and objectives. In addition, the exercise and drill program provides for the necessary control and observations, followed by formal critiques and the implementation of identified corrective actions and necessary improvements.

State and Local Emergency Plans [N.1, N.2.a, N.2.c, N.2.d, N.2.e(1), N.3, N.4, N.5]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard N of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard N are adequate. The following summarizes the FEMA findings for planning standard N.

a. State of Georgia

[N.1.a, N.1.b] GA REP-Base Plan, Section VII.A, "Exercises/Drills," states that periodic exercises will be conducted to evaluate major portions of emergency response capabilities and to develop and maintain key skills. Periodic exercises will be held in accordance with current FEMA requirements and will include mobilization of State and/or local emergency response personnel. **[N.2.a, N.2.d, N.2.e]** Drills may be a part of an exercise and generally consist of communication, medical emergency, radiological monitoring, and health physics drills. Sections VII.A.2.b(1)-(4) describe these drills in more detail.

[N.1.a, N.3.a-f] Exercise and drill scenarios will be written to include specific testing of various elements of response. Major exercises will occur every 2 years, with full participation of the State of Georgia at least every 6 years. The Burke County government is required to participate in a full exercise at least every 2 years. (See also GA REP-Annex D, Section G, "Drills/Exercises/Training and Review.") Additional conduct and responsibilities associated with exercises and drills are described in GEOP Sections V.B.5 and V.C.6, and Section II of ESFs 1 through 15 refer to participating in exercises and tests. **[N.4, N.5]** After each exercise/drill has been terminated, a critique will be held and recommendations for improvement discussed. On the basis of lessons learned, each individual State agency will implement recommendations, as appropriate.

b. Burke County, Georgia

[N.1.a, N.1.b] Burke County Plan Section V.B states that the EMA director will establish a training program and coordinate with the department and agency heads of local governments to make available appropriate personnel for training and participation in drills and exercises. Attachment K, Section B, "Exercises and Drills," states that to ensure that county emergency preparedness is kept at a high level of readiness, periodic local exercises and drills will be conducted to test plans and personnel and to identify any organizational or operational deficiencies. **[N.2.a, N.2.c, N.2.d, N.3.a-f]** Various drills and scenario development, including exercise/drill frequencies, are also discussed.

[N.4, N.5] The EMA director will coordinate with GEMA on the use of State and Federal agencies as observers or evaluators. GEMA will provide advance notification to Federal agencies if they become involved. Procedures and guidelines will be established to assist in evaluating the formal critique, and the EMA director (or designated planning coordinator) will be responsible for revising the county plan to reflect the critique findings.

c. State of South Carolina

[N.1.a, N.1.b] SCORERP Section V.A.4 (14) states that SCEMD is responsible for conducting RER drills and exercises as specified in NUREG-0654/FEMA-REP-1 and South Carolina Code of Regulations 58-1 and 58-101. In addition, SCORERP Annex D, "Exercises and Drills," states that exercises and drills are conducted, based on simulated incidents at nuclear power plants, to test and evaluate State and local offsite RER capabilities and to develop and maintain skills of emergency responders. The State will conduct an exercise at least biennially with each FNF to demonstrate all emergency-phase capabilities and to verify that State and county emergency plans and procedures are adequate to protect the health and safety of the public living within 10 miles of the plant. At least every 6 years, the State will conduct a full participation exercise to include a plume phase and ingestion exposure pathway exercise.[33]

[N.3.a-f] SCORERP Annex D states that the nuclear power plant will provide SCEMD with a scenario and radiological data no later than 75 days before the exercise, which will be submitted to DHS for approval no later than 60 days before the exercise. SCEMD will coordinate the extent of play with DHEC and the affected counties. **[N.2.a, N.2.d, N.2.e]** Various drills and scenario development, including exercise/drill frequencies, are also discussed in Annex D,

---

[33] The ingestion exposure pathway exercise is conducted once every 6 years, alternating between a site within the State boundary and a site where the State shares an ingestion pathway EPZ. Each year, the State will fully participate in at least one exercise.

Section III.C, "Drills." (See also SCORERP-Part 5, Section IV.B.12, and SCTRERP, Appendix X, "Exercises and Drills.") **[N.4, N.5]** SCEMD is responsible for coordinating and conducting the evaluation critique for each exercise.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[N.1.a, N.1.b] Section IV.R, "Exercises and Drills," of the county plans states that the counties will participate in RER exercises in conjunction with exercises at the FNF and that these exercises will be conducted on a frequency and as set forth in FEMA and NRC regulations. **[N.2.a, N.2.c, N.2.d]** Communications between the county, VEGP, and SCEMD will be tested monthly. Medical emergency drills will be coordinated through VEGP and Doctors Hospital in Augusta, Georgia. Radiological monitoring drills will be conducted in coordination with DHEC.

[N.3.a-f] Exercises and drills will be designed and executed in a manner that allows free play for decision-making and meets the stated objectives. **[N.4, N.5]** SCEMD, DHEC, and VEGP will prepare the exercises, and Federal and/or State and local officials will observe and evaluate them. Each drill will be planned and prepared to include a description of arrangements for advanced materials to be issued to official observers. Every drill will be evaluated, and a critique will be made and retraining conducted, if required.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for exercises and drills, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard N of NUREG-0654/ FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(14), and Sections III, IV.F, and IV.G of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.15 Radiological Emergency Response Training (10 CFR 50.47(b)(15); NUREG-0654/FEMA-REP-1, planning standard O)

The regulation, as reflected in the planning standard, requires that RER training be provided to those who may be called on to assist in an emergency.

In ESP Plan Section O, "Radiological Emergency Response Training," the applicant described the training that will be conducted for both onsite and offsite response organizations in support of an emergency at the VEGP site. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was the evaluation of the emergency plan against NUREG-0654/FEMA-REP-1, planning standard O, "Radiological Emergency Response Training." Planning standard O provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(15).

[O.1, O.4, O.5] In ESP Plan Section O, the applicant stated that emergency response training is provided at the following four levels:

1. All VEGP badged personnel will receive general employee training (GET) at the inception of onsite duties. GET will include emergency classification, individual response, signals, accountability, and site dismissal procedures.

2. All VEGP ERO personnel will receive specialized training per Table O-2, "Training Course Description."

3. Offsite response groups who may support onsite situations, such as fire or personnel injury, will be offered annual training in notification, expected roles, site orientation, security procedures, and basic radiation protection. [O.1.a]

4. Selected State and local emergency response management personnel with offsite emergency response roles will be offered a seminar/training course in the following specific areas for VEGP: [O.1.a]

    - emergency classification system
    - protective action recommendation criteria and relationship to plant conditions
    - emergency response organization

[O.1, O.5] These offsite management personnel will be offered initial training and annual retraining. Coordination with offsite authorities will include planning for and participation in VEGP exercises. All badged VEGP workers will receive general training in emergency preparedness. Selected individuals on site and off site will receive specialized annual training in the implementation of the VEGP Emergency Plan.

[H.2, H.4, O.1, O.4] In addition to ESP Plan Section O, ESP Plan Appendix 7 also addresses RER training. In Section A7A.1, "Purpose," of Appendix 7, the applicant presented the framework for operations of the EOF and SNC and stated that Appendix 7 is an integral part of the site-specific emergency plans. The applicant further stated in Section A7G.1.1, "Training," that corporate personnel identified in the ERO receive training, which consists of familiarization with the site emergency plans and applicable EIPs required to carry out their specific functions. The corporate emergency planning coordinator is responsible for assuring that training is conducted for corporate emergency response personnel each calendar year and documented in accordance with established practice. The applicant provided a training matrix for corporate personnel who are assigned to the ERO in Appendix 7, Table A7-2, "Corporate Emergency Response Organization Training Matrix," which cross-references each position with the three training subject areas (emergency plan overview, position-specific items, and offsite dose assessment). In Appendix 7, Table A7-3, "Description of Training Subject Areas," the applicant also described in detail the three subject areas. (Appendix 7 is also addressed in ESP Plan Sections A, B, and H and discussed in SER Sections 13.3.3.2.1, 13.3.3.2.2, and 13.3.3.2.8, respectively.)

[O.1, O.4] As a minimum, training will be provided in the subject areas shown in Table O-1, "ERO Qualification," to various personnel according to their emergency response position, also shown in Table O-2. These subject areas do not necessarily represent specific course titles, since several individual courses may be used to implement the training in each area. Also, both the content and depth of training may be varied slightly, depending on the particular audience, to tailor the presentation to the specific needs of the group. Table O-2, "Training Course Description," lists the following training courses and the description of each course:

- core damage assessment
- offsite communications
- emergency plan overview
- first aid standard Red Cross multimedia, or equivalent [O.3]
- management of radiological emergencies
- offsite dose assessment
- post-accident sampling
- repair and corrective actions
- field monitoring team
- radiological emergency team in plant
- security
- medical support of radiation emergencies
- self-contained breathing apparatus

[O.1] The training will be conducted in accordance with lesson plans. Lesson plans will incorporate classroom lectures, demonstration and use of equipment, and walkthroughs of facilities, as appropriate. A written examination or practical exercise may be administered at the conclusion of a lesson. Records of the attendance and examination scores will be retained in the training files. Those designated to receive training in each subject area are indicated in Table O-3, "Training Requirements for VEGP ERO Personnel."

[O.1, O.5] RER training is offered throughout the year, with each training course presented a least once per calendar year, or as often as necessary to ensure that ERO personnel remain qualified in accordance with training requirements in ESP Plan Section O.2, "Qualifications." Annual retraining consists of initial training material reinforcement and appropriate lessons learned from the previous year's operating experience. Lessons learned that are distributed by other methods may not be included in annual retraining. The general manager of the nuclear plant may receive credit for management of radiological emergencies requalification by participation in an integrated drill or annual exercise. **[O.2]** In addition, drills and exercises are an integral part of the training program and are conducted as specified in ESP Plan Section N and discussed in SER Section 13.3.3.2.14. During practical drills, on-the-spot corrections will be made if the situation and time allow. If not, the critique will indicate the corrections. Upon completion of each training session or drill, the participants will be asked to evaluate the training to ensure continued improvement.

The staff finds that the applicant has established an adequate training program, which includes initial and annual retraining, for members of the onsite emergency organization, and offsite emergency organizations who may be called on to assist in an emergency at the VEGP site. In addition, the training program for members of the onsite emergency organization includes classroom training, as well as practical drills and exercises in which each individual demonstrates the ability to perform his assigned emergency function.

State and Local Emergency Plans [O.1, O.1.b, O.4.a-h, j, O.5]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard O of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard O are adequate. The following summarizes the FEMA findings for planning standard O.

a. State of Georgia

[O.1, O.4, O.5] GEOP Section IV.A.2 states that preparedness activities occur before an emergency or disaster to support and enhance response and that these activities include planning, training, exercises, and community awareness and education. Section V, "Direction and Coordination," states that GEMA will provide disaster preparedness information, training, and exercises, including technical assistance and planning guidance to State and local agencies. The State agency heads will support and/or conduct training and exercises for State personnel who are assigned to execute ESF responsibilities. GEOP ESF-10, "Hazardous Materials," states in Section III.A.2.a.v that training in radiological monitoring for self-protection is provided for hospital and emergency personnel.

GA REP-Base Plan, Section IV.A.2.h, states that GEMA provides radiological monitoring training assistance. In addition, Section VII.B, "Training," states that Georgia considers adequately trained emergency response personnel at all levels of government to be absolutely essential to ensuring the protection of the public health and safety. Because of the turnover in personnel, improvements in technology, and the lack of actual emergencies to provide experience, it is necessary to continuously upgrade capabilities and retrain personnel. Training programs are implemented at all levels of government in the State. The success of the efforts is evaluated after various categories of personnel have responded to real situations or after participation in drills and exercises conducted on a statewide basis. The results of these evaluations are utilized by the respective organizations to improve their training programs. Section VII.B also describes Federal- and State-sponsored training for State and local personnel and local training for local personnel.

In addition to initial training programs on RER, the State plans to conduct retraining (i.e., refresher training) in essential program areas on an annual (or as needed) basis. The retraining will be provided to those individuals and organizations that provide a key role in RER. Emphasis will be given to various program areas, including emergency plans, protective actions, accident assessment techniques, notification procedures, and agency roles and responsibilities. GA REP-Base Plan, Section VIII.B, "Planner Training," states that personnel involved in RER planning will be required to receive periodic training on planning techniques. The principal source of training will be federally sponsored workshops and training sessions on emergency planning. Additionally, planning personnel may participate in planning training sessions sponsored by States, professional associations, or private organizations. Personnel selected for participation in such training programs will normally be State and local government personnel with key roles in the emergency planning process.

GA REP-Annex D, Section F.1.c, states that a private contract corporation provides training for hospital staff, and the State will provide initial and supplemental training for emergency medical technicians and hospital emergency room personnel. (See also Section F.4.) Section G.2, "Training," states that the DNR-EPD radiation program and GEMA will develop a joint radiological training program. This program will be oriented toward training support personnel involved in RER. The State will identify designated persons responsible for training, including scheduling and conducting drills. A typical training program will include the following elements:

- familiarization with emergency plan
- use of radiological survey instruments
- sample collection procedures
- health physics fundamentals

- notification and reporting procedures

b. Burke County, Georgia

[O.1, O.4, O.5] Burke County Plan Section IV.A.2 states that the Georgia DNR-EPD will monitor the situation at VEGP and be responsible for keeping the State disaster coordinator (i.e., GEMA director) and pertinent Federal agencies informed of planning, training, and operational requirements related to environmental health and safety matters. Section V.A states that the responsibility for overall RER planning, training, and operations in the county rests with the chairman of the County Board of Commissioners, who has the responsibility to initiate action and provide direction and control at the local level and to conduct emergency operations to cope with the effects of a nuclear incident (consistent with its classification).

Section V.B states that the EMA director is responsible for actual plan development and updating and establishment of a training program. In addition, the EMA director will coordinate with local department and agency heads to make available the appropriate personnel for training and participation in drills and exercises. Burke County Plan Attachment K, "Training and Exercises," states in Section A, "Training," that county EMA personnel, as well as other department/agency personnel and emergency workers, train regularly through State and locally sponsored programs. The GEMA training office assists and monitors local training activities. (News media training is discussed in SER Section 13.3.3.2.7.)

Training in radiological monitoring and decontamination is provided by the GEMA radiological programs and DNR-EPD (as needed) to local and other emergency management organizations – such as police, fire, EMS, and public works – including staff of reception and care centers and shelter and decontamination centers. Specialized initial training and periodic retraining programs are conducted for personnel involved in conducting RER operations. Training modules, which have been designed for local officials, provide objectives and scope related to the particular course of instruction. The local EMA director and staff, other local officials, and department/agency personnel receive emergency preparedness training through GEMA-sponsored professional development series courses. This program enhances the capabilities of these officials to carry out their responsibilities in administration, planning, and response.

c. State of South Carolina

[O.1, O.4, O.5] SCORERP Section V.A.4 (12) states that SCEMD is responsible for coordinating the RER training of State and local government personnel. SCORERP Annex B, "Training," states that accident assessment personnel and radiological monitoring teams are trained by DHEC, as outlined in SCTRERP Appendix IX, "Training." Appendix IX describes training programs and requirements and states that each member of the (DHEC) BLWM technical staff will be trained in basic health physics, radiation protection, and emergency response techniques during the first 6 months of employment. This training may consist of on-the-job and in-house training, and additional formal training in RER will be provided. The BLWM encourages the training of other response organizations, such as highway patrol, local law enforcement, firefighters, rescue squads, hospital emergency personnel, and emergency managers, and has a training unit assigned to give emergency radiological response training (on request) to outside agencies. SCORERP Annex D, "Exercises and Drills," describes the procedures for the periodic testing of State and county RER plans and evaluation of offsite response organizations' capabilities to respond to an FNF incident.

Annex B, Section III, "Concept of Operations," states that SCEMD is responsible for ensuring the availability of training opportunities for all agencies and individuals involved in emergency response to an incident at a nuclear power plant. At the State level, department or agency heads are responsible for ensuring that their personnel attend appropriate RER courses needed to accomplish all tasks assigned by this (and other applicable) documents. County emergency preparedness directors/coordinators are responsible for coordinating the training of local personnel and facilitating their attendance at SCEMD-sponsored training. SCEMD will make use of the train-the-trainer concept to ensure that State and local agencies and organizations have qualified instructors for maintenance of internal personnel capabilities. In support of State and county training, SCEMD will conduct an annual training needs assessment of State agencies and FNF counties to determine specific requirements for courses involving radiological monitoring and decontamination, medical services, and emergency worker safety. SCEMD will use the information derived from this assessment to develop an annual training program that will integrate initial RER training for new personnel, annual refresher training, on-the-job training, and periodic drills and exercises.

State and local directors/coordinators and key response personnel participate in relevant independent study courses, radiological courses, and Federal/State training workshops and seminars. SCEMD has developed the fundamentals course for radiological monitors and emergency workers, which fills the training requirements for local responders, and focuses on the unique aspects of South Carolina RER plans, procedures, equipment, and standards. Shelter managers complete a shelter operations course, conducted by the ARC, and participate in regularly scheduled drills, exercises, and refresher courses to maintain proficiency and shelter manager qualification. Training for medical support personnel involved in transport and treatment of radiologically contaminated individuals is conducted by hospital radiation safety officers, health physicists from the utility, and SCEMD personnel.

The Governor's Office (or authorized representative) and the utility information specialist will assure that State and local PIOs are trained on JIC operations, as well as transmission procedures. The EAS and the ETV networks will periodically test their abilities to disseminate emergency information to monitoring stations. In addition, SCORERP Section V.A.4(23) states that SCEMD will provide training and information briefings for news media, including State and local PIOs, to acquaint them with JIC operations, State and local RER plans, media communications, and measures to protect the public against radiation exposure. Section V of Annex B lists training frequencies for agencies and personnel.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[O.1, O.4, O.5] Section IV.S, "Radiological Emergency Response Training," of the county plans states that the county EMA is responsible for training offsite emergency personnel to respond effectively to an incident involving VEGP. Personnel who receive initial and follow-up training include law enforcement, fire, rescue, emergency medical, shelter management, and radiological defense personnel. The annual training program for offsite emergency response personnel consists of classroom training, tabletop exercises, and government conferences. In addition, emergency service and government officials with emergency assignments will participate in an annual exercise with VEGP.

The county EMA director will receive initial and follow-up training by SCEMD, which will address daily responsibilities and radiological defense and will include management seminars, workshops, and career development courses. The EMA director is responsible for county training and refresher courses, which address county government responsibilities and specific

duties of the emergency services. Instructors take periodic refresher courses. Accident assessment, which is a State responsibility, is addressed in the STRERP. (See also SCORERP Annex B, "Training.)

Instructors take periodic refresher courses. To become a local radiological monitor, one must take the standard fundamentals course for radiological monitors and emergency workers. A refresher course is given every year, and monitors must take this refresher course to remain certified. Monitors must also participate in exercises and drills that involve radiological monitoring, which is provided to the following county and municipal agencies:

- county law enforcement and municipal police departments
- municipal and volunteer fire departments
- county EMS and volunteer rescue services
- local ARC workers

County personnel will be trained locally, with assistance from SCEMD and other appropriate State agencies. Annual training will cover responsibilities, notification and alert procedures, sector assignments, and familiarization with SOPs. Personnel will participate in government conferences, tabletop exercises, and an annual RER exercise with VEGP.

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for RER training, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard O of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(15) and Sections III, IV.A, and IV.F of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.3.2.16 Responsibility for the Planning Effort—Development, Periodic Review, and Distribution of Emergency Plans (10 CFR 50.47(b)(16); NUREG-0654/ FEMA-REP-1, planning standard P)

The regulation, as reflected in the planning standard, requires that responsibilities for plan development and review and for distribution of emergency plans be established and that planners be properly trained.

In ESP Plan Section P, "Responsibility for the Planning Effort," the applicant described the responsibilities and authorities associated with developing and maintaining emergency preparedness for the VEGP site, including training and conducting audits of the emergency preparedness program. The staff reviewed this section, as well as other relevant portions of the application, to determine whether the application conforms to the applicable guidance and complies with the pertinent regulatory requirements. The staff's primary focus was its evaluation of the emergency plan compared to NUREG-0654/FEMA-REP-1, planning standard P, "Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans." Planning standard P provides the detailed evaluation criteria that the staff should consider in determining whether the emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(16).

[P.2] In ESP Plan Section P, the applicant stated that the executive vice-president/chief nuclear officer at SNC has overall responsibility and authority for all nuclear activities, including emergency preparedness programs. **[P.3]** The emergency planning supervisor is responsible for overseeing emergency planning activities off site and coordinating those activities with VEGP, Federal, State, and local response organizations. The EPC, stationed at the plant site, is responsible for coordinating emergency preparedness activities on site and in the vicinity of the plant. The emergency planning coordinator coordinates site input and involvement in emergency planning programs with the EPC. The EPC is responsible for the implementation of the emergency plan and procedure development and maintenance. Figure P-1, "Emergency Preparedness Organization," shows these individuals and other responsible members of the organization, along with the associated reporting chain and interfaces. The staff finds that the applicant has adequately identified those individuals (by title) who have the authority and responsibility for RER planning, as well as development and updating of the emergency plans and coordination with other response organizations.

[P.1] Individuals with emergency planning responsibilities are trained by self-study and by attending industry seminars, short courses, and workshops. In RAI 13.3-5.a, the staff asked the applicant to describe how SNC determines that the planners are properly trained. The applicant responded that the responsibility to ensure proper training of the emergency planning supervisor, emergency planning coordinator, EPC, and other individuals with emergency planning responsibilities is assigned to the respective individual's supervisor. SNC uses a management system that provides for the annual review of performance and associated individual training and qualification issues. All employees prepare an annual training plan and are held accountable for the execution of the training plan by their supervisors. The staff finds that the training and qualifications of VEGP personnel responsible for radiological emergency planning in support of the VEGP site are adequate.

The emergency plans are maintained by the fleet security and emergency planning manager with the emergency planning supervisor as the principal emergency planning contact. Onsite EIPs are maintained by the plant training and emergency preparedness manager, with the EPC as the principal emergency preparedness contact. EIPs for the corporate ERO are maintained by the emergency planning supervisor. (The submission of detailed emergency implementing procedures for VEGP Units 3 and 4 is addressed in **Unit 3 ITAAC 9.1**, and is further discussed in SER Sections 13.3.3.2.1, 13.3.3.2.2, 13.3.3.2.4, 13.3.3.2.8, 13.3.3.2.9, and 13.3.3.2.10.) [P.6] In addition to the VEGP Plan, several other formal emergency plans have been developed to support the overall emergency response effort. These supporting plans and their sources are listed in procedure NMP-EP-300, "SNC Corporate Emergency Planning Activities." [P.7] In RAI 13.3-5.e, the staff asked for a listing (by title) of procedures that will be required to implement the emergency plan, cross-referenced to the section(s) of the plan to be implemented by each procedure for VEGP Units 3 and 4. In its response, the applicant provided a proposed revision to Annex V2, Appendix 1, listing various EIPs, and stated that SNC intends to modify the existing EIPs to include the elements associated with Units 3 and 4. Further, the procedure naming and numbering convention may or may not be retained for the new units.

[P.4, P.9] The EPC reviews the site-specific emergency plan annually and all onsite EIPs biennially. The review includes the letters of agreement, which are updated as necessary. The emergency planning supervisor reviews the emergency plans for SNC once each calendar year. The review includes a comparison for consistency of all emergency plans for the specific sites including the security plan, State, county, and SRS plan as appropriate. [P.5] The emergency plan and EPIPs are revised in accordance with applicable site procedures. Emergency plan

changes that are judged to reduce the effectiveness of the plan will be submitted to the NRC for approval before implementation. [P.10] In RAI 13.3-5.c, the staff asked the applicant to describe how telephone numbers in emergency procedures are updated on at least a quarterly basis. In its response, the applicant stated that procedures containing telephone numbers and documents/directories will be reviewed quarterly and the numbers verified/validated by either contacting the responsible agency/owner or calling the number directly to verify that it is operable.

[P.9] An annual independent audit of the emergency preparedness program is conducted by the SNC QA department. This audit is conducted as part of the standard audit program and will include a review of the emergency plan, its implementing procedures and practices, emergency preparedness training, annual exercises, equipment, and ERFs. In addition, an audit of the interfaces with offsite agencies is performed by the corporate SNC QA group. Each audit is nominally conducted every 12 months; the interval from the previous audit may be shortened but may not be extended beyond 15 months. Audits are performed in accordance with SNC QA department procedures. **[P.5]** Audit reports are written and distributed to management, and in addition, applicable portions of the corporate audit reports are made available to affected Federal, State, and local agencies, as appropriate, in accordance with 10 CFR 50.54(t). Appropriate departments are responsible for implementing corrective actions resulting from the audit findings. Records of these audits and exercise findings are maintained in accordance with plant procedures. In RAI 13.3-5.d, the staff asked the applicant to describe its procedures for retaining these records for a period of 5 years. In its response, the applicant stated that 10 CFR 50.54(t) audit results are made available by way of letter to State and local organizations, per distribution associated with procedure NMP-QA-105. Procedure NMP-QA-109 provides requirements for record retention, including maintaining the audits for the life of the plant.

[P.8] The ESP Plan contains a table of contents, which provides section designations consistent with the 16 planning standards of NUREG-0654/FEMA-REP-1. In addition, the applicant has provided the "VEGP Emergency Plan Correlation to NUREG 0654," which cross-references the ESP Plan to NUREG-0654/FEMA-REP-1.

State and Local Emergency Plans [P.1, P.2, P.3, P.4, P.5, P.6, P.7, P.8, P.10]

Pursuant to 10 CFR 52.17(b)(ii) and 10 CFR 50.47, the staff reviewed the FEMA findings and determinations associated with the relevant evaluation criteria in planning standard P of NUREG-0654/FEMA-REP-1. On the basis of its review, FEMA found that the application's State and local emergency plans associated with planning standard P are adequate. The following summarizes the FEMA findings for planning standard P.

a. State of Georgia

[P.1] GA REP-Base Plan, Section VII.B.1, "Federally Sponsored Training of State Personnel," states that training courses include radiological emergency planning, exercise evaluation, and dose assessment. The training is normally conducted at the FEMA Emergency Management Institute in Emmitsburg, Maryland. Section VII.B.5, "Retraining," states that in addition to initial RER training programs, the State plans to conduct annual (or as needed) retraining (i.e., refresher training) in essential program areas. The training of individuals responsible for the planning effort is addressed in Section VIII.B and in SER Section 13.3.3.2.15.a.

[P.2] GA REP-Base Plan, Section IV.A.2, states that GEMA is responsible for general State emergency planning, exercise control and direction, and control of emergency or disaster operations. GEOP Section V.A, "Responsibilities of GEMA and State Agencies and Organizations," states that the GEMA director is responsible for the State program of emergency management, will coordinate emergency management activities of all agencies/organizations within the State, and will serve as a liaison with other States and the Federal Government. This individual will assume responsibility for direction and coordination of ESFs at the SOC in Atlanta, Georgia. [P.1] GEOP Section V.B states that the GEMA director will provide training, technical assistance, and planning guidance to State agencies and local governments/agencies and will conduct and participate in periodic exercises to evaluate State and local plans in order to maintain a high standard of preparedness.

[P.3, P.4, P.5] GA REP-Base Plan, Section VIII.A, "Development Responsibility," states that the GA REP has been prepared by GEMA and DNR planners, in conjunction with the coordinated efforts of supporting State agencies. Section VIII.C, "Plan Review and Update," and GA REP-Annex D, Section G.3, state that the responsibility for review and update of the GA REP is vested with GEMA, in coordination with EPD. The EPD environmental radiation protection manager has the designated responsibility for ensuring that the technical portions of the plan are reviewed and updated. GEMA is responsible for the plan's overall coordination and distribution.

The GA REP (including annexes) will be reviewed annually, with the participation of appropriate State agencies, and updated (if required). Changes will be made based on such factors as experience gained in drills, exercises, response to incidents, changes in State or Federal statutes or planning guidance, and changes in operations procedures and mutual assistance/support agreements. A record of plan changes will be maintained by GEMA; revised pages will be dated, and the reason for changes will be reflected on the plan change instruction sheet. In addition, GEOP Section V.B states that the GEMA director will maintain, update, and distribute all plan revisions and initiate other actions necessary for effective plan implementation. GA REP-Annex D, Section G.3, further states that plan changes or revisions will be sent to all holders of the plan who either have a key role in RER planning or have asked to be on the plan distribution list. **[P.8]** (The GEOP, GA REP-Base Plan, and GA REP-Annex D all include a detailed table of contents.)

[P.6] GEOP Section V.A.4 states that ESFs are matched with the NRP to assure efficient and effective response. State agencies and organizations with primary ESF responsibilities will develop and maintain SOPs, in coordination with support agencies and organizations. Appendix 4 to the GA REP-Base Plan lists the supporting emergency response plans, which either augment or complement the GA REP. **[P.7]** Appendix 5 provides a list of emergency operations procedures and SOPs that may be implemented by the appropriate State agencies during a radiological emergency. These procedures, which are periodically reviewed and updated, are those that are most significant to RER. **[P.10]** GA REP-Annex D, Section B.7, states that emergency response telephone numbers will be updated quarterly and that all other telephone numbers will be verified during the annual plan review.

b. Burke County, Georgia

[P.1] Burke County Plan Attachment K states that the local EMA director and staff, other local officials, and department/agency personnel receive emergency preparedness training through GEMA-sponsored professional development series courses, which enhance the capabilities of these officials to carry out their responsibilities in administration, planning, and response.

(Additional training programs for enhancement of local emergency preparedness are discussed in GA REP Section VII.B and GA REP-Annex D, Section G.)

[P.2, P.3] Burke County Plan Section V.A identifies the Chairman of the Burke County Board of Commissioners as the individual with the overall authority and responsibility for RER planning in the county. The Burke County EMA Director is responsible for actual county plan development and updating the plan to keep it current with existing conditions and procedures. The director will establish a training program and coordinate with the local department and agency heads to make available appropriate personnel for training and participation in drills and exercises. (See also SER Section 13.3.3.2.1.b.)

[P.4, P.10] Section VI.D states that the plan will be reviewed, updated, or revised annually or as otherwise required. All changes will be dated by page, added to the plan, and recorded on the record of changes in GA REP-Annex D. Attachment C provides a roster of key emergency staff personnel, with their business and personal telephone numbers, which is available to the county EOC and communications office. (Attachment C was not included in the application in order to protect personal information and privacy.) **[P.5]** Attachment A, Section H, "Distribution," states that the Burke County EMA office will maintain a list of all parties receiving a copy of the county plan and will (as necessary) furnish all addresses with plan changes or revisions.

[P.6] Attachment A, Section G, "Supporting Plans and Documents," states that the county plan will be implemented and executed in accordance with the authority of State laws listed in GA REP-Base Plan, Section II, and the county and municipal laws listed in Section III. The county plan will be executed within the organizational and functional parameters of the following supporting State and local plans:

- Burke County Emergency Operations Plan
- State of Georgia Emergency Operations Plan
- State of Georgia Radiological Emergency Plan
- State of Georgia Radiological Emergency Plan, Annex D (Plant Vogtle)

[P.7] Attachment K, Section C, "Checklists," states that to enhance the training program and further ensure emergency operational readiness, checklists have been prepared for local officials and department/agency personnel. Each checklist has been developed to correspond with the EAL guidelines, in reference to an incident at the nuclear power plant. The checklists, which are listed in Section C, expand the functional responsibilities of local government departments/ agencies, as outlined in Section V of the plan. In addition, Section D, "Operational Procedures," lists procedures that address various areas, such as decontamination, KI, exposure control, communications, and care for handicapped personnel. [P.8] Finally, the plan contains a specific table of contents, which reflects the plan sections and attachments, including content descriptions.

c. State of South Carolina

[P.1, P.2] SCORERP states that SCEMD is the lead State agency for coordinating the State's offsite response to an incident at an FNF. SCEMD is responsible for coordinating State government activities with those of affected local governments, other States, and Federal agencies. SCEMD is responsible for ensuring the availability of training opportunities for all agencies and individuals involved in emergency response to an incident at a nuclear power plant. At the State level, department or agency heads are responsible for ensuring that their

personnel attend appropriate RER courses needed to accomplish all assigned tasks. State and local directors/coordinators and key response personnel participate in independent study courses, radiological courses, and Federal and State training workshops and seminars. In addition, SCEOP Section III.F identifies the SCEMD director as the individual who is responsible for providing technical and planning support to State agencies and local governments.

[P.3] SCORERP states that the SCEMD is responsible for preparing and maintaining the State RER plans and procedures for State areas that can be affected by an FNF (incident) in South Carolina, Georgia, and North Carolina. **[P.4, P.10]** SCEMD will coordinate the development and revision of site-specific plans for each FNF in the State and will assist local governments in preparing and maintaining their local plans. The plans will be reviewed annually and updated (if required). If major changes occur that could affect State or local disaster operations before the annual revision, the plan will be immediately changed to reflect current capabilities.

SCTRERP, Section B.XIII, states that NREES will continuously review the contents of the SCTRERP and will annually verify it to be current. **[P.5]** The plan and approved changes will be forwarded to all organizations and individuals with responsibility for implementing the plan. Revised pages, sections, and appendices will be dated and/or marked to indicate the changes. **[P.8]** (Each South Carolina plan contains a detailed table of contents.) **[P.6, P.7]** SCORERP Appendix 1 and SCEOP Section IX list supporting plans and responsible organizations.

d. Aiken, Allendale, and Barnwell Counties, South Carolina

[P.1, P.2] Each county EMA director is assigned responsibility for planning and procedure preparation and review and will receive initial and follow-up training from SCEMD. This training will consist of daily responsibilities, radiological defense, government conferences, management seminars, workshops, and career development courses. (Training is also addressed in SCORERP Annex B and SER Section 13.3.3.2.15.c.)

[P.3, P.4, P.5] Plan annexes will be developed in conformity with the county plans and will provide for necessary plan changes and revisions, including preparation, coordination, publishing, and distribution. The plans will be reviewed/updated annually by the county office with primary plan responsibility. **[P.10]** Supporting SOPs will be reviewed/updated by the responsible agencies at the time of the county plan update, and all telephone numbers will be updated quarterly by the county EMA. **[P.6, P.7]** A detailed listing of supporting plans and their sources is provided in county base plans and in Annex Q2 (Sections IV and V and appendices). [P.8] (The county plans include a detailed table of contents.)

Conclusion

On the basis of its review of the onsite emergency plans and FEMA findings, as described above for the planning effort responsibility, the NRC staff concludes that the information provided in the ESP application is consistent with the guidelines in RS-002, Supplement 2, and planning standard P of NUREG-0654/FEMA-REP-1. Therefore, the information is acceptable and meets the relevant requirements of 10 CFR 50.47(b)(16) and Sections III, IV.A, IV.F, and IV.G of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning and the provisions made to cope with emergency situations, as set forth above.

13.3.4 Conclusion

The staff has reviewed the complete and integrated RER plans provided in the VEGP ESP application for the proposed Vogtle Units 3 and 4. The staff reviewed the onsite emergency plan against the relevant requirements of 10 CFR 50.33, "Contents of Applications: General Information," 10 CFR 50.34, 10 CFR 50.47, Appendix E to 10 CFR Part 50, and 10 CFR 100.21, "Non-seismic Site Criteria," using the guidance criteria in NUREG-0654/FEMA-REP-1, Revision 1, and Supplement 1 to NUREG-0737. The staff concludes that, provided that the permit conditions identified below are adequately addressed, and the enumerated ITAAC are met, the VEGP onsite emergency plan establishes an adequate planning basis for an acceptable state of onsite emergency preparedness, and there is reasonable assurance that the plan can be implemented.

FEMA provided its findings and determinations concerning the adequacy of offsite emergency planning and preparedness, which are based on its review of State and local emergency plans. FEMA concluded that the offsite State and local emergency plans are adequate to cope with an incident at VEGP and that there is reasonable assurance that these plans can be implemented. On the basis of its review of these FEMA findings and determinations, the NRC staff concludes that, provided the permit conditions identified below are adequately addressed, and the enumerated ITAAC are met, the VEGP offsite emergency plans establish an adequate planning basis for an acceptable state of offsite emergency preparedness, and there is reasonable assurance that the plans can be implemented.

Pursuant to 10 CFR 52.17(b)(3), the VEGP ESP emergency plan includes the proposed inspections, tests, and analyses that the holder of a COL referencing the VEGP ESP 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, then the Vogtle Units 3 and 4 have been constructed and will operate in conformity with the license, the provisions of the Atomic Energy Act, and the NRC's regulations.

The staff concludes that the emergency plans provide an adequate expression of the overall concept of operation and describe the essential elements of advanced planning and the provisions made to cope with emergency situations. Thus, the staff concludes that the overall state of onsite and offsite emergency preparedness, when fully implemented, will meet the requirements of 10 CFR 50.33, 10 CFR 50.34, 10 CFR 50.47, Appendix E to 10 CFR Part 50, 10 CFR 52.17(b)(2)(ii), 10 CFR 52.17(b)(4), 10 CFR 52.18, and 10 CFR 100.21. Further, pursuant to 10 CFR 50.47(a), the staff concludes that, subject to the required conditions and limitations of the full-power license and satisfactory completion of the ITAAC, there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the VEGP site, and that emergency preparedness at Vogtle Units 3 and 4 is adequate to support full-power operations.

When referenced by a COL applicant pursuant to 10 CFR 52.73, "Relationship to Subparts A and B," this ESP is subject to the following permit conditions, and to the ITAAC contained in SER Sections 13.3.5 and 13.3.6, for full power for the emergency preparedness program:

Permit Conditions

2. An applicant for a combined license (COL) referencing this early site permit shall revise the EALs for Unit 3 to reflect the final revision of NEI 07-01. (See SER Section 13.3.3.2.4.)

3. An applicant for a combined license (COL) referencing this early site permit shall revise the EALs for Unit 4 to reflect the final revision of NEI 07-01. (See SER Section 13.3.3.2.4.)

4. An applicant for a combined license (COL) referencing this early site permit shall submit a fully developed EAL scheme for Unit 3 that reflects the completed AP1000 design details, subject to allowable ITAAC. (See SER Section 13.3.3.2.4.)

5. An applicant for a combined license (COL) referencing this early site permit shall submit a fully developed EAL scheme for Unit 4 that reflects the completed AP1000 design details, subject to allowable ITAAC. (See SER Section 13.3.3.2.4.)

6. An applicant for a combined license (COL) referencing this early site permit shall complete a fully developed set of EALs for Unit 3, which are based on in-plant conditions and instrumentation, including onsite and offsite monitoring, and which have been discussed and agreed on by the applicant or licensee and State and local governmental authorities, and shall include the full set of EALs in the COL application. If the EALs are not fully developed, the COL application shall contain appropriate ITAAC for the fully developed set of EALs for Unit 3. (See SER Section 13.3.3.2.4.)

7. An applicant for a combined license (COL) referencing this early site permit shall complete a fully developed set of EALs for Unit 4, which are based on in-plant conditions and instrumentation, including onsite and offsite monitoring, and which have been discussed and agreed on by the applicant or licensee and State and local governmental authorities, and shall include the full set of EALs in the COL application. If the EALs are not fully developed, the COL application shall contain appropriate ITAAC for the fully developed set of EALs for Unit 4. (See SER Section 13.3.3.2.4.)

8. An applicant for a combined license (COL) referencing this early site permit shall resolve the difference between the VEGP Units 3 and 4 common Technical Support Center (TSC), and the TSC location specified in the AP1000 certified design. (See SER Section 13.3.3.2.8.)

13.3.5 VEGP Unit 3 ITAAC

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
1.0 Emergency Classification System			
10 CFR 50.47(b)(4) – A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.	1.1 An emergency classification and emergency action level (EAL) scheme must be established by the licensee. The specific instruments, parameters, or equipment status shall be shown for establishing each emergency class, in the in-plant emergency procedures. The plan shall identify the parameter values and equipment status for each emergency class. [D.1]	1.1.1 An inspection of the control room, technical support center (TSC), and emergency operations facility (EOF) will be performed to verify that the displays for retrieving system and effluent parameters specified in Table Annex V2 D.2-1, *Hot Initiating Condition Matrix, Modes 1, 2, 3, and 4*; Table V2 D.2-2, *Cold Initiating Condition Matrix, Modes 5, 6, and De-fueled* are installed and perform their intended functions; and that emergency implementing procedures (EIPs) have been completed. 1.1.2 An analysis of the EAL technical bases will be performed to verify as-built, site-specific implementation of the EAL scheme.	1.1.1 The parameters specified in Table Annex V2 H-1, *Post Accident Monitoring Variables*, are retrievable in the control room, TSC, and EOF. The ranges of values of these parameters that can be displayed encompass the values specified in the emergency classification and EAL scheme. 1.1.2 The EAL scheme is consistent with Regulatory Guide 1.101, *Emergency Planning and Preparedness for Nuclear Power Reactors.*
3.0 Emergency Communications			
10 CFR 50.47(b)(6) – Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.	3.1 The means exists for communications between the control room, OSC, TSC, EOF, principal State and local emergency operations centers (EOCs), and radiological field monitoring teams. [F.1.d]	3.1 A test will be performed of the communications capabilities between the control room, OSC, TSC and EOF, and to the State and local EOCs, and radiological field monitoring teams.	3.1 Communications are established between the control room, OSC, TSC, and EOF. Communications are established between the control room, TSC, and Georgia Emergency Management Agency (GEMA) Operation Center; Burke County Emergency Operation Center (EOC); SRS Operations Center; South Carolina Warning Point; and Aiken, Allendale, and Barnwell County Dispatchers. Communications are established between the TSC and radiological monitoring teams.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	3.2 The means exists for communications from the control room, TSC, and EOF to the NRC headquarters and regional office EOC (including establishment of the Emergency Response Data System (ERDS) between the onsite computer system and the NRC Operations Center. [F.1.f]	3.2 A test will be performed of the communications capabilities from the control room, TSC and EOF to the NRC, including ERDS.	3.2 Communications are established from the control room, TSC, and EOF to the NRC headquarters and regional office EOCs and an access port for the Emergency Response Data System (ERDS) is provided.
5.0 Emergency Facilities and Equipment			
10 CFR 50.47(b)(8) – Adequate emergency facilities and equipment to support the emergency response are provided and maintained.	5.1 The licensee has established a technical support center (TSC) and an onsite operations support center (OSC). [H.1]	5.1 An inspection of the as-built TSC and OSC will be performed, including a test of the capabilities.	5.1.1 The TSC has at least 2,175 square feet of floor space. 5.1.2 Communication equipment is installed in the TSC and OSC, and voice transmission and reception are accomplished. 5.1.3 The plant parameters listed in Table Annex V2 H-1, *Post Accident Monitoring Values*, can be retrieved and displayed in the TSC. 5.1.4 The TSC is located within the protected area, and no major security barriers exist between the TSC and the control room. 5.1.5 The OSC is located adjacent to the passage from the annex building to the control room. 5.1.6 The TSC ventilation system includes a high-efficiency particulate air (HEPA) and charcoal filter, and radiation monitors are installed. 5.1.7 A reliable and backup electrical power supply is available for the TSC.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	5.2 The licensee has established an emergency operations facility (EOF). [H.2]	5.2 An inspection of the EOF will be performed, including a test of the capabilities.	5.2.1 Voice transmission and reception are accomplished between the EOF and the control room. 5.2.2 The plant parameters listed in Table Annex V2 H-1, *Post Accident Monitoring Values*, can be retrieved and displayed in the EOF.
6.0 Accident Assessment			
10 CFR 50.47(b)(9) – Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	6.1 The means exists to provide initial and continuing radiological assessment throughout the course of an accident. [I.2]	6.1 A test of the emergency plan will be conducted by performing a drill to verify the capability to perform accident assessment.	6.1 Using selected monitoring parameters listed in Table Annex V2 H-1 of the VEGP emergency plan, simulated degraded plant conditions are assessed and protective actions are initiated in accordance with the following criteria: A. Accident Assessment and Classification 1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the drill. B. Radiological Assessment and Control 1. Demonstrate the ability to obtain onsite radiological surveys and samples. 2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers. 3. Demonstrate the ability to assemble and deploy field monitoring teams within 60 minutes from the decision to do so. 4. Demonstrate the ability to

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			satisfactorily collect and disseminate field team data. 5. Demonstrate the ability to develop dose projections. 6. Demonstrate the ability to make the decision whether to issue radio-protective drugs (KI) to emergency workers. 7. Demonstrate the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development.
	6.2 The means exists to determine the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors. [I.3]	6.2 An analysis of the emergency implementing procedures (EIPs) and the Offsite Dose Calculation Manual (ODCM) will be completed to verify ability to determine the source term and magnitude of releases.	6.2 The EIPs and ODCM correctly calculate source terms and magnitudes of postulated releases.
	6.3 The means exists to continuously assess the impact of the release of radioactive materials to the environment, accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions. [I.4]	6.3 An analysis of the emergency implementing procedures (EIPs) and the Offsite Dose Calculation Manual (ODCM) will be completed to verify the relationship between effluent monitor readings, and onsite and offsite exposures and contamination.	6.3 The EIPs and ODCM calculate the relationship between effluent monitor readings, and onsite and offsite exposures and contamination.
	6.4 The means exists to acquire and evaluate meteorological information. [I.5]	6.4 A test will be performed to verify the ability to access meteorological information in the TSC and control room.	6.4 The following parameters are displayed in the TSC and control room: • Wind speed (at 10 and 60 meters) • Wind direction (at 10 and 60 meters) • Standard deviation of horizontal wind direction (at 10 meters) • Vertical temperature difference (between 10 and 60 meters) • Ambient temperature (at 10 meters) • Dew-point temperature (at 10 meters) • Precipitation (at the tower base)
	6.5 The means exists to make rapid	6.5 A test will be performed of the	6.5 Demonstrate the capability to make

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	assessments of actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways, including activation, notification means, field team composition, transportation, communication, monitoring equipment, and estimated deployment times. [I.8]	capabilities to make rapid assessment of actual or potential radiological hazards through liquid or gaseous release pathways.	rapid assessment of actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways.
	6.6 The means exists to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with the EPA protective action guides (PAGs). [I.10]	6.6 An analysis of the methodology contained in the emergency implementing procedures (EIPs) for estimating dose and preparing protective action recommendations (PARs), and in the Offsite Dose Calculation Manual (ODCM) will be performed to verify the ability to estimate an integrated dose from projected and actual dose rates.	6.6 The EIPs and ODCM estimate an integrated dose.
7.0 Protective Response			
10 CFR 50.47(b)(10) – A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.	7.1 The means exists to warn and advise onsite individuals of an emergency, including those in areas controlled by the operator, including: • Employees not having emergency assignments • Visitors • Contractor and construction personnel • Other persons who may be in the public access areas, on or passing through the site, or within the owner controlled area [J.1]	7.1 A test of the onsite warning and communication capability emergency implementing procedures (EIPs) including protective action guidelines, assembly and accountability, and site dismissal will be performed during a drill.	7.1.1 Demonstrate the capability to direct and control emergency operations. 7.1.2 Demonstrate the ability to transfer emergency direction from the control room (simulator) to the technical support center (TSC) within 30 minutes from activation. 7.1.3 Demonstrate the ability to prepare for around-the-clock staffing requirements. 7.1.4 Demonstrate the ability to perform assembly and accountability for all onsite individuals within 30 minutes of an emergency requiring protected area assembly and accountability. 7.1.5 Demonstrate the ability to perform site dismissal.
8.0 Exercises and Drills			
10 CFR 50.47(b)(14) – Periodic exercises are (will be) conducted	8.1 The licensee conducts a full participation exercise to evaluate major	8.1 A full participation exercise (test) will be conducted within the specified	8.1.1 The exercise is completed within the specified time periods of Appendix E

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.	portions of emergency response capabilities, which includes participation by each State and local agency within the plume exposure EPZ, and each State within the ingestion pathway EPZ. [N.1]	time periods of 10 CFR Part 50, Appendix E.	to 10 CFR Part 50, onsite exercise objectives listed below have been met and there are no uncorrected onsite exercise deficiencies. A. *Accident Assessment and Classification* 1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the exercise Standard Criteria: a. Determine the correct highest emergency classification level based on events which were in progress, considering past events and their impact on the current conditions, within 15 minutes from the time the initiating condition(s) or EAL is identified. B. *Notifications* 1. Demonstrate the ability to alert, notify, and mobilize site emergency response personnel. Standard Criteria: a. Complete the designated checklist and perform the announcement within 5 minutes of the initial event classification for an Alert or higher. b. Activate the emergency recall system within 5 minutes of the initial event classification for an Alert or higher. 2. Demonstrate the ability to notify responsible State and local government agencies within 15 minutes and the

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			NRC within 60 minutes after declaring an emergency. Standard Criteria: a. Transmit information using the designated checklist, in accordance with approved emergency implementing procedures (EIPs), within 15 minutes of event classification. b. Transmit information using the designated checklist, in accordance with approved EIPs, within 60 minutes of last transmittal for a follow-up notification to State and local authorities. c. Transmit information using the designated checklist within 60 minutes of event classification for an initial notification of the NRC. 3. Demonstrate the ability to warn or advise onsite individuals of emergency conditions. Standard Criteria: a. Initiate notification of onsite individuals (via plant page or telephone), using the designated checklist within 15 minutes of notification. 4. Demonstrate the capability of the Prompt Notification System (PNS), for the public, to operate properly when required. Standard Criteria: a. 90% of the sirens operate properly, as indicated by the Whelen feedback system.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			b. A NOAA tone alert radio is activated. C. *Emergency Response* 1. Demonstrate the capability to direct and control emergency operations. Standard Criteria: a. Command and control is demonstrated by the control room in the early phase of the emergency and the technical support center (TSC) within 60 minutes from TSC activation. 2. Demonstrate the ability to transfer emergency direction from the control room (simulator) to the TSC within 30 minutes from activation. Standard Criteria: a. Briefings were conducted prior to turnover responsibility. Personnel document transfer of duties. 3. Demonstrate the ability to prepare for around-the-clock staffing requirements. Standard Criteria: a. Complete 24-hour staff assignments. 4. Demonstrate the ability to perform assembly and accountability for all onsite individuals within 30 minutes of an emergency requiring protected area assembly and accountability. Standard Criteria: a. Protected area personnel assembly and accountability completed within 30 minutes of the Alert or higher

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			emergency declaration via public address announcement. D. *Emergency Response Facilities* 1. Demonstrate activation of the operational support center (OSC), and full functional operation of the TSC and EOF within 60 minutes of activation. Standard Criteria: a. The TSC, OSC, and EOF are activated within about 60 minutes of the initial notification. 2. Demonstrate the adequacy of equipment, security provisions, and habitability precautions for the TSC, OSC, EOF, and emergency news center (ENC), as appropriate. Standard Criteria: a. Demonstrate the adequacy of the emergency equipment in the emergency response facilities, including availability and general consistency with emergency implementing procedures (EIPs). b. The Security Shift Captain implements and follows applicable EIPs. c. The Health Physics Supervisor (TSC) implements the designated checklist if an onsite or offsite release has occurred. 3. Demonstrate the adequacy of communications for all emergency support resources. Standard Criteria:

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			a. Emergency response communications listed in emergency implementing procedures (EIPs) are available and operational. b. Communications systems are tested in accordance with TSC, OSC, and EOF activation checklists. c. Emergency response facility personnel are able to operate all specified communication systems. d. Clear primary and backup communications links are established and maintained for the duration of the exercise. E. *Radiological Assessment and Control* 1. Demonstrate the ability to obtain onsite radiological surveys and samples. Standard Criteria: a. HP Technicians demonstrate the ability to obtain appropriate instruments (range and type) and take surveys. b. Airborne samples are taken when the conditions indicate the need for the information. 2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers. Standard Criteria: a. Emergency workers are issued self-reading dosimeters when radiation levels require, and exposures are

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			controlled to 10 CFR Part 20 limits (unless the Emergency Director authorizes emergency limits). b. Exposure records are available, either from the ALARA computer or a hard copy dose report. c. Emergency workers include Security and personnel within all emergency facilities. 3. Demonstrate the ability to assemble and deploy field monitoring teams within 60 minutes from the decision to do so. Standard Criteria: a. One field monitoring team is ready to be deployed within 60 minutes of being requested from the OSC, and no later than 90 minutes from the declaration of an Alert or higher emergency. 4. Demonstrate the ability to satisfactorily collect and disseminate field team data. Standard Criteria: a. Field team data to be collected is dose rate or counts per minute (cpm) from the plume, both open and closed window, and air sample (gross/net cpm) for particulate and iodine, if applicable. b. Satisfactory data dissemination is from the field team to the Dose Assessment Supervisor, via the field team communicator and field team coordinator. 5. Demonstrate the ability to develop dose projections.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			Standard Criteria: a. The on-shift HP/Chemistry Shared Foreman or Dose Assessment Supervisor performs timely and accurate dose projections, in accordance with emergency implementing procedures (EIPs). 6. Demonstrate the ability to make the decision whether to issue radioprotective drugs (KI) to emergency workers. Standard Criteria: a. KI is taken (simulated) if the estimated dose to the thyroid will exceed 25 rem committed dose equivalent (CDE). 7. Demonstrate the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development. Standard Criteria: a. Total effective dose equivalent (TEDE) and CDE dose projections from the dose assessment computer code are compared to emergency implementing procedures (EIPs). b. PARs are developed within 15 minutes of data availability. c. PARs are transmitted to responsible State and local government agencies via voice or fax within 15 minutes of PAR development.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			F. *Public Information* 1. Demonstrate the capability to develop and disseminate clear, accurate, and timely information to the news media, in accordance with EIPs. Standard Criteria: a. Media information (e.g., press releases, press briefings, electronic media) is made available within 60 minutes of notification of the on-call media representative. b. Follow-up information is provided, at a minimum, within 60 minutes of an emergency classification or PAR change. 2. Demonstrate the capability to establish and effectively operate rumor control in a coordinated fashion. Standard Criteria: a. Calls are answered in a timely manner with the correct information, in accordance with EIPs. b. Calls are returned or forwarded, as appropriate, to demonstrate responsiveness. c. Rumors are identified and addressed. G. *Evaluation* 1. Demonstrate the ability to conduct a post-exercise critique, to determine areas requiring improvement and corrective action. Standard Criteria:

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			a. An exercise time line is developed, followed by an evaluation of the objectives. b. Significant problems in achieving the objectives are discussed to ensure understanding of why objectives were not fully achieved. c. Recommendations for improvement in non-objective areas are discussed. 8.1.2 Onsite emergency response personnel are mobilized in sufficient number to fill the emergency positions identified in emergency plan Section B, *VEGP Emergency Organization*, and they successfully perform their assigned responsibilities as outlined in Acceptance Criterion 8.1.1.D, *Emergency Response Facilities*. 8.1.3 The exercise is completed within the specified time periods of Appendix E to 10 CFR Part 50, offsite exercise objectives have been met, and there are either no uncorrected offsite deficiencies, or a license condition requires offsite deficiencies to be corrected prior to operation above 5% of rated power.
9.0 Implementing Procedures			
10 CFR Part 50, Appendix E.V – No less than 180 days prior to the scheduled issuance of an operating license for a nuclear power reactor or a license to possess nuclear material, the applicant's detailed implementing procedures for its emergency plan shall be submitted to the Commission.	9.1 The licensee has submitted detailed implementing procedures for its emergency plan no less than 180 days prior to fuel load.	9.1 An inspection of the submittal letter will be performed.	9.1 The licensee has submitted detailed emergency implementing procedures (EIPs) for the onsite emergency plan no less than 180 days prior to fuel load.

13.3.6 VEGP Unit 4 ITAAC

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
1.0 Emergency Classification System			
10 CFR 50.47(b)(4) – A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.	1.1 An emergency classification and emergency action level (EAL) scheme must be established by the licensee. The specific instruments, parameters, or equipment status shall be shown for establishing each emergency class, in the in-plant emergency procedures. The plan shall identify the parameter values and equipment status for each emergency class. [D.1]	1.1.1 An inspection of the control room will be performed to verify that the displays for retrieving system and effluent parameters specified in Table Annex V2 D.2-1, *Hot Initiating Condition Matrix, Modes 1, 2, 3, and 4*; Table V2 D.2-2, *Cold Initiating Condition Matrix, Modes 5, 6, and De-fueled*; are installed and perform their intended functions; and that emergency implementing procedures (EIPs) have been completed. 1.1.2 An analysis of the EAL technical bases will be performed to verify as-built, site-specific implementation of the EAL scheme.	1.1.1 The parameters specified in Table Annex V2 H-1, *Post Accident Monitoring Variables*, are retrievable in the control room. The ranges of values of these parameters that can be displayed encompass the values specified in the emergency classification and EAL scheme. 1.1.2 The EAL scheme is consistent with Regulatory Guide 1.101, *Emergency Planning and Preparedness for Nuclear Power Reactors.*
3.0 Emergency Communications			
10 CFR 50.47(b)(6) – Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.	3.1 The means exists for communications between the control room, OSC, TSC, and EOF. [F.1.d]	3.1 A test will be performed of the communications capabilities between the control room, OSC, TSC and EOF, and to the State and local EOCs.	3.1 Communications are established between the control room, OSC, TSC, and EOF. Communications are established between the control room, Georgia Emergency Management Agency (GEMA) Operation Center; Burke County Emergency Operations Center (EOC); SRS Operations Center; South Carolina Warning Point; and Aiken, Allendale, and Barnwell County Dispatchers.
	3.2 The means exists for communications from the control room to the NRC headquarters and regional office EOC. [F.1.f]	3.2 A test will be performed of the communications capabilities from the control room, TSC and EOF to the NRC, including ERDS.	3.2 Communications are established from the control room, TSC, and EOF, to the NRC headquarters and regional office EOCs and an access port for the Emergency Response Data System (ERDS) is provided.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
5.0 Emergency Facilities and Equipment			
10 CFR 50.47(b)(8) – Adequate emergency facilities and equipment to support the emergency response are provided and maintained.	5.1 The licensee has established an onsite operations support center (OSC). [H.1]	5.1 An inspection of the as-built OSC will be performed, including a test of the capabilities.	5.1.1 Communication equipment is installed in the OSC, and voice transmission and reception are accomplished. 5.1.2 The plant parameters listed in Table Annex V2 H-1, *Post Accident Monitoring Values*, can be retrieved and displayed in the TSC. 5.1.3 The OSC is located adjacent to the passage from the annex building to the control room.
	5.2 The licensee has established an emergency operations facility (EOF). [H.2]	5.2 An inspection of the EOF will be performed, including a test of the capabilities.	5.2.1 Voice transmission and reception are accomplished between the EOF and the control room. 5.2.2 The plant parameters listed in Table Annex V2 H-1, *Post Accident Monitoring Values*, can be retrieved and displayed in the EOF.
6.0 Accident Assessment			
10 CFR 50.47(b)(9) – Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	6.1 The means exists to provide initial and continuing radiological assessment throughout the course of an accident. [I.2]	6.1 A test of the emergency plan will be conducted by performing a drill to verify the capability to perform accident assessment.	6.1 Using selected monitoring parameters listed in Table Annex V2 H-1 of the VEGP emergency plan, simulated degraded plant conditions are assessed and protective actions are initiated in accordance with the following criteria: A. Accident Assessment and Classification 1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the drill. B. Radiological Assessment and Control

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			1. Demonstrate the ability to obtain onsite radiological surveys and samples. 2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers. 3. Demonstrate the ability to assemble and deploy field monitoring teams within 60 minutes from the decision to do so. 4. Demonstrate the ability to satisfactorily collect and disseminate field team data. 5. Demonstrate the ability to develop dose projections. 6. Demonstrate the ability to make the decision whether to issue radio-protective drugs (KI) to emergency workers. 7. Demonstrate the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development.
	6.2 The means exists to determine the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors. [I.3]	6.2 An analysis of the emergency implementing procedures (EIPs) and the Offsite Dose Calculation Manual (ODCM) will be completed to verify ability to determine the source term and magnitude of releases.	6.2 The EIPs and ODCM correctly calculate source terms and magnitudes of postulated releases.
	6.3 The means exists to continuously assess the impact of the release of radioactive materials to the environment, accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for	6.3 An analysis of the emergency implementing procedures (EIPs) and the Offsite Dose Calculation Manual (ODCM) will be completed to verify the relationship between effluent monitor readings, and onsite and offsite exposures and contamination.	6.3 The EIPs and ODCM calculate the relationship between effluent monitor readings, and onsite and offsite exposures and contamination.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	various meteorological conditions. [I.4]		
	6.4 The means exists to acquire and evaluate meteorological information. [I.5]	6.4 A test will be performed to verify the ability to access meteorological information in the TSC and control room.	6.4 The following parameters are displayed in the TSC and control room: • Wind speed (at 10 and 60 meters) • Wind direction (at 10 and 60 meters) • Standard deviation of horizontal wind direction (at 10 meters) • Vertical temperature difference (between 10 and 60 meters) • Ambient temperature (at 10 meters) • Dew-point temperature (at 10 meters) • Precipitation (at the tower base)
	6.5 The means exists to make rapid assessments of actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways, including activation, notification means, field team composition, transportation, communication, monitoring equipment, and estimated deployment times. [I.8]	6.5 A test will be performed of the capabilities to make rapid assessments of actual or potential radiological hazards through liquid or gaseous release pathways.	6.5 Demonstrate the capability to make rapid assessment of actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways.
	6.6 The means exists to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with the EPA protective action guides (PAGs). [I.10]	6.6 An analysis of the methodology contained in the emergency implementing procedures (EIPs) for estimating dose and preparing protective action recommendations (PARs), and in the Offsite Dose Calculation Manual (ODCM) will be performed to verify the ability to estimate an integrated dose from projected and actual dose rates.	6.6 The EIPs and ODCM estimate an integrated dose.
7.0 Protective Response			
10 CFR 50.47(b)(10) – A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium	7.1 The means exists to warn and advise onsite individuals of an emergency, including those in areas controlled by the operator, including: • Employees not having emergency assignments • Visitors • Contractor and construction personnel	7.1 A test of the onsite warning and communication capability emergency implementing procedures (EIPs) including protective action guidelines, assembly and accountability, and site dismissal will be performed during a drill.	7.1.1 Demonstrate the capability to direct and control emergency operations. 7.1.2 Demonstrate the ability to transfer emergency direction from the control room (simulator) to the technical support center (TSC) within 30 minutes of activation.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
iodide (KI), as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.	• Other persons who may be in the public access areas, on or passing through the site, or within the owner controlled area [J.1]		7.1.3 Demonstrate the ability to prepare for around-the-clock staffing requirements. 7.1.4 Demonstrate the ability to perform assembly and accountability for all onsite individuals within 30 minutes of an emergency requiring protected area assembly and accountability. 7.1.5 Demonstrate the ability to perform site dismissal.
8.0 Exercises and Drills			
10 CFR 50.47(b)(14) – Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.	8.1 The licensee conducts a limited participation exercise to evaluate portions of emergency response capabilities, which includes participation by each State and local agency within the plume exposure EPZ that have not been tested in a previous exercise. [N.1]	8.1 A limited participation exercise (test) will be conducted within the specified time periods of 10 CFR Part 50, Appendix E.	8.1.1 The exercise is completed within the specified time periods of Appendix E to 10 CFR Part 50, onsite exercise objectives listed below have been met and there are no uncorrected onsite exercise deficiencies. A. *Accident Assessment and Classification* 1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the exercise Standard Criteria: a. Determine the correct highest emergency classification level based on events which were in progress, considering past events and their impact on the current conditions, within 15 minutes from the time the initiating condition(s) or EAL is identified. B. *Notifications* 1. Demonstrate the ability to alert, notify, and mobilize site emergency response personnel.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			Standard Criteria: a. Complete the designated checklist and perform the announcement within 5 minutes of the initial event classification for an Alert or higher. b. Activate the emergency recall system within 5 minutes of the initial event classification for an Alert or higher. 2. Demonstrate the ability to notify responsible State and local government agencies within 15 minutes and the NRC within 60 minutes after declaring an emergency. Standard Criteria: a. Transmit information using the designated checklist, in accordance with approved emergency implementing procedures (EIPs), within 15 minutes of event classification. b. Transmit information using the designated checklist, in accordance with approved EIPs, within 60 minutes of last transmittal for a follow-up notification to State and local authorities. c. Transmit information using the designated checklist within 60 minutes of event classification for an initial notification of the NRC. 3. Demonstrate the ability to warn or advise onsite individuals of emergency conditions. Standard Criteria:

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			a. Initiate notification of onsite individuals (via plant page or telephone) using the designated checklist, within 15 minutes of notification. C. *Emergency Response* 1. Demonstrate the capability to direct and control emergency operations. Standard Criteria: a. Command and control is demonstrated by the control room in the early phase of the emergency and by the TSC within 60 minutes from activation. 2. Demonstrate the ability to transfer emergency direction from the control room (simulator) to the TSC within 30 minutes from activation. Standard Criteria: a. Briefings were conducted prior to turnover responsibility. Personnel document transfer of duties. 3. Demonstrate the ability to prepare for around-the-clock staffing requirements. Standard Criteria: a. Complete 24-hour staff assignments. 4. Demonstrate the ability to perform assembly and accountability for all onsite individuals within 30 minutes of an emergency requiring protected area assembly and accountability. Standard Criteria:

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			a. Protected area personnel assembly and accountability completed within 30 minutes of the Alert or higher emergency declaration via public address announcement. D. *Emergency Response Facilities* 1. Demonstrate timely activation of the OSC. Standard Criteria: a. The OSC is activated within about 60 minutes of the initial notification. 2. Demonstrate the adequacy of equipment, security provisions, and habitability precautions for the OSC, as appropriate. Standard Criteria: a. Demonstrate the adequacy of the emergency equipment in the emergency response facilities, including availability and general consistency with emergency implementing procedures (EIPs). b. The Security Shift Captain implements and follows applicable EIPs. c. The Health Physics Supervisor (TSC) implements the designated checklist if an onsite or offsite release has occurred. 3. Demonstrate the adequacy of communications for all emergency support resources. Standard Criteria:

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			a. Emergency response communications listed in emergency implementing procedures (EIPs) are available and operational. b. Communications systems are tested in accordance with OSC activation checklist. c. Emergency response facility personnel are able to operate all specified communication systems. d. Clear primary and backup communications links are established and maintained for the duration of the exercise. E. *Radiological Assessment and Control* 1. Demonstrate the ability to obtain onsite radiological surveys and samples. Standard Criteria: a. HP Technicians demonstrate the ability to obtain appropriate instruments (range and type) and take surveys. b. Airborne samples are taken when the conditions indicate the need for the information. 2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers. Standard Criteria: a. Emergency workers are issued self-

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			reading dosimeters when radiation levels require, and exposures are controlled to 10 CFR Part 20 limits (unless the Emergency Director authorizes emergency limits). b. Exposure records are available, either from the ALARA computer or a hard copy dose report. c. Emergency workers include Security and personnel within all emergency facilities. 3. Demonstrate the ability to assemble and deploy field monitoring teams within 60 minutes from the decision to do so. Standard Criteria: a. One field monitoring team is ready to be deployed within 60 minutes of being requested from the OSC, and no later than 90 minutes from the declaration of an Alert or higher emergency. 4. Demonstrate the ability to satisfactorily collect and disseminate field team data. Standard Criteria: a. Field team data to be collected is dose rate or counts per minute (cpm) from the plume, both open and closed window, and air sample (gross/net cpm) for particulate and iodine, if applicable. b. Satisfactory data dissemination is from the field team to the Dose Assessment Supervisor, via the field team communicator and field team coordinator.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			5. Demonstrate the ability to develop dose projections. Standard Criteria: a. The on-shift HP/Chemistry Shared Foreman or Dose Assessment Supervisor performs timely and accurate dose projections, in accordance with emergency implementing procedures (EIPs). 6. Demonstrate the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development. Standard Criteria: a. Total effective dose equivalent (TEDE) and CDE dose projections from the dose assessment computer code are compared to emergency implementing procedures (EIPs). b. PARs are developed within 15 minutes of data availability. c. PARs are transmitted to responsible State and local government agencies via voice or fax within 15 minutes of PAR development. 8.1.2 Onsite emergency response personnel are mobilized in sufficient number to fill the emergency positions identified in emergency plan Section B, *VEGP Emergency Organization,* and they successfully perform their assigned responsibilities as outlined in Acceptance Criterion 8.1.1.D, *Emergency Response Facilities.*

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			8.1.3 The exercise is completed within the specified time periods of Appendix E to 10 CFR Part 50, offsite exercise objectives have been met, and there are either no uncorrected offsite deficiencies, or a license condition requires offsite deficiencies to be corrected prior to operation above 5% of rated power.
9.0 Implementing Procedures			
10 CFR Part 50, Appendix E.V – No less than 180 days prior to the scheduled issuance of an operating license for a nuclear power reactor or a license to possess nuclear material, the applicant's detailed implementing procedures for its emergency plans shall be submitted to the Commission.	9.1 The licensee has submitted detailed implementing procedures for its emergency plan no less than 180 days prior to fuel load.	9.1 An inspection of the submittal letter will be performed.	9.1 The licensee has submitted detailed emergency implementing procedures (EIPs) for the onsite emergency plan no less than 180 days prior to fuel load.

13.6 Physical Security

The NRC staff reviewed the physical security aspects of the ESP application to determine whether site characteristics are such that adequate security plans and measures can be developed.

13.6.1 Introduction

In Section 13.6 of the SSAR, the applicant stated that there will be a protected area (PA) encompassing the new units and committed to implementing a vehicle barrier system at the appropriate standoff distance once construction is completed on the first new unit. The applicant stated that the site characteristics are such that the applicable NRC regulations, guidance documents, and orders can be met. The applicant based this conclusion on the size of the VEGP site, which is sufficiently large to provide adequate distance between vital areas and the probable location of a security boundary.

During a November 1–3, 2006, site safety review audit, the NRC staff asked the applicant to describe how the site characteristics are such that adequate security plans and measures can be developed to address (1) the applicable provisions of 10 CFR 73.55, "Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Radiological Sabotage," (2) RG 4.7, Revision 2, issued April 1998, and (3) post-September 11, 2001, (post-9/11) NRC orders (see letter dated November 16, 2006, entitled, "NRC Information Needs from November 2006 Safety Review Site Audit for VEGP Application). Specifically, the NRC staff requested additional information from SNC to address segments of the planned physical protection program with respect to the following:

1. site characteristics that may require mitigation to control close approaches to the facility (e.g., cliffs, depression, hills, mounds, waterways)

2. existing PA boundary for the power block structures and safety-related cooling tower (e.g., enlargement, redesign)

3. existing owner controlled area (OCA) and PA vehicle checkpoint (e.g., proposed additions, relocation)

4. proposed location of the intake structure

5. barge slips within the OCA

6. navigable waterway access

7. integrated response provisions (e.g., memoranda of agreement/understanding with local law enforcement agencies)

8. OCA patrol revisions (e.g., patrol frequency, increased staffing, surveillance technology)

Section 13.6 of the SSAR states that VEGP has a security program in place for the existing units and notes that this program complies with current 10 CFR 73.55 requirements and post-9/11 NRC orders. The SSAR further concludes that SNC anticipates that it will continue to meet those requirements and will extend them to the new units. SSAR Section 13.6 also states

that the COL application will address the specific security design features to ensure site security and will include the design of security monitoring equipment and screening methods for station operating personnel. Finally, SSAR Section 13.6 points out that no security hazards exist within the vicinity of the VEGP site.

13.6.2 Regulatory Basis

In Section 13.6 of the SSAR, the applicant identified 10 CFR 100.21(f) and 10 CFR 73.55 as applicable regulations and noted that RG 4.7, Revision 2, provides applicable guidance. The NRC staff reviewed this portion of the application for conformance with applicable regulations and considered the corresponding regulatory guidance as identified above.

According to the NRC regulations, applicants for an ESP must address characteristics of the proposed site that could affect security. Specifically, 10 CFR 52.17 requires that site characteristics comply with the requirements of 10 CFR Part 100, in particular, 10 CFR 52.17(a)(1)(x) (like 100.21(f)) states that site characteristics must be such that adequate security plans and measures can be developed. In RG 4.7, Revision 2, the NRC provides amplifying guidance and notes that 10 CFR 73.55 describes the physical protection requirements for nuclear power plants. The NRC staff reviewed this portion of the application for conformance with the applicable regulations and considered the corresponding regulatory guidance.

13.6.3 Technical Evaluation

The NRC staff reviewed the application and responses to the site safety review audit information requests and examined aspects of the application during an onsite visit. The proposed ESP site is located on the 3169-acre existing VEGP site on a coastal plain bluff on the southwest side of the Savannah River in eastern Burke County. The site exclusion area is bounded by River Road, Hancock Landing Road, and 1.7 miles of the Savannah River (river-miles 150.0 to 151.7). The proposed Units 3 and 4 would be located within the proposed power block area, which is the perimeter of a 775-foot-radius circle with the centroid at a point between the two units. The centerline of the proposed VEGP Unit 3 will be located approximately 1500 feet west and 200 feet south of the center of the existing VEGP Unit 2 containment building. The centerline of the proposed Unit 4 will be approximately 900 feet west of the proposed Unit 3 (see Figure 13.3-2 in the ESP application).

Using the criteria set forth in 10 CFR 100.21(f), the NRC staff identified and considered various characteristics of the site that could affect the establishment of adequate security plans and measures. The NRC staff considered pedestrian land approaches, vehicular land approaches, railroad approaches, water approaches, potential "high-ground" adversary advantage areas, integrated response provisions, and nearby road transportation routes.

With respect to potential high-ground adversary advantage areas and vehicular land approaches, the applicant stated that, based upon the current site plan for the proposed Units 3 and 4, it does not anticipate mitigation with respect to the topographical features of the site.

With respect to pedestrian land approaches, the NRC staff's onsite evaluation, coupled with a review of the various pictorial figures in the application, identified that the location of the proposed Units 3 and 4 on the VEGP site map will include the power block area, within which all safety-related structures would be located if one or more reactors were to be constructed.

During the safety review site audit, the NRC staff asked the applicant to identify its plans to address the guidance in RG 4.7, Revision 2, which specifies that an applicant provide a minimum of 360 feet between PA barriers and vital areas to allow for appropriate barriers, detection equipment, isolation zones, and vehicle barriers to protect vital equipment. In its response, the applicant stated that the physical protection of both the proposed VEGP Units 3 and 4 and the existing VEGP Units 1 and 2 will rely upon time-proven elements of detection, delay, and response. The applicant anticipates that, during the operational phase, all four units will be circumscribed by a contiguous PA boundary. The NRC staff concluded that the distance from planned locations of vital equipment and structures (which might be located anywhere in the ESP site footprint because the complete design is not specified at the ESP stage) to the planned PA boundary can be made sufficiently large so that holders of a COL or a CP could appropriately locate delay barriers, isolation zones, detection equipment, and vehicle barriers to protect vital equipment and structures. Therefore, the NRC staff concludes that the site characteristics are such that adequate security plans and measures can be developed to address pedestrian land approaches.

As discussed above, the applicant does not anticipate the need for mitigation with respect to the topographical features of the site. However, based on preliminary calculations, the area surrounding the proposed site is adequate for the installation of an engineered vehicle barrier system designed to deny a close approach of unauthorized vehicles. Furthermore, the applicant stated that land-based close approaches to the facility have been addressed by prior NRC security orders that applied to the existing units.

The NRC staff concludes that the location of existing roads and site terrain features does not preclude the establishment of adequate vehicle control measures to (1) prevent the use of a land vehicle to gain unauthorized proximity to vital areas and (2) protect against a vehicle bomb. The NRC staff based its conclusion on the fact that the location of the existing vehicle checkpoint, which could be used for vehicular control to the ESP site, has adequate standoff distance to mitigate overpressure effects from a vehicle bomb. Furthermore, the NRC staff confirmed during a site visit that the terrain features on all borders of the site are amenable to the implementation of a vehicle barrier system. Therefore, the NRC staff concludes that the site characteristics are such that adequate security plans and measures can be developed with respect to a vehicle barrier system.

With respect to water approaches, the NRC staff notes that vital equipment for the existing VEGP units is sufficiently far from the Savannah River that restrictions to river access are not required. The need for such restrictions for any new units will depend on the design of the units and their location on the proposed site. However, even if such restrictions to river access were necessary, the NRC staff finds that the site configuration would allow for the development of such restrictions.

With respect to integrated response provisions with local law enforcement agencies (LLEAs), the NRC staff identified that the applicant satisfactorily included in the application specific acknowledgment that stipulated the VEGP site, which is located in Burke County in the State of Georgia, has written letters of agreement with the Burke County Sheriff and the Georgia State Patrol to provide off-site armed response support in the event of a VEGP security (or radiological) emergency. The NRC staff finds that these acknowledgments and agreements demonstrate security plans and measures containing integrated response provisions can be developed.

With respect to roads and railroads that penetrate the OCA, the NRC staff identified an existing rail spur. The applicant advised that roads and railroads that penetrate the required vehicle access denial system will be provided with appropriate access control measures in accordance with existing regulations and the Physical Security Plan filed with the COL application. The COL or CP applicant will need to provide the specific access control measures to address the existing rail spur. **This is COL Action Item 13.6-1**.

13.6.4 Conclusion

As set forth above, the NRC staff examined the site characteristics with respect to their potential to affect the establishment of adequate security plans and measures. The NRC staff examined pedestrian, vehicle, and water approaches, including nearby railroad lines, as well as terrain features. On the basis of the above evaluation, the NRC staff concludes that the ESP site characteristics will allow an applicant for a COL or CP to develop adequate security plans and measures for a reactor(s) that it might construct and operate on the ESP site.

13.7 Fitness for Duty Program

13.7.1 Introduction

On March 28, 2008, Southern Nuclear Operating Company (SNC or the applicant) submitted the "Vogtle Electric Generating Plant Units 3 and 4 Fitness for Duty Program during LWA Construction" as part of an early site permit application. SNC revised the document on June 16, 2008, to incorporate language from Title 10, Part 26, "Fitness for Duty Programs," of the Code of Federal Regulations (10 CFR Part 26) issued subsequent to March 28, 2008. Following a teleconference with the U.S. Nuclear Regulatory Commission (NRC) on July 7, 2008, SNC submitted Revision 3 to the original document on July 9, 2008, which will be referred to as the "FFD Program" throughout this document.

NRC recognizes the experience of this applicant with administering existing full-scope fitness for duty programs at multiple operating nuclear reactors located in the southeastern United States, and in the applicant's ability to meet regulatory expectations in its established FFD programs.

13.7.2 Regulatory Basis

The NRC staff reviewed the contents of the applicant's fitness for duty (FFD) program in accordance with the criteria found in 10 CFR 26.4(e) and in Subpart K, "FFD Programs for Construction," of 10 CFR Part 26, issued on March 31, 2008 (10 CFR 26.401 through 10 CFR 26.419).

13.7.3 Technical Evaluation

13.7.3.1 General

10 CFR 26.401 identifies applicants who can develop an FFD program using Subpart K, and individuals who must be included in the FFD program. Specifically, 10 CFR 26.3(c) describes the type of applicant, and 10 CFR 26.4(e) and (f) identify the individuals who are subject to FFD programs and under which subsection. 10 CFR 26.4(e) includes, but is not limited to, the following individuals who are subject to a full-scope FFD program, as identified in 10 CFR Part 26, Subparts A through H, N and O: Second line supervisors and above, quality assurance (QA) / quality control (QC) personnel, witnesses to tests and certifications, and individuals affiliated with the access authorization program. 10 CFR 26.4(f) specifically relates to individuals constructing or directing the construction of safety- or security-related structures (SSCs) at the construction site, who must be covered by an FFD program that meets the requirements of 10 CFR Part 26, Subpart K.

The applicant stated that its FFD program is applicable to the Vogtle Electric Generating Plant (VEGP) Units 3 and 4 construction site (defined in the applicant's proposed plan) and applies only to persons who will perform limited work authorization (LWA) construction activities on safety or security-related structures, systems, and components (SSCs) at the location where the nuclear plant will be constructed and operated. The applicant's document states that it "is intended to serve as the FFD Program description for VEGP Units 3 and 4 LWA construction site as required in 10 CFR 26.401(b)." The applicant identified the types of individuals specified in 10 CFR 26.4(e) and (f) in its FFD Program. The document specifies that the individuals specified in 10 CFR 26.4(e) will be subject to the same requirements as those individuals

participating in a full operating plant FFD program under 10 CFR Part 26, Subparts A through H, N and O. The document also specifies that the individuals specified in 10 CFR 26.4(f) will be subject to the requirements in 10 CFR Part 26, Subpart K.

The staff finds this approach to be acceptable because the proposed FFD Program applies to the type of entity subject to Subpart K and identifies the individuals to be included in the program as identified in 10 CFR 26.4(e) and (f).

13.7.3.2 Written Policy and Procedures

10 CFR 26.403 states that "a policy statement must be written in sufficient detail to provide affected individuals with information on what is expected of them and what consequences may result from a lack of adherence to the policy." This section specifies the content of the applicant's written procedures, including the methods and techniques to be used to test for alcohol and drugs, procedures for protecting privacy and for ensuring the integrity of specimens, and actions and procedures for responding to specific FFD-related situations that could adversely affect the FFD program or an individual's ability to safely and competently perform his or her duties.

The applicant's proposed program includes this information in Section 5, "Drug and Alcohol Policy and Procedures." The applicant outlines expectations of individuals subject to the FFD program in their application, as well as the consequences for noncompliance with the policy. Prior to commencing work on SSCs, the applicant commits to the development, implementation, and maintenance of written site procedures that address the methods and techniques that will be used to test for alcohol and drugs. The applicant also commits to addressing privacy provisions for individuals subject to the program and response actions and procedures for individuals not complying with the applicant's FFD policy.

The staff finds this approach to be acceptable because the policies and procedures described in the applicant's proposed FFD Program meet the requirements of the regulations. The applicant defines a policy to inform individuals of the expectation that they must comply with the FFD Program and the associated consequences for violations of the program. The program identifies procedures that address the methods and techniques used in FFD testing and ensure that personal privacy is preserved during the process.

13.7.3.3 Drug and Alcohol Testing

Section 6, "Drug and Alcohol Testing Procedure," of the applicant's proposed FFD Program provides the means that will be used to detect and deter substance abuse through a drug and alcohol testing program.

10 CFR 26.405(b)(1)–(4) requires that the testing process (1) provide reasonable assurance that individuals are unable to predict the time periods during which specimens will be collected, (2) require individuals who are selected for random testing to report to the collection site as soon as reasonably practicable after notification, (3) ensure that all individuals in the population subject to random testing on a given day have an equal probability of being selected and tested, and (4) provide that an individual completing a test is immediately eligible for another random test.

Section 6.2.3 of the applicant's proposed FFD Program states that "testing will be conducted during all types of work periods including weekends and holidays at various times of the day throughout the calendar year." The applicant specifies that individuals will report for random FFD tests within one hour of notification. The applicant describes how it will develop a process that ensures that all individuals in the population subject to testing will have an equal probability of being selected and tested. Section 6.2.3 also states that individuals selected for testing will be immediately available to be selected the next time a random list is generated.

The staff finds this approach to be acceptable because the applicant's program meets the intent of the regulation, which is to provide reasonable assurance that individuals are not able to subvert the testing process by predicting testing frequencies; establishes a timetable for reporting to an FFD test from the time of notification; ensures that each individual has the same opportunity to be selected from the random testing pool; and ensures that each individual in the program is eligible each and every time a random pool of individuals is selected.

10 CFR 26.405(c) describes the conditions under which testing will be imposed by the licensee-preassignment, for cause, post-accident (significant illness or damage), and followup.

For clarification, in Section 6.2 the applicant uses the term "pre-access," which is equivalent to the term "preassignment" as specified in 10 CFR 26.405(c). Section 6.2 of the applicant's proposed FFD Program, which addresses "pre-access," states, in part, that "Each worker who will construct or direct the construction of safety- or security-related SSCs shall have negative drug and alcohol test results prior to constructing or directing the construction of safety- or security-related SSCs." Section 6.2.2 defines the parameters of for-cause testing as post-accident, occupational injury or illness, significant property damage, observed behavior, custodial arrest, and followup testing. Section 6.2.3 defines the random drug and alcohol testing program, including the selection process and the rate and frequency of tests that an individual must consent to in order to obtain and maintain unescorted access.

The staff finds this approach to be acceptable because the applicant's proposed FFD Program meets all of the requirements defined in 10 CFR 26.405(c)(1)–(4) by describing the conditions under which an individual must be tested.

10 CFR 26.405(d) specifies the substances, at a minimum, that shall be tested for and the threshold levels of each substance.

The applicant's program, under Section 5.3, provides tables that list the substances to be tested for and the threshold levels for both initial tests and confirmatory tests.

The staff finds this approach to be acceptable because the applicant's program includes all of the substances identified in 10 CFR Part 26. In addition, the applicant's threshold levels meet the levels specified in the 10 CFR Part 26.

10 CFR 26.405(e) requires that the specimen collection and FFD testing program protect the donor's privacy and the integrity of the specimen. The applicant must implement stringent quality controls to ensure that test results are valid and attributable to the correct individual. This regulation also provides for alternate testing sites under the requirements of 49 CFR Part 40, "Procedures for Transportation Workplace Drug and Alcohol Testing Programs," and subsequent amendments thereto.

The applicant has committed to creating drug and alcohol procedures that will require that construction site entities develop, implement, and maintain "methods and techniques to be used in testing for drugs and alcohol, including procedures for protecting the privacy of an individual who provides a specimen, procedures for protecting the integrity of the specimen, and procedures used to ensure that the test results are valid and attributable to the correct individual." The applicant also identifies alternative collection and testing facilities and associated requirements under 49 CFR Part 40.

The staff finds this approach to be acceptable based on the applicant's description of its plans to create and incorporate procedures that meet the requirements of administering an FFD program that protects individuals subject to its provisions, including the privacy of individuals, ensures the integrity of specimens taken from individuals, and identifies the requirements in the event an alternate testing facility is used.

10 CFR 26.405(f) specifies that "testing of urine specimens for drugs and validity, except validity screening and initial drug and validity tests that may be performed by licensee testing facilities, must be performed in a laboratory that is certified by the U.S. Department of Health and Human Services (HHS) for that purpose, consistent with its standards and procedures certification." Any initial drug test performed by a licensee or other entity subject to Subpart K of 10 CFR Part 26 must use an immunoassay that meets the requirements of the Food and Drug Administration (FDA) for commercial distribution. Urine specimens that yield invalid initial validity or drug test results must be subject to confirmatory testing by the HHS-certified laboratory, except for invalid specimens that cannot be tested. Other specimens that yield positive initial drug test results must be subject to confirmatory testing by a laboratory that meets stringent quality control requirements that are comparable to those required for certification by the HHS.

The applicant's proposed FFD Program states in section 6.3, "Initial analysis and validity testing may be performed by the construction site entity testing facility or by HHS-certified laboratories." Furthermore, "Testing for drugs and drug metabolites will be conducted through the analysis of urine specimens or other process which meets the requirements of the FDA." The applicant's program also discusses initial positive tests and states, "urine specimens that yield presumptive positive, adulterated, substituted, or invalid initial validity or drug test results must be confirmed using a HHS-certified laboratory, except for invalid specimens that cannot be tested." The application also states, "Confirmatory analysis is performed by a laboratory that meets stringent quality control requirements that are comparable to those required for certification by HHS."

The staff finds this approach to be acceptable in that the applicant has met the requirements for initial, validity, and initial positive tests citing quality control requirements of HHS laboratories and processes approved by the FDA, as required by the rule. It is also noted that this applicant currently manages successful FFD programs at multiple operating reactors which adds to its familiarity with acceptable practices and procedures.

10 CFR 26.405(g) specifies that "licensees and other entities shall provide for an MRO review of positive, adulterated, substituted, and invalid confirmatory drug and validity test results to determine whether the donor has violated the FFD policy, before reporting the results to the individual designated by the licensee or other entity to perform the suitability and fitness evaluations required under 10 CFR 26.419."

The applicant will use a medical review officer (MRO) as described in its proposed FFD Program. The MRO will be a licensed physician who is responsible for receiving laboratory

results generated by an HHS-certified laboratory and who has the appropriate medical training to properly interpret and evaluate an individual's drug and validity test results, together with his or her medical history, and any other relevant biomedical information. Furthermore, the applicant states in Section 6.5 that, "All presumptive positive drug test results confirmed by the HHS certified laboratory as positive shall be reviewed by the MRO. The MRO will determine whether a legitimate medical reason exists for the positive result and will be the final determination as to whether an individual is in violation of the FFD program. If the MRO determines that there is a legitimate medical explanation for the confirmed positive result, the MRO shall report the result as negative. Substituted, adulterated or diluted test results will also be subject to MRO review for final determination. Invalid confirmatory drug and validity test results will be reviewed by the MRO to determine if the donor has violated the FFD policy." The applicant also states that the MRO shall report all positive results to the construction site management person responsible for the FFD program.

The staff finds this approach to be acceptable because the applicant has defined the MRO position and the MRO's role in the process. Specifically, the MRO will review positive, substituted, adulterated, or diluted tests results to determine whether the donor has violated the FFD policy. The applicant has also identified who the MRO will report to with the information, as required by 10 CFR Part 26.

13.7.3.4 Fitness Monitoring

10 CFR 26.406, "Fitness Monitoring" provides an alternative to random testing to deter substance abuse and detect indications of possible use, sale, or possession of illegal drugs; use or possession of alcohol while constructing SSCs; or impairment from any cause that if left unattended may result in a risk to public health and safety or the common defense and security. The fitness monitoring section of the rule only applies to those licensees who elect not to impose a random drug and alcohol testing program. Because the applicant plans to subject applicable individuals to random FFD testing for drugs and alcohol, the fitness monitoring requirement is not applicable to this applicant.

13.7.3.5 Behavioral Observation

10 CFR 26.407, "Behavioral Observation," is required when fitness monitoring is not the method used to ensure that applicable individuals are fit for duty at the site. This section states, "While the individuals specified in 10 CFR 26.4(f) are constructing safety- or security-related SSCs, licensees and other entities shall ensure that these individuals are subject to behavioral observation, except if the licensee or other entity has implemented a fitness monitoring program under 10 CFR 26.406."

The applicant describes its behavioral observation program (BOP) in section 6.7. It states that the BOP "is the primary means to detect behavior that may indicate possible use, sale, or possession of illegal drugs; use or possession of alcohol onsite or while on duty; or any physical impairment or any cause that, if left unattended, may constitute a risk to public health and safety or the common defense and security." Also, "supervisors that are responsible for observing individuals subject to a BOP shall report any FFD concerns about individuals to the personnel designated in the construction site entity's policy." The application also addresses the need for training of individuals participating in the BOP citing "Training shall communicate the expectation of promptly reporting noticeable changes in behavior or FFD concerns about other

individuals to the construction site entity designated personnel for appropriate evaluation and action in accordance with the FFD policy."

The staff finds this approach to be acceptable because it requires observation of individuals working on safety- or security-related SSCs by individuals trained to detect possible impairment.

13.7.3.6 Sanctions

10 CFR 26.409, "Sanctions," states that sanctions must, "at a minimum, prohibit the individuals specified in 10 CFR 26.4(f) from being assigned to construct safety- or security-related SSCs unless or until the licensee or other entity determines that the individual's condition or behavior does not pose a potential risk to public health and safety or the common defense and security."

The applicant's proposed FFD Program states in section 5.2 that "employees who violate the FFD Policy by testing positive for drugs or alcohol are subject to discipline up to and including immediate discharge." The applicant also states that employees who refuse to submit to FFD tests as required are subject to discipline up to and including immediate discharge. Section 5.2 of the applicant's program describes "disciplinary actions," which include the requirement that individuals sign a Consent Form attesting to their understanding of the consequences for a violation of the FFD policy. These sanctions, at a minimum, prohibit individuals from being assigned to construct SSCs until the applicant ascertains that the individual's condition or behavior no longer poses a potential risk to public health and safety or the common defense and security.

The staff finds this approach to be acceptable because the proposed FFD Program contains the same prohibition as the rule, communicates the possibility of sanctions to individuals seeking unescorted access, and requires such individuals to acknowledge the possibility of sanctions by means of a consent letter. Together, these provisions of the applicant's FFD Program will reduce the risk of individuals violating the FFD Program.

13.7.3.7 Protection of Information

10 CFR 26.411, "Protection of Information," requires the establishment and maintenance of a system of files and procedures to protect the personal information collected about an individual for purposes of complying with Subpart K of 10 CFR Part 26 and the maintenance and use of such records "with the highest regard for personal privacy." Paragraph (b) of this section requires a signed consent authorizing the disclosure of the personal information except for disclosures to specific individuals.

Section 6.8 of the applicant's proposed FFD Program provides that "personal information, whether electronic or hard copy, must not be disclosed to unauthorized persons." This section lists personnel authorized to receive information and establishes limits on accessing personal data "to each authorized individual's area of responsibility."

10 CFR 26.411(b) states that "licensees and other entities shall obtain a signed consent that authorizes the disclosure of the personal information collected and maintained under this subpart before disclosing personal information, except for disclosures to the individuals and entities specified in 10 CFR 26.37(b)(1) through (b)(6), (b)(8), and persons deciding matters under review in 10 CFR 26.413." The applicant's proposed FFD Program description includes a sample consent form. The first page of the document provides the authorizations and

understandings to which the individual is consenting, and the second and third pages comprise the actual form. Individuals reading the form prior to signing it should gain a clear understanding of who is eligible to receive information that will be released on a strictly "need-to-know" basis in the event that the person does not conform to the FFD policy.

The staff finds this approach to be acceptable because the applicant fulfills the requirements of 10 CFR 26.411 by developing procedures that protect personal privacy, identifying individuals authorized for disclosure of personal information meeting requirements, and using a consent form that creates a written, signed, and dated agreement with the individual regarding personal privacy.

13.7.3.8 Review Process

10 CFR 26.413, "Review Process," states, in part, that licensees "shall establish and implement procedures for the review of a determination that an individual...has violated the FFD policy."

Section 6.6 of the applicant's proposed FFD Program states that the "construction site entity shall have an alternative review process that is objective and impartial." Furthermore, individuals "will be provided the opportunity to have the decision, together with any additional information, reviewed by another designated construction site entity manager who is equivalent or senior to and independent of the individual who made the decision to deny or terminate access."

The staff finds this approach to be acceptable as it meets the requirements and intent of the 10 CFR 26.413 by providing a review process for FFD policy violations.

13.7.3.9 Audits

10 CFR 26.415, "Audits," states, in part, that "audits are performed to assure the continuing effectiveness of the FFD program." In particular, 10 CFR 26.415(b) addresses the frequency of audits to ensure continued effectiveness and the need for action to be taken to resolve any identified problems. In addition, 10 CFR 26.415(c) explains the requirements for licensee audits of HHS-certified laboratories.

Section 6.9 of the applicant's proposed FFD Program states, "Construction site entities who implement an FFD program shall ensure that audits are performed to assure the continuing effectiveness of the FFD program." The applicant addresses 10 CFR 26.415(b) by stating that "these programs are audited at a frequency that assures their continuing effectiveness and that corrective actions are taken to resolve any problems identified." The applicant's proposed program to implement 10 CFR 26.415(c) states that "construction site entities need not audit HHS-certified laboratories or a specimen collection and alcohol testing service that meets the requirements of 49 CFR 40 on which the construction site entity may rely to meet the drug and alcohol testing requirements of 10 CFR 26."

The staff finds this approach to be acceptable because implementation of the applicant's proposed FFD Program, as written, will meet the requirements of 10 CFR 26.415. Based on the applicant's familiarity with FFD programs and associated audits, the staff has further confidence in its conclusion that a successful audit program will be implemented.

13.7.3.10 Recordkeeping and Reporting

As required by 10 CFR 26.417, "Recordkeeping and Reporting," the licensee must make records available for NRC inspection purposes and for any legal proceedings resulting from the administration of the program. As required by 10 CFR 26.417(b)(1), the licensee must report any intentional act that casts doubt on the integrity of the FFD program and any programmatic failure to the NRC Operations Center by telephone within 24 hours after discovery. As required by 10 CFR 26.417(b)(2), the licensee must submit to the NRC annual program performance reports for FFD programs.

The applicant states, in section 6.8 of its proposed FFD Program, that it will make records, electronic or hardcopy, available for NRC inspection and will disclose such records to appropriate law enforcement or judicial officials under procedures established in the FFD Program consistent with regulatory requirements. The applicant's proposed reporting requirements are consistent with 10 CFR 26.417(b)(1) and (2) since they use wording identical to that of the rule.

The staff finds this approach to be acceptable as the applicant's program is written in accordance with the 10 CFR 26.417.

13.7.3.11 Suitability and Fitness Evaluations

10 CFR 26.419, "Suitability and Fitness Evaluations," requires licensees and other entities who implement FFD programs to "develop, implement, and maintain procedures for evaluating whether to assign individuals to construct safety- and security-related SSCs. These procedures must provide reasonable assurance that the individuals are fit to safely and competently perform their duties, and are trustworthy and reliable, as demonstrated by the avoidance of substance abuse."

The applicant's proposed FFD Program describes policies, procedures, and processes to determine an individual's fitness to perform work on safety- or security-related SSCs at the construction site. The proposed program describes training and implementation procedures for managers and supervisors to observe an individual's behaviors and actions on an ongoing basis. Together, the applicant's proposed testing program and BOP serve as the means to evaluate and verify, with reasonable assurance, that the workforce is reliable and fit to perform duties safely and competently. Therefore, the staff finds this approach acceptable.

13.7.4 Conclusion

The applicant has defined an FFD program for LWA construction at the Vogtle site that meets the regulations found in 10 CFR Part 26. As a result, the staff finds the SNC FFD program for the requested LWA activities at Vogtle to be acceptable.

15.0 ACCIDENT ANALYSIS

15.0.3 Radiological Consequences of Design Basis Accidents

15.0.3.1 Introduction

In Chapter 15 of the SSAR submitted by SNC, as part of the ESP application for the VEGP site, the applicant analyzed and provided the radiological consequences of DBAs to demonstrate that a new nuclear unit(s) could be sited at the proposed ESP site without undue risk to the health and safety of the public, in compliance with the requirements of 10 CFR 52.17 and 10 CFR Part 100. The applicant used the Westinghouse AP1000 certified reactor design in its consideration of the proposed ESP site. The applicant used the AP1000 characteristics in conjunction with site characteristics for accident analysis purposes, to assess the suitability of the proposed ESP site. Using the source term developed for this design, the applicant performed and provided radiological consequence analyses for the following DBAs:

- PWR main steamline break
- PWR feedwater system pipe break
- reactor coolant pump shaft seizure (locked rotor)
- reactor coolant pump shaft break
- PWR rod cluster control assembly ejection accident
- failure of small lines carrying primary coolant outside containment
- steam generator tube rupture
- loss-of-coolant accident
- fuel handling accident

The applicant presented the dose consequence assessment results in a series of tables found in SSAR Chapter 15 which provide the postulated radiological consequences of the DBAs identified above at the proposed EAB and the LPZ. The dose consequence assessment results in the tables also demonstrate that any potential doses would be within the radiological consequence evaluation factors set forth in 10 CFR 50.34(a)(1). The applicant provided the accident-specific source terms (release rates of radioactive materials from the ESP footprint to the environment) and resulting site-specific dose consequences for each DBA in Tables 15-2 through 15-22 of the SSAR.

15.0.3.2 Regulatory Basis

In SSAR Table 1-2 and Chapter 15, the applicant identified the following applicable NRC regulations and guidance regarding reactor accident radiological consequence analyses:

- 10 CFR 52.17
- 10 CFR Part 100
- 10 CFR 50.34
- RG 1.145, issued November 1982
- RG 1.183, issued July 2000
- NUREG-0800, Revision 3, issued June 1987

The NRC staff reviewed SSAR Chapter 15 for conformance with the applicable regulations and considered the corresponding guidance, as identified above in addition to RS-002 (May 3, 2004). The regulations at 10 CFR 52.17(a)(1) require that ESP applications contain an analysis and evaluation of the major SSCs of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in 10 CFR 52.17(a)(1)(ix). In addition, the ESP site characteristics must comply with the requirements of 10 CFR Part 100.21, which states that radiological dose consequences of postulated accidents shall meet the criteria set forth in 10 CFR 50.34(a)(1). In its evaluation, the NRC staff used the radiological consequence evaluation factors found in 10 CFR 52.17(a)(1) as a factor in determining the acceptability of the site. The radiological consequence evaluation factors for a postulated fission product release based on a major accident (Dose Factors) given both in 10 CFR 50.34(a)(1) and 10 CFR 52.17(a)(1) are:

- An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release would not receive a radiation dose in excess of 25 rem [roentgen equivalent man] TEDE.

- An individual located at any point on the outer boundary of the LPZ who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose in excess of 25 rem TEDE.

The applicant used the AP1000 fission product release values in its assumed release from the ESP footprint to the environment; the NRC staff reviewed the applicant's dose evaluation based on this release.

15.0.3.3 Technical Evaluation

The applicant evaluated the suitability of the site under the Dose Factors using bounding reactor accident source terms and radiological consequences based on the AP1000 design, as well as site-specific atmospheric dispersion factor (χ/Q) values derived from the ESP footprint. The following sections describe the NRC staff's review of each aspect of the applicant's evaluation.

15.0.3.3.1 Selection of Design Basis Accidents

The applicant selected the DBAs listed in Chapter 15 of this SER on the basis of the AP1000 reactor design. The applicant selected the entire set of DBAs that the agency evaluated for the AP1000 reactor design and found to be acceptable in its approval of the AP1000 DCD. The AP1000 is an advanced light-water reactor of the PWR type. The AP1000 advanced design is not substantially different from the designs evaluated by the guidance in Chapter 15 of NUREG-0800 and in RG 1.183. On this basis, the NRC staff used the light-water reactor guidance in NUREG-0800 and RG 1.183 in its review and approval of the AP1000 DCD. The NRC staff finds that the applicant selected DBAs that are consistent with the DBAs listed and analyzed in Chapter 15 of NUREG-0800 and in RG 1.183 for PWRs. Therefore, the NRC staff finds that the applicant provided an acceptable DBA selection for evaluating the compliance of the proposed ESP site with the dose consequence evaluation factors specified in 10 CFR 52.17(a)(1).

15.0.3.3.2 Design-Specific (Assumed) Short-Term Atmospheric Dispersion Factors

Short-term atmospheric dispersion factor values are used in the radiological consequences analyses to characterize the effect of the site-specific meteorological conditions, topography, and distance to either the EAB or LPZ on the radioactivity concentration in the accident release plume. The applicant compared the ESP site-specific short-term χ/Q values to the AP1000 DCD χ/Q values. This comparison ensured that the accident doses calculated in accordance with the AP1000 DCD Chapter 15 results, remain at or below the limiting values of RG 1.183 when taking into consideration the ESP site specific values. In lieu of site-specific meteorological data, the AP1000 DCD provided a set of hypothetical reference short-term χ/Q values for the EAB and LPZ to use in evaluating the AP1000 design. The AP1000 DCD states that the EAB and LPZ χ/Q values were selected to bound the majority of the operating U.S. nuclear power plant sites, but the values were not certified for this specific ESP site. Table 15.0.3-1 of this SER lists the AP1000 χ/Q values:

Table 15.0.3-1 - Design-Specific Short-Term χ/Q Values in s/m^3

Location	Time (hr)	DCD χ/Q (s/m^3)
EAB	0 - 2	0.00051
LPZ	0 - 8	0.00022
LPZ	8 - 24	0.00016
LPZ	24 - 96	0.0001
LPZ	96 - 720	0.00008

15.0.3.3.3 Site-Specific Short-Term Atmospheric Dispersion Factors

The NRC staff reviewed the applicant's site-specific short-term χ/Q values in accordance with the guidance provided in Section 2.3.4 of RS-002 and confirmed the applicant's results on atmospheric dispersion. The NRC staff finds the χ/Q values to be acceptable, as described in Section 2.3.4 of this SER. Table 15.0.3-2 of this SER lists the site-specific short-term χ/Q values used by the applicant and reviewed by the NRC staff. Table 15.0.3-2 also includes the ratio of the site-specific values to the DCD values as a comparison. The NRC staff intends to include these site-specific short-term χ/Qs as site characteristics in any ESP that the NRC may issue for the VEGP ESP site.

Table 15.0.3-2 - Site-Specific Short-Term χ/Q Values

Location	Time (hr)	Site χ/Q (s/m^3)	χ/Q Ratio (Site/DCD)
EAB	0 - 2	0.000349	0.684
LPZ	0 - 8	0.0000704	0.32
LPZ	8 - 24	0.0000525	0.328
LPZ	24 - 96	0.0000277	0.277
LPZ	96 - 720	0.0000111	0.139

15.0.3.3.4 Source Terms and Radiological Consequence Evaluations

To evaluate the suitability of the site using the Dose Factors, the applicant provided the reactor accident source terms from the AP1000 design and the site-specific χ/Qs based on the ESP footprint. The source terms are expressed as the timing and release rate of fission products to the environment from the proposed ESP site. The radiological consequences are then derived from the source terms using established methods. The AP1000 accident-specific source term is based on the guidance provided in RG 1.183. The methodologies and assumptions that the AP1000 vendor, Westinghouse, used in its radiological consequence analyses are consistent with the guidance provided in RG 1.183 and were found acceptable to the NRC staff in its review of the AP1000 DCD for certification of the AP1000 design. The resulting doses calculated for the AP1000 design using assumed site parameters meet the Dose Factors.

In determining the potential radiological consequence doses resulting from DBAs at the proposed site, the applicant used the site-specific χ/Q values in conjunction with the DBA radiological consequences and the postulated χ/Q values provided in the certified AP1000 DCD.

The certified AP1000 design met the Dose Factors with the reference χ/Q values in the certified AP1000 DCD. The χ/Q values indicate the atmospheric dilution capability. Smaller χ/Q values are associated with greater dilution capability, resulting in lower radiological doses. The radiological consequence doses are directly proportional to the χ/Q values. Table 15-11 of the SSAR provides the site-specific χ/Q values the applicant used in its radiological consequence analyses, and Section 2.3.4 of this SER discusses the NRC staff's evaluation of these χ/Q values. The applicant used the atmospheric dispersion computer code PAVAN to derive its site-specific χ/Q values.

The certified AP1000 design met the Dose Factors with its postulated χ/Q values. The estimated site-specific χ/Q values for the proposed site are lower than those postulated in the AP1000 DCD, as summarized in SSAR Table 15-12. The applicant used the ratios of the site-specific χ/Q values to those postulated in the AP1000 DCD to determine and demonstrate that the radiological consequences at the proposed site meet the requirements of 10 CFR 52.17. Accordingly, the resulting DBA radiological consequence doses at the proposed site are lower than those provided in the AP1000 DCD and, therefore, meet the requirements of 10 CFR 52.17.

The NRC staff evaluated the design-specific source terms the applicant provided and finds them to be consistent with those evaluated as part of the AP1000 design certification review. Furthermore, the NRC staff finds that the references provided by the applicant and the methodology it used to determine timing and release rate of fission product source terms to the environment (and consequent dose consequences) from the proposed ESP site are acceptable. The NRC staff intends to include the site-specific χ/Q values as site characteristics listed in Appendix A to this SER, for use in any ESP that the NRC might issue for the VEGP site.

Based on its evaluation of the applicant's DBA radiological consequences analysis methodology and the inputs to that analysis, the NRC staff finds that the applicant correctly concluded that the radiological consequences for the chosen design comply with the Dose Factors. Table 15.0.3-2 of this SER identifies the site-specific χ/Q values as appropriate for inclusion in any ESP that the NRC might issue for the VEGP ESP site.

The design-related inputs to the applicant's DBA radiological consequence calculation were directly extracted from design documentation previously submitted to and reviewed by the NRC in connection with design certification applications. Because the NRC staff performed this calculation in the DCD review, and the applicant simply used the ratio of the site-specific χ/Q values to the postulated design χ/Q values, the NRC staff did not consider an independent calculation to be useful or necessary and, therefore, did not perform one.

15.0.3.4 Conclusion

As set forth above, the applicant submitted its radiological consequence analyses using the site-specific χ/Q values and AP1000 source-term values and concluded that the proposed site meets the radiological consequence evaluation factors identified in 10 CFR 50.34(a)(1) and 10 CFR 52.17(a)(1) for a design such as the AP1000. Based on the reasons set forth above, the NRC staff finds that the applicant's values for source terms included as inputs to the radiological consequence analyses are reasonable. Furthermore, the NRC staff finds that the applicant's site-specific χ/Q values and dose consequence evaluation methodology are acceptable.

For the reasons stated above, the source term values forming the basis of the dose consequence analysis in this Chapter are included in Appendix A of this SER, and would be included in any ESP issued for the Vogtle site. However, the staff notes that for COL or CP applications that reference a certified design, staff guidance in RG 1.206 permits an applicant to demonstrate compliance with the regulatory radiological consequence evaluation criteria by demonstrating that its site-specific χ/Q values are bounded by the postulated design χ/Q values analyzed in the approval of the certified design, thereby demonstrating that the postulated accident radiological consequences calculated in the design certification bound that for the site and meet the regulatory criteria. Accordingly, the staff proposes that the following permit condition be included in any ESP issued for the Vogtle site.

If a COL or CP application referencing this ESP also references a certified design, the COL or CP applicant may demonstrate compliance with the radiological consequence evaluation factors in 10 CFR 52.79(a)(1) or 10 CFR 50.34(a)(1), respectively, by demonstrating that the site-specific χ/Q values determined in the ESP fall within those evaluated in the approval of the referenced certified design. However, if a COL or CP referencing this ESP does not reference a certified design, the applicant would still need to demonstrate that its source term is bounded by the source term values included in the ESP. This is **Permit Condition 9**.

The NRC staff further concludes that the proposed distances to the EAB and the LPZ outer boundary of the proposed ESP site, in conjunction with the fission product release rates to the environment provided by the applicant, are adequate to provide reasonable assurance that the radiological consequences of the postulated DBAs will be within the dose consequence evaluation factors set forth at 10 CFR 50.34(a)(1) and 10 CFR 52.17(a)(1) for the proposed ESP site.

The NRC staff further concludes that, with respect to the radiological consequences of design basis accidents: (1) the applicant demonstrated that the proposed ESP site is suitable for power reactors with source term characteristics bounded by those of the AP1000, as specified in Appendix A, without undue risk to the health and safety of the public; and (2) the applicant complies with the applicable requirements of 10 CFR 52.17 and 10 CFR Part 100.

As noted in the applicant's comments on the NRC staff's draft environmental impact statement (DEIS) (Southern 2007f), Westinghouse, the AP1000 reactor vendor, has submitted a revision to the AP1000 design to NRC for review (Westinghouse 2007, NRC 2008). The NRC staff is reviewing that request independently of the Vogtle ESP review. The source term information in the Westinghouse submission indicates that the doses from postulated accidents would decrease should the proposed design revision be accepted. However, the staff has not completed its review of the design changes or done a site-specific analysis of the radiological consequences of postulated design basis accidents for the revised design at the Vogtle site.

17.0 QUALITY ASSURANCE PROGRAM DESCRIPTION

17.1 Introduction

Southern Nuclear Operating Company (SNOC) submitted an Early Site Permit Application for the Vogtle site by letter, dated August 15, 2007. Chapter 17.0, Appendix 17.1A, "Nuclear Development Quality Assurance Manual" (QA Manual), establishes a quality assurance program that can be applied to the Early Site Permit application (ESP) and the limited work authorization (LWA) activities described in Supplement 2-S1.

This safety evaluation addresses Revision 6 of the Vogtle Early Site Permit Application QA Manual. Revision 6 of the QA manual incorporates the standard format and content of Nuclear Energy Institute (NEI) 06-14A, "Quality Assurance Program Description," and supersedes the staff's previous safety evaluation on Revision 3 of the Vogtle ESP QA Manual issued on August 30, 2007. NEI 06-14A covers a variety of applications, including combined licenses, construction, preoperation, and operation activities. However, this evaluation covers only those activities described in the Vogtle ESP Application and Supplement 2-S1.

17.2 Regulatory Evaluation

Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," establishes the Commission's QA requirements for the design, fabrication, construction, and testing of the structures, systems and components (SSCs) of the facility. These requirements apply to all activities affecting the safety-related functions of those SSCs. This includes designing, purchasing, fabricating, handling, shipping, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling, and modifying.

Section 52.17, "Contents of Applications; Technical Information," of 10 CFR establishes the technical information requirements for ESP applications. Subsection 52.17(1)(a)(xi) requires that ESP applications provide a description of the QA program applied to site-related activities for the future design, fabrication, construction, and testing of the SSCs of a facility or facilities that may be constructed on the site.

17.3 Technical Evaluation

The staff used Standard Review Plan (SRP) Section 17.5, "Quality Assurance Program Description—Design Certification, Early Site Permit and New License Applicants," (NUREG-0800, Section 17.5, "Quality Assurance Program Description") to evaluate the applicant's QA program description (QAPD). In developing SRP Section 17.5, the staff used American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA) Standard NQA-1-1994, as supplemented by regulatory and industry guidance for nuclear operating facilities.

The QAPD is a top-level policy document that defines the quality policy and assigns major functional responsibilities. The QAPD applies to safety-related SSCs as well as selected elements of nonsafety-related SSCs that are nevertheless important to plant safety.

The QAPD cites a number of activities, such as operating, refueling, and decommissioning activities, that are outside the scope of this safety evaluation. This safety evaluation is limited to activities described by the Vogtle ESP application and LWA supplement.

17.3.1 Organization

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.A, for providing an organizational description that includes an organizational structure, functional responsibilities, levels of authority, and interfaces for establishing, executing, and verifying QAPD implementation. The QAPD establishes independence between the organization responsible for checking a function and the organization that performs the function. In addition, the QAPD allows management to size the quality assurance organization according to the duties and responsibilities assigned.

The applicant commits to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 1 and Supplement 1S-1.

17.3.2 Quality Assurance Program

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.B, to ensure that the QA Manual describes all aspects of work that are important to the safety of nuclear power plants. The quality assurance program comprises those planned and systematic actions necessary to provide confidence that SSCs will perform their intended safety function, as described in the applicant's final safety analysis report (FSAR). This includes certain nonsafety-related SSCs and activities that are important to plant safety. The appropriate facility maintains a list or system identifying SSCs and activities to which the QAPD applies.

The QAPD provides measures to assess its adequacy and to ensure its effective implementation at least once each year or at least once during the life of the activity, whichever is shorter. Consistent with SRP Section 17.5, paragraph II.B.8, the QAPD applies a grace period of 90 days to activities that must be performed on a periodic basis. The grace period does not allow the "clock" for a particular activity to be reset forward. However, the "clock" for an activity is reset backwards by performing the activity early.

The QAPD follows the guidance of SRP Section 17.5, paragraphs II.S and II.T, for establishing and maintaining training programs for personnel who perform, verify, or maintain activities within the scope of the QAPD. The QAPD provides the minimum training requirements for managers responsible for QAPD implementation. It also provides the minimum training requirements for the individual responsible for planning, implementing, and maintaining the QAPD.

The applicant commits to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 2 and Supplements 2S-1, 2S-2, 2S-3, and 2S-4, with the following clarifications and exceptions:

- ASME Standard NQA-1-1994, Supplement 2S-1, includes use of the guidance provided in Appendix 2A-1 to ASME Standard NQA-1-1994. The following alternatives may be applied to the implementation of this supplement and appendix:

As an alternative to the requirement in Appendix 2A-1 to be certified as Level I, II, or III; personnel performing independent quality verification inspections, examinations, measurements, or tests will be required to possess qualifications equal to or better than those required for performing the task being verified. In addition, the verification performed must be within the skills of these personnel and/or addressed by procedures. These personnel will not be responsible for planning quality verification inspections and tests (i.e., establishing hold points and acceptance criteria in procedures, and determining who will be responsible for performing the inspection), evaluating inspection training programs, or certifying inspection personnel. This alternative is consistent with SRP Section 17.5, paragraph II.T.5.

A qualified engineer may plan inspections, evaluate the capabilities of an inspector, or evaluate the training program for inspectors. For the purposes of these functions, a qualified engineer is one who has a baccalaureate degree in engineering in a discipline related to the inspection activity (such as electrical, mechanical, or civil engineering) and has at least 5 years of engineering work experience, with at least 2 years of this experience related to nuclear facilities. In accordance with Supplement 2S-1 to ASME Standard NQA-1-1994, the organization must designate those activities that require qualified inspectors and test personnel and establish written procedures for the qualification of these personnel. The U. S. Nuclear Regulatory Commission (NRC) staff determined that the designation of a qualified engineer to plan inspections, evaluate inspectors, or evaluate the inspector qualification programs is acceptable. The staff's review determined that this approach is consistent with regulatory guidance, ASME Standard NQA-1-1994, or other industry guidance in this subject area.

- ASME Standard NQA-1-1994, Supplement 2S-2, describes the qualification requirements of nondestructive examination personnel. As an alternative, the applicant's QAPD provides guidance to follow the applicable standard cited in the version(s) of Sections III and XI of the ASME Boiler and Pressure Vessel Code. The regulation in 10 CFR 50.55a, "Codes and Standards," requires use of the latest edition and addenda of ASME Boiler and Pressure Vessel Code Sections III and XI. Therefore, the staff accepts the use of Sections III and XI of the ASME Code for qualification of nondestructive examination personnel.

- ASME Standard NQA-1-1994, Supplement 2S-3 requires that prospective lead auditors must have participated in a minimum of five audits in the previous 3 years. As an alternative, the applicant's QAPD follows the guidance provided in SRP Section 17.5, paragraph II.S.4.c:

  The prospective lead auditor shall demonstrate his/her ability to properly implement the audit process, as implemented by the company, to effectively lead an audit team, and to effectively organize and report results, including participation in at least one nuclear audit within the year preceding the date of qualification.

17.3.3 Design Control

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.C, for controlling the design, design changes, and temporary modifications (e.g., temporary bypass lines, electrical jumpers and lifted wires, and temporary setpoints) of items that are subject to the provisions of the QAPD. The QAPD design process includes provisions to control design

inputs, outputs, changes, interfaces, records, and organizational interfaces with the applicant and its suppliers. These provisions ensure that the design inputs (e.g., design bases and the performance, regulatory, quality, and quality verification requirements) are correctly translated into design outputs (e.g., analyses, specifications, drawings, procedures, and instructions). In addition, the QAPD provides for individuals knowledgeable in quality assurance principles to review design documents for the necessary quality assurance requirements.

The QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 3 and Supplement 3S-1, for establishing the program for design control and verification, ASME Standard NQA-1-1994 Subpart 2.20 for the subsurface investigation requirements and ASME Standard NQA-1-1994 Subpart 2.7 for the standards for computer software quality assurance controls.

17.3.4 Procurement Document Control

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.D, for ensuring that procurement documents include or reference applicable regulatory, technical, and quality assurance program requirements. These requirements (such as specifications, codes, standards, tests, inspections, special processes, and the regulation at 10 CFR Part 21, "Reporting of Defects and Noncompliance") are invoked for procurement of items and services.

The QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 4 and Supplement 4S-1, with the following clarifications and exceptions:

- ASME Standard NQA-1-1994, Supplement 4S-1, Section 2.3, states that procurement documents must require suppliers to have a documented quality assurance program that implements ASME Standard NQA-1-1994, Part I. As an alternative, the QAPD proposes that suppliers have a documented quality assurance program that meets Appendix B to 10 CFR Part 50, as applicable to the circumstances of the procurement. Criterion IV, "Procurement Document Control," of 10 CFR Part 50, Appendix B requires suppliers to have a quality assurance program consistent with Appendix B. Therefore, the staff accepted this clarification, as delineated in SRP Section 17.5, paragraph II.D.2.d.

- The QAPD proposes that procurement documents allow the supplier to work under the applicant's QAPD (in lieu of the supplier having its own quality assurance program). Criterion IV of 10 CFR Part 50, Appendix B requires suppliers to have a quality assurance program consistent with Appendix B. Therefore, the NRC staff accepted this clarification, as delineated in SRP Section 17.5, paragraph II.D.2.d.

- ASME Standard NQA-1-1994, Supplement 4S-1, Section 3, requires procurement documents to be reviewed before award of the contract. As an alternative, the QAPD proposes to conduct the quality assurance review of procurement documents through review of the applicable procurement specification, including the technical and quality procurement requirements, before contract award. In addition, procurement document changes (e.g., scope, technical, or quality requirements) will also receive quality assurance review.

- The NRC staff evaluated this proposed alternative and determined that it provides adequate quality assurance review of procurement documents before awarding the contract and after any change. Therefore, the NRC staff accepted this alternative.

- Procurement documents for commercial-grade items that the applicant or holder will procure as safety-related items shall contain technical and quality requirements such that the procured item can be appropriately dedicated. This alternative is consistent with NRC staff guidance in Generic Letter (GL) 89-02, "Actions to Improve the Detection of Counterfeit and Fraudulently Marked Products," dated March 21, 1989, and GL 91-05, "Licensee Commercial-Grade Procurement and Dedication Programs," dated April 9, 1991, as delineated in SRP Section 17.5, paragraphs II.U.1.d and II.U.1.e.

17.3.5 Instructions, Procedures, and Drawings

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.E, for establishing the necessary measures and governing procedures to ensure that activities affecting quality are prescribed by and performed in accordance with documented instructions, procedures, and drawings.

The QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 5, for establishing procedural controls.

17.3.6 Document Control

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.F, for controlling the preparation, review, approval, issuance, and changes of documents that specify quality requirements or prescribe measures for controlling activities affecting quality, including organizational interfaces. The QAPD provides measures to ensure that the same organization that performed the original review and approval also reviews and approves changes, unless other organizations are specifically designated. A listing of all controlled documents identifying the current approved revision or date is maintained so personnel can readily determine the appropriate document for use.

In establishing provisions for document control, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 6 and Supplement 6S-1.

17.3.7 Control of Purchased Material, Equipment, and Services

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.G, for controlling the procurement of items and services to ensure conformance with requirements. The program provides measures for evaluating prospective suppliers and selecting only those that are qualified. In addition, the program provides for auditing and evaluating suppliers to ensure that qualified suppliers continue to provide acceptable products and services.

The program provides for acceptance actions (e.g. source verification, receipt inspection, pre- and postinstallation tests) and review of documentation (e.g., certificates of conformance), to ensure that the procurement, inspection, and test requirements have been satisfied before relying on the item to perform its intended safety function. Purchased items (e.g., components, spares, and replacement parts necessary for plant operation, refueling, maintenance, and

modifications) and services are subject to quality and technical requirements at least equivalent to those specified for original equipment or by properly reviewed and approved revisions to ensure that the items are suitable for the intended service and are of acceptable quality to maintain safety.

In establishing procurement verification control, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 7 and Supplement 7S-1, with the following clarifications and exceptions:

- The QAPD proposes that other 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," licensees (i.e., other than the applicant or holder), authorized nuclear inspection agencies, the National Institute of Standards and Technology (NIST), and other State and Federal agencies that may provide items or services to the applicant do not require evaluation or audit.

  The NRC staff acknowledges that 10 CFR Part 50 licensees, authorized nuclear inspection agencies, NIST, and other State and Federal agencies perform work under acceptable quality programs, and require no additional evaluation. The applicant or holder is still responsible for ensuring that the items or services conform to 10 CFR Part 50, Appendix B program, applicable ASME Code requirements, and other regulatory requirements and commitments. The applicant or holder is also responsible for ensuring and documenting that the items or services are suitable for the intended use. The NRC staff accepted a similar exception in a previous safety evaluation ("Approval of Relief Request RR-27," ADAMS No. ML003693241) and accepts the applicant's exception because it provides an appropriate level of quality and safety.

- The QAPD includes provisions consistent with the regulatory guidance provided in SRP Section 17.5, paragraph II.L.8, for the procurement of commercial-grade calibration services for safety-related applications. The QAPD proposes not to require procurement source evaluation and selection measures provided each of the following conditions are met:

  - Purchase documents impose additional technical and administrative requirements to satisfy QAPD and technical requirements.

  - Purchase documents require reporting as-found calibration data when calibrated items are found to be out of tolerance.

  - A documented review of the supplier's accreditation will be performed and will include a verification of the following:

    - The calibration laboratory holds a domestic accreditation by the National Voluntary Laboratory Accreditation Program (NVLAP) or by the American Association for Laboratory Accreditation, as recognized by NVLAP through the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement.

    - The accreditation is based on ANS/ISO/IEC 17025.

    - The published scope of the accreditation for the calibration laboratory covers the necessary measurement parameters, range, and uncertainties.

- ASME Standard NQA-1-1994, Supplement 7S-1, Section 8.1, describes requirements for documents to be available at the site. As an alternative, the QAPD proposes that documents may be stored in approved electronic media under the applicant's, holder's, or supplier's control and not physically located at the plant site, as long as they are accessible from the respective nuclear facility. Following completion of the construction period, sufficient as-built documentation will be turned over to the licensee to support operations. The NRC staff determined that this alternative meets 10 CFR Part 50, Appendix B, Criterion VII, "Control of Purchased Material, Equipment, and Services." Criterion VII requires documentary evidence that items conform to procurement documents to be available at the nuclear facility before installation or use. Therefore, this provision, which would allow for accessing and reviewing the necessary procurement documents at the site before installation and use, would meet this requirement.

- ASME Standard NQA-1-1994, Supplement 7S-1, Section 10, describes requirements for the control of commercial-grade items and services. As an alternative, the QAPD commits the applicant to follow NRC guidance discussed in GL 89-02 and GL 91-05 as delineated in SRP Section 17.5, paragraphs II.U.1.d and II.U.1.e.

- Consistent with the guidance mentioned above for commercial-grade items and services, the commercial-grade program provides for special quality verification requirements to provide the necessary assurance that the item will perform satisfactorily in service. In addition, the documents provide for determining critical characteristics to ensure that an item is suitable for its intended use. It also provides for technical evaluation of the item, receipt requirements, and quality evaluation of the item.

17.3.8 Identification and Control of Materials, Parts, and Components

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.H, for establishing the necessary measures for the identification and control of items such as materials, including consumables and items with limited shelf life, parts, components, and partially fabricated subassemblies. The identification of items is maintained throughout fabrication, erection, installation, and use so that the item can be traced to its documentation.

In establishing provisions for identification and control of items, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 8 and Supplement 8S-1.

17.3.9 Control of Special Processes

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.I, to assure that special processes requiring interim process controls (e.g. welding, heat treating, chemical cleaning, and nondestructive examinations), are quality controlled in accordance with the applicable codes, specifications, and standards of the specific work.

In establishing measures for the control of special processes, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 9 and Supplement 9S-1.

17.3.10 Inspection

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.J, to ensure that items, services, and activities that affect safety meet requirements and conform to specifications, instructions, procedures, and design documents. The inspection program establishes requirements for planning inspections, determining applicable acceptance criteria, setting the frequency of inspection, and identifying special tools needed to perform the inspection. Inspectors are properly qualified personnel who are independent of those who performed or directly supervised the work.

In establishing inspection requirements, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 10, Supplement 10S-1, and Subparts 2.4, 2.5 and 2.8, with the following clarifications and exceptions:

- ASME Standard NQA-1-1994, Subpart 2.4, commits the applicant or licensee to Institute of Electrical and Electronic Engineers (IEEE) Standard 336-1985, "IEEE Standard Installation, Inspection, and Testing Requirements for Power, Instrumentation, and Control Equipment at Nuclear Facilities." IEEE 336-1985 refers to IEEE 498-1985, "IEEE Standard Requirements for the Calibration and Control of Measuring and Test Equipment Used in Nuclear Facilities." Both of these standards use the definition of "safety systems equipment" from IEEE 603-1980, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations." The QAPD commits the applicant or licensee, as applicable, to the definition of safety systems equipment from IEEE 603-1980 but does not commit the applicant or holder to the balance of IEEE 603-1980. This definition applies only to equipment in the context of ASME Standard NQA-1-1994, Subpart 2.4.

The following is the definition of safety system in IEEE 603-1980:

> Those systems (the reactor trip system, an engineered safety feature, or both, including all their auxiliary supporting features and other auxiliary feature) which provide a safety function. A safety system is comprised of more than one safety group of which any one safety group can provide the safety function.

The QAPD needs to commit to the definition of safety systems equipment from IEEE 603-1980 in order to appropriately implement Subpart 2.4 of ASME Standard NQA-1-1994. The clarification reinforces the fact that the QAPD is not committing to the entirety of IEEE 603-1980. The NRC staff accepts the definition of safety systems equipment in the context of ASME Standard NQA-1-1994, Subpart 2.4 because it clarifies the definition.

- As an alternative for sites that may not meet the requirement of ASME Standard NQA-1-1994, Supplement 10S-1, Section 3.1, for independent reporting, the QAPD proposes that the inspector must report to quality control management while performing the inspection. This alternative is consistent with NRC staff guidance provided in SRP 17.5, paragraph II.J.1.

17.3.11 Test Control

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.K, to demonstrate that items subject to the provisions of the QAPD will perform satisfactorily in service, that the plant can be operated safely as designed, and that the operation of the plant, as a whole, is satisfactory.

In establishing provisions for testing, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 11 and Supplement 11S-1.

In establishing provisions to ensure that computer software used in applications affecting safety is prepared, documented, verified, tested, and used such that the expected outputs are obtained and configuration control maintained, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Supplements 11S-2 and Subpart 2.7.

17.3.12 Control of Measuring and Test Equipment

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.L, for controlling the calibration, maintenance, and use of measuring and test equipment that provides safety information.

In establishing provisions for control of measuring and test equipment, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 12 and Supplement 12S-1, with the following clarifications and exceptions:

The QAPD clarifies that the out-of-calibration conditions, described in paragraph 3.2 of Supplement 12S-1 of ASME Standard NQA-1-1994, refer to cases where the measuring and test equipment are found to be out of the required accuracy limits (i.e., out of tolerance) during calibration. The NRC staff determined that the clarification for the out-of-calibration conditions is acceptable, on the basis that it clarifies a definition.

- ASME Standard NQA-1-1994, Subpart 2.4, Section 7.2.1 describes calibration labeling requirements. As an alternative, the QAPD proposes that for measuring and test equipment impractical to mark because of size or configuration, the required calibration information be maintained in suitable documentation traceable to the device. This alternative is consistent with the NRC staff guidance provided in SRP 17.5, paragraph II.L.3.

17.3.13 Handling, Storage, and Shipping

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.M, for controlling the handling, storage, packaging, shipping, cleaning, and preservation of items to prevent inadvertent damage or loss and to minimize deterioration.

In establishing provisions for handling, storage, and shipping, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 13 and Supplement 13S-1. The QAPD also commits the applicant, during the construction and preoperations phase of the plant, to comply with the requirements of

ASME Standard NQA-1-1994, Subparts 2.1, 2.2, and 2.15, with the following clarification and exception:

ASME Standard NQA-1-1994, Subpart 2.2, Section 6.6, "Storage Records," contains requirements for the preparation of records containing information on personnel access to quality assurance records. As an alternative, the QAPD provides for documents to establish control of storage areas that describe those authorized to access the area and the requirements for recording access of personnel. The QAPD proposes not to consider these records as quality records. The plants will retain these records in accordance with the plants' administrative controls. The NRC staff determined that the proposed alternative is acceptable, on the basis that these records do not meet the classification of a quality record as defined in ASME Standard NQA-1-1994, Supplement 17S-1, Section 2.7.

17.3.14 Inspection, Test, and Operating Status

The applicant's QAPD follows the guidance of SRP Section 17.5, paragraph II.N, for identifying the inspection, test, and operating status of items and components subject to the QAPD. This maintains personnel and reactor safety and avoids inadvertent operation of equipment.

In establishing measures for control of inspection, test and operating status, the QAPD commits to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 14.

17.3.15 Nonconforming Materials, Parts, or Components

The QAPD follows the guidance of SRP Section 17.5, paragraph II.O, to control items, including services, which do not conform to specified requirements to prevent inadvertent installation or use. Instances of nonconformance are evaluated for their impact on operability of quality SSCs to ensure that the final condition does not adversely affect safety, operation, or maintenance of the item or service. Results of evaluations of conditions adverse to quality are analyzed to identify quality trends. They are then documented and reported to upper management.

In addition, the QAPD provides for establishing the necessary measures to implement a reporting program in accordance with the requirements of 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants"; 10 CFR 50.55(e), "Definitions"; and/or 10 CFR Part 21," Reporting of Defects and Noncompliance."

In establishing measures for nonconforming material, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 15 and Supplement 15S-1.

17.3.16 Corrective Action

The QAPD follows the guidance of SRP Section 17.5, paragraph II.P, to promptly identify, control, document, classify, and correct conditions adverse to quality. The QAPD requires personnel to identify conditions adverse to quality and find trends. Significant conditions adverse to quality are documented and reported to responsible management. In the case of suppliers working on safety-related activities or similar situations, the applicant or holder may

delegate specific responsibility for the corrective action program, but the applicant or holder maintains responsibility for the program's effectiveness.

In addition, the QAPD provides for establishing the necessary measures to implement a program to identify, evaluate, and report defects and noncompliances in accordance with the requirements of 10 CFR 50.55(e) and/or 10 CFR Part 21, as applicable.

In establishing a corrective action program, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 16.

17.3.17 Quality Assurance Records

The applicant's QAPD follows SRP Section 17.5, paragraph II.Q to ensure that records of items and activities affecting quality are generated, identified, retained, maintained, and retrievable.

Concerning the use of electronic records storage and retrieval systems, the QAPD provides for compliance with NRC guidance given in Regulatory Issue Summary 2000-18, "Guidance on Managing Quality Assurance Records in Electronic Media," dated October 23, 2000; and associated Nuclear Information and Records Management Association (NIRMA) guidelines TG 11-1998, TG 15-1998, and TG 21-1998.

The QAPD commits the applicant to comply with the records standards described in ASME Standard NQA-1-1994, Basic Requirement 17 and Supplement 17S-1, with the following clarification and exception:

- ASME Standard NQA-1-1994, Supplement 17S-1, Section 4.2(b) requires records to be firmly attached in binders or placed in folders or envelopes for storage in steel file cabinets or on shelving in containers. As an alternative, the QAPD proposes that hard records be stored in steel cabinets or on shelving in containers, except that methods other than binders, folders, or envelopes may be used to organize records for storage. In a previous safety evaluation (ADAMS Accession No. ML052430024), the NRC staff accepted a similar alternative. Therefore this alternative is acceptable.

17.3.18 Quality Assurance Audits

The applicant's QAPD follows SRP Section 17.5, paragraph II.R, to audit activities covered by the QAPD. The audit program is reviewed as part of the overall audit process. The QAPD provides for the applicant or holder to conduct periodic internal and external audits. Internal audits determine the adequacy of the program and procedures and determine if they comply with the overall QAPD. Internal audits are performed with a frequency commensurate with safety significance. An audit of all applicable quality assurance program elements is completed for each functional area within 2 years after the program is well established. External audits determine the adequacy of a supplier's or contractor's quality assurance program. The responsible management documents and reviews audit results. Management responds to all audit findings and initiates corrective action. In addition, where corrective actions are indicated, documented followup of applicable areas through inspections, review, reaudits, or other means is conducted to verify corrective action.

In establishing the independent audit program, the QAPD commits the applicant to comply with the quality standards described in ASME Standard NQA-1-1994, Basic Requirement 18 and Supplement 18S-1.

17.3.19 Non-safety-Related SSC Quality Assurance Control

17.3.19.1 Non-safety-Related SSCs Important to Plant Safety

The QAPD follows the guidance of SRP Section 17.5, paragraph II.V.1, for establishing specific program controls applied to nonsafety-related SSCs that are important to plant safety and to which 10 CFR Part 50, Appendix B does not apply. The QAPD applies specific controls to those items in a selected manner, targeting those characteristics or critical attributes that render the SSC important to plant safety consistent with applicable sections of the QAPD.

17.3.19.2 Nonsafety-Related SSCs Credited for Regulatory Events

The applicant's QAPD commitments refer to fire protection (10CFR 50.48, "Fire Protection"), anticipated transients without scram (10 CFR 50.62, "Requirements for Reduction of Risk from Anticipated Transients without Scram (ATWS) Events for Light-Water-Cooled Nuclear Power Plants"), and station blackout (10 CFR 50.63, "Loss of all Alternating Current Power"). These regulations are outside the scope of the application and, therefore, staff did not review them as part of this safety evaluation.

17.3.20 Regulatory Commitments

The QAPD follows the guidance of SRP Section 17.5, paragraph II.U, for establishing quality assurance program commitments. The QAPD commits the applicant to comply with the following NRC regulatory guides and other quality assurance standards to supplement and support the QAPD:

- Regulatory Guide 1.26, Revision 4, "Quality Group Classification and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants," March 2007.

  The QAPD commits the applicant to comply with the regulatory positions of this guidance with the exception of Criteria C.1, C.1.a, C.1.b, and C.3. As documented in NUREG-1793, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design," dated September 2000, and Supplement 1 to NUREG-1793, dated December 2005, the NRC staff determined that the proposed exceptions are acceptable for use with the AP1000 design.

- Regulatory Guide 1.29, Revision 3, "Seismic Design Classification," September 1978.

  The QAPD commits the applicant to comply with Regulatory Guide 1.29 with the exception of Criteria C.1.d, C.1.g, and C.1.n. As documented in NUREG-1793 and Supplement 1 to NUREG-1793, the NRC staff determined that the proposed exceptions are acceptable for use with the AP1000 design.

- ASME Standard NQA-1-1994, "Quality Assurance Requirements for Nuclear Facility Applications," Parts I and II, as described in Sections 17.3.1 through 17.3.18 of this safety evaluation report (SER).

- NIRMA technical guides, as described in Section 17.3.17 of this SER.

17.4 Conclusion

- The NRC staff used the provisions of Appendix B to 10 CFR Part 50 and the guidance of SRP Section 17.5 to evaluate the QAPD. Staff concludes the following:

- The QAPD provides adequate guidance for an applicant to describe the authority and responsibility of management and supervisory personnel, performance/verification personnel, and self-assessment personnel.

- The QAPD provides adequate guidance for an applicant to provide for organizations and persons to perform verification and self-assessment functions with the authority and independence to conduct their activities without undue influence from those directly responsible for costs and schedules.

- The QAPD provides adequate guidance for an applicant to apply the QAPD to activities and items that are important to safety.

- The QAPD provides adequate guidance for establishing controls that, when properly implemented, comply with the requirements of 10 CFR Part 52, 10 CFR Part 50, Appendix B, 10 CFR Part 21, 10 CFR 50.55(e); with the acceptance criteria contained in SRP 17.5, and with the commitments to applicable regulatory guidance.

On the basis of its review, the NRC staff concludes that the applicant's QAPD provides adequate guidance for establishing a quality assurance program that complies with Appendix B to 10 CFR Part 50 by following the guidance of ASME Standard NQA-1-1994, as supplemented by regulatory and industry guidance. Accordingly, the NRC staff concludes that the QAPD can be used by the applicant for ESP and activities authorized by the limited work authorization.

18.0 REVIEW BY THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

The Advisory Committee on Reactor Safeguards (ACRS) completed its review of the application submitted by Southern Nuclear Operating Company (SNC) for an early site permit (ESP) and limited work authorization (LWA) for the Vogtle Electric Generating Plant (VEGP) ESP site. The ACRS also completed its review of the U.S. Nuclear Regulatory Commission (NRC) staff's safety evaluation report (SER).

The ACRS ESP subcommittee met with representatives from SNC and the staff on October 24, 2007. The ACRS held its full committee meeting on the SNC ESP SER with open items on November 1, 2007. The discussions during these meetings focused on the staff's ongoing review, in particular the development and the significance of the open items identified by the staff. On the basis of its review, the ACRS issued an interim letter report, dated November 20, 2007, which addressed the portions of the SNC ESP application that concern safety. The staff responded to the interim letter report in its letter dated December 28, 2007. This final safety evaluation report (FSER) documents the resolution of open items discussed in the SER with open items.

During its meeting with the ACRS on December 3rd and December 4th, 2008, the staff discussed the resolution of open items for the ESP review as well as the staff's review of SNC's LWA request. Since an LWA was requested by SNC a year after its request for an ESP, the staff had not been able to present the results of its review of the LWA request during the October and November 2007 ACRS meetings. At the 558th meeting of the ACRS, the full committee considered the staff's advanced SER with no open items, as well as SNC's ESP application and LWA request, and issued its final letter report to the NRC Chairman on December 22, 2008. That letter report is included as Appendix E to this report.

In its final letter report dated December 22, 2008, the ACRS stated that the application for an ESP and LWA for the VEGP ESP site were adequate, and found that the NRC staff's review of the application were adequate. The ACRS concluded that the ESP and the LWA should be granted.

19.0 CONCLUSIONS

In accordance with Subpart A, "Early Site Permits," of Title 10 of the Code of Federal Regulations (10 CFR), Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," the staff of the U.S. Nuclear Regulatory Commission reviewed the site safety analysis report (SSAR), the emergency planning information, and the limited work authorization (LWA) request included in the early site permit (ESP) application submitted by Southern Nuclear Operating Company (SNC), for the Vogtle Electric Generating Plant (VEGP) ESP site. On the basis of its evaluation and its independent analyses as discussed in this safety evaluation report (SER), the staff concludes that the VEGP ESP site characteristics comply with the requirements of 10 CFR Part 100, "Reactor Site Criteria," subject to limitations and conditions proposed by the staff in this SER for inclusion in any ESP that might be issued. Further, for the reasons set forth in this SER, the staff concludes that, taking into consideration the site criteria contained in 10 CFR Part 100, two reactors, having characteristics that fall within the parameters for the site, and which meet the terms and conditions proposed by the staff in this SER, can be constructed and operated without undue risk to the health and safety of the public. The staff also finds that the proposed ITAAC for emergency planning are necessary and sufficient, within the scope of the ESP, to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the provisions of the Atomic Energy Act, and the Commission's rules and regulations. For the reasons above, the staff also concludes that issuance of the requested ESP will not be inimical to the common defense and security or to the health and safety of the public. If issued, the VEGP ESP may be referenced in an application to construct and operate two nuclear power reactors with a total generating capacity of up to 6800 megawatts (thermal) at the ESP site, subject to the terms and conditions of the permit.

In addition, the staff also concludes that the VEGP LWA request meets the applicable standards and requirements of the Act and the Commission's regulations. The staff finds that reasonable assurance has been established such that there is adequate protection to public health and safety, and that issuance of the LWA will also not be inimical to the common defense and security. The staff also finds that the proposed ITAAC for an LWA are necessary and sufficient, within the scope of the LWA, to provide reasonable assurance that the facility has been constructed and will be operated in conformity with the license, the provisions of the Atomic Energy Act, and the Commission's rules and regulations.

APPENDIX A

PERMIT CONDITIONS, COL ACTION ITEMS, SITE CHARACTERISTICS, BOUNDING PARAMETERS, AND INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

A.1 Permit Conditions

Permit Condition: The Commission's regulations at 10 CFR 52.24 require an ESP to specify any terms and conditions of the ESP the Commission deems appropriate. A permit condition is not needed when an existing NRC regulation requires a future regulatory review of a matter to ensure adequate safety during design, construction, or inspection activities for a new plant. The staff is proposing that the Commission include nine permit conditions, which are set forth below, to control various safety matters.

Permit Condition No.	SER Section	Description
2.5 – Geology, Seismology, and Geotechnical Engineering		
1	2.5.4	The ESP holder shall either remove and replace, or shall improve, the soils directly above the blue bluff marl for soils under or adjacent to Seismic Category 1 structures, to eliminate any liquefaction potential.
13.3 – Emergency Planning		
2	13.3.3.2.4	An applicant for a combined license (COL) referencing this early site permit shall revise the EALs for Unit 3 to reflect the final revision of NEI 07-01.
3	13.3.3.2.4	An applicant for a combined license (COL) referencing this early site permit shall revise the EALs for Unit 4 to reflect the final revision of NEI 07-01.
4	13.3.3.2.4	An applicant for a combined license (COL) referencing this early site permit shall submit a fully developed EAL scheme for Unit 3 that reflects the completed AP1000 design details, subject to allowable ITAAC.
5	13.3.3.2.4	An applicant for a combined license (COL) referencing this early site permit shall submit a fully developed EAL scheme for Unit 4 that reflects the completed AP1000 design details, subject to allowable ITAAC.
6	13.3.3.2.4	An applicant for a combined license (COL) referencing this early site permit shall complete a fully developed set of EALs for Unit 3, which are based on in-plant conditions and instrumentation, including onsite and offsite monitoring, and which have been discussed and agreed on by the applicant or licensee and State and local governmental authorities, and shall include the full set of EALs in the COL application. If the EALs are not fully developed, the COL application shall contain appropriate ITAAC for the fully developed set of EALs for Unit 3.

Permit Condition No.	SER Section	Description
7	13.3.3.2.4	An applicant for a combined license (COL) referencing this early site permit shall complete a fully developed set of EALs for Unit 4, which are based on in-plant conditions and instrumentation, including onsite and offsite monitoring, and which have been discussed and agreed on by the applicant or licensee and State and local governmental authorities, and shall include the full set of EALs in the COL application. If the EALs are not fully developed, the COL application shall contain appropriate ITAAC for the fully developed set of EALs for Unit 4.
8	13.3.3.2.8	An applicant for a combined license (COL) referencing this early site permit shall resolve the difference between the VEGP Units 3 and 4 common Technical Support Center (TSC), and the TSC location specified in the AP1000 certified design.
15.0 – Accident Analysis		
9	15.0.3.4	If a COL or CP application referencing this ESP also references a certified design, the COL or CP applicant may demonstrate compliance with the radiological consequence evaluation factors in 10 CFR 52.79(a)(1) or 10 CFR 50.34(a)(1), respectively, by demonstrating that the site-specific χ/Q values determined in the ESP fall within those evaluated in the approval of the referenced certified design. However, if a COL or CP referencing this ESP does not reference a certified design, the applicant would still need to demonstrate that its source term is bounded by the source term values included in the ESP.

A.2 COL Action Items

COL Action Items: The COL action items set forth in the SER and incorporated herein identify certain matters that shall be addressed in the FSAR by an applicant for a CP or COL who submits an application referencing the Vogtle ESP. These items constitute information requirements but do not form the only acceptable set of information in the FSAR. An applicant may depart from or omit these items, provided that the departure or omission is identified and justified in the FSAR. In addition, these items do not relieve an applicant from any requirement in 10 CFR Parts 50 and 52 that governs the application. After issuance of a CP or COL, these items are not controlled by NRC requirements unless such items are restated in the preliminary safety analysis report or FSAR, respectively.

The staff identified the following COL action items with respect to individual site characteristics in order to ensure that particular significant issues are tracked and considered during the review of a later application referencing any ESP that might be issued for the VEGP site.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
2.2 – Nearby Industrial, Transportation, and Military Facilities			
2.2-1	2.2.3.3	A COL or CP applicant should address the potential accidental release of hydrazine from onsite storage tanks that may have an impact on control room habitability for the new units.	Since the design of the control room at the proposed ESP site is not available, it is expected to be evaluated at the CP or COL stage.
2.2-2	2.2.3.3	A COL or CP applicant should identify the quantities of the chemicals that will be used for the proposed Units 3 and 4 at VEGP and address their potential impact on control room habitability.	Since the quantities of the chemicals used are not available, and the design of the control room is not available, it is expected to be evaluated at the CP or COL stage.
2.3 – Meteorology			
2.3-1	2.3.1.3	If, at the COL or CP stage, the applicant chooses an alternative plant design that requires the use of a UHS cooling tower, the applicant will need to identify the appropriate meteorological site characteristics (i.e., maximum evaporation and drift loss and minimum water cooling conditions) used to evaluate the design of	The applicant has chosen a reactor design that does not use a cooling tower to release heat to the atmosphere following a loss of coolant accident.

Action Item No.	SER Section	Subject To Be Addressed	Reason For Deferral
		the chosen UHS cooling tower.	
2.4 – Hydrology			
2.4-1	2.4.13	A COL or CP applicant will need to confirm that no chelating agents will be comingled with radioactive waste liquids and that such agents will not be used to mitigate an accidental release. Alternatively, the applicant should repeat the distribution coefficient experiments with chelating agents included, and incorporate these newly determined distribution coefficients into the analysis to demonstrate that 10 CFR Part 20, Appendix B, Table 2 is satisfied.	The detailed design of the radwaste treatment system was not available at the ESP stage, and the applicant, in response to an RAI, stated that comingling of chelating agents and radionuclides was highly unlikely. Subsequent analysis of radionuclide transport by staff indicate that either comingling must not occur, or additional data and further analysis is necessary. Therefore, the prospect for comingling chelating agents and radionuclides must be revisited at the CP or COL stage.
13.6 – Industrial Security			
13.6-1	13.6	The COL or CP applicant will need to provide the specific access control measures to address the existing rail spur.	Such measures are not required at the ESP stage.

A.3 Site Characteristics

Site Characteristics: Based on site investigation, exploration, analysis, and testing, the applicant initially proposes a set of site characteristics. These site characteristics are specific physical attributes of the site, whether natural or man-made. Site characteristics, if reviewed and approved by the staff, are specified in the ESP. The staff proposes to include the following site characteristics in any ESP that might be issued for the Vogtle.

Site Characteristic	Value	Definition
2.1 - Geography and Demography		
Exclusion Area Boundary	The EAB for the proposed Units 3 and 4 at the VEGP site is the same as the existing EAB for VEGP Units 1 and 2. The EAB is bounded by River Road, Hancock Landing Road, and 1.7 miles of the Savannah River (River miles 150.0 to 151.7). See Figure A3-1.	The area surrounding the reactor(s), in which the reactor licensee has the authority to determine all activities including exclusion or removal of personnel and property from the area.
Low Population Zone	The area falling within a 2-mile radius circle from the midpoint between the Units 1 and 2 containment buildings.	The area immediately surrounding the exclusion area that contains residents.
Population Center Distance	- 2-2/3 miles (minimum allowable distance) - 26 miles (Augusta, GA) (current actual distance)	- The minimum allowable distance from the reactor to the nearest boundary of a densely populated center containing more than about 25,000 residents. - The current distance from the reactor to the nearest boundary of a densely populated center containing more than about 25,000 residents.

Site Characteristic		Value	Definition
2.3 - Meteorology			
Ambient Air Temperature and Humidity			
Maximum Dry-Bulb Temperature	2% annual exceedance	92 °F / 75 °F	The ambient dry-bulb temperature (and mean coincident wet-bulb temperature) that will be exceeded 2% of the time annually
	0.4% annual exceedance	97 °F / 76 °F	The ambient dry-bulb temperature (and mean coincident wet-bulb temperature) that will be exceeded 0.4% of the time annually
	100-year return period	115 °F	The ambient dry-bulb temperature that has a 1% annual probability of being exceeded (100-year mean recurrence interval).
Minimum Dry-Bulb Temperature	99% annual exceedance	25 °F	The ambient dry-bulb temperature below which dry-bulb temperatures will fall 1% of the time annually.
	99.6% annual exceedance	21 °F	The ambient dry-bulb temperature below which dry-bulb temperatures will fall 0.4% of the time annually.
	100-year return period	-8 °F	The ambient dry-bulb temperature for which a 1% annual probability of a lower dry-bulb temperature exists (100-year mean recurrence interval).
Maximum Wet-Bulb Temperature	0.4% annual exceedance	79 °F	The ambient wet-bulb temperature that will be exceeded 0.4% of the time annually.
	100-year return period	88 °F	The ambient wet-bulb temperature that has a 1% annual probability of being exceeded (100-year mean recurrence interval).

Site Characteristic	Value	Definition
Site Temperature Basis for AP1000		
Maximum Safety Dry-Bulb and Coincident Wet-Bulb	115 °F / 77.7 °F	These AP1000 specific site characteristics values represent a maximum dry-bulb temperature that exists for 2 hours or more, combined with the maximum wet-bulb temperature that exists in that population of dry-bulb temperatures.
Maximum Safety Wet-Bulb (Non-Coincident)	83.9 °F	This AP1000 specific site characteristic value represents a maximum wet-bulb temperature that exists within a set of hourly data for a duration of 2 hours or more.
Maximum Normal Dry-Bulb and Coincident Wet-Bulb	94 °F / 78 °F	The dry-bulb temperature component of this AP1000 specific site characteristics pair is represented by a maximum dry-bulb temperature that exists for 2 hours or more, excluding the highest 1 percent of the values in an hourly data set. The wet-bulb temperature component is similarly represented by the highest wet-bulb temperature excluding the highest 1 percent of the data, although there is no minimum 2-hour persistence criterion associated with this wet-bulb temperature.
Maximum Normal Wet-Bulb (Non-Coincident)	78 °F	This AP1000 specific site characteristic value represents a maximum wet-bulb temperature, excluding the highest 1 percent of the values in an hourly data set (i.e., a 1 percent exceedance), that exists for 2 hours or more.
Basic Wind Speed		
3-Second Gust	104 mi/h	The 3-second gust wind speed to be used in determining wind loads, defined as the 3-second gust wind speed at 33 feet above the ground that has a 1% annual probability of being exceeded (100-year mean recurrence interval)
Tornado		
Maximum Wind Speed	300 mi/h	Maximum wind speed resulting from passage of a

Site Characteristic	Value	Definition
		tornado having a probability of occurrence of 10^{-7} per year
Maximum Translational Speed	60 mi/h	Translation component of the maximum tornado wind speed
Rotational Speed	240 mi/h	Rotation component of the maximum tornado wind speed
Radius of Maximum Rotational Speed	150 feet	Distance from the center of the tornado at which the maximum rotational wind speed occurs
Pressure Drop	2.0 lbf/in.^{2}	Decrease in ambient pressure from normal atmospheric pressure resulting from passage of the tornado
Rate of Pressure Drop	1.2 lbf/in.^{2}/s	Rate of pressure drop resulting from the passage of the tornado
Winter Precipitation		
100-Year Snowpack	10 lb/ft^2	Weight of the 100-year return period snowpack (to be used in determining normal precipitation loads for roofs)
48-Hour Probable Maximum Winter Precipitation	28.3 inches of water	PMP during the winter months (to be used in conjunction with the 100-year snowpack in determining extreme winter precipitation loads for roofs)
Short-Term (Accident Release) Atmospheric Dispersion		
0–2 hr χ/Q Value @ EAB	3.49×10^{-4} s/m^3	The 0–2 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the EAB.
0–8 hr χ/Q Value @ LPZ outer boundary	7.04×10^{-5} s/m^3	The 0–8 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ.
8–24 hr χ/Q Value @ LPZ outer boundary	5.25×10^{-5} s/m^3	The 8–24 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne

Site Characteristic	Value	Definition
		releases at the LPZ.
1-4 day χ/Q Value @ LPZ outer boundary	2.77×10^{-5} s/m^3	The 1-4 day atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ.
4-30 day χ/Q value @ LPZ outer boundary	1.11×10^{-5} s/m^3	The 4-30 day atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ.
Long-Term (Routine Release) Atmospheric Dispersion		
Annual Average Undepleted/No Decay χ/Q Value @ EAB, northeast, 0.5 mile	5.5×10^{-6} s/m^3	The maximum annual average EAB undepleted/no decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/2.26-Day Decay χ/Q Value @ EAB, northeast, 0.5 mile	5.5×10^{-6} s/m^3	The maximum annual average EAB undepleted/2.26 day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Depleted/8.00-Day Decay χ/Q Value @ EAB, northeast, 0.5 mile	5.0×10^{-6} s/m^3	The maximum annual average EAB depleted/8.00 day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average D/Q Value @ EAB, northeast and east-northeast, 0.5 mile	1.7×10^{-8} 1/m^2	The maximum annual average EAB relative deposition factor (D/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/No Decay χ/Q Value @ Nearest Resident, northeast, 0.67 mile	3.4×10^{-6} s/m^3	The maximum annual average resident undepleted/no decay atmospheric dispersion factor (χ/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/2.26-Day Decay χ/Q Value @ Nearest Resident, northeast, 0.67 mile	3.4×10^{-6} s/m^3	The maximum annual average resident undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.

Site Characteristic	Value	Definition
Annual Average Depleted/8.00-Day Decay χ/Q Value @ Nearest Resident, northeast, 0.67 mile	3.0×10^{-6} s/m^3	The maximum annual average resident depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average D/Q Value @ Nearest Resident, northeast, east-northeast, and east, 0.67 mile	1.0×10^{-8} 1/m^2	The maximum annual average resident relative deposition factor (D/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/No Decay χ/Q Value @ Nearest Meat Animal, northeast, 0.67 mile	3.4×10^{-6} s/m^3	The maximum annual average meat animal undepleted/no decay atmospheric dispersion factor (χ/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/2.26-Day Decay χ/Q Value @ Nearest Meat Animal, northeast, 0.67 mile	3.4×10^{-6} s/m^3	The maximum annual average meat animal undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Depleted/8.00-Day Decay χ/Q Value @ Nearest Meat Animal, northeast, 0.67 mile	3.0×10^{-6} s/m^3	The maximum annual average meat animal depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average D/Q Value @ Nearest Meat Animal, northeast, east-northeast, and east, 0.67 mile	1.0×10^{-8} 1/m^2	The maximum annual average meat animal relative deposition factor (D/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/No Decay χ/Q Value @ Nearest Vegetable Garden, northeast, 0.67 mile	3.4×10^{-6} s/m^3	The maximum annual average vegetable garden undepleted/no decay atmospheric dispersion factor (χ/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/2.26-Day Decay χ/Q Value @ Nearest Vegetable Garden, northeast, 0.67 mile	3.4×10^{-6} s/m^3	The maximum annual average vegetable garden undepleted/2.26-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.

Site Characteristic	Value	Definition
Annual Average Depleted/8.00-Day Decay χ/Q Value @ Nearest Vegetable Garden, northeast, 0.67 mile	3.0×10^{-6} s/m^3	The maximum annual average vegetable garden depleted/8.00-day decay χ/Q value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average D/Q Value @ Nearest Vegetable Garden, northeast, east-northeast, and east, 0.67 mile	1.0×10^{-8} 1/m^2	The maximum annual average vegetable garden relative deposition factor (D/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
2.4 - Hydrology		
Hydrology		
Proposed Facility Boundaries	Appendix A Figure A3-1 (Figure 2.4.14-1)	The site boundary within which all safety-related SSC will be located.
Highest Ground Water Elevation	165 feet MSL at the Water Table Aquifer	The highest elevation of the water table within the site boundaries.
Maximum Flood Elevation (maximum hydrostatic water surface elevation due to a postulated upstream dam breach scenario)	166.79 feet MSL	The stillwater elevation, without accounting for wind-induced waves that the water surface reaches during a flood event.
Wind run-up (to add to the maximum flood elevation)	11.31 feet	The water surface elevation reached by wind-induced waves running up on the shore.
Combined Effects Maximum Flood Elevation	178.10 feet MSL	The water surface elevation obtained by adding wind run-up to the highest flood level.
Local Intense Precipitation	19.2 inches during 1 hour 6.2 inches during 5 minutes	The depth of PMP for duration of one hour on a one square-mile drainage area. The surface water drainage system should be designed for a flood produced by the local intense precipitation. The local intense precipitation is specified by SSAR Table 2.4.2-3 (SER Table 2.4.2-1).

Site Characteristic	Value	Definition
Frazil Ice	The ESP site does not have the potential for the formation of frazil and anchor ice	Ice crystals that form in turbulent, open waters in presence of supercooling. Frazil ice is very sticky and may lead to blockages of intake screens and trash racks.
2.5 – Geology, Seismology, and Geotechnical Engineering		
Basic Geologic and Seismic Information		
Capable Tectonic Structures	none	No fault displacement potential within the investigative area.
Vibratory Ground Motion		
Ground Motion Response Spectra (Site Safe Shutdown Earthquake)	Appendix A Figure A3-2	Site specific response spectra.
Stability of Subsurface Materials and Foundations		
Liquefaction	None at the site-specific SSE	Liquefaction potential for the subsurface material at the site.
Minimum bearing capacity (static and dynamic)	1627 kPa (34 ksf) – static 2010 kPa (42 ksf) - dynamic	Load-bearing capacity of bearing soil layer for plant structures.
Minimum shear wave velocity of the load bearing soil layers	Appendix A Tables A3-1 and A3-2	Soil property.

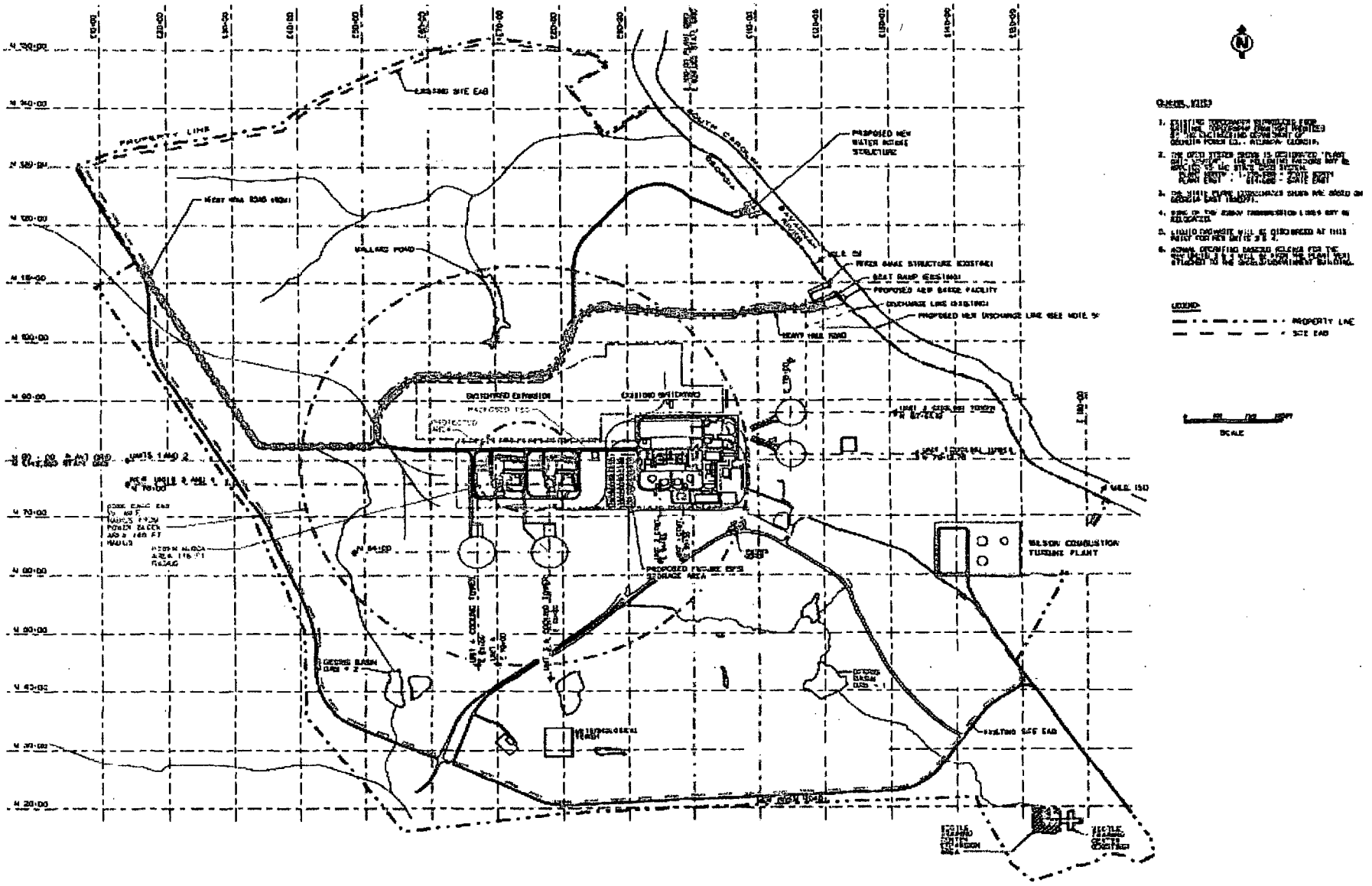

Figure A3-1 (Figure 2.4.14-1) – The proposed facility boundary for the VEGP site (Taken from SSAR Figure 1-4)

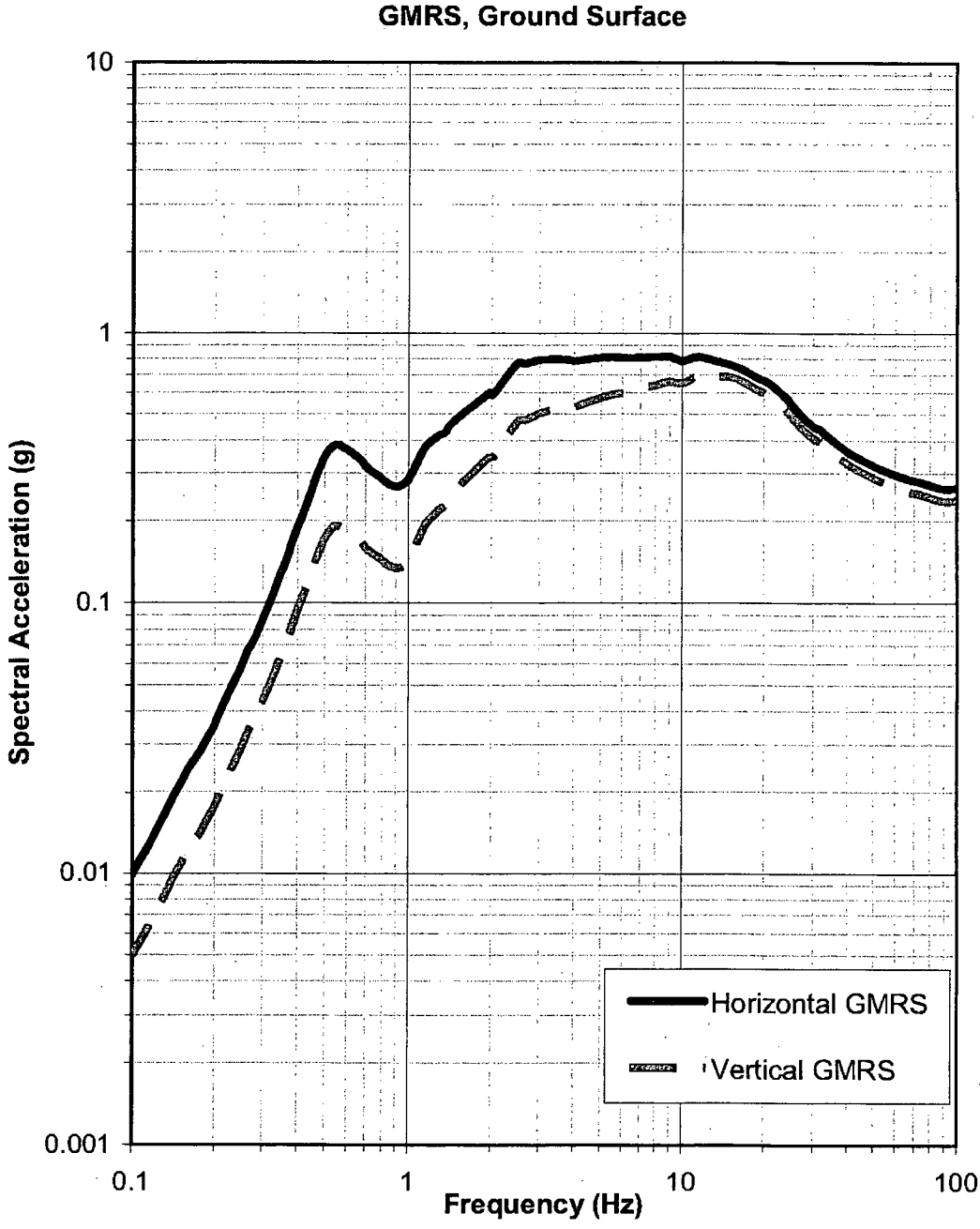

Figure A3-2 (SER Figure 2.5.2-25) - Plots of the horizontal and vertical GMRS (reproduced from SSAR Figure 2.5.2-44b).

Part A: Soil Shear-Wave Velocities (ESP)

Geologic Formation	Depth (feet)	V_s (fps)
Compacted Backfill	0 to 6	573
	6 to 10	732
	10 to 14	811
	14 to 18	871
	18 to 23	927
	23 to 29	983
	29 to 36	1,040
	36 to 43	1,092
	43 to 50	1,137
	50 to 56	1,175
	56 to 63	1,209
	63 to 71	1,232
	71 to 79	1,253
	79 to 86	1,273
Blue Bluff Marl (Lisbon Formation)	86 to 92	1,400
	92 to 97	1,700
	97 to 102	2,100
	102 to 105	1,700
	105 to 111	2,200
	111 to 123	2,350
	123 to 149	2,650
Lower Sand Stratum (Still Branch)	149 to 156	2,000
	156 to 216	1,650
(Congaree)	216 to 331	1,950
(Snapp)	331 to 438	2,050
(Black Mingo)	438 to 477	2,350
(Steel Creek)	477 to 587	2,650
(Gaillard/Black Creek)	587 to 798	2,850
(Pio Nono)	798 to 858	2,870
(Cape Fear)	858 to 1,049	2,710
Dunbarton Triassic Basin & Paleozoic Crystalline Rock	> 1,049	see Table 2.5.4-11, Part B

Table A3-1 - Shear Wave Velocity Values for Site Amplification Analysis (Taken from SSAR Table 2.5.4-11)

Part B: Rock Shear-Wave Velocities - Six Alternate Profiles

	Vs (ft/s)	
Depth (ft)	Gradient #1	Gradient #2
1,049 to 1,100	4,400	4,400
1,100 to 1,150	5,650	5,650
1,150 to 1,225	6,650	6,650
1,225 to 1,337.5	7,600	7,600
1,337.5 to 1,402.5	8,000	8,700
1,402.5 to 1,405	8,005	8,703
1,405 to 1,525	8,059	8,739
> 1,525	9,200	9,200

Rock Vs profile corresponding to the location midway between B-1002 and B-1003.

	Vs (ft/s)	
Depth (ft)	Gradient #1	Gradient #2
1,049 to 1,100	4,400	4,400
1,100 to 1,150	5,650	5,650
1,150 to 1,225	6,650	6,650
1,225 to 1,337.5	7,600	7,600
1,337.5 to 1,450	8,000	8,700
1,450 to 1,550	8,090	8,760
1,550 to 1,650	8,180	8,820
1,650 to 1,750	8,270	8,880
1,750 to 1,830	8,360	8,940
1,830 1,900	8,414	8,976
> 1,900	9,200	9,200

Rock Vs profile corresponding to the location of B-1003.

	Vs (ft/s)	
Depth (ft)	Gradient #1	Gradient #2
1,049 to 1,100	4,400	4,400
1,100 to 1,150	5,650	5,650
1,150 to 1,225	6,650	6,650
1,225 to 1,337.5	7,600	7,600
1,337.5 to 1,450	8,000	8,700
1,450 to 1,550	8,090	8,760
1,550 to 1,650	8,180	8,820
1,650 to 1,750	8,270	8,880
1,750 to 1,850	8,360	8,940
1,850 to 1,950	8,450	9,000
1,950 to 2,050	8,540	9,060
2,050 to 2,127.5	8,630	9,120
2,127.5 to 2,155	8,679.5	9,153
2,155 to 2,275	8,733.5	9,189
> 2,275	9,200	9,200

Table A3-1 (cont.) - Shear Wave Velocity Values for Site Amplification Analysis (Taken from SSAR Table 2.5.4-11)

Part A: Soil Shear-Wave Velocities (COL Soil Column)

Geologic Formation	Depth (feet) (ft)	V_s (fps) (fps)
Compacted Backfill	0	550
	5	724
	10	832
	20	975
	30	1064
	40	1130
	50	1183
	60	1228
	70	1267
	80	1302
	85	1318
	86.5	1327
	88	1327
Blue Bluff Marl (Lisbon Formation)	88 to 96	1,341
	96 to 102	1,747
	102 to 110	1,988
	110 to 122	2,300
	122 to 156	2,541
Lower Sand Stratum (Still Branch)	156 to 164	1,820
	164 to 220	1,560
(Congaree)	220 to 236	1,757
	236 to 280	2,000
	280 to 328	1,926
	328 to 340	1,727
(Snapp)	340 to 447	2,050
(Black Mingo)	447 to 486	2,350
(Steel Creek)	486 to 596	2,650
(Gaillard/Black Creek)	596 to 807	2,850
(Pio Nono)	807 to 867	2,870
(Cape Fear)	867 to 1,059	2,710

Table A3-2 - Shear Wave Velocity Values for Site Amplification Analysis (Taken from SSAR Table 2.5.4-11a)

A.4 Bounding Parameters (Including Accident Source Term)

Bounding Parameters: The bounding parameters set forth postulated values of design parameters that provide design details to support the NRC staff's review of an ESP application. Because the NRC staff is relying on certain design parameters specified in the ESP application to reach its conclusions on site suitability, these bounding parameters would be included in any ESP that might be issued for the VEGP site. A COL or CP application referencing an ESP must contain information sufficient to demonstrate that the actual characteristics of the design chosen by the COL or CP applicant falls within the bounding design parameters specified in the ESP.

Bounding Parameters	Value	Definition
2.4 – Hydrology		
Plant Grade	220 feet MSL	Finished plant grade at the ESP site.
15.0 – Accident Analysis		
Accident Source Term	See tables A4-1 through tables A4-9	The activity, by isotope, contained in post-accident airborne effluents.

Activity Releases for Steam System Piping Failure with Pre-Existing Iodine Spike

	Activity Release (Ci)				
Isotope	0-2 hr	2-8 hr	8-24 hr	24-72 hr	Total
Kr-85m	6.56E-02	1.14E-01	6.80E-02	6.18E-03	2.57E-01
Kr-85	2.82E-01	8.46E-01	2.26E+00	6.69E+00	1.01E+01
Kr-87	2.76E-02	1.34E-02	5.29E-04	8.80E-08	4.15E-02
Kr-88	1.12E-01	1.37E-01	4.04E-02	8.27E-04	2.91E-01
Xe-131m	1.28E-01	3.79E-01	9.81E-01	2.70E+00	4.19E+00
Xe-133m	1.59E-01	4.51E-01	1.04E+00	2.05E+00	3.70E+00
Xe-133	1.16E+01	3.45E+01	8.64E+01	2.16E+02	3.49E+02
Xe-135m	3.04E-03	1.33E-05	0.00E+00	0.00E+00	3.06E-03
Xe-135	3.10E-01	6.90E-01	8.35E-01	3.38E-01	2.17E+00
Xe-138	3.99E-03	1.14E-05	0.00E+00	0.00E+00	4.00E-03
I-130	3.59E-01	1.42E-01	2.09E-01	1.33E-01	8.44E-01
I-131	2.40E+01	1.21E+01	3.10E+01	8.22E+01	1.49E+02
I-132	3.05E+01	4.14E+00	8.06E-01	6.55E-03	3.55E+01
I-133	4.34E+01	1.90E+01	3.53E+01	3.98E+01	1.37E+02
I-134	6.74E+00	1.63E-01	1.43E-03	4.54E-09	6.91E+00
I-135	2.60E+01	8.16E+00	7.54E+00	1.71E+00	4.34E+01
Cs-134	1.90E+01	1.95E-01	5.19E-01	1.54E+00	2.12E+01
Cs-136	2.82E+01	2.86E-01	7.43E-01	2.06E+00	3.13E+01
Cs-137	1.37E+01	1.41E-01	3.74E-01	1.11E+00	1.53E+01
Cs-138	1.01E+01	1.02E-03	4.42E-07	0.00E+00	1.01E+01
Total	2.15E+02	8.15E+01	1.68E+02	3.56E+02	8.21E+02

Table A4-1 (SSAR Table 15-2)

Activity Releases for Steam System Piping Failure with Accident-Initiated Iodine Spike

	Activity Release (Ci)				
Isotope	0-2 hr	2-8 hr	8-24 hr	24-72 hr	Total
Kr-85m	6.66E-02	1.14E-01	6.80E-02	6.18E-03	2.57E-01
Kr-85	2.62E-01	3.46E-01	2.25E+00	6.69E+00	1.01E+01
Kr-87	2.76E-02	1.34E-02	5.29E-04	8.80E-08	4.15E-02
Kr-88	1.12E-01	1.37E-01	4.04E-02	8.27E-04	2.91E-01
Xe-131m	1.26E-01	3.79E-01	9.81E-01	2.70E+00	4.19E+00
Xe-133m	1.59E-01	4.51E-01	1.04E+00	2.05E+00	3.70E+00
Xe-133	1.16E+01	3.45E+01	8.64E+01	2.16E+02	3.42E+02
Xe-135m	3.04E-03	1.33E-05	0.00E+00	0.00E+00	3.05E-03
Xe-135	3.10E-01	8.90E-01	8.35E-01	3.38E-01	2.17E+00
Xe-138	3.99E-03	1.14E-05	0.00E+00	0.00E+00	4.00E-03
I-130	4.20E-01	9.95E-01	1.58E+00	1.01E+00	4.01E+00
I-131	2.60E+01	5.73E+01	1.56E+02	4.13E+02	6.53E+02
I-132	4.62E+01	9.74E+01	2.24E+01	1.32E-01	1.66E+02
I-133	4.91E+01	1.14E+02	2.27E+02	2.55E+02	6.45E+02
I-134	1.34E+01	1.86E+01	2.65E-01	8.42E-07	3.23E+01
I-135	3.24E+01	7.74E+01	7.83E+01	1.77E+01	2.08E+02
Cs-134	1.90E+01	1.95E-01	5.19E-01	1.54E+00	2.12E+01
Cs-136	2.62E+01	2.86E-01	7.43E-01	2.08E+00	3.13E+01
Cs-137	1.37E+01	1.41E-01	3.74E-01	1.11E+00	1.53E+01
Cs-138	1.01E+01	1.02E-03	4.42E-07	0.00E+00	1.01E+01
Total	2.51E+02	4.03E+02	5.78E+02	9.20E+02	2.15E+03

Table A4-2 (SSAR Table 15-3)

Activity Releases for Reactor Coolant Pump Shaft Seizure

	Activity Release (Ci)				
	No Feedwater	Feedwater Available			
Isotope	0-1.5 hr	0-2 hr	2-8 hr	6-8 hr	Total
Kr-85m	8.16E+01	1.05E+02	1.74E+02	4.13E+01	2.79E+02
Kr-85	7.58E+00	1.01E+01	3.03E+01	1.01E+01	4.04E+01
Kr-87	1.20E+02	1.43E+02	6.97E+01	5.43E+00	2.13E+02
Kr-88	2.06E+02	2.62E+02	3.20E+02	6.05E+01	5.82E+02
Xe-131m	3.77E+00	5.03E+00	1.49E+01	4.85E+00	1.99E+01
Xe-133m	2.02E+01	2.69E+01	7.64E+01	2.48E+01	1.03E+02
Xe-133	6.66E+02	8.87E+02	2.60E+03	8.57E+02	3.49E+03
Xe-135m	3.24E+01	3.28E+01	1.43E-01	2.65E-06	3.30E+01
Xe-135	1.59E+02	2.08E+02	4.84E+02	1.32E+02	6.72E+02
Xe-138	1.29E+02	1.30E+02	3.72E-01	3.01E-06	1.30E+02
I-130	8.45E-01	1.17E-01	1.33E+00	5.65E-01	1.45E+00
I-131	3.77E+01	5.39E+00	7.51E+01	3.46E+01	8.05E+01
I-132	2.79E+01	3.45E+00	1.48E+01	3.95E+00	1.83E+01
I-133	4.66E+01	6.86E+00	8.29E+01	3.64E+01	8.98E+01
I-134	2.68E+01	2.76E+00	2.98E+00	2.09E-01	5.74E+00
I-135	4.19E+01	5.68E+00	5.22E+01	2.05E+01	5.79E+01
Cs-134	1.29E+00	1.82E-01	2.40E+00	1.11E+00	2.59E+00
Cs-136	5.63E-01	8.45E-02	7.79E-01	3.47E-01	8.63E-01
Cs-137	7.74E-01	1.10E-01	1.41E+00	6.51E-01	1.52E+00
Cs-138	6.06E+00	7.29E-01	3.35E+00	1.13E+00	4.08E+00
Rb-86	1.33E-02	1.83E-03	2.73E-02	1.27E-02	2.81E-02
Total	1.62E+03	1.84E+03	3.29E+03	1.23E+03	5.82E+03

Note: The release period of 6-8 hr yields the maximum 2-hr EAB dose with feedwater available.

Table A4-3 (SSAR Table 15-4)

Activity Releases for Spectrum of Rod Cluster Control Assembly Ejection Accidents

	Activity Release (Ci)					
Isotope	0-2 hr	2-8 hr	8-24 hr	24-96 hr	96-720 hr	Total
Kr-85m	1.12E+02	6.48E+01	3.87E+01	1.77E+00	2.51E-05	2.13E+02
Kr-85	5.01E+00	5.60E+00	1.49E+01	3.35E+01	2.88E+02	3.47E+02
Kr-87	1.82E+02	2.60E+01	1.03E+00	8.37E-05	0.00E+00	2.09E+02
Kr-88	2.91E+02	1.18E+02	3.49E+01	3.59E-01	8.41E-09	4.45E+02
Xe-131m	4.94E+00	5.46E+00	1.42E+01	2.86E+01	1.16E+02	1.69E+02
Xe-133m	2.87E+01	2.81E+01	6.49E+01	8.45E+01	5.31E+01	2.57E+02
Xe-133	8.79E+02	9.58E+02	2.40E+03	4.27E+03	8.45E+03	1.70E+04
Xe-135m	7.34E+01	5.30E-02	4.33E-09	0.00E+00	0.00E+00	7.35E+01
Xe-135	2.15E+02	1.72E+02	2.09E+02	4.35E+01	1.79E-01	6.39E+02
Xe-138	2.99E+02	1.38E-01	3.19E-09	0.00E+00	0.00E+00	2.99E+02
I-130	4.90E+00	7.28E+00	4.32E+00	2.03E-01	2.95E-04	1.67E+01
I-131	1.36E+02	2.45E+02	2.31E+02	3.10E+01	1.68E+01	6.60E+02
I-132	1.53E+02	9.94E+01	9.85E+00	8.24E-03	0.00E+00	2.62E+02
I-133	2.72E+02	4.40E+02	3.18E+02	2.28E+01	2.41E-01	1.05E+03
I-134	1.66E+02	2.85E+01	1.37E-01	4.48E-08	0.00E+00	1.95E+02
I-135	2.39E+02	2.97E+02	1.19E+02	2.39E+00	7.32E-05	6.57E+02
Cs-134	3.08E+01	6.22E+01	6.03E+01	7.76E+00	5.16E+00	1.66E+02
Cs-136	8.79E+00	1.75E+01	1.67E+01	2.05E+00	6.58E-01	4.57E+01
Cs-137	1.79E+01	3.62E+01	3.51E+01	4.52E+00	3.05E+00	9.68E+01
Cs-138	1.09E+02	7.05E+00	1.68E-03	0.00E+00	0.00E+00	1.16E+02
Rb-86	3.62E-01	7.27E-01	6.98E-01	8.67E-02	3.42E-02	1.91E+00
Total	3.23E+03	2.62E+03	3.58E+03	4.53E+03	8.93E+03	2.29E+04

Table A4-4 (SSAR Table 15-5)

Activity Releases for Failure of Small Lines Carrying Primary Coolant Outside Containment

	Activity Release (Ci)
Isotope	0-2 hr
Kr-83m	1.24E+01
Kr-85	4.40E+01
Kr-87	7.05E+00
Kr-88	2.21E+01
Xe-131m	1.99E+01
Xe-133m	2.50E+01
Xe-133	1.84E+03
Xe-135m	2.59E+00
Xe-135	5.20E+01
Xe-138	3.65E+00
I-130	1.89E+00
I-131	9.26E+01
I-132	3.49E+02
I-133	2.01E+02
I-134	1.58E+02
I-135	1.68E+02
Cs-134	4.16E+00
Cs-136	8.16E+00
Cs-137	3.00E+00
Cs-138	2.21E+00
Total	3.02E+03

Table A4-5 (SSAR Table 15-6)

Activity Releases for Steam Generator Tube Rupture with Pre-Existing Iodine Spike

	Activity Release (Ci)			
Isotope	0-2 hr	2-8 hr	8-24 hr	Total
Kr-85m	5.53E+01	1.93E+01	7.53E-03	7.46E+01
Kr-85	2.20E+02	1.09E+02	1.34E-01	3.29E+02
Kr-87	2.39E+01	3.61E+00	9.12E-05	2.75E+01
Kr-88	9.22E+01	2.65E+01	5.43E-03	1.19E+02
Xe-131m	9.96E+01	4.88E+01	5.91E-02	1.46E+02
Xe-133m	1.24E+02	5.91E+01	6.81E-02	1.83E+02
Xe-133	9.19E+03	4.47E+03	5.29E+00	1.37E+04
Xe-135m	3.44E+00	5.86E-03	0.00E+00	3.45E+00
Xe-135	2.46E+02	1.02E+02	7.10E-02	3.47E+02
Xe-138	4.56E+00	5.07E-03	0.00E+00	4.57E+00
I-130	1.78E+00	5.39E-02	2.68E-01	2.12E+00
I-131	1.21E+02	5.27E+00	3.08E+01	1.56E+02
I-132	1.42E+02	7.43E-01	1.92E+00	1.44E+02
I-133	2.16E+02	7.63E+00	4.06E+01	2.64E+02
I-134	2.74E+01	4.40E-03	4.23E-03	2.74E+01
I-135	1.27E+02	2.70E+00	1.17E+01	1.42E+02
Cs-134	1.63E+00	6.05E-02	2.16E-01	1.90E+00
Cs-136	2.42E+00	6.86E-02	3.14E-01	2.82E+00
Cs-137	1.17E+00	4.37E-02	1.56E-01	1.37E+00
Cs-138	5.64E-01	2.91E-06	5.73E-07	5.64E-01
Total	1.07E+04	4.85E+03	9.14E+01	1.58E+04

Table A4-6 (SSAR Table 15-7)

Activity Releases for Steam Generator Tube Rupture with Accident-Initiated Iodine Spike

	Activity Release (Ci)			
Isotope	0-2 hr	2-8 hr	8-24 hr	Total
Kr-85m	5.53E+01	1.93E+01	7.53E-03	7.46E+01
Kr-85	2.20E+02	1.09E+02	1.34E-01	3.29E+02
Kr-87	2.39E+01	3.61E+00	9.12E-05	2.75E+01
Kr-88	9.22E+01	2.65E+01	5.43E-03	1.19E+02
Xe-131m	9.98E+01	4.88E+01	5.91E-02	1.46E+02
Xe-133m	1.24E+02	5.91E+01	8.61E-02	1.83E+02
Xe-133	9.19E+03	4.47E+03	5.29E+00	1.37E+04
Xe-135m	3.44E+00	5.86E-03	0.00E+00	3.45E+00
Xe-135	2.46E+02	1.02E+02	7.10E-02	3.47E+02
Xe-138	4.56E+00	5.07E-03	0.00E+00	4.57E+00
I-130	8.67E-01	1.62E-01	8.24E-01	1.67E+00
I-131	4.36E+01	1.14E+01	6.78E+01	1.23E+02
I-132	1.47E+02	4.86E+00	1.28E+01	1.65E+02
I-133	9.33E+01	2.00E+01	1.09E+02	2.22E+02
I-134	5.59E+01	8.04E-02	5.94E-02	5.60E+01
I-135	7.61E+01	9.88E+00	4.38E+01	1.30E+02
Cs-134	1.63E+00	6.06E-02	2.16E-01	1.90E+00
Cs-136	2.42E+00	8.86E-02	3.14E-01	2.82E+00
Cs-137	1.17E+00	4.37E-02	1.56E-01	1.37E+00
Cs-138	5.64E-01	2.91E-08	5.73E-07	5.64E-01
Total	1.05E+04	4.88E+03	2.40E+02	1.56E+04

Table A4-7 (SSAR Table 15-8)

Activity Releases for Loss-of-Coolant Accident Resulting from a Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary

	Activity Release (Ci)					
Isotope	1.4-3.4 hr	0-8 hr	8-24 hr	24-96 hr	96-720 hr	Total
I-130	5.64E+01	1.12E+02	5.37E+00	7.10E-01	1.27E-02	1.18E+02
I-131	1.68E+03	3.49E+03	2.66E+02	2.39E+02	7.19E+02	4.71E+03
I-132	1.23E+03	2.14E+03	1.64E+01	1.46E-02	0.00E+00	2.15E+03
I-133	3.23E+03	6.54E+03	3.83E+02	1.04E+02	1.04E+01	7.04E+03
I-134	6.60E+02	1.14E+03	2.96E-01	6.79E-08	0.00E+00	1.14E+03
I-135	2.56E+03	4.69E+03	1.56E+02	6.09E+00	3.16E-03	5.03E+03
Kr-85m	1.42E+03	3.77E+03	1.87E+03	9.56E+01	1.22E-03	5.73E+03
Kr-85	5.31E+01	2.97E+02	7.06E+02	1.59E+03	1.36E+04	1.62E+04
Kr-87	1.10E+03	1.95E+03	4.97E+01	4.05E-03	0.00E+00	1.99E+03
Kr-88	3.11E+03	7.26E+03	1.70E+03	1.75E+01	4.02E-07	8.97E+03
Xe-131m	8.26E+01	2.94E+02	6.79E+02	1.37E+03	5.57E+03	7.91E+03
Xe-133m	4.43E+02	1.54E+03	3.15E+03	4.11E+03	2.58E+03	1.14E+04
Xe-133	1.47E+04	5.19E+04	1.16E+05	2.06E+05	4.07E+05	7.80E+05
Xe-135m	1.06E+01	3.59E+01	2.14E-07	0.00E+00	0.00E+00	3.59E+01
Xe-135	3.15E+03	9.64E+03	1.01E+04	2.11E+03	5.68E+00	2.19E+04
Xe-138	3.11E+01	1.20E+02	1.58E-07	0.00E+00	0.00E+00	1.20E+02
Rb-86	3.04E+00	6.32E+00	2.99E-01	9.83E-02	5.13E-01	7.23E+00
Cs-134	2.58E+02	5.36E+02	2.57E+01	9.11E+00	7.74E+01	6.50E+02
Cs-136	7.33E+01	1.52E+02	7.18E+00	2.28E+00	9.88E+00	1.72E+02
Cs-137	1.51E+02	3.13E+02	1.50E+01	5.32E+00	4.57E+01	3.79E+02
Cs-138	1.50E+02	3.30E+02	2.18E-03	0.00E+00	0.00E+00	3.30E+02
Sb-127	2.42E+01	4.50E+01	2.29E+00	5.67E-01	7.82E-01	5.16E+01
Sb-129	5.10E+01	8.94E+01	1.51E+00	4.93E-03	4.20E-08	9.09E+01
Te-127m	3.15E+00	6.30E+00	3.16E-01	1.11E-01	8.71E-01	7.60E+00
Te-127	2.05E+01	3.93E+01	1.15E+00	2.75E-02	1.33E-04	3.94E+01
Te-129m	1.07E+01	2.15E+01	1.07E+00	3.65E-01	2.36E+00	2.52E+01

Table A4-8 (SSAR Table 15-9)

(cont.) Activity Releases for Loss-of-Coolant Accident Resulting from a Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary

	Activity Release (Ci)					
Isotope	1.4-3.4 hr	0-8 hr	8-24 hr	24-96 hr	96-720 hr	Total
Te-129	1.88E+01	2.53E+01	2.69E-02	3.54E-08	0.00E+00	2.84E+01
Te-131m	3.17E+01	6.20E+01	2.64E+00	3.35E-01	7.81E-02	6.50E+01
Te-132	3.23E+02	6.40E+02	3.02E+01	7.04E+00	7.83E+00	6.85E+02
Sr-89	9.23E+01	1.55E+02	9.24E+00	3.19E+00	2.26E+01	2.20E+02
Sr-90	7.95E+00	1.59E+01	7.99E-01	2.84E-01	2.44E+00	1.94E+01
Sr-91	9.68E+01	1.61E+02	5.46E+00	1.35E-01	7.06E-04	1.57E+02
Sr-92	6.83E+01	1.13E+02	1.01E+00	5.15E-04	0.00E+00	1.14E+02
Ba-139	5.44E+01	8.30E+01	1.49E-01	9.91E-07	0.00E+00	8.32E+01
Ba-140	1.83E+02	3.25E+02	1.61E+01	5.11E+00	2.17E+01	3.65E+02
Mo-99	2.15E+01	4.25E+01	1.95E+00	4.29E-01	3.78E-01	4.53E+01
Tc-99m	1.47E+01	2.66E+01	6.05E-01	5.27E-03	1.33E-06	2.72E+01
Ru-103	1.73E+01	3.46E+01	1.73E+00	5.93E-01	3.99E+00	4.09E+01
Ru-105	5.18E+00	1.44E+01	2.48E-01	8.26E-04	1.17E-08	1.46E+01
Ru-106	5.70E+00	1.14E+01	5.73E-01	2.03E-01	1.70E+00	1.39E+01
Rh-105	1.03E+01	2.02E+01	8.81E-01	1.29E-01	4.14E-02	2.12E+01
Ce-141	3.89E+00	7.76E+00	3.88E-01	1.32E-01	8.46E-01	9.15E+00
Ce-143	3.46E+00	6.76E+00	2.93E-01	4.05E-02	1.14E-02	7.13E+00
Ce-144	2.94E+00	5.89E+00	2.96E-01	1.05E-01	8.68E-01	7.15E+00
Pu-238	9.16E-03	1.53E-02	9.21E-04	3.27E-04	2.82E-03	2.24E-02
Pu-239	6.08E-04	1.61E-03	8.10E-05	2.88E-05	2.48E-04	1.97E-03
Pu-240	1.18E-03	2.37E-03	1.19E-04	4.22E-05	3.63E-04	2.89E-03
Pu-241	2.66E-01	5.31E-01	2.67E-02	9.48E-03	8.14E-02	6.49E-01
Np-239	4.48E+01	8.97E+01	4.06E+00	8.15E-01	5.70E-01	9.41E+01
Y-90	8.08E-02	1.60E-01	7.44E-03	1.59E-03	1.35E-03	1.70E-01
Y-91	1.19E+00	2.37E+00	1.19E-01	4.12E-02	3.00E-01	2.83E+00
Y-92	7.89E-01	1.35E+00	1.80E-02	2.86E-06	0.00E+00	1.37E+00

Table A4-8 Cont. (SSAR Table 15-9 cont)

(cont.) Activity Releases for Loss-of-Coolant Accident Resulting from a Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary

	Activity Release (Ci)					
Isotope	1.4-3.4 hr	0-8 hr	8-24 hr	24-96 hr	96-720 hr	Total
Y-93	1.21E+00	2.26E+00	7.08E-02	1.98E-03	1.42E-05	2.35E+00
Nb-95	1.60E+00	3.19E+00	1.59E-01	5.44E-02	3.56E-01	3.76E+00
Zr-95	1.59E+00	3.16E+00	1.59E-01	5.52E-02	4.08E-01	3.80E+00
Zr-97	1.43E+00	2.74E+00	1.03E-01	6.73E-03	3.71E-04	2.85E+00
La-140	1.67E+00	3.29E+00	1.46E-01	2.36E-02	9.62E-03	3.47E+00
La-141	1.03E+00	1.79E+00	2.71E-02	6.41E-05	2.01E-10	1.81E+00
La-142	5.38E-01	8.31E-01	2.09E-03	3.39E-08	0.00E+00	8.33E-01
Nd-147	6.16E-01	1.25E+00	6.08E-02	1.90E-02	7.29E-02	1.38E+00
Pr-143	1.39E+00	2.75E+00	1.37E-01	4.40E-02	1.84E-01	3.15E+00
Am-241	1.20E-04	2.39E-04	1.20E-05	4.27E-06	3.68E-05	2.92E-04
Cm-242	2.82E-02	5.65E-02	2.83E-03	9.98E-04	8.02E-03	6.84E-02
Cm-244	3.46E-03	6.93E-03	3.48E-04	1.24E-04	1.08E-03	8.47E-03
Total	3.53E+04	9.55E+04	1.35E+05	2.15E+05	4.30E+05	8.79E+05

Table A4-8 Cont. (SSAR Table 15-9 cont)

Activity Releases for Fuel Handling Accident

Isotope	Activity Release (Ci) 0-2 hr
Kr-85m	3.42E+02
Kr-85	1.11E+03
Kr-87	6.00E-02
Kr-88	1.07E+02
Xe-131m	5.54E+02
Xe-133m	2.80E+03
Xe-133	9.66E+04
Xe-135m	1.26E+03
Xe-135	2.49E+04
I-130	2.51E+00
I-131	3.76E+02
I-132	3.01E+02
I-133	2.40E+02
I-135	3.94E+01
Total	1.29E+05

Table A4-9 (SSAR Table 15-10)

A.5 INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

Inspections, Tests, Analyses, and Acceptance Criteria: An ESP application proposing complete and integrated emergency plans for review and approval should propose the inspections, tests, and analyses that the holder of a COL referencing the ESP 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 emergency plans, the provisions of the Atomic Energy Act, and the Commission's rules and regulations. Likewise, a request for a limited work authorization (LWA) to be issued in conjunction with an ESP should propose the inspections, tests, and analyses that the ESP holder authorized to conduct LWA activities 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 approved construction activities will have been completed in conformity with the provisions of the Atomic Energy Act and the Commission's rules and regulations.

A.5.1 ITAAC for the LWA

Backfill ITAAC

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
Backfill material under Seismic Category 1 structures is installed to meet a minimum of 95 percent modified Proctor compaction.	Required testing will be performed during placement of the backfill materials.	A report exists that documents that the backfill material under Seismic Category 1 structures meets the minimum 95 percent modified Proctor compaction.
Backfill shear wave velocity is greater than or equal to 1,000 fps at the depth of the NI foundation and below.	Field shear wave velocity measurements will be performed when backfill placement is at the elevation of the bottom of the Nuclear Island foundation and at finish grade.	A report exists and documents that the as-built backfill shear wave velocity at the NI foundation depth and below is greater than or equal to 1,000 fps.

Waterproof Membrane ITAAC

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
The friction coefficient to resist sliding is 0.7 or higher	Testing will be performed to confirm that the mudmat-waterproofing-mudmat interface beneath the Nuclear Island basemat has a minimum coefficient of friction to resist sliding of 0.7	A report exists and documents that the as-built waterproof system (mudmat-waterproofing-mudmat interface) has a minimum coefficient of friction of 0.7 as demonstrated through material qualification testing.

A.5.2 ITAAC for the ESP

VEGP Unit 3 Emergency Planning ITAAC

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
1.0 Emergency Classification System			
10 CFR 50.47(b)(4) – A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.	1.1 An emergency classification and emergency action level (EAL) scheme must be established by the licensee. The specific instruments, parameters, or equipment status shall be shown for establishing each emergency class, in the in-plant emergency procedures. The plan shall identify the parameter values and equipment status for each emergency class. [D.1]	1.1.1 An inspection of the control room, technical support center (TSC), and emergency operations facility (EOF) will be performed to verify that the displays for retrieving system and effluent parameters specified in Table Annex V2 D.2-1, *Hot Initiating Condition Matrix, Modes 1, 2, 3, and 4*; Table V2 D.2-2, *Cold Initiating Condition Matrix, Modes 5, 6, and De-fueled* are installed and perform their intended functions; and that emergency implementing procedures (EIPs) have been completed. 1.1.2 An analysis of the EAL technical bases will be performed to verify as-built, site-specific implementation of the EAL scheme.	1.1.1 The parameters specified in Table Annex V2 H-1, *Post Accident Monitoring Variables*, are retrievable in the control room, TSC, and EOF. The ranges of values of these parameters that can be displayed encompass the values specified in the emergency classification and EAL scheme. 1.1.2 The EAL scheme is consistent with Regulatory Guide 1.101, *Emergency Planning and Preparedness for Nuclear Power Reactors.*
3.0 Emergency Communications			
10 CFR 50.47(b)(6) – Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.	3.1 The means exists for communications between the control room, OSC, TSC, EOF, principal State and local emergency operations centers (EOCs), and radiological field monitoring teams. [F.1.d]	3.1 A test will be performed of the communications capabilities between the control room, OSC, TSC and EOF, and to the State and local EOCs, and radiological field monitoring teams.	3.1 Communications are established between the control room, OSC, TSC, and EOF. Communications are established between the control room, TSC, and Georgia Emergency Management Agency (GEMA) Operation Center; Burke County Emergency Operation Center (EOC); SRS Operations Center; South Carolina Warning Point; and Aiken, Allendale, and Barnwell County Dispatchers. Communications are established between the TSC and radiological monitoring teams.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	3.2 The means exists for communications from the control room, TSC, and EOF to the NRC headquarters and regional office EOC (including establishment of the Emergency Response Data System (ERDS) between the onsite computer system and the NRC Operations Center. [F.1.f]	3.2 A test will be performed of the communications capabilities from the control room, TSC and EOF to the NRC, including ERDS.	3.2 Communications are established from the control room, TSC, and EOF to the NRC headquarters and regional office EOCs and an access port for the Emergency Response Data System (ERDS) is provided.
5.0 Emergency Facilities and Equipment			
10 CFR 50.47(b)(8) – Adequate emergency facilities and equipment to support the emergency response are provided and maintained.	5.1 The licensee has established a technical support center (TSC) and an onsite operations support center (OSC). [H.1]	5.1 An inspection of the as-built TSC and OSC will be performed, including a test of the capabilities.	5.1.1 The TSC has at least 2,175 square feet of floor space. 5.1.2 Communication equipment is installed in the TSC and OSC, and voice transmission and reception are accomplished. 5.1.3 The plant parameters listed in Table Annex V2 H-1, *Post Accident Monitoring Values*, can be retrieved and displayed in the TSC. 5.1.4 The TSC is located within the protected area, and no major security barriers exist between the TSC and the control room. 5.1.5 The OSC is located adjacent to the passage from the annex building to the control room. 5.1.6 The TSC ventilation system includes a high-efficiency particulate air (HEPA) and charcoal filter, and radiation monitors are installed. 5.1.7 A reliable and backup electrical power supply is available for the TSC.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	5.2 The licensee has established an emergency operations facility (EOF). [H.2]	5.2 An inspection of the EOF will be performed, including a test of the capabilities.	5.2.1 Voice transmission and reception are accomplished between the EOF and the control room. 5.2.2 The plant parameters listed in Table Annex V2 H-1, *Post Accident Monitoring Values*, can be retrieved and displayed in the EOF.
6.0 Accident Assessment			
10 CFR 50.47(b)(9) – Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	6.1 The means exists to provide initial and continuing radiological assessment throughout the course of an accident. [I.2]	6.1 A test of the emergency plan will be conducted by performing a drill to verify the capability to perform accident assessment.	6.1 Using selected monitoring parameters listed in Table Annex V2 H-1 of the VEGP emergency plan, simulated degraded plant conditions are assessed and protective actions are initiated in accordance with the following criteria: A. Accident Assessment and Classification 1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the drill. B. Radiological Assessment and Control 1. Demonstrate the ability to obtain onsite radiological surveys and samples. 2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers. 3. Demonstrate the ability to assemble and deploy field monitoring teams within 60 minutes from the decision to do so. 4. Demonstrate the ability to satisfactorily collect and disseminate field team data.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			5. Demonstrate the ability to develop dose projections. 6. Demonstrate the ability to make the decision whether to issue radio-protective drugs (KI) to emergency workers. 7. Demonstrate the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development.
	6.2 The means exists to determine the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors. [I.3]	6.2 An analysis of the emergency implementing procedures (EIPs) and the Offsite Dose Calculation Manual (ODCM) will be completed to verify ability to determine the source term and magnitude of releases.	6.2 The EIPs and ODCM correctly calculate source terms and magnitudes of postulated releases.
	6.3 The means exists to continuously assess the impact of the release of radioactive materials to the environment, accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions. [I.4]	6.3 An analysis of the emergency implementing procedures (EIPs) and the Offsite Dose Calculation Manual (ODCM) will be completed to verify the relationship between effluent monitor readings, and onsite and offsite exposures and contamination.	6.3 The EIPs and ODCM calculate the relationship between effluent monitor readings, and onsite and offsite exposures and contamination.
	6.4 The means exists to acquire and evaluate meteorological information. [I.5]	6.4 A test will be performed to verify the ability to access meteorological information in the TSC and control room.	6.4 The following parameters are displayed in the TSC and control room: • Wind speed (at 10 and 60 meters) • Wind direction (at 10 and 60 meters) • Standard deviation of horizontal wind direction (at 10 meters) • Vertical temperature difference (between 10 and 60 meters) • Ambient temperature (at 10 meters) • Dew-point temperature (at 10 meters) • Precipitation (at the tower base)
	6.5 The means exists to make rapid assessments of actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways, including activation, notification means, field	6.5 A test will be performed of the capabilities to make rapid assessment of actual or potential radiological hazards through liquid or gaseous release pathways.	6.5 Demonstrate the capability to make rapid assessment of actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	team composition, transportation, communication, monitoring equipment, and estimated deployment times. [I.8]		
	6.6 The means exists to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with the EPA protective action guides (PAGs). [I.10]	6.6 An analysis of the methodology contained in the emergency implementing procedures (EIPs) for estimating dose and preparing protective action recommendations (PARs), and in the Offsite Dose Calculation Manual (ODCM) will be performed to verify the ability to estimate an integrated dose from projected and actual dose rates.	6.6 The EIPs and ODCM estimate an integrated dose.
7.0 Protective Response			
10 CFR 50.47(b)(10) – A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.	7.1 The means exists to warn and advise onsite individuals of an emergency, including those in areas controlled by the operator, including: • Employees not having emergency assignments • Visitors • Contractor and construction personnel • Other persons who may be in the public access areas, on or passing through the site, or within the owner controlled area [J.1]	7.1 A test of the onsite warning and communication capability emergency implementing procedures (EIPs) including protective action guidelines, assembly and accountability, and site dismissal will be performed during a drill.	7.1.1 Demonstrate the capability to direct and control emergency operations. 7.1.2 Demonstrate the ability to transfer emergency direction from the control room (simulator) to the technical support center (TSC) within 30 minutes from activation. 7.1.3 Demonstrate the ability to prepare for around-the-clock staffing requirements. 7.1.4 Demonstrate the ability to perform assembly and accountability for all onsite individuals within 30 minutes of an emergency requiring protected area assembly and accountability. 7.1.5 Demonstrate the ability to perform site dismissal.
8.0 Exercises and Drills			
10 CFR 50.47(b)(14) – Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.	8.1 The licensee conducts a full participation exercise to evaluate major portions of emergency response capabilities, which includes participation by each State and local agency within the plume exposure EPZ, and each State within the ingestion pathway EPZ. [N.1]	8.1 A full participation exercise (test) will be conducted within the specified time periods of 10 CFR Part 50, Appendix E.	8.1.1 The exercise is completed within the specified time periods of Appendix E to 10 CFR Part 50, onsite exercise objectives listed below have been met and there are no uncorrected onsite exercise deficiencies. A. *Accident Assessment and Classification*

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the exercise Standard Criteria: a. Determine the correct highest emergency classification level based on events which were in progress, considering past events and their impact on the current conditions, within 15 minutes from the time the initiating condition(s) or EAL is identified. B. *Notifications* 1. Demonstrate the ability to alert, notify, and mobilize site emergency response personnel. Standard Criteria: a. Complete the designated checklist and perform the announcement within 5 minutes of the initial event classification for an Alert or higher. b. Activate the emergency recall system within 5 minutes of the initial event classification for an Alert or higher. 2. Demonstrate the ability to notify responsible State and local government agencies within 15 minutes and the NRC within 60 minutes after declaring an emergency. Standard Criteria: a. Transmit information using the designated checklist, in accordance with approved emergency implementing procedures (EIPs), within 15 minutes of event classification.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			b. Transmit information using the designated checklist, in accordance with approved EIPs, within 60 minutes of last transmittal for a follow-up notification to State and local authorities. c. Transmit information using the designated checklist within 60 minutes of event classification for an initial notification of the NRC. 3. Demonstrate the ability to warn or advise onsite individuals of emergency conditions. Standard Criteria: a. Initiate notification of onsite individuals (via plant page or telephone), using the designated checklist within 15 minutes of notification. 4. Demonstrate the capability of the Prompt Notification System (PNS), for the public, to operate properly when required. Standard Criteria: a. 90% of the sirens operate properly, as indicated by the Whelen feedback system. b. A NOAA tone alert radio is activated. C. *Emergency Response* 1. Demonstrate the capability to direct and control emergency operations. Standard Criteria: a. Command and control is demonstrated by the control room in the early phase of the emergency and the technical support center (TSC) within 60

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			minutes from TSC activation. 2. Demonstrate the ability to transfer emergency direction from the control room (simulator) to the TSC within 30 minutes from activation. Standard Criteria: a. Briefings were conducted prior to turnover responsibility. Personnel document transfer of duties. 3. Demonstrate the ability to prepare for around-the-clock staffing requirements. Standard Criteria: a. Complete 24-hour staff assignments. 4. Demonstrate the ability to perform assembly and accountability for all onsite individuals within 30 minutes of an emergency requiring protected area assembly and accountability. Standard Criteria: a. Protected area personnel assembly and accountability completed within 30 minutes of the Alert or higher emergency declaration via public address announcement. D. *Emergency Response Facilities* 1. Demonstrate activation of the operational support center (OSC), and full functional operation of the TSC and EOF within 60 minutes of activation. Standard Criteria: a. The TSC, OSC, and EOF are activated within about 60 minutes of the initial notification.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			2. Demonstrate the adequacy of equipment, security provisions, and habitability precautions for the TSC, OSC, EOF, and emergency news center (ENC), as appropriate. Standard Criteria: a. Demonstrate the adequacy of the emergency equipment in the emergency response facilities, including availability and general consistency with emergency implementing procedures (EIPs). b. The Security Shift Captain implements and follows applicable EIPs. c. The Health Physics Supervisor (TSC) implements the designated checklist if an onsite or offsite release has occurred. 3. Demonstrate the adequacy of communications for all emergency support resources. Standard Criteria: a. Emergency response communications listed in emergency implementing procedures (EIPs) are available and operational. b. Communications systems are tested in accordance with TSC, OSC, and EOF activation checklists. c. Emergency response facility personnel are able to operate all specified communication systems. d. Clear primary and backup communications links are established and maintained for the duration of the exercise.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			E. *Radiological Assessment and Control* 1. Demonstrate the ability to obtain onsite radiological surveys and samples. Standard Criteria: a. HP Technicians demonstrate the ability to obtain appropriate instruments (range and type) and take surveys. b. Airborne samples are taken when the conditions indicate the need for the information. 2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers. Standard Criteria: a. Emergency workers are issued self-reading dosimeters when radiation levels require, and exposures are controlled to 10 CFR Part 20 limits (unless the Emergency Director authorizes emergency limits). b. Exposure records are available, either from the ALARA computer or a hard copy dose report. c. Emergency workers include Security and personnel within all emergency facilities. 3. Demonstrate the ability to assemble and deploy field monitoring teams within 60 minutes from the decision to do so. Standard Criteria: a. One field monitoring team is ready to be deployed within 60 minutes of being requested from the OSC, and no later

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			than 90 minutes from the declaration of an Alert or higher emergency. 4. Demonstrate the ability to satisfactorily collect and disseminate field team data. Standard Criteria: a. Field team data to be collected is dose rate or counts per minute (cpm) from the plume, both open and closed window, and air sample (gross/net cpm) for particulate and iodine, if applicable. b. Satisfactory data dissemination is from the field team to the Dose Assessment Supervisor, via the field team communicator and field team coordinator. 5. Demonstrate the ability to develop dose projections. Standard Criteria: a. The on-shift HP/Chemistry Shared Foreman or Dose Assessment Supervisor performs timely and accurate dose projections, in accordance with emergency implementing procedures (EIPs). 6. Demonstrate the ability to make the decision whether to issue radioprotective drugs (KI) to emergency workers. Standard Criteria: a. KI is taken (simulated) if the estimated dose to the thyroid will exceed 25 rem committed dose equivalent (CDE). 7. Demonstrate the ability to develop appropriate protective action

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			recommendations (PARs) and notify appropriate authorities within 15 minutes of development. Standard Criteria: a. Total effective dose equivalent (TEDE) and CDE dose projections from the dose assessment computer code are compared to emergency implementing procedures (EIPs). b. PARs are developed within 15 minutes of data availability. c. PARs are transmitted to responsible State and local government agencies via voice or fax within 15 minutes of PAR development. F. *Public Information* 1. Demonstrate the capability to develop and disseminate clear, accurate, and timely information to the news media, in accordance with EIPs. Standard Criteria: a. Media information (e.g., press releases, press briefings, electronic media) is made available within 60 minutes of notification of the on-call media representative. b. Follow-up information is provided, at a minimum, within 60 minutes of an emergency classification or PAR change. 2. Demonstrate the capability to establish and effectively operate rumor control in a coordinated fashion. Standard Criteria: a. Calls are answered in a timely

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			manner with the correct information, in accordance with EIPs. b. Calls are returned or forwarded, as appropriate, to demonstrate responsiveness. c. Rumors are identified and addressed. G. *Evaluation* 1. Demonstrate the ability to conduct a post-exercise critique, to determine areas requiring improvement and corrective action. Standard Criteria: a. An exercise time line is developed, followed by an evaluation of the objectives. b. Significant problems in achieving the objectives are discussed to ensure understanding of why objectives were not fully achieved. c. Recommendations for improvement in non-objective areas are discussed. 8.1.2 Onsite emergency response personnel are mobilized in sufficient number to fill the emergency positions identified in emergency plan Section B, *VEGP Emergency Organization*, and they successfully perform their assigned responsibilities as outlined in Acceptance Criterion 8.1.1.D, *Emergency Response Facilities*. 8.1.3 The exercise is completed within the specified time periods of Appendix E to 10 CFR Part 50, offsite exercise objectives have been met, and there are either no uncorrected offsite deficiencies, or a license condition requires offsite deficiencies to be

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			corrected prior to operation above 5% of rated power.
9.0 Implementing Procedures			
10 CFR Part 50, Appendix E.V – No less than 180 days prior to the scheduled issuance of an operating license for a nuclear power reactor or a license to possess nuclear material, the applicant's detailed implementing procedures for its emergency plan shall be submitted to the Commission.	9.1 The licensee has submitted detailed implementing procedures for its emergency plan no less than 180 days prior to fuel load.	9.1 An inspection of the submittal letter will be performed.	9.1 The licensee has submitted detailed emergency implementing procedures (EIPs) for the onsite emergency plan no less than 180 days prior to fuel load.

VEGP Unit 4 Emergency Planning ITAAC

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
1.0 Emergency Classification System			
10 CFR 50.47(b)(4) – A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.	1.1 An emergency classification and emergency action level (EAL) scheme must be established by the licensee. The specific instruments, parameters, or equipment status shall be shown for establishing each emergency class, in the in-plant emergency procedures. The plan shall identify the parameter values and equipment status for each emergency class. [D.1]	1.1.1 An inspection of the control room will be performed to verify that the displays for retrieving system and effluent parameters specified in Table Annex V2 D.2-1, *Hot Initiating Condition Matrix, Modes 1, 2, 3, and 4*; Table V2 D.2-2, *Cold Initiating Condition Matrix, Modes 5, 6, and De-fueled*; are installed and perform their intended functions; and that emergency implementing procedures (EIPs) have been completed. 1.1.2 An analysis of the EAL technical bases will be performed to verify as-built, site-specific implementation of the EAL scheme.	1.1.1 The parameters specified in Table Annex V2 H-1, *Post Accident Monitoring Variables*, are retrievable in the control room. The ranges of values of these parameters that can be displayed encompass the values specified in the emergency classification and EAL scheme. 1.1.2 The EAL scheme is consistent with Regulatory Guide 1.101, *Emergency Planning and Preparedness for Nuclear Power Reactors.*
3.0 Emergency Communications			
10 CFR 50.47(b)(6) – Provisions exist for prompt communications among principal response organizations to emergency	3.1 The means exists for communications between the control room, OSC, TSC, and EOF. [F.1.d]	3.1 A test will be performed of the communications capabilities between the control room, OSC, TSC and EOF, and to the State and local EOCs.	3.1 Communications are established between the control room, OSC, TSC, and EOF. Communications are established between the control room,

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
personnel and to the public.			Georgia Emergency Management Agency (GEMA) Operation Center; Burke County Emergency Operations Center (EOC); SRS Operations Center; South Carolina Warning Point; and Aiken, Allendale, and Barnwell County Dispatchers.
	3.2 The means exists for communications from the control room to the NRC headquarters and regional office EOC. [F.1.f]	3.2 A test will be performed of the communications capabilities from the control room, TSC and EOF to the NRC, including ERDS.	3.2 Communications are established from the control room, TSC, and EOF, to the NRC headquarters and regional office EOCs and an access port for the Emergency Response Data System (ERDS) is provided.
5.0 Emergency Facilities and Equipment			
10 CFR 50.47(b)(8) – Adequate emergency facilities and equipment to support the emergency response are provided and maintained.	5.1 The licensee has established an onsite operations support center (OSC). [H.1]	5.1 An inspection of the as-built OSC will be performed, including a test of the capabilities.	5.1.1 Communication equipment is installed in the OSC, and voice transmission and reception are accomplished. 5.1.2 The plant parameters listed in Table Annex V2 H-1, *Post Accident Monitoring Values*, can be retrieved and displayed in the TSC. 5.1.3 The OSC is located adjacent to the passage from the annex building to the control room.
	5.2 The licensee has established an emergency operations facility (EOF). [H.2]	5.2 An inspection of the EOF will be performed, including a test of the capabilities.	5.2.1 Voice transmission and reception are accomplished between the EOF and the control room. 5.2.2 The plant parameters listed in Table Annex V2 H-1, *Post Accident Monitoring Values*, can be retrieved and displayed in the EOF.
6.0 Accident Assessment			
10 CFR 50.47(b)(9) – Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.	6.1 The means exists to provide initial and continuing radiological assessment throughout the course of an accident. [I.2]	6.1 A test of the emergency plan will be conducted by performing a drill to verify the capability to perform accident assessment.	6.1 Using selected monitoring parameters listed in Table Annex V2 H-1 of the VEGP emergency plan, simulated degraded plant conditions are assessed and protective actions are initiated in accordance with the following criteria: A. Accident Assessment and

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			Classification 1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the drill. B. Radiological Assessment and Control 1. Demonstrate the ability to obtain onsite radiological surveys and samples. 2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers. 3. Demonstrate the ability to assemble and deploy field monitoring teams within 60 minutes from the decision to do so. 4. Demonstrate the ability to satisfactorily collect and disseminate field team data. 5. Demonstrate the ability to develop dose projections. 6. Demonstrate the ability to make the decision whether to issue radio-protective drugs (KI) to emergency workers. 7. Demonstrate the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development.
	6.2 The means exists to determine the source term of releases of radioactive material within plant systems, and the magnitude of the release of radioactive materials based on plant system	6.2 An analysis of the emergency implementing procedures (EIPs) and the Offsite Dose Calculation Manual (ODCM) will be completed to verify ability to determine the source term	6.2 The EIPs and ODCM correctly calculate source terms and magnitudes of postulated releases.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
	parameters and effluent monitors. [I.3]	and magnitude of releases.	
	6.3 *The means exists to continuously* assess the impact of the release of radioactive materials to the environment, accounting for the relationship between effluent monitor readings, and onsite and offsite exposures and contamination for various meteorological conditions. [I.4]	6.3 *An analysis of the emergency* implementing procedures (EIPs) and the Offsite Dose Calculation Manual (ODCM) will be completed to verify the relationship between effluent monitor readings, and onsite and offsite exposures and contamination.	6.3 *The EIPs and* ODCM calculate the relationship between effluent monitor readings, and onsite and offsite exposures and contamination.
	6.4 The means exists to acquire and evaluate meteorological information. [I.5]	6.4 A test will be performed to verify the ability to access meteorological information in the TSC and control room.	6.4 The following parameters are displayed in the TSC and control room: • Wind speed (at 10 and 60 meters) • Wind direction (at 10 and 60 meters) • Standard deviation of horizontal wind direction (at 10 meters) • Vertical temperature difference (between 10 and 60 meters) • Ambient temperature (at 10 meters) • Dew-point temperature (at 10 meters) • Precipitation (at the tower base)
	6.5 The means exists to make rapid assessments of actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways, including activation, notification means, field team composition, transportation, communication, monitoring equipment, and estimated deployment times. [I.8]	6.5 A test will be performed of the capabilities to make rapid assessments of actual or potential radiological hazards through liquid or gaseous release pathways.	6.5 Demonstrate the capability to make rapid assessment of actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways.
	6.6 The means exists to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with the EPA protective action guides (PAGs). [I.10]	6.6 An analysis of the methodology contained in the emergency implementing procedures (EIPs) for estimating dose and preparing protective action recommendations (PARs), and in the Offsite Dose Calculation Manual (ODCM) will be performed to verify the ability to estimate an integrated dose from projected and actual dose rates.	6.6 The EIPs and ODCM estimate an integrated dose.
7.0 Protective Response			
10 CFR 50.47(b)(10) – A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In	7.1 The means exists to warn and advise onsite individuals of an emergency, including those in areas controlled by the operator, including:	7.1 A test of the onsite warning and communication capability emergency implementing procedures (EIPs) including protective action guidelines, assembly and accountability, and site	7.1.1 Demonstrate the capability to direct and control emergency operations. 7.1.2 Demonstrate the ability to transfer

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
developing this range of actions, consideration has been given to evacuation, sheltering, and, as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.	• Employees not having emergency assignments • Visitors • Contractor and construction personnel • Other persons who may be in the public access areas, on or passing through the site, or within the owner controlled area [J.1]	dismissal will be performed during a drill.	emergency direction from the control room (simulator) to the technical support center (TSC) within 30 minutes of activation. 7.1.3 Demonstrate the ability to prepare for around-the-clock staffing requirements. 7.1.4 Demonstrate the ability to perform assembly and accountability for all onsite individuals within 30 minutes of an emergency requiring protected area assembly and accountability. 7.1.5 Demonstrate the ability to perform site dismissal.
8.0 Exercises and Drills			
10 CFR 50.47(b)(14) – Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.	8.1 The licensee conducts a limited participation exercise to evaluate portions of emergency response capabilities, which includes participation by each State and local agency within the plume exposure EPZ that have not been tested in a previous exercise. [N.1]	8.1 A limited participation exercise (test) will be conducted within the specified time periods of 10 CFR Part 50, Appendix E.	8.1.1 The exercise is completed within the specified time periods of Appendix E to 10 CFR Part 50, onsite exercise objectives listed below have been met and there are no uncorrected onsite exercise deficiencies. A. *Accident Assessment and Classification* 1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the exercise Standard Criteria: a. Determine the correct highest emergency classification level based on events which were in progress, considering past events and their impact on the current conditions, within 15 minutes from the time the initiating condition(s) or EAL is identified. B. *Notifications* 1. Demonstrate the ability to alert, notify, and mobilize site emergency

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			response personnel. Standard Criteria: a. Complete the designated checklist and perform the announcement within 5 minutes of the initial event classification for an Alert or higher. b. Activate the emergency recall system within 5 minutes of the initial event classification for an Alert or higher. 2. Demonstrate the ability to notify responsible State and local government agencies within 15 minutes and the NRC within 60 minutes after declaring an emergency. Standard Criteria: a. Transmit information using the designated checklist, in accordance with approved emergency implementing procedures (EIPs), within 15 minutes of event classification. b. Transmit information using the designated checklist, in accordance with approved EIPs, within 60 minutes of last transmittal for a follow-up notification to State and local authorities. c. Transmit information using the designated checklist within 60 minutes of event classification for an initial notification of the NRC. 3. Demonstrate the ability to warn or advise onsite individuals of emergency conditions. Standard Criteria: a. Initiate notification of onsite individuals (via plant page or telephone) using the designated checklist, within

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			15 minutes of notification. C. *Emergency Response* 1. Demonstrate the capability to direct and control emergency operations. Standard Criteria: a. Command and control is demonstrated by the control room in the early phase of the emergency and by the TSC within 60 minutes from activation. 2. Demonstrate the ability to transfer emergency direction from the control room (simulator) to the TSC within 30 minutes from activation. Standard Criteria: a. Briefings were conducted prior to turnover responsibility. Personnel document transfer of duties. 3. Demonstrate the ability to prepare for around-the-clock staffing requirements. Standard Criteria: a. Complete 24-hour staff assignments. 4. Demonstrate the ability to perform assembly and accountability for all onsite individuals within 30 minutes of an emergency requiring protected area assembly and accountability. Standard Criteria: a. Protected area personnel assembly and accountability completed within 30 minutes of the Alert or higher emergency declaration via public address announcement. D. *Emergency Response Facilities*

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			1. Demonstrate timely activation of the OSC. Standard Criteria: a. The OSC is activated within about 60 minutes of the initial notification. 2. Demonstrate the adequacy of equipment, security provisions, and habitability precautions for the OSC, as appropriate. Standard Criteria: a. Demonstrate the adequacy of the emergency equipment in the emergency response facilities, including availability and general consistency with emergency implementing procedures (EIPs). b. The Security Shift Captain implements and follows applicable EIPs. c. The Health Physics Supervisor (TSC) implements the designated checklist if an onsite or offsite release has occurred. 3. Demonstrate the adequacy of communications for all emergency support resources. Standard Criteria: a. Emergency response communications listed in emergency implementing procedures (EIPs) are available and operational. b. Communications systems are tested in accordance with OSC activation checklist. c. Emergency response facility

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			personnel are able to operate all specified communication systems. d. Clear primary and backup communications links are established and maintained for the duration of the exercise. E. *Radiological Assessment and Control* 1. Demonstrate the ability to obtain onsite radiological surveys and samples. Standard Criteria: a. HP Technicians demonstrate the ability to obtain appropriate instruments (range and type) and take surveys. b. Airborne samples are taken when the conditions indicate the need for the information. 2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers. Standard Criteria: a. Emergency workers are issued self-reading dosimeters when radiation levels require, and exposures are controlled to 10 CFR Part 20 limits (unless the Emergency Director authorizes emergency limits). b. Exposure records are available, either from the ALARA computer or a hard copy dose report. c. Emergency workers include Security and personnel within all emergency facilities. 3. Demonstrate the ability to assemble

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			and deploy field monitoring teams within 60 minutes from the decision to do so. Standard Criteria: *a. One field monitoring team is ready to* be deployed within 60 minutes of being requested from the OSC, and no later than 90 minutes from the declaration of an Alert or higher emergency. 4. Demonstrate the ability to satisfactorily collect and disseminate field team data. Standard Criteria: a. Field team data to be collected is dose rate or counts per minute (cpm) from the plume, both open and closed window, and air sample (gross/net cpm) for particulate and iodine, if applicable. b. Satisfactory data dissemination is from the field team to the Dose Assessment Supervisor, via the field team communicator and field team coordinator. 5. Demonstrate the ability to develop dose projections. Standard Criteria: a. The on-shift HP/Chemistry Shared Foreman or Dose Assessment Supervisor performs timely and accurate dose projections, in accordance with emergency implementing procedures (EIPs). 6. Demonstrate the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development.

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			Standard Criteria: a. Total effective dose equivalent (TEDE) and CDE dose projections from the dose assessment computer code are compared to emergency implementing procedures (EIPs). b. PARs are developed within 15 minutes of data availability. c. PARs are transmitted to responsible State and local government agencies via voice or fax within 15 minutes of PAR development. 8.1.2 Onsite emergency response personnel are mobilized in sufficient number to fill the emergency positions identified in emergency plan Section B, *VEGP Emergency Organization,* and they successfully perform their assigned responsibilities as outlined in Acceptance Criterion 8.1.1.D, *Emergency Response Facilities.* 8.1.3 The exercise is completed within the specified time periods of Appendix E to 10 CFR Part 50, offsite exercise objectives have been met, and there are either no uncorrected offsite deficiencies, or a license condition requires offsite deficiencies to be corrected prior to operation above 5% of rated power.
9.0 Implementing Procedures			
10 CFR Part 50, Appendix E.V – No less than 180 days prior to the scheduled issuance of an operating license for a nuclear power reactor or a license to possess nuclear material, the applicant's detailed implementing procedures for its emergency plans shall be submitted to the Commission.	9.1 The licensee has submitted detailed implementing procedures for its emergency plan no less than 180 days prior to fuel load.	9.1 An inspection of the submittal letter will be performed.	9.1 The licensee has submitted detailed emergency implementing procedures (EIPs) for the onsite emergency plan no less than 180 days prior to fuel load.

APPENDIX B

CHRONOLOGY OF AN EARLY SITE PERMIT APPLICATION AND LIMITED WORK AUTHORIZATION REQUEST FOR THE VEGP SITE

This appendix lists correspondence, including between the Southern Nuclear Operating Company, Inc. and the U.S. Nuclear Regulatory Commission, regarding the Vogtle Early Site Permit application through November 4, 2008, with the exception of legal fillings related to the hearing. It also contains correspondence regarding the LWA request through November 4, 2008. Source: Agencywide Documents Access and Management System (ADAMS).

Revisions to the VEGP Application

Revision	Date	Accession Number
0	August 14, 2006	ML062290246
1	November 13, 2006	ML063210516
2	May 5, 2007	ML071710055
3	November 30, 2007	ML073470849
4	March 28, 2008	ML081020073
5	December 23, 2008	ML090280033

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
11/02/1972	ML071710091	Alvin W. Vogtle Nuclear Plant Units 1, 2, 3, 4, Drilling Log of Standby Makeup Test Well, Figure 3K-6. (1 Pages)	Graphics incl Charts and Tables	- No Known Affiliation	US Atomic Energy Commission (AEC)	05000424 05000425 05000426 05000427 05200011
05/13/1974	ML071710071	Alvin W. Vogtle Nuclear Plant - Excavation Dewatering. (2 Pages)	Letter	- No Known Affiliation	Bechtel Power Corp US Atomic Energy Commission (AEC)	05000424 05000425 05200011
04/30/1978	ML070780691	Sprays Wash Fish to Safety from Traveling Screens. (1 Pages)	Journal Article News Article	Power Engineering	NRC/NRO	05200011
09/09/1985	ML053250010	DPST-85-782, "Oxalic Acid Cleaning of Tank 24H." (12 Pages)	Letter Report, Technical	E. I. duPont de Nemours & Co, Inc	NRC/FSME NRC/NMSS	PROJ0737
09/27/1985	ML071710081	Calculation G-008, "Vogtle Nuclear Power Plant, Flow Rate in Mathes Pond Stream & West Branch Stream." (18 Pages)	Calculation	Bechtel Corp	NRC/NRO	05000424 05000425 05200011
03/31/1986	ML071840378	DPST-86-798, "Distribution and Abundance of Ichthyoplankton in the Mid-reaches of the Savannah River and Selected Tributaries." (227 Pages)	Report, Technical	Environmental & Chemical Sciences, Inc	NRC/NRO	05200011
06/30/1986	ML071841017	Report, ECS-SR-28, "Effects of Thermal Discharges on the Distribution and Abundance of Adult Fishes in the Savannah River and Selected Tributaries," Annual Report for Period November 1984 through August 1985. (154 Pages)	Annual Report Report, Technical	Environmental & Chemical Sciences, Inc	NRC/NRO	05200011
12/31/1988	ML073370310	Techniques of Water-Resources Investigations of the United States Geological Survey, Chapter A1, A Modular Three-Dimensional Finite Difference Ground-Water Flow Model, Book 6 Modeling Techniques. (586 Pages)	Report, Technical	US Dept of Interior, Geological Survey (USGS)	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
08/18/1992	ML071841001	Transmittal of Final Report, WSRC-TR-92-179, "Ichthyoplankton Entrainment Study at the SRS Savannah River Water Intakes for Westinghouse Savannah River Company," for classification and technical approvals for external release. (412 Pages)	Letter Report, Technical	Westinghouse Savannah River Co	NRC/NRO US Dept of Energy, Savannah River Operations Office	05200011
01/21/1993	ML071840383	Letter re Request for Approval to Release Scientific/Technical Information. (21 Pages)	Letter	Westinghouse Savannah River Co	NRC/NRO US Dept of Energy (DOE)	05200011
03/01/1994	ML070800052	General Highway Map Burke County Georgia (1 Pages)	Map	NRC/NRO/DSER		05200011
03/03/1999	ML070871038	WSRC-TR-98-00424, "Potential Effect of Increased SRS River Water Withdrawal on the Savannah River Shortnose Sturgeon Population." (8 Pages)	Report, Technical	Westinghouse Savannah River Co	NRC/NRO	05200011
07/31/1999	ML070871012	USFWS 99 Savannah River Study (22 Pages)	Report, Miscellaneous	US Dept of Interior, Fish & Wildlife Service	NRC/NRO	05200011
09/05/2000	ML071710097	Layne Christensen Company, Vogtle Electric - Well #2A. (1 Pages)	- No Document Type Applies	Layne Christensen Co	NRC/NRO	05200011
04/23/2003	ML073330950	"Precipitation, Ground-Water Use, and Ground-Water Levels in the Vicinity of the Savannah River Site, Georgia and South Carolina, 1992-2002." (6 Pages)	Conference/Symposium/Workshop Paper Technical Paper	US Dept of Interior, Geological Survey (USGS)	NRC/NRO	05200011
05/31/2005	ML062340411	Georgia Radiological Emergency Plan Annex D - Plant Vogtle. (605 Pages)	Emergency Preparedness-Emergency Plan License-Application for Construction Permit DKT 50	State of GA	NRC/NRO	PROJ0737
08/17/2005	ML080220556	Letter for Beasley, Chairman, President & CEO of Southern Nuclear Operating Co. to Commissioner Jaczko, re: Early site Permit and combined Operating Licenses at Vogtle Site. (2 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/OCM	05200011 PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
08/17/2005	ML080220556	Letter for Beasley, Chairman, President & CEO of Southern Nuclear Operating Co. to Commissioner Jaczko, re: Early site Permit and combined Operating Licenses at Vogtle Site. (2 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/OCM	05200011 PROJ0737
08/17/2005	ML052340478	Southern Nuclear Early Site Permit Pre-Application Review - Summary of Telephone Call Held on August 17, 2005 to Discuss the Quality Assurance Controls Audit. (2 Pages)	Memoranda Note to File incl Telcon Record, Verbal Comm	NRC/NRR/DRIP	NRC/NRR/DRIP	PROJ0737
08/17/2005	ML052300507	Southern Nuclear Early Site Permit Pre-Application Review - Summary of Telephone Call Held on August 17, 2005, to Discuss the Quality Assurance Controls Audit. (2 Pages)	Memoranda Note to File incl Telcon Record, Verbal Comm	NRC/NRR/DRIP/RNRP		PROJ0737
08/24/2005	ML052350535	09/08/2005 Notice of Meeting with the Southern Nuclear Operating Company to Discuss Southern's Plans for an Early Site Permit at the Vogtle Site. (8 Pages)	Meeting AgendaMeeting NoticeMemoranda	NRC/NRR/DRIP/RNRP	NRC/NRR/DRIP/RNRP	PROJ0737
09/12/2005	ML073470880	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, GEOVision Job 5492, Appendix F, "Report of SPT Energy Measurements by GRL Engineers," through References. (104 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	GRL Engineers, Inc Southern Nuclear Operating Co, Inc	MACTEC Engineering & Consulting, Inc NRC/NRO	05200011
09/13/2005	ML052350677	G20050573/LTR-05-0417 - J. B. Beasley Ltr re: Provides Formal Notification that Georgia Power Company has Directed Southern Nuclear Operating Company to Pursue an Early Site Permit and Combined License at Vogtle Site (1 Pages)	Letter	NRC/Chairman	Southern Nuclear Operating Co, Inc	PROJ0737
10/18/2005	ML052910023	Pre-application Site Visit to Vogtle Nuclear Plant to Observe Early Site Permit (ESP) Pre-application Subsurface Investigation Activities (Project No. 737). (8 Pages)	Memoranda	NRC/RGN-II/DRS/EB3	NRC/NRR/DRIP/RNRP	PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
10/18/2005	ML052710018	09/08/2005-Summary of Category 1 Meeting with SNC to Discuss Southern's Plans for an ESP at the Vogtle Site. (8 Pages)	Meeting Summary	NRC/NRR/DRIP/RNRP		PROJ0737
11/10/2005	ML053140298	Pre-Application Review of Southern Nuclear Company Early Site Permit Quality Assurance Program. (6 Pages)	Memoranda	NRC/NRR/ADES/DE/EQVA	NRC/NRR/ADRA/DNRL/NRBA	PROJ0737
12/02/2005	ML053210182	Pre-Application Review of Southern Nuclear Operating Company Early Site Permit Quality Assurance Program. (9 Pages)	Letter	NRC/NRR/ADRA/DNRL	Southern Nuclear Operating Co, Inc	PROJ0737
12/19/2005	ML073470877	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, GEOVision Job 5492, Appendix E through TP-4: Unit Weight of Sample. (315 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	GEOVision Geophysical Services Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
12/19/2005	ML073470875	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, GEOVision Job 5492, Appendix A through GEOVision Suspension Logging Field Notes. (80 Pages)	Final Safety Analysis Report (FSAR)License-Application for Construction Permit DKT 50	GEOVision Geophysical ServicesSouthern Nuclear Operating Co, Inc	NRC/NRO	05200011
01/16/2006	ML062700467	Map, "Surveyed Areas Southern Half of Vogtle-Thalmann, Vogtle Electric Generating Plant Transmission Corridors," Exhibit 2D (Sheet 4 of 4). (1 Pages)	Map	Third Rock Consultants	NRC/NRO	PROJ0737
01/16/2006	ML062700455	Map, "Surveyed Areas Northern Half of Vogtle-Thalmann, Vogtle Electric Generating Plant Transmission Corridors," Exhibit 2C (Sheet 3 of 4). (1 Pages)	Map	Third Rock Consultants	NRC/NRO	PROJ0737
01/16/2006	ML062700441	Map, "Surveyed Areas Western Half of Vogtle-Scherer, Vogtle Electric Generating Plant Tramsmission Corridors," Exhibit 2B (Sheet 2 of 4). (1 Pages)	Map	Third Rock Consultants	NRC/NRO	PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
01/16/2006	ML062700420	Map, "Surveyed Areas Voglte-Scherer Vogtle-Goshen Vogtle- Thalmann & Vogtle-Savannah Rive Site Vogtle Electric Generating Plant Transmission Corridors," Exhibit 2A (Sheet 1of 4). (1 Pages)	Map	Third Rock Consultants	NRC/NRO	PROJ0737
01/16/2006	ML062700408	"Threatened and Endangered Species Survey Final Report - Vogtle Electric Generating Plant and Associated Transmission Corridors." (106 Pages)	Report, Technical	Third Rock Consultants	NRC/NRO Tetra Tech NUS, Inc	PROJ0737
02/16/2006	ML063490419	Drawing H-993-4, "Plant Vogtle New Unit Early Permit Study, Savannah River Hydrographic Study - Topographic Map Burke County, Georgia." (1 Pages)	Drawing	Georgia Power Co	NRC/NRO	05200011
02/16/2006	ML070930496	Drawing H-993-4, "Plant Vogtle New Unit Early Permit Study Savannah River Hydrographic Study - Topographic Map Burke County, Georgia." (1 Pages)	Drawing	Georgia Power Co	NRC/NRO	05200011
02/28/2006	ML071710171	1013080, "EPRI-GTC Overhead Electric Transmission Line Siting Methodology." A-4 through End. (93 Pages)	Report, Technical	Electric Power Research Institute (EPRI) Georgia Transmission Corp	NRC/NRO	05200011
02/28/2006	ML071710168	1013080, "EPRI-GTC Overhead Electric Transmission Line Siting Methodology." Cover through A-3. (100 Pages)	Report, Technical	Electric Power Research Institute (EPRI) Georgia Transmission Corp	NRC/NRO	05200011
03/20/2006	ML061090076	Southern Nuclear/Vogtle Early Site Permit Pre-Application Scouting Trip, Project 737. (5 Pages)	Trip Report	Southern Nuclear Operating Co, Inc	NRC/NRR	05000424 05000425 PROJ0737
04/12/2006	ML061010773	05/11/2006 - Forthcoming Meeting to Discuss the Review Process for Southern Nuclear Operating Company's Early Site Permit Application for the Vogtle Site. (10 Pages)	Meeting Agenda Meeting Notice	NRC/NRR/ADRA/DNRL/NRBA	NRC/NRR/ADRA/DNRL/NRBA	PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
04/19/2006	ML061080679	05/10/2006, Forthcoming open house meeting to discuss the NRC's process for reviewing an Early Site Permit (ESP) in regards to the future SNC ESP application. (7 Pages)	Meeting Notice	NRC/NRR/ADRA/DNRL/NRBA	NRC/NRR/ADRA/DNRL/NRBA	PROJ0737
04/25/2006	ML061380621	Trip Summary - Vogtle/Southern Nuclear Operating Company Early Site Permit Pre-Application Alternate Site Visits April 25 and 26, 2006. (4 Pages)	Trip Report	NRC/NRR		05000424 05000425 PROJ0737
04/28/2006	ML061180493	Southern Nuclear Early Site Permit Pre-Application Review - Summary of Telephone Call Held on January 27, 2006, to Discuss the Information Required for Complete Emergency Plans. (4 Pages)	Meeting Summary Memoranda	NRC/NRR/ADRA/DNRL	NRC/NRR/ADRA/DNRL	PROJ0737
05/10/2006	ML061530411	Attachment 1-List of Meeting Attendees for May 10th Open House at Burke County Library in Waynesboro, GA. (1 Pages)	- No Document Type Applies	NRC/NRR/ADRA/DNRL		PROJ0737
05/16/2006	ML061380639	Attachment 4 - NRC Slides for May 11th Public Meeting at the Augusta Technical College in Waynesboro, GA in regards to SNC ESP. (26 Pages)	Meeting Briefing Package/Handouts Slides and Viewgraphs	NRC/NRR/ADRA/DNRL		PROJ0737
05/16/2006	ML061380596	Attachment 2 - List of Meeting Attendees for May 11th public Meeting at Augusta Technical College in Waynesboro, GA in regards to SNC ESP. (6 Pages)	- No Document Type Applies	NRC/NRR/ADRA/DNRL		PROJ0737
05/18/2006	ML061380615	Attachment 3- Agenda for May 11th Public Meeting at the Augusta Technical College in Waynesboro, GA in regards to SNC ESP. (1 Pages)	Meeting Agenda	NRC/NRR/ADRA/DNRL		PROJ0737
06/12/2006	ML061530285	Meeting Summary for an Open House on May 10th and a Public Meeting on May 11th in Regards to the Expected SNC Early Permit (ESP) Application for the Vogtle Site. (8 Pages)	Meeting Summary	NRC/NRR/ADRA/DNRL		05000424 05000425 PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
06/23/2006	ML061860165	Southern Nuclear Operating Company, Pre-Docketing Phase for Early Site Permit Application. (40 Pages)	Letter Report, Miscellaneous	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	PROJ0737
06/30/2006	ML070220073	CD-ROM File: APP-GW-GLR-021, Rev. 0, "AP1000 Standard Combined License Technical Report, AP1000 As-Build COL Information Items." (35 Pages)	Report, Technical	Westinghouse Electric Co	NRC/NRO	05200006 05200018 05200019 05200022 05200023 PROJ0737 PROJ0738 PROJ0740 PROJ0742 PROJ0743 PROJ0744 PROJ0745
07/01/2006	ML072080257	Information Summary July 2006 SERC Reliability Corporation. (23 Pages)	Brochure Organization Chart Report, Miscellaneous Slides and Viewgraphs	SERC Reliability Corp	NRC/NRO	05200011
07/27/2006	ML062080413	Inspection of Southern Nuclear Company Quality Assurance Program Implementation for Early Site Permit. (7 Pages)	Letter	NRC/RGN-II/DRS	Southern Nuclear Operating Co, Inc	PROJ0737
08/09/2006	ML062220548	Maintenance of Documents at the Burke County Library Related to Application by SNC for an ESP For the Vogtle Site (5 Pages)	Letter	NRC/NRR/ADRA/DNRL	Burke County, GA	PROJ0737
08/11/2006	ML063600278	Map P-9-1, "Plant Vogtle Early Site Permit, Topographic Map Burke County, Georgia." Sheet 6 of 6. (1 Pages)	Map	Metro Engineering & Surveying Co, Inc	Georgia Power Co NRC/NRO	05200011
08/11/2006	ML063600276	Map P-9-1, "Plant Vogtle Early Site Permit, Topographic Map Burke County, Georgia." Sheet 5 of 6. (1 Pages)	Map	Metro Engineering & Surveying Co, Inc	Georgia Power Co NRC/NRO	05200011
08/11/2006	ML063600273	Map P-9-1, "Plant Vogtle Early Site Permit, Topographic Map Burke County, Georgia." Sheet 4 of 6. (1 Pages)	Map	Metro Engineering & Surveying Co, Inc	Georgia Power Co NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
08/11/2006	ML063600270	Map P-9-1, "Plant Vogtle Early Site Permit, Topographic Map Burke County, Georgia." Sheet 3 of 6. (1 Pages)	Map	Metro Engineering & Surveying Co, Inc	Georgia Power Co NRC/NRO	05200011
08/11/2006	ML063600222	Map P-9-1, "Plant Vogtle Early Site Permit, Topographic Map Burke County, Georgia." Sheet 2 of 6. (1 Pages)	Map	Metro Engineering & Surveying Co, Inc	Georgia Power Co NRC/NRO	05200011
08/11/2006	ML063600220	Map P-9-1, "Plant Vogtle Early Site Permit, Topographic Map Burke County, Georgia." Sheet 1 of 6. (1 Pages)	Map	Metro Engineering & Surveying Co, Inc	Georgia Power Co NRC/NRO	05200011
08/14/2006	ML062290246	Transmittal of Vogtle Electric Generating Plant Early Site Permit Application. (17 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	PROJ0737
08/15/2006	ML062220689	Request For DHS Review Of Early Site Permit (ESP) Application Southern Nuclear Company / Vogtle Site. (3 Pages)	Letter	NRC/NSIR/DPR/DDEP/ICB	US Dept of Homeland Security	PROJ0737
08/16/06	ML062150004	Meeting Summary, Forthcoming Meeting for Southern Nuclear to Brief the Staff on the Early Site Permit (ESP) Application for Plant Vogle (Pages)	Meeting Summary	NRC/NRR/ADRA/DNRL/NEPB	NRC/NRR/ADRA/DNRL/NEPB	05200011
08/17/2006	ML062340406	South Carolina Operational Radiological Emergency Response Plan & Georgia Emergency Response Plan. (669 Pages)	Emergency Preparedness-Emergency Plan License-Application for Construction Permit DKT 50	State of GA State of SC	NRC/NRO	PROJ0737
08/17/2006	ML062340401	Transmittal of Vogtle Early Site Permit Application Supplemental Emergency Planning Information. (3 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	PROJ0737
08/18/2006	ML062350371	08/18/2006-Enclosure 3 - Meeting Slides for Public Meeting to Discuss ESP Application for Plant Vogtle, Units 3 and 4. (79 Pages)	Meeting Briefing Package/Handouts Slides and Viewgraphs	NRC/NRR/ADRA/DNRL/NEPB		PROJ0737
08/18/2006	ML062350363	08/18/2006-Enclosures 1 and 2 - Agenda and Attendee List for Plant Vogtle ESP Application Briefing. (3 Pages)	Meeting Agenda Meeting Briefing Package/Handouts	NRC/NRR/ADRA/DNRL/NEPB		PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
08/22/2006	ML062330240	Letter of Acknowledgement of the Receipt of Vogtle ESP Application. (7 Pages)	Letter	NRC/NRR/ADRA/DNRL	Southern Nuclear Operating Co, Inc	PROJ0737
08/25/2006	ML062330165	Memorandum Transmitting a Notice for *Publication into the Federal Register.* (3 Pages)	Memoranda	NRC/NRR/ADRA/DNRL	NRC/ADM/DAS/RDB	PROJ0737
08/28/2006	ML061440582	Letters to Potential Applicants on Security Clearances. (31 Pages)	Letter	NRC/NRR/ADRA/DNRL/NAPB	Dominion Resources Services, Inc Duke Power Co Entergy Nuclear, Inc Florida Power & Light Group, Inc NuStart Energy Development, LLC Progress Energy Co South Carolina Electric & Gas Co Southern Nuclear Operating Co, Inc UniStar Nuclear	05200018 05200019 05200022 05200023 PROJ0737 PROJ0738 PROJ0740 PROJ0741 PROJ0742 PROJ0743 PROJ0744 PROJ0745 PROJ0746
08/31/2006	ML073320844	Science and Democratic Action, Volume 14, Number 2. (24 Pages)	Report, Miscellaneous	Institute for Energy & Environmental Research	NRC/NRO	05200011
08/31/2006	ML073240571	Drawing Vogtle, Units 1 and 2, "Figure 5.2-4 River Cross Sections at Existing Discharge Location." (1 Pages)	Drawing	Southern Nuclear Operating Co, Inc	NRC/NRR	05000424 05000425 PROJ0737
08/31/2006	ML062290307	Vogtle Electric Generating Plant Early Site Permit Application, Part 5 - Emergency Plan. (273 Pages)	Emergency Preparedness-Emergency Plan License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
08/31/2006	ML062290305	Vogtle Electric Generating Plant Early Site Permit Application, Part 4 - Site Redress Plan. (21 Pages)	License-Application for Construction Permit DKT 50 Operating Plan	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
08/31/2006	ML062290297	Vogtle Electric Generating Plant Early Site Permit Application, Part 2 - Site Safety Analysis Report. Chapter 3 "Design of Structures, Components, Equipment, and Systems." (160 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
08/31/2006	ML062290278	Vogtle Electric Generating Plant Early Site Permit Application, Part 2 - Site Safety Analysis Report, Appendix E "Caliper, Natural Gamma, Resistively, and Spontaneous Potential Logs." (41 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50 Report, Technical	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
08/31/2006	ML062290277	Vogtle Electric Generating Plant Early Site Permit Application, Part 2 - Site Safety Analysis Report, Appendix A "Suspension Velocity Measurement Quality Assurance Suspension Source to Receiver Analysis Results." (80 Pages)	Final Safety Analysis Report (FSAR) Graphics incl Charts and Tables License-Application for Construction Permit DKT 50 Report, Technical	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
08/31/2006	ML062290275	Vogtle Electric Generating Plant Early Site Permit Application, Part 2 - Site Safety Analysis Report, Appendix B "CPT Testing Report From Applied Research Services." (129 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50 Report, Technical	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
08/31/2006	ML062290274	Vogtle Electric Generating Plant Early Site Permit Application, Part 2 - Site Safety Analysis Report, Appendix 2.5A "Geotechnical Investigation & Laboratory Testing Data Report." (90 Pages)	Final Safety Analysis Report (FSAR) Graphics incl Charts and Tables Letter License-Application for Construction Permit DKT 50 Report, Miscellaneous	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
08/31/2006	ML062290272	Vogtle Electric Generating Plant Early Site Permit Application, Part 2 - Site Safety Analysis Report, Section 2.5.2 "Vibratory Ground Motion" Through Section 2.5.6 "Embankments and Dams." (242 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
08/31/2006	ML062290271	Vogtle Electric Generating Plant Early Site Permit Application, Part 2 - Site Safety Analysis Report, Figure 2.5.1-32 "Site Topographic Map (0.6-Mile Radius)." (50 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50 Map	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
08/31/2006	ML062290269	Vogtle Electric Generating Plant Early Site Permit Application, Part 2 - Site Safety Analysis Report, Figure 2.5.1-1 "Physiographic Provinces of the Southeastern United States" Through Figure 2.5.1-31 "Site Geologic Map (0.6-Mile Radius)." (50 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50 Map	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
08/31/2006	ML062290267	Vogtle Electric Generating Plant Early Site Permit Application, Part 2 - Site Safety Analysis Report, Section 2.4 "Hydrologic Engineering." (424 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
08/31/2006	ML062290263	Vogtle Electric Generating Plant Early Site Permit Application, Part 2 - Site Safety Analysis Report, Table of Contents Through Section 2.3 "Meteorology." (216 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
08/31/2006	ML062290260	Vogtle Electric Generating Plant Early Site Permit Application, Cover Page Through Part 1 - Administrative Information, Chapter 3. (34 Pages)	License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	PROJ0737
09/06/2006	ML062510149	Vogtle Electric Generating Plant Early Site Permit Application Site Safety Analysis Report Section 2.2 Supplement 1. (31 Pages)	Final Safety Analysis Report (FSAR) Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	PROJ0737
09/06/2006	ML062510145	Vogtle Early Site Permit Application Site Safety Analysis Report Table 2.5.2-23, Supplement S2. (6 Pages)	Final Safety Analysis Report (FSAR) Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	PROJ0737
09/06/2006	ML062490219	Acceptance Review Results for the Vogtle Early Site Permit Application (Section 13.6). (2 Pages)	Memoranda	NRC/NSIR/DSP/DDR SR/RSB	NRC/NRR/ADRA/DNR L/NAPB	05000424 05000425 PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
09/13/2006	ML062580074	Vogtle Electric Generating Plant Early Site Permit Application Site Safety Analysis Report Section 2.5.2, Supplement 3. (146 Pages)	Final Safety Analysis Report (FSAR) Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011 PROJ0737
09/13/2006	ML062580074	Vogtle Electric Generating Plant Early Site Permit Application Site Safety Analysis Report Section 2.5.2, Supplement 3. (146 Pages)	Final Safety Analysis Report (FSAR) Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011 PROJ0737
09/14/2006	ML062430262	08/18/06 Summary of Briefing by Southern Nuclear Operating Company to the U.S. Nuclear Regulatory Commission Staff on the Vogtle Site Early Site Permit Application. (6 Pages)	Meeting Summary	NRC/NRR/ADRA/DNRL/NEPB		PROJ0737
09/14/2006	ML062000273	Southern Nuclear Early Site Permit Pre-Application Review- Summary of Telephone call Held on July 5, 2006, To Discuss Potential Limited Work Authorization (LWA) Activities. (4 Pages)	Letter Note to File incl Telcon Record, Verbal Comm	NRC/NRR/ADRA/DNRL	NRC/NRR/ADRA/DNRL	PROJ0737
09/19/2006	ML062580107	Review Schedule for the Southern Nuclear Operating Company Early Site Permit Application (ESP) for the Vogtle ESP Site. (1 Pages)	Schedule and Calendars	NRC/NRR		05200011
09/19/2006	ML062570460	J. A. Miller Ltr re: Acceptance of the Southern Nuclear Operating Company Application for an Early Site Permit (ESP) for the Vogtle ESP Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNRL	Southern Nuclear Operating Co, Inc	05200011
09/19/2006	ML062570431	FRN: General Notice. Notice of Acceptance of an Application for an Early Site Permit (ESP) for the Vogtle ESP Site. (3 Pages)	Federal Register Notice	NRC/NRO/DNRL		05200011
09/19/2006	ML062570424	M. T. Lesar Memo re: Notice of Acceptance of an Application for an Early Site Permit (ESP) for the Vogtle ESP Site. (3 Pages)	Memoranda	NRC/NRO/DNRL	NRC/ADM/DAS/RDEB	05200011
09/22/2006	ML062700066	Vogtle Electric Generating Plant Early Site Permit Application Additional Meteorological Data Transmittal. (4 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
09/25/2006	ML073050490	Principles for Safeguarding Nuclear Waste at Reactors. (5 Pages)	- No Document Type Applies	Public Citizen, Inc	NRC/FSME	05200011 WM-00011
09/26/2006	ML062720158	Vogtle ESP Application, 10 CFR 2.101 Affidavit. (4 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
10/04/2006	ML062790298	Southern Nuclear Operating Company AR-06-2295, List of Enclosures, Including State of SC Radiological Emergency Response Plan, State of SC Technical Radiological Emergency Response Plan & VEGP Site Specific Plant, Part 5. (1279 Pages)	Emergency Preparedness-Emergency Plan	Southern Nuclear Operating Co, Inc	NRC/NRO	05000261 05000269 05000270 05000287 05000395 05000413 05000414 05000424 05000425 05200011
10/04/2006	ML062790292	Vogtle Early Site Permit Application Supplemental Emergency Planning Information in Electronic Format. (3 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
10/04/2006	ML062720273	Application by Southern Nuclear Operating Company for an Early Site Permit for the Vogtle Site. (4 Pages)	Letter	NRC/NRR/ADRA/DNRL	Burke County, GA	PROJ0737
10/05/2006	ML062830466	IR 05200011-06/001 on 08/28-09/01/06, Southern Nuclear Operating Company Applicant and Contractor Quality Assurance Activities Involved With the Preparation of the Application for an Early Site Permit. (56 Pages)	Inspection Report Inspection Report Correspondence Letter	NRC/RGN-II/DCI	Southern Nuclear Operating Co, Inc	05200011
10/06/2006	ML063610007	Vogtle Early Site Permit Application Public Meeting. (166 Pages)	Meeting Transcript	NRC/OGC		05200011
10/12/2006	ML062850345	Absentee-Shawnee Tribe Letter Regarding ESP Review for the Vogtle Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNRL/NEPB	Absentee-Shawnee Tribe of Oklahoma	05200011 PROJ0737
10/12/2006	ML062850266	Seminole Tribe of Florida Letter Regarding ESP Review for the Vogtle Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNRL/NEPB	Seminole Tribe of Florida	05200011 PROJ0737
10/12/2006	ML062850260	Alabama-Coushatta Letter (2) Regarding ESP Review for the Vogtle Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNRL/NEPB	Alabama-Coushatta Tribe of Texas	05200011 PROJ0737
10/12/2006	ML062850187	Cherokee Nation Letter Regarding ESP Review for the Vogtle Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNRL/NEPB	Cherokee Nation	05200011 PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
10/12/2006	ML062850139	Miccosukee Tribe Letter Regarding ESP Review for the Vogtle Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	Miccosukee Indian Tribe	05200011 PROJ0737
10/12/2006	ML062850057	NOAA Letter Regarding ESP Review of the Vogtle ESP Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	US Dept of Commerce, National Marine Fisheries Service	05200011 PROJ0737
10/12/2006	ML062850034	US Fish and Wildlife Service Letter for ESP Review for the Vogtle ESP Site. (6 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	US Dept of Interior, Fish & Wildlife Service	05200011 PROJ0737
10/12/2006	ML062850030	SHPO Alabama Letter Regarding ESP Review for the Vogtle ESP Site. (5 Pages)	Letter	NRC/NRR/ADRA/DNR L/NESB	State of AL, Historical Commission	05200011 PROJ0737
10/12/2006	ML062850019	ACHP Letter for ESP Review for the Vogtle ESP Site. (6 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	US Advisory Council On Historic Preservation	05200011 PROJ0737
10/12/2006	ML062840610	Catawba Indian Tribe - Early Site Permit (ESP) Review for the Vogtle Site. (8 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	Catawba Indian Nation	05200011 PROJ0737
10/12/2006	ML062850345	Absentee-Shawnee Tribe Letter Regarding ESP Review for the Vogtle Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	Absentee-Shawnee Tribe of Oklahoma	05200011 PROJ0737
10/12/2006	ML062850266	Seminole Tribe of Florida Letter Regarding ESP Review for the Vogtle Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	Seminole Tribe of Florida	05200011 PROJ0737
10/12/2006	ML062850260	Alabama-Coushatta Letter (2) Regarding ESP Review for the Vogtle Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	Alabama-Coushatta Tribe of Texas	05200011 PROJ0737
10/12/2006	ML062850187	Cherokee Nation Letter Regarding ESP Review for the Vogtle Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	Cherokee Nation	05200011 PROJ0737
10/12/2006	ML062850139	Miccosukee Tribe Letter Regarding ESP Review for the Vogtle Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	Miccosukee Indian Tribe	05200011 PROJ0737
10/12/2006	ML062850057	NOAA Letter Regarding ESP Review of the Vogtle ESP Site. (7 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	US Dept of Commerce, National Marine Fisheries Service	05200011 PROJ0737
10/12/2006	ML062850034	US Fish and Wildlife Service Letter for ESP Review for the Vogtle ESP Site. (6 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	US Dept of Interior, Fish & Wildlife Service	05200011 PROJ0737
10/12/2006	ML062850030	SHPO Alabama Letter Regarding ESP Review for the Vogtle ESP Site. (5 Pages)	Letter	NRC/NRR/ADRA/DNR L/NESB	State of AL, Historical Commission	05200011 PROJ0737
10/12/2006	ML062850019	ACHP Letter for ESP Review for the Vogtle ESP Site. (6 Pages)	Letter	NRC/NRR/ADRA/DNR L/NEPB	US Advisory Council On Historic Preservation	05200011 PROJ0737

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
10/12/2006	ML062840610	Catawba Indian Tribe - Early Site Permit (ESP) Review for the Vogtle Site. (8 Pages)	Letter	NRC/NRR/ADRA/DNRL/NEPB	Catawba Indian Nation	05200011 PROJ0737
10/17/2006	ML062960036	G20060857/LTR-06-0530 - Senator Saxby Chambliss and Johnny Isakson Ltr re: Support of Southern Nuclear Operating Company's Application for an ESP for Two Additional Reactors on the Site of the Vogtle Electric Generating Plant. (3 Pages)	Letter	US SEN (Senate)	NRC/Chairman	05200011
10/19/2006	ML063610055	10/19/06- Slides -Summary of Public Scoping Meetings to Support Review of Vogtle Electric Generating Plant Early Site Permit Application (TAC NO. MD 3010) (20 Pages)	Meeting Briefing Package/Handouts	NRC/NRO/DSER/EPB 1		05200011
10/19/2006	ML070860200	Vogtle Early Site Permit Application Public Meeting. (166 Pages)	Meeting Transcript	NRC/NRO/DSER/EPB 1		05200011
10/19/2006	ML070850341	Public Scoping Meeting on the Early Site Permit Application for the Plant Vogtle ESP Site. (20 Pages)	Slides and Viewgraphs	NRC/NRO/DSER/EPB 1		05200011
10/19/2006	ML073060111	Resolution from Board of Commissioners of Burke County. (1 Pages)	- No Document Type Applies	- No Known Affiliation	NRC/NRO	05200011
10/25/2006	ML062980350	Ltr to Vanessa E. Quinn - Vogtle Early Site Permit (ESP) Application - Supplemental Emergency Planning Information (Compact Disc). (2 Pages)	Letter	NRC/NSIR/DPR/DDEP/ICB	US Dept of Homeland Security	05200011
11/13/2006	ML063210569	Vogtle Early Site Permit Application Revision 1, Part 5, Emergency Plan. (275 Pages)	Emergency Preparedness-Emergency Plan	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210568	Vogtle Early Site Permit Application Revision 1, Part 4, Site Redress Plan. (21 Pages)	Site Characterization Plan	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210554	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Pages 3.5-1 through 17.1A-2 and Quality Assurance Manual. (160 Pages)	Final Safety Analysis Report (FSAR) Report, Technical	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
11/13/2006	ML063210551	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Appendix 2.5A - MACTEC Geotechnical Investigation and Laboratory Testing Data Report, Appendix F Through Appendix G, Cover Only. (60 Pages)	Final Safety Analysis Report (FSAR) Report, Technical	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210549	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Appendix 2.5A - MACTEC Geotechnical Investigation and Laboratory Testing Data Report, Appendix D through Appendix E. (274 Pages)	Final Safety Analysis Report (FSAR)	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210546	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Appendix 2.5A - MACTEC Geotechnical Investigation and Laboratory Testing Data Report, Appendix C, Page 127 of 167 Through Page 167 of 167. (41 Pages)	Final Safety Analysis Report (FSAR)	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210544	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Appendix 2.5A - MACTEC Geotechnical Investigation and Laboratory Testing Data Report, Appendix C, Page 47 of 167 Through Page 126 of 167. (80 Pages)	Final Safety Analysis Report (FSAR)	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210543	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Appendix 2.5A - MACTEC Geotechnical Investigation and Laboratory Testing Data Report, Appendix B Through Appendix C, Page 46 of 167. (129 Pages)	Final Safety Analysis Report (FSAR)	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210542	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Appendix 2.5A - MACTEC Geotechnical Investigation and Laboratory Testing Data Report, Table of Contents Through Appendix A. (90 Pages)	Final Safety Analysis Report (FSAR) Report, Technical	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
11/13/2006	ML063210541	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Pages 2.5.2-1 through 2.5.6-2. (248 Pages)	Final Safety Analysis Report (FSAR)	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210537	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Pages 2.5.1-133 through 2.5.1-182. (50 Pages)	Final Safety Analysis Report (FSAR) Map	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210535	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Pages 2.5.1-82 through 2.5.1-132. (50 Pages)	Final Safety Analysis Report (FSAR) Map	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210533	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Pages 2.5.1-1 through 2.5.1-82. (82 Pages)	Final Safety Analysis Report (FSAR)	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210530	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Pages 2.4.1-1 through 2.4A-228. (424 Pages)	Final Safety Analysis Report (FSAR)	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210528	Vogtle Early Site Permit Application Revision 1, Part 2, Site Safety Analysis Report, Table of Contents through Page 2.3-112. (224 Pages)	Final Safety Analysis Report (FSAR)	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/13/2006	ML063210525	Vogtle Early Site Permit Application Revision 1, Part 1, Administrative Information. (40 Pages)	License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/16/2006	ML063240171	Vogtle - Early Site Permit Application Safety Review Site Audit Information Needs. (11 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
11/16/2006	ML070930446	AR-06-2684 Enclosure Attachment A-8 #47, "Burke County, Georgia - QT-H 14. Value, Mortgage Status, and Selected Conditions: 2000." (7 Pages)	- No Document Type Applies	US Dept of Commerce, Bureau of Census	NRC/NRO	05200011
11/16/2006	ML070930428	AR-06-2684 Enclosure Attachment A-4 #28. (6 Pages)	Memoranda	Troutman Sanders, LLP	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
11/22/2006	ML063040583	Southern Nuclear Operating Company's Application for an Early Site Permit for Additional Reactors on the Site of the Alvin W. Vogtle Electric Generating Plant Near Waynesboro, GA. (2 Pages)	Letter	NRC/OCA	US SEN (Senate)	PROJ0737
11/27/2006	ML062750453	Request for Additional Information Letter No. 1 - Southern Nuclear Operating Company Early Site Permit (ESP) Application for the Vogtle ESP Site. (8 Pages)	Letter Request for Additional Information (RAI)	NRC/NRO/DNRL/AP1000B1	Southern Nuclear Operating Co, Inc	05200011
11/28/2006	ML063310422	Southern Nuclear Operations Company Early Site Permit Application for the Vogtle ESP Site - Summary of Telephone Call Held on November 1, 2006. (3 Pages)	Meeting Summary Memoranda	NRC/NRO/DNRL NRC/NRO/DNRL/AP1000B1	NRC/NRO/DNRL/AP1000B1	05200011
12/06/2006	ML070930493	AR-06-2664 Enclosure C-3 #177 Soil A. (14 Pages)	Graphics incl Charts and Tables Memoranda Report, Technical	Southern Co Services	NRC/NRO Southern Co Services	05200011
12/06/2006	ML070930491	Memo re Plant Vogtle Soil Analysis. (11 Pages)	Memoranda	Southern Co Services	NRC/NRO Southern Co Services	05200011
12/07/2006	ML070580268	Vogtle ESP - Meterology Site Audit 12/6 - 7/2006 Tour Layout. (5 Pages)	Slides and Viewgraphs	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
12/08/2006	ML063540103	Letter from PNNL to Robert Moody dated December 8, 2006. (1 Pages)	Letter	Battelle Memorial Institute, Pacific Northwest National Lab	NRC/NSIR/DPR	05200011
12/11/2006	ML070930506	AR-06-2684 Enclosure Attachment B-3 #123 ER Total Porosity and Grain size Distribution. (2 Pages)	- No Document Type Applies	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
12/11/2006	ML070930498	AR-06-2684 Enclosure Attachment C-2 #157 Savanna River Hydrographic Study Map. (2 Pages)	Map	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
12/11/2006	ML070930443	AR-06-2684 Enclosure Attachment A-7 #45. (12 Pages)	- No Document Type Applies	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
12/11/2006	ML070930436	AR-06-2684 Enclosure Attachment A-6 #42. (8 Pages)	- No Document Type Applies	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
12/11/2006	ML070930434	AR-06-2684 Enclosure Attachment A-5 #33. (6 Pages)	- No Document Type Applies	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
12/11/2006	ML070930431	AR-06-2684 Enclosure Attachment A-2 #25. (6 Pages)	- No Document Type Applies	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
12/11/2006	ML070930426	Map of Native American Tribes and Groups in South Carolina. (1 Pages)	Map	SCIway, LLC	NRC/NRO	05200011
12/14/2006	ML063380162	Request for Additional Information Letter No. 2 - Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application for the Vogtle ESP Site. (7 Pages)	Letter Request for Additional Information (RAI)	NRC/NRO/DNRL/AP1000B1	Southern Nuclear Operating Co, Inc	05200011
12/15/2006	ML063540102	Vogtle Early Site Permit Application - Response to Requests for Additional Information on Quality Assurance. (6 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
12/15/2006	ML063540098	Vogtle Early Site Permit Application - Safety Review Audit Site Hazard Analysis Information Needs. (10 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
12/18/2006	ML063320207	Regulatory Drivers of Part 52 for Early Site Permit Applications and Determination of Reasonable Assurance. (4 Pages)	Memoranda	NRC/NRR/ADRO/DIRS/IHPB	NRC/NRO/DNRL	05200011
01/10/2007	ML063530196	10/19/2006 Summary of Public Scoping Meetings to Support Review of Vogtle Electric Generating Plant Early Site Application (TAC No. MD3010). (16 Pages)	Meeting Summary	NRC/NRO/DSER	Southern Nuclear Operating Co, Inc	05200011
01/10/2007	ML070580264	Vogtle ESP - Hydrology Site Audit on 01/10-12/2007, Tour Layout. (8 Pages)	- No Document Type Applies	- No Known Affiliation	NRC/NRO	05200011
01/10/2007	ML070580258	Vogtle ESP - Geologic Site Audit, Jan 10-12, 2007, Tour Layout. (10 Pages)	Meeting Agenda Photograph	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
01/12/2007	ML072290172	Projections with Allotments Monthly System Enrollment 07-08 after Re-zoning (Revised on 01/12/2007). (2 Pages)	Spreadsheet File	NRC/NRO		05200011
01/18/2007	ML070460522	Map 2 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 6 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML070460517	Map 1 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 6 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML070460513	Map 2 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 5 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML070460503	Map 1 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 5 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML070460497	Map 2 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 4 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML070460490	Map 1 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 4 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML070460484	Map 2 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 3 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML070460479	Map 1 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 3 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML070460476	Map 2 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 2 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML070460402	Map 1 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 2 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML070460382	Map 2 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 1of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
01/18/2007	ML070460376	Map 1 of 2, "Thomson - Vogtle 500kV Transmission Line Alternative Corridors Map." Sheet 1 of 6. (1 Pages)	Map	Georgia Power Co	NRC/NRO	05200011
01/18/2007	ML063610091	12/14/2006 Summary of Telephone Call with Southern Nuclear Operating Company (SNC) Pertaining to Vogtle Early Site Permit Application Site Safety Analysis Report Requests for Additional Information. (3 Pages)	Meeting Summary Memoranda Note to File incl Telcon Record, Verbal Comm	NRC/NRO/DNRL/AP1000B1	NRC/NRO/DNRL/AP1000B1	05200011
01/19/2007	ML070260264	Southern Nuclear and Vogtle - Response to Requests for Additional Information on Vibratory Ground Motion. (85 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
01/19/2007	ML070170387	Letter - Vogtle Early Site Permit (ESP) Application - Request For DHS Concurrence On Request For Additonal Information (RAIs) & Provide Supplemental PSER Information. (4 Pages)	Letter	NRC/NSIR	US Dept of Homeland Security	05200011
01/30/2007	ML070460537	Map, "Areas of VEGP Property Searched in 2005 Threatened and Endangered Surveys." (1 Pages)	Map	- No Known Affiliation	NRC/NRO	05200011
01/30/2007	ML070330054	Vogtle Early Site Permit Application - Safety Review Site Audit Meteorology Information Needs. (21 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
01/30/2007	ML070460540	Map, "Disturbed Areas." (1 Pages)	Map	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
01/31/2007	ML070110487	Trip Report - November 6 through 9, 2006, Tour of the Hatch, Farley, and the Barton Alternative Site. (23 Pages)	Memoranda Trip Report	NRC/NRO/DSER NRC/NRO/DSER/ETSB	NRC/NRR/ADRO/DORL	05200011
01/31/2007	ML070110460	Trip Report- October 17 through 19, 2006, Vogtle Electric Generating Plant (VEGP) Early Site Permit (ESP), Units 3 & 4. (28 Pages)	Memoranda Trip Report	NRC/NRO/DSER	NRC/NRO/DSER	05200011
01/31/2007	ML072070271	FEMA 06/05/07 Letter Enclosure: Concurrence on Vogtle ESP PSER (Misc. *Enclosure: GA RERP, Standard Operating* Procedure, January 2007, 27 Pages. (28 Pages)	Emergency Preparedness-*Emergency Plan*	State of GA, Office of Homeland Security	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
02/01/2007	ML070330513	Request for Additional Information and Preliminary Safety Analysis Report Input for the Vogtle Early Site Permit Application. (2 Pages)	Memoranda Request for Additional Information (RAI)	NRC/NRR/ADES/DRA /AADB	NRC/NRO/DNRL/AP1 000B1	05200011
02/09/2007	ML070430110	Site Visit to Vogtle to Observe Combined License Pre-Application Subsurface Investigation Activities (Project No. 755.). (8 Pages)	Letter	NRC/RGN-II/DCI/CIB1	Southern Nuclear Operating Co, Inc	05200011 PROJ0755
02/12/2007	ML070430088	Vogtle, Memo, Preliminary Safety Evaluation Report (PSER) Input and Request for Additional Information for the Vogtle Early Site Permit Chapter 2.3. (2 Pages)	Memoranda Safety Evaluation Report	NRC/NRO/DSER/RSA C	NRC/NRO/DNRL/AP1 000B1	05200011
02/13/2007	ML070570039	Enclosure 1, List of RAI # 2.4.1-1 Response Data Files and Enclosure 2 - Hard Copy Data, Part 1. (254 Pages)	- No Document Type Applies	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
02/13/2007	ML070570036	Transmittal of Vogtle Early Site Permit Application - Supplemental Information for Response to Requests for Additional Information on Hydrology. (3 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
02/13/2007	ML070470008	Vogtle Early Site Permit Application, Safety Review Site Audit Hydrology Information Needs. (31 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
02/16/2007	ML070360248	Request for Additional Information Letter No. 3 - Southern Nuclear Operating Company Early Site Permit Application for the Vogtle ESP Site. (17 Pages)	Letter Request for Additional Information (RAI)	NRC/NRO/DNRL/AP1 000B1	Southern Nuclear Operating Co, Inc	05200011
02/23/2007	ML070470270	Request for Additional Information Letter No. 4 - Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application for the Vogtle ESP Site. (9 Pages)	Letter Request for Additional Information (RAI)	NRC/NRO/DNRL/AP1 000B1	Southern Nuclear Operating Co, Inc	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
02/26/2007	ML070310063	Letter to US Army Corps of Engineers-Savannah District, Early Site Permit for the Plant Vogtle Site. (13 Pages)	Letter	NRC/NRO/DSER/ETSB	US Dept of the Army, Corps of Engineers, Savannah District	PROJ0737
03/01/2007	ML070650557	Vogtle Early Site Permit Application re Supplemental Information Concerning Emergency Action Levels and Generic Communications. (302 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
03/06/2007	ML070650427	Draft Technical Information for Preliminary Site Evaluation Report (PSER). (2 Pages)	Memoranda	NRC/NRO/DSER/GGEB1	NRC/NRO/DNRL/AP1000B1	05200011
03/06/2007	ML070370019	Vogtle Electric Generating Plant, Letter, Request for Withholding Information from Public Disclosure. (13 Pages)	Letter Proprietary Information Review	NRC/NRO/DSER/ETSB	Southern Nuclear Operating Co, Inc	PROJ0737
03/08/2007	ML070780689	River Intake Structure Canal General Arrangement. (4 Pages)	Drawing Map	Bechtel Corp	Georgia Power Co NRC/NRO	05200011
03/15/2007	ML070740727	Press Release-07-035 - NRC Issues First-Ever Early Site Permit for Clinton Site in Illinois. (2 Pages)	Press Release	NRC/OPA		05200007 05200008 05200009 05200011
03/15/2007	ML070660266	Early Site Permit (ESP) Application for the Vogtle Esp Site, RAI Number 6 regarding Site Safety Analysis Report (SSAR) Sections 2.4 and 2.5. (32 Pages)	Letter Request for Additional Information (RAI) Weekly Activities/LEAP (WAR)	NRC/NRO/DNRL	Southern Nuclear Operating Co, Inc	05200011
03/15/2007	ML070650577	Request for Additional Information Letter No. 5 - Southern Nuclear Operating Company Early Site Permit (ESP) Application for the Vogtle ESP Site. (37 Pages)	Letter Request for Additional Information (RAI)	NRC/NRO/DNRL/AP1000B1	Southern Nuclear Operating Co, Inc	05200011
03/16/2007	ML070810213	Vogtle Early Site Permit Application, Response to Requests for Additional Information Letter No. 3. (114 Pages)	Letter Updated Final Safety Analysis Report (UFSAR)	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
03/19/2007	ML070180445	Trip Report from Site Visit to the Vogtle Early Site Permit (ESP) Site and Audit of Section 2.3, Meteorology, of the Vogtle ESP Application. (21 Pages)	Memoranda Trip Report	NRC/NRO/DNRL/AP1000B1	NRC/NRO/DNRL/AP1000B1	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/19/2007	ML070580302	Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application for the Vogtle ESP Site- Summary of Telephone Call Held on February 23, 2007. (7 Pages)	Memoranda Note to File incl Telcon Record, Verbal Comm	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
03/19/2007	ML070580295	02/20/2007 Summary of Telephone Call Re: Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application for the Vogtle ESP Site. (8 Pages)	Meeting Summary Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
03/19/2007	ML070470611	Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application for the Vogtle ESP Site - Summary of Telephone Call Held on February 8, 2007. (17 Pages)	Memoranda Note to File incl Telcon Record, Verbal Comm	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
03/22/2007	ML070780677	The Altamaha River, The Nature Conservancy. (3 Pages)	News Article	The Nature Conservancy	NRC/NRO	05200011
03/26/2007	ML070880685	Vogtle Early Site Permit Application Response to Requests for Additional Information Letter No. 4. (81 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
03/30/2007	ML070720622	03/09/2007 Summary of Teleconference Between the NRC & Southern Nuclear Operating Company (SNC) to Discuss Site Safety Analysis Report (SSAR) Section 2.5 for the Early Site Permit (ESP) Application for the Vogtle ESP Site. (28 Pages)	Meeting Summary Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
04/03/2007	ML070740099	Trip Report - March 7 through 9, 2007, Vogtle Electric Generating Plant (VEGP) Early Site Permit (ESP), Site Visit. (14 Pages)	Memoranda Trip Report	NRC/NRO/DSER/ETS B	NRC/NRO/DSER/EPB 1	05200011
04/15/2007	ML070720368	Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application for the Vogtle ESP Site- Summary of Telephone Call Held on March 9, 2007 to Discuss Site Safety Analysis Report (SSAR) Section 2.4. (8 Pages)	Meeting Summary Memoranda Note to File incl Telcon Record, Verbal Comm	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
04/30/2007	ML071710169	Vogtle Early Site Permit Application, Revision 2, Part 5 - Emergency Plan. Cover through Page V2A4-4. (301 Pages)	Emergency Preparedness-Emergency Plan Graphics incl Charts and Tables License-Application for Construction Permit DKT 50 Map Organization Chart	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710165	Vogtle Early Site Permit Application, Revision 2, Part 4 - Site Redress Plan. Cover Through Page 1-15. (21 Pages)	License-Application for Construction Permit DKT 50 Site Redress Plan	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710112	Vogtle Early Site Permit Application, Revision 2, Part 5 - Emergency Plan. Cover Through Page V2A4-4. (301 Pages)	Emergency Preparedness-Emergency Plan License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710111	Vogtle Early Site Permit Application, Revision 2, Part 4 - Site Redress Plan. Pages Cover Through 1-15. (21 Pages)	License-Application for Construction Permit DKT 50 Site Redress Plan	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710100	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Pages 3.5-1 Through Nuclear Development Quality Assurance Manual (182 Pages)	Final Safety Analysis Report (FSAR) Graphics incl Charts and Tables License-Application for Construction Permit DKT 50 Manual Quality Assurance Program	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
04/30/2007	ML071710098	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Pages 2.5B-1 Through 2.5B-29. (29 Pages)	Final Safety Analysis Report (FSAR) Graphics incl Charts and Tables License-Application for Construction Permit DKT 50 Photograph	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710095	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Appendix F Through Appendix G Cover Page. (60 Pages)	Final Safety Analysis Report (FSAR) Graphics incl Charts and Tables License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710092	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Appendix D Through Appendix E. (274 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710089	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Appendix E Through Appendix F. (41 Pages)	Calculation Final Safety Analysis Report (FSAR) Graphics incl Charts and Tables License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710086	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Appendix C, Pages 47 Through 167. (80 Pages)	Final Safety Analysis Report (FSAR) Graphics incl Charts and Tables License-Application for Construction Permit DKT 50 Operating Procedures	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
04/30/2007	ML071710084	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Appendix B Through Appendix C, Page 46. (129 Pages)	Final Safety Analysis Report (FSAR) Graphics incl Charts and Tables License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710083	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Appendix 2.5A. (90 Pages)	Final Safety Analysis Report (FSAR) Graphics incl Charts and Tables License-Application for Construction Permit DKT 50 Map	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710079	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Pages 2.5.2-1 Through 2.5.6-1. (256 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710077	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Pages 2.5.1-125 Through 2.5.1-186. (62 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50 Map	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710074	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Pages 2.5 1-1 Through 2.5.1-124. (124 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710072	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Pages 2.4.13 Through 2.4A-228. (230 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
04/30/2007	ML071710067	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Pages 2.4.1-1 Through 2.4.12-104. (230 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710064	Vogtle Early Site Permit Application, Revision 2, Part 2 - Site Safety Analysis Report. Cover Through Page 2.3-122. (242 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/30/2007	ML071710060	Vogtle Early Site Permit Application, Revision 2, Part 1 - Administrative Information. Cover through Chapter 3. (40 Pages)	License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
05/14/2007	ML073330039	Out of Control - On Purpose, DOE's Dispersal of Radioactive Waste Into Landfills and Consumer Products. (122 Pages)	Report, Miscellaneous	Nuclear Information & Resource Service (NIRS)	NRC/NRO	05200011
05/31/2007	ML073470893	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment C, "Cone Penetrometer Test Results," Volume 1 of 1. (120 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
05/31/2007	ML073470895	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment D, "Geophysical Test Data (Downhole) Field Electrical Resistivity," Volume 1 of 1. (329 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
06/06/2007	ML072070273	FEMA 06/06/07 Letter Enclosure: Concurrence on Vogtle ESP PSER (Misc. Enclosures: Burke County, GA Emergency Response Procedural Checklists, Various). (90 Pages)	Emergency Preparedness-FEMA Correspondence to NRC	US Federal Emergency Mgmt Agency (FEMA)	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
06/20/2007	ML073330046	Health Risks of Adding New Reactors To The Vogtle Nuclear Plant. (25 Pages)	Report, Miscellaneous	Blue Ridge Environmental Defense League	NRC/NRO	05200011
06/27/2007	ML071770619	07/11/07 - Notice of Forthcoming Meeting with Southern Nuclear Operating Company to Discuss Southern's Potential Limited Work Authorization (LWA) - 2 Request for the Vogtle Early Site Permit Application to Discuss Southern's Upcoming LWA. (7 Pages)	Meeting Agenda Meeting Notice	NRC/NRO/DNRL/AP1000B1	NRC/NRO/DNRL/AP1000B1	05200011
06/27/2007	ML073470891	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Report of SPT Energy - MACTEC Charlotte Diedrich D-50 ATV Hammer Serial No. 100 Automatic Hammer, Work Instruction VGCOL 152. (85 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50 Memoranda	MACTEC Engineering & Consulting, Inc	MACTEC Engineering & Consulting, Inc NRC/NRO	05200011
07/02/2007	ML071300019	Letter to G. Jackson: Revision Two Application by Southern Nuclear Operating Company for an Early Site Permit (ESP) for the Vogtle Site. (5 Pages)	Letter	NRC/NRO/DSER	Burke County, GA	05200011 PROJ0737
07/20/2007	ML072080259	Supplemental Information on Water Treatment Chemical Residuals in the Vogtle Unit 3 and 4 Final Discharge. (3 Pages)	Report, Miscellaneous	- No Known Affiliation	NRC/NRO	05200011
07/30/2007	ML072340525	Vogtle Early Site Permit Application, Supplement 2-S1, Part 2, Site Safety Analysis Report, Chapter 1 (Drawings 0-CY-0000-00001, Rev. 4 & 0-CY-0000-00002, Rev. 5). (3 Pages)	Drawing Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
08/06/2007	ML072280100	V. out. (160 Pages)	Spreadsheet File	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
08/07/2007	ML072280108	1-Mile Early Fatality Risk. (1 Pages)	Spreadsheet File	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
08/07/2007	ML072280085	VEarly. (7 Pages)	Spreadsheet File	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
08/08/2007	ML072360369	Vogtle Early Site Permit Application - Addendum Report for Archaeological Survey of Water Line Corridor for Proposed Intake Structure. (4 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRR	05200011
08/10/2007	ML072270305	Vogtle ESP Tornado Statistics. (5 Pages)	Graphics incl Charts and Tables Map Report, Miscellaneous	US Dept of Commerce, National Oceanic & Atmospheric Admin (NOAA)	NRC/NRO	05200011
08/10/2007	ML072270048	Vogtle Early Site Permit Application, Supplement Information on Savannah River at Risk Water Quality Study. (3 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
08/10/2007	ML072260257	Vogtle ESP Hail and Tornado Reports 2.3.1.3.3.6. (1 Pages)	Graphics incl Charts and Tables Report, Miscellaneous	US Dept of Commerce, National Oceanic & Atmospheric Admin (NOAA)	NRC/NRO	05200011
08/10/2007	ML072260248	The Climate Atlas of the United States for the Vogtle ESP. (7 Pages)	Report, Miscellaneous	US Dept of Commerce, National Oceanic & Atmospheric Admin (NOAA)	NRC/NRO	05200011
08/10/2007	ML072260084	One Hundred Year Return Temperatures 2.3.1.3.5. (7 Pages)	Graphics incl Charts and Tables	- No Known Affiliation	NRC/NRO	05200011
08/10/2007	ML072260074	Vogtle ESP Hurricane Trends 2.3.1.3.7. (4 Pages)	Graphics incl Charts and Tables	- No Known Affiliation	NRC/NRO	05200011
08/15/2007	ML072330245	Transmittal of Vogtle Early Site Permit Application, Supplement to Include Limited Work Authorization 2 Activities. (3 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
08/16/2007	ML072280160	08/20/07 - 09/24/07 Commission Meetings - FRN. (3 Pages)	Federal Register Notice	NRC/SECY		05200011 07200026
08/21/2007	ML072330552	8/27/07 - 9/3/07 Commission Meetings - Special FRN. (1 Pages)	Federal Register Notice	NRC/SECY		05200011 07200026
08/29/2007	ML072350413	Letter to Charles Hardigree, Responding to Help Defining the Wages for Skilled Crafts in the Augusta, Georgia Area. (6 Pages)	Letter	NRC/NRO/DSER	- No Known Affiliation	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
08/30/2007	ML072040363	Vogtle Early Site Permit Safety Evaluation Report, Section 2.4, Hydrologic Engineering. (85 Pages)	Safety Evaluation Report	NRC/NRO		05200011
08/30/2007	ML071970283	Vogtle Early Site Permit Safety Evaluation Report, 13.0 Conduct of Operations. (147 Pages)	Safety Evaluation Report	NRC/NRO		05200011
08/30/2007	ML071800270	Vogtle Early Site Permit Safety Evaluation Report, 2.0 Site Characteristics, Sections 2.1 - 2.3. (86 Pages)	Safety Evaluation Report	NRC/NRO		05200011
08/30/2007	ML071770255	Vogtle Early Site Permit Safety Evaluation Report, 11.0 Radiological Effluent Release Dose Consequences from Normal Operations. (7 Pages)	Safety Evaluation Report	NRC/NRO		05200011
08/30/2007	ML072420139	M070830 - Affirmation Session: SECY-07-0113 - Final Rule: 10 CFR Pts 30, 31, 32, 150 Exempt fm Licensing, Gen Licenses & Dist of Byproduct Material: Licensing & Reporting Rqmts; II. SECY-07-0137 Southern Nuclear Op Co. (Early Site Permit for Vogtle). (5 Pages)	Commission Meeting Transcript/Exhibit	NRC/OCM		05200011
08/30/2007	ML072420114	SRM-M070830 - Affirmation Session: I - SECY-07-0113 - Final Rule: 10 CFR Parts 30, 31, 32, and 150 Governing Distribution of Byproduct Material; (2) SECY-07-0137 - Early Site Permit for Vogtle ESP Site. (3 Pages)	Commission Staff Requirements Memo (SRM)	NRC/SECY	NRC/EDO NRC/OCAA	05200011
08/30/2007	ML072400469	Letter, Vogtle Safety Evaluation Report for the Vogtle Early Site Permit Application. (7 Pages)	Letter	NRC/NRO/DNRL	Southern Nuclear Operating Co, Inc	05200011
08/30/2007	ML072330246	Vogtle Early Site Permit Application, Supplement 2-S1, Part 2, Site Safety Analysis Report, Chapter 1 (Pages 1-1 through 1-38), Section 2.5.4 (Pages 2.5.4-1 through 2.5.4-100), and Appendix 2.5.C, Attachment A. (226 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
08/30/2007	ML072260173	Vogtle Early Site Permit Safety Evaluation Report, Appendix A, Permit Conditions, COL Action Items, Site Characteristics, Bounding Parameters, and Inspections, Tests, Analyses, and Acceptance Criteria	Safety Evaluation Report	NRC/NRO		05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
		Tables. (55 Pages)				
08/30/2007	ML072250595	Vogtle Early Site Permit Safety Evaluation Report, 19.0 Conclusions. (1 Pages)	Safety Evaluation Report	NRC/NRO		05200011
08/30/2007	ML072250593	Vogtle Early Site Permit Safety Evaluation Report, 18.0 Review By the Advisory Committee on Reactor Safeguards. (1 Pages)	Safety Evaluation Report	NRC/NRO		05200011
08/30/2007	ML072250471	Vogtle Early Site Permit Safety Evaluation Report, Abstract, Table of Contents, Appendices, Figures, Tables. and Executive Summary. (27 Pages)	Safety Evaluation Report	NRC/NRO		05200011
08/30/2007	ML072250444	Vogtle Early Site Permit Safety Evaluation Report, Appendix D, Principal Contributors. (1 Pages)	Safety Evaluation Report	NRC/NRO		05200011
08/30/2007	ML072220271	Vogtle Early Site Permit Safety Evaluation Report, Appendix C, References. (22 Pages)	Safety Evaluation Report	NRC/NRO		05200011
08/30/2007	ML072220065	Vogtle Early Site Permit Safety Evaluation Report, Appendix B, Chronology. (24 Pages)	Safety Evaluation Report	NRC/NRO		05200011
08/31/2007	ML073320852	Science and Democratic Action, Volume 15, Number 1, "Carbon-Free and Nuclear-Free, A Roadmap for US Energy Policy". (16 Pages)	Newsletter	Institute for Energy & Environmental Research	NRC/NRO	05200011
08/31/2007	ML072340543	Vogtle Early Site Permit Application, Supplement 2-S1, Part 4, Site Redress Plan, Chapter 1 (Pages 1-1 through 1-14). (21 Pages)	License-Application for Construction Permit DKT 50 Site Redress Plan	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
08/31/2007	ML072330252	Vogtle Early Site Permit Application, Supplement 2-S1, Part 2, Site Safety Analysis Report, Appendix 2.5.C, Attachment D, Geophysical Test Data (Downhole) Field..., Section 3.8.5, Foundations, Section 13.7, Fitness for Duty, and Appendix 17.1A. (386 Pages	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
08/31/2007	ML072330249	Vogtle Early Site Permit Application, Supplement 2-S1, Part 2, Site Safety Analysis Report, Appendix 2.5.C, Attachment C, Penetrometer Test Results. (121 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
08/31/2007	ML072330248	Vogtle Early Site Permit Application, Supplement 2-S1, Part 2, Site Safety Analysis Report, Appendix 2.5.C, Attachment B, Geotechnical Boring Logs. (713 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
09/04/2007	ML072470645	Letter to Dr. W. Ray Luce, Early Site Permit Review for the Vogtle Electric Generating Plant (VEGP) Site. (15 Pages)	Letter	NRC/NRO/DSER	State of GA, Dept of Natural Resources	05200011
09/06/2007	ML080100039	Transmittal of Materials for the Subcommittee on Early Site Permit Regarding the Vogtle Early Site Permit (ESP) Application on October 24, 2007, In Rockville, Maryland. (1 Pages)	Memoranda Status Report	NRC/ACRS	NRC/ACRS	05200011
09/10/2007	ML072430133	Letter to US Geological Survey, NRC Staff Review of "Simulation and Particle-Tracking Analysis of Selected Ground-Water Pumping Scenarios at Plant Vogtle, Burke County, Georgia", Task Order 2, Contract Q-4109/J-3332. (10 Pages)	Letter	NRC/NRO/DSER/EPB 1	US Dept of Interior, Geological Survey (USGS)	05200011
09/12/2007	ML072550271	Press Release-07-118 - NRC Seeks Public Input on Vogtle Early Site Permit Application; Meeting to be Held Oct. 4. (5 Pages)	Press Release	NRC/OPA		05200011
09/12/2007	ML072530510	Revision to the Vogtle Early Site Permit Application Review Schedule to Incorporate a Limited Work Authorization Request-2 Review Provided by Southern Nuclear Operating Company. (8 Pages)	Letter	NRC/NRO/DNRL/AP1 000B1	Southern Nuclear Operating Co, Inc	05200011
09/13/2007	ML072620268	Vogtle, Early Site Permit Application Response to Safety Evaluation Report. (2 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
09/20/2007	ML072180315	W. Burton Memo re: Conference Call Summary - July 18, 2007, Discussion with Southern Nuclear Operating Company (SNC) Concerning Staff Questions for the	Meeting Summary Memoranda	NRC/NRO/DSER/EPB 1	NRC/NRO/DSER/EPB 1	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
		Early Site Permit Plant Vogtle Site. (4 Pages)				
09/20/2007	ML072180214	W. Burton Memo re: Conference Call Summary - July 13, 2007; Discussion with Southern Nuclear Operating Company (SNC) Concerning the Input and Output Files for the MACCS-2 Code Runs for the Early Site Permit for the Plant Vogtle Site. (5 Pages)	Meeting Summary Memoranda	NRC/NRO/DSER/EPB 1	NRC/NRO/DSER/EPB 1	05200011
09/20/2007	ML072200030	W. Burton Memo re: Conference Call Summary - August 6, 2007, Discussion with Southern Nuclear Operating Company (SNC) Concerning the Output Files for the MACCS-2 Code Runs for the ESP for the Plant Vogtle Site Submitted to the NRC on July 18, 2007. (4 Pag	Meeting Summary Memoranda	NRC/NRO/DSER/EPB 1	NRC/NRO/DSER/EPB 1	05200011
09/26/2007	ML072690127	FRN - Early Site Permits, October 24, 2007 (4 Pages)	Federal Register Notice Memoranda	NRC/ACRS	NRC/ACRS	05200011
10/01/2007	ML073440163	Attachment 2 - Vogtle ESP Resolution. (10 Pages)	- No Document Type Applies Letter	State of GA, Senate	NRC/ADM NRC/NRO	05200008 05200011
10/01/2007	ML072681210	Request for Additional Information Letter No. 8 - Southern Nuclear Operating Company Early Site Permit Application for the Vogtle ESP Site. (11 Pages)	Letter Request for Additional Information (RAI)	NRC/NRO/DNRL/AP1 000B1	Southern Nuclear Operating Co, Inc	05200011
10/02/2007	ML073050440	Resolution of the Mayor and Council of the City of Sylvania, Georgia Supporting Plant Vogtle Expansion. (1 Pages)	- No Document Type Applies	City of Sylvania, GA City of Sylvania, GA, City Council	NRC/NRO	05200011
10/02/2007	ML073050437	Resolution of the Screven County Board of Commissioners Supporting an Expansior to Plant Vogtle. (1 Pages)	- No Document Type Applies	Screven County, GA	NRC/NRO	05200011
10/02/2007	ML072750195	Transmittal of Safety Evaluation Report for the Vogtle Electric Generating Plant Early Site Permit Application. (2 Pages)	Memoranda	NRC/NRO/DNRL	NRC/ACNW NRC/ACRS	05200011
10/03/2007	ML073060361	Letter from US Senators Isakson and Chambliss in Support of Plant Vogtle Early Site Permit. (1 Pages)	Letter	US SEN (Senate)	NRC/ADM/DAS/RDEB	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
10/04/2007	ML073060366	A Resolution Of Support for Expansion at Plant Vogtle. (1 Pages)	- No Document Type Applies	City of Waynesboro, GA	NRC/NRO	05200011
10/15/2007	ML072900349	Vogtle Early Site Permit Application - Response to Safety Evaluation Report Open Items. (3 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
10/15/2007	ML072900252	Enclosure - 1 of 2, Vogtle Early Site Permit Application, Response to Safety Evaluation Report Open Items. (24 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
10/18/2007	ML072900259	Enclosure - 2 of 2, SER Open Item Responses, Vogtle Early Site Permit Application. (148 Pages)	Graphics incl Charts and Tables Report, Technical	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
10/26/2007	ML072910730	Southern Nuclear Operating Company, Inc., Request for Additional Information Letter No. 9 - Southern Nuclear Operating Company Early Site Permit Application for the Vogtle ESP Site. (11 Pages)	Letter Request for Additional Information (RAI)	NRC/NRO/DNRL/AP1 000B1	Southern Nuclear Operating Co, Inc	05200011
11/05/2007	ML073240570	Drawing H-993-3, "Plant Vogtle New Unit Early Permit Study Savannah River hydrographic Study - Proposed Discharge Burke County, Georgia." (3 Pages)	Drawing	Georgia Power Co	NRC/NRR	05000424 05000425 PROJ0737
11/06/2007	ML073120135	Vogtle Early Site Permit Application - Response to Request for Additional Information Involving Quality Assurance Controls for Limited Work Authorization-2. (11 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
11/08/2007	ML073130628	Vogtle Early Site Permit Application, New and Significant Information Review. (3 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
11/09/2007	ML073470888	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment B, "SPT Energy Ratio Measurements." (101 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/09/2007	ML073470884	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment B, "Geotechnical Boring Logs, Geotechnical Test Pit Logs, SPT Energy Ratio Measurements," Volume 1 of 1. (538 Pages)	Final Safety Analysis Report (FSAR) License-Application for (Amend/Renewal/New) for DKT 30, 40, 70	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
11/09/2007	ML073470936	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 18 of 18, "Unconsolidated Undrained Triaxial Test by ASTM D4767". (105 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/09/2007	ML073470935	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 17 of 18, "Unconsolidated Undrained Triaxial Test by ASTM D2850". (100 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/09/2007	ML073470931	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 16 of 18, "Consolidation Test Data". (76 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/09/2007	ML073470926	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 15 of 18, "Consolidation Test Data". (100 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/09/2007	ML073470924	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 14 of 18, "Consolidation Test Data". (102 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/09/2007	ML073470923	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 13 of 18, "Consolidation Test Data". (100 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/09/2007	ML073470921	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 12 of 18, "Consolidation Test Data". (76 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
11/09/2007	ML073470918	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 11 of 18, "Consolidation Test Data". (103 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/09/2007	ML073470896	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 1 of 18, "Laboratory Testing Data (Geotechnical)," Volume 1 of 2. (72 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/16/2007	ML073470883	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Appendix 2.5C, "Geotechnical Investigation and Laboratory Testing Data Report - COL," through Quality Assurance Reports. (269 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/16/2007	ML073470872	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Appendix 2.5A, "Geotechnical Investigation and Laboratory Testing Data Report," through Table 7, "Boring C-1005A, Suspension R1-R2 Depths and P-and SH-Wave... (223 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/19/2007	ML073470937	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, Addendum to Geotechnical Data Report. (17 Pages)	Final Safety Analysis Report (FSAR) Letter License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc	Georgia Power Co NRC/NRO Southern Nuclear Operating Co, Inc	05200011
11/28/2007	ML073331123	Vogtle Early Site Permit Application - Response to Request for Additional Information Involving Limited Work Authorization-2 Supplement. (59 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
11/30/2007	ML073470869	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Section 2.4, "Hydrologic Engineering," through Appendix J, "Site Photos". (477 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
11/30/2007	ML073470867	Vogtle Early Site Permit Application - Revision 3, Part 1 - Administrative Information, Cover through Part 2 - Site Safety Analysis Report. (266 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470948	Vogtle Early Site Permit Application - Revision 3, Part 5, Emergency Plan, NEI 07-01, "Emergency Action Levels Technical Basis." (91 Pages)	Emergency Preparedness-Emergency Plan License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470941	Vogtle Early Site Permit Application - Revision 3, Part 4 - Site Redress Plan and Part 5 - Emergency Plan, Cover to Page V2A4-14. (369 Pages)	Emergency Preparedness-Emergency Plan License-Application for Construction Permit DKT 50 Site Redress Plan	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470938	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Chapter 3, "Design of Structures, Components, Equipment, and Systems," through Chapter 17, "Quality Assurance." (220 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470915	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 10 of 18, "Consolidation Test Data". (101 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470912	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 9 of 18, "Unconfined Compression Test Report". (121 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470910	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 8 of 18, "Liquid and Plastic Limits Test Report". (80 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Development Corp Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
11/30/2007	ML073470908	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 7 of 18, "Particle Size Distribution Report". (89 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470904	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 6 of 18, "Particle Size Distribution Report". (80 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470903	Vogtle Early Site Permit Application - Revision 3, part 2 - Site Safety Analysis Report, Attachment F, 5 of 18, "Particle Size Distribution Report." (80 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470900	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 4 of 18, "Particle Size Distribution Report". (81 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470899	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 3 of 18, "Particle Size Distribution Report". (79 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
11/30/2007	ML073470897	Vogtle Early Site Permit Application - Revision 3, Part 2 - Site Safety Analysis Report, Attachment F, 2 of 18, "Particle Size Distribution Reports". (80 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	MACTEC Engineering & Consulting, Inc Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
12/07/2007	ML080070436	10/24/2007 Minutes on Meeting of the ACRS Early Site Permits Subcommittee, Rockville, Maryland. (28 Pages)	Meeting Minutes	NRC/ACRS	NRC/ACRS	05200011
12/11/2007	ML073461084	Vogtle Early Site Permit Application Supplemental Information Regarding Safety Evaluation Report Open Items. (13 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
12/12/2007	ML073390235	Vogtle Extended Service Mailing List. (10 Pages)	- No Document Type Applies	NRC/NRO/DSER/EPB 1	Nuclear Information & Resource Service (NIRS)	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
12/13/2007	ML073520352	Vogtle ESP: Open Item 2.3.1 Resolution. (4 Pages)	Graphics incl Charts and Tables	US Dept of Commerce, National Oceanic & Atmospheric Admin (NOAA)	NRC/NRO	05200011
12/18/2007	ML081510795	Meeting Minutes of the ACRS Early Site Permits Subcommittee, October 24, 2007. (246 Pages)	Meeting Minutes	NRC/ACRS		05200011
12/28/2007	ML073480252	G20070834/EDATS: OEDO-2007-0713 - William J. Shack Ltr re: Interim Letter: Southern Nuclear Operating Company Application for the Vogtle Early Site Permit and the Associated NRC Safety Evaluation Report with Open Items (2 Pages)	Letter	NRC/EDO	NRC/ACRS	05200011
01/08/2008	ML073450602	Trip Report from Visit to Bechtel Office in Support of the Vogtle Early Site Permit (ESP) Site and Audit of Meteorological Aspects of the Vogtle ESP Application. (3 Pages)	Memoranda Trip Report	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
01/11/2008	ML080040228	Request For Additional Information Letter No. 10 - Southern Nuclear Operating Company Early Site Permit Application For The Vogtle Esp Site. (10 Pages)	Letter Request for Additional Information (RAI)	NRC/NRO/DNRL/AP1 000B1	Southern Nuclear Operating Co, Inc	05200011
01/18/2008	ML080230701	Vogtle Early Site Permit Application, Submittal Date for Application Revision 4. (2 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
01/23/2008	ML080310359	Vogtle Early Site Permit Application, Response to Hydrology Safety Evaluation Report Open Item Followup Questions. (36 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
01/25/2008	ML080070538	Biological Assessment for Threatened and Endangered Species and Designated Critical Habitat for the Vogtle Electric Generating Plant Early Site (ESP) Application. (8 Pages)	Letter	NRC/NRO/DSER/EPB 1	State of FL, National Marine Fisheries Services	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
01/25/2008	ML080070534	Biological Assessment for Threatened and Endangered Species and Designated Critical Habitat for the Vogtle Electric Generating Plant Early Site Permit (ESP) Application. (8 Pages)	Letter	NRC/NRO/DSER/EPB 1	US Dept of Interior, Geological Survey (USGS)	05200011
01/28/2008	ML080370283	Vogtle Expansion Documentation Review. (1 Pages)	Letter	State of GA, Dept of Natural Resources	NRC/NRO Southern Nuclear Operating Co, Inc	05200011
02/12/2008	ML080590496	Vogtle Early Site Permit Application, Part 5, Emergency Plan, Revision 4. (214 Pages)	Emergency Preparedness-Emergency Plan License-Early Site Permit (ESP)	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
02/12/2008	ML080590481	Vogtle Early Site Permit Application, Supplemental Information Regarding Safety Evaluation Report Open Items. (4 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
02/12/2008	ML080420653	2/28/08 - FORTHCOMING PUBLIC MEETING WITH SOUTHER NUCLEAR OPERATING COMPANY (SNC) TO DISCUSS THEIR BACKFILL PROGRAM IN SUPPORT OF THEIR LIMITED WORK AUTHORIZATION REQUEST (5 Pages)	Meeting Agenda Meeting Notice	NRC/NRO/DNRL	NRC/NRO/DNRL	05200011
02/13/2008	ML080430469	02/28/08 - Forthcoming Public Meeting with Southern Nuclear Operating Company (SNC) to Discuss Their Backfill Program in Support of Their Limited Work Authorization Request. (7 Pages)	Meeting Agenda Meeting Notice	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
02/27/2008	ML080650414	Southern Nuclear - Rev. 4 to Emergency Plan, Part 5, "Vogtle Early Site Permit." (361 Pages)	Emergency Preparedness-Emergency Plan Graphics incl Charts and Tables Slides and Viewgraphs	Southern Nuclear Operating Co, Inc	NRC/NRR	05200011
02/27/2008	ML080650391	Vogtle Early Site Permit Application Part 5 - Draft Revision 4. (7 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
02/28/2008	ML080640235	SNC Presentations, Slides for Public Meeting to Discuss SNC's LWA Backfill Program for the Vogtle ESP. (112 Pages)	Meeting Briefing Package/Handouts Slides and Viewgraphs	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
02/28/2008	ML080640218	Presentation Slides from Public Meeting to Discuss SNC's LWA Backfill Program for the Vogtle ESP - 2/28/2008 (6 Pages)	Slides and Viewgraphs	NRC/NRO/DSER		05200011
03/19/2008	ML080810497	Vogtle Early Site Permit Application, Part 5, Emergency Plan, Draft Revision 4. (214 Pages)	Emergency Preparedness-Emergency Plan	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/19/2008	ML080810495	Vogtle Early Site Permit Application, Transmittal of Supplemental Information Regarding Safety Evaluation Report Open Items. (4 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
03/25/2008	ML080850047	04/08/08 - Notice of Meeting with Southern Nuclear (Snc) to Discuss the Hydrology Modeling for the Vogtle Early Site Permit. (8 Pages)	Meeting Agenda Meeting Notice Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
03/25/2008	ML080770517	02/22/2008 Summary of Telephone Call with Southern Nuclear Operating Company (SNC) Regarding Early Site Permit (ESP) Application for the Vogtle ESP Site. (8 Pages)	Meeting Summary Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
03/28/2008	ML081020171	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Mactec 2.5C, Attachment F, 17 of 18. (100 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020170	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Mactec 2.5C, Attachment F, 16 of 18. (76 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020169	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Mactec 2.5C, Attachment F,	Final Safety Analysis Report (FSAR) License-Application for Construction Permit	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
		15 of 18. (100 Pages)	DKT 50			
03/28/2008	ML081020117	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 14 of 18. (102 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020116	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 13 of 18. (100 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020115	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 12 of 18. (76 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020114	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 11 of 18. (104 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020112	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 10 of 18. (100 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020111	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 9 of 18. (122 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020108	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 8 of 18. (80 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/28/2008	ML081020107	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 7 of 18. (88 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020106	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 6 of 18. (80 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020104	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 5 of 18. (80 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020102	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 4 of 18. (82 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020101	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 3 of 18. (78 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020100	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 2 of 18. (80 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020099	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment F, 1 of 18. (72 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/28/2008	ML081020097	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, MACTEC Attachment D and Attachment E. (330 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020096	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, MACTEC Attachment C. (120 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020095	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment B. (86 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020094	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment B. (102 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020092	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, MACTEC Attachment B. (538 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020091	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, MACTEC, Attachment A. (270 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/28/2008	ML081020090	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5A, MACTEC Appendix F through Appendix 2.5B. (103 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020089	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5A, Appendix E through MACTEC Appendix E. (316 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020087	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5A, Appendix A through Appendix D. (80 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020086	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5A. (224 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML080910423	Vogtle, Units 3 and 4 - COL Application Physical Security Plan. (3 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011 PROJ0755
03/28/2008	ML081020274	Transmittal of Vogtle Early Site Permit Application, Revision 4. (23 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
03/28/2008	ML081020227	Vogtle Early Site Permit Application, Revision 4, Part 2, Site Safety Analysis Report, Table of Contents. (24 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/28/2008	ML081020226	Vogtle Early Site Permit Application, Revision 4, Part 5 - Emergency Plan. (364 Pages)	Emergency Preparedness-Emergency Plan License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020225	Vogtle Early Site Permit Application, Revision 4, Part 4 - Site Redress Plan. (16 Pages)	License-Application for Construction Permit DKT 50 Site Redress Plan	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020224	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.5.6. (4 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020223	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.5.5. (4 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020222	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.5.4. (114 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020221	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.5.3. (30 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020220	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.5.2. (190 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/28/2008	ML081020218	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.5.1. (164 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020217	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5E. (74 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020216	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.5, Table of Contents. (1 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020215	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.4. (478 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020214	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.3. (124 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020213	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.2. (30 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020212	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Section 2.1. (28 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/28/2008	ML081020211	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 17, "Quality Assurance." (63 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020210	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 15, "Accident Analyses." (26 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020209	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 13, "Conduct of Operations." (106 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020208	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 11, "Radioactive Waste Management." (24 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020207	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 3, "Design of Structures, Components, Equipment, and Systems," Sections 3.5 Through 3.8-4. (14 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020206	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 1, "Introduction and General Description." (32 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020205	Vogtle Early Site Permit Application, Revision 4, Part 1, Administrative Information. (30 Pages)	License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/28/2008	ML081020204	Vogtle Early Site Permit Application, Revision 4, Cover and Table of Contents. (4 Pages)	License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020203	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment E, 9 of 9. (89 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020202	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment E, 8 of 9. (65 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020201	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment E, 7 of 9. (64 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020199	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment E, 6 of 9. (61 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020198	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment E, 5 of 9. (40 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020196	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment E, 4 of 9. (85 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/28/2008	ML081020195	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment E, 3 of 9. (26 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020194	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment E, 2 of 9. (74 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020193	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment E, 1 of 9. (47 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020192	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment D. (26 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020191	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment C, 8 of 8. (182 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020189	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment C, 7 of 8. (118 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020188	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment C, 6 of 8. (104 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/28/2008	ML081020187	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment C, 5 of 8. (77 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020186	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment C, 4 of 8. (86 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020185	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment C, 3 of 8. (60 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020184	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment C, 2 of 8. (96 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020183	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment C, 1 of 8. (29 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020182	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment B. (88 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020181	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Attachment A. (26 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
03/28/2008	ML081020178	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5D, Sections 1 Through 3. (86 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020176	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment G, 2 of 2. (214 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020175	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Attachment G, 1 of 2. (298 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020174	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Mactec 2.5C, Attachment F - Addendum. (18 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
03/28/2008	ML081020173	Vogtle Early Site Permit Application, Revision 4, Part 2 - Site Safety Analysis Report, Chapter 2, "Site Characteristics," Appendix 2.5C, Mactec 2.5C, Attachment F, 18 of 18. (105 Pages)	Final Safety Analysis Report (FSAR) License-Application for Construction Permit DKT 50	Southern Nuclear Operating Co, Inc	NRC/NRO	05200011
04/02/2008	ML080920468	4/8/08 - Notice of Revised Meeting with Southern Nuclear (SNC) to Discuss the Hydrology Modeling for the Vogtle Early Site Permit. (8 Pages)	Meeting Agenda Meeting Notice Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
04/08/2008	ML081000526	Southern Nuclear Vogtle Groundwater Model Review Meeting Handout. (11 Pages)	Meeting Briefing Package/Handouts Slides and Viewgraphs	Battelle Memorial Institute, Pacific Northwest National Lab	NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
04/08/2008	ML081000502	04/08/2008 Meeting Handouts "Vogtle Units 3 & 4 Groundwater Model Overview." (43 Pages)	Graphics incl Charts and Tables Meeting Briefing Package/Handouts Slides and Viewgraphs	NRC/NRO/DNRL/AP1 000B1		05200011
04/17/2008	ML081120048	Vogtle Early Site Permit Application, Supplemental Information Regarding Request for Additional Information No. 2.5.2-3 and Safety Evaluation Report Open Item No. 2.5-5. (30 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
04/18/2008	ML080780345	Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application for the Vogtle ESP Site - Summary of /Telephone Call Held on March 5, 2008 to Discuss GMRS. (3 Pages)	Meeting Summary Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
04/24/2008	ML081060305	Acknowledgment of Receipt of The Combined License Application for Vogtle Electric Generating Plant Unit 3 and 4 and Associated Federal Register Notice. (8 Pages)	Federal Register Notice Letter	NRC/NRO/DNRL/AP1 000B1	Southern Nuclear Operating Co, Inc	05200011 PROJ0755
05/01/2008	ML080780306	02/28/2008 - Summary of Category 1 Public Meeting with Southern Nuclear Operating Company to Discuss Southern's Backfill Program for a Limited Work Authorization Request Under their Vogtle Early Site Permit Application. (10 Pages)	Meeting Agenda Meeting Summary	NRC/NRO/DNRL/AP1 000B1		05200011
05/14/2008	ML082070066	Vogtle, Early Site Permit Application, Phase II Testing at Archaelogical Site 9BK416 Within Proposed Water Line and Intake Structure. (3 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/NRO State of GA, Dept of Natural Resources	05200011
05/19/2008	ML081350199	04/08/2008-Summary of Meeting with Southern Nuclear Operating Company to Discuss Vogtle Hydrology Modeling Topics. (5 Pages)	Meeting Briefing Package/Handouts Meeting Summary	NRC/NRO/DNRL/AP1 000B1		05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
05/27/2008	*ML081510022*	*Vogtle Early Site Permit Application,* Impingement and Entrainment Monitoring. (8 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
06/10/2008	ML081720197	Vogtle Electric Generating Plant Expansion, Burke County, Georgia HP-060428-001. (1 Pages)	Letter	State of GA, Dept of Natural Resources	NRC/NRO Southern Nuclear Operating Co, Inc	05200011
06/16/2008	ML081700563	Vogtle, Early Site Permit Application - Revised Fitness-For-Duty Program During Limited Work Authorization. (36 Pages)	Letter License-Fitness for Duty (FFD) Performance Report	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
06/18/2008	ML081510740	05/05/2008-Summary of Vogtle ESP Site Telephone Call to Discuss Appendix 2.5 E of the ESP Application. (3 Pages)	Meeting Summary Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
06/18/2008	ML081510661	04/28/2008-Summary of Telephone Call to Review Hydrology Modeling Progress. (3 Pages)	Meeting Summary Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
06/18/2008	ML081400433	Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application For The Vogtle ESP Site- Summary Of Telephone Call Held On April 11, 2008 To Discuss Site Response Damping Curves. (4 Pages)	Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
06/18/2008	ML081400268	Trip Report From Visit To Bechtel Office In Support Of The Vogtle Early Site Permit (ESP) And Audit Of Hydrology Modeling. (4 Pages)	Memoranda Trip Report	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
06/19/2008	ML081750239	Vogtle Early Site Permit Application, Revised Response to Draft Safety Evaluation Report Open Item Involving Hydrology. (6 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
06/26/2008	ML081820118	Vogtle Early Site Permit Application Supplement to Provide Additional Hydrology Information. (130 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
06/26/2008	ML081640428	Southern Nuclear Operating Company (SNC) - Vogtle, Revision to Early Site Permit Application Review Schedule. (7 Pages)	Letter	NRC/NRO/DNRL/AP1 000B1	Southern Nuclear Operating Co, Inc	05200011
06/30/2008	ML081610805	Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application For The Vogtle ESP Site- Summary Of Telephone Call Held On May 22, 2008, To Discuss SNC's Fitness For Duty Program. (5 Pages)	Memoranda Note to File incl Telcon Record, Verbal Comm	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
07/03/2008	ML081850151	Press Release-08-125: NRC Meeting July 17 in Waynesboro, GA., to Discuss Review Process for Vogtle New Reactor Application. (2 Pages)	Press Release	NRC/OPA		05200011
07/07/2008	ML081080553	Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application for the Vogtle ESP Site - Summary of Telephone Call Held on March 11, 2008 to Discuss Meteorological and Emergency Planning Topics. (5 Pages)	Meeting Summary Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011
07/07/2008	ML081080535	Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application For The Vogtle ESP Site - Summary Of Telephone Call Held On March 10, 2008 To Discuss Geological And Geotechnical Topics. (5 Pages)	Meeting Summary Memoranda	NRC/NRO/DNRL/AP1 000B1	NRC/NRO/DNRL/AP1 000B1	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
07/07/2008	ML081080529	Southern Nuclear Operating Company (SNC) Early Site Permit (ESP) Application For The Vogtle ESP Site - Summary Of Telephone Call Held On March 24, 2008 To Discuss ITAAC For Backfill And Waterproof Membrane; And GMSR Hazard Curves. (3 Pages)	Meeting Summary Memoranda	NRC/NRO/DNRL/AP1000B1	NRC/NRO/DNRL/AP1000B1	05200011
07/09/2008	ML081960194	Vogtle Early Site Permit Application - Further Revised Fitness-For-Duty Program During Limited Work Authorization. (27 Pages)	Letter License-Fitness for Duty (FFD) Performance Report	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
07/22/2008	ML081960368	Request For Additional Information Letter No. 11 - Southern Nuclear Operating Company Early Site Permit Application For The Vogtle ESP Site. (12 Pages)	Letter Request for Additional Information (RAI)	NRC/NRO/DNRL/AP1000B1	Southern Nuclear Operating Co, Inc	05200011
08/14/2008	ML082280539	Site Visit to Vogtle to Observe Erection of a Mechanically Stabilized Earth (MSE) Demonstration retaining Wall to Support Early Site Permit, Limited Work Authorization, and Combined License Activities. (8 Pages)	Letter Trip Report	NRC/RGN-II/DCI/CIB2	Southern Nuclear Operating Co, Inc	05200011 05200025 05200026
08/21/2008	ML082410440	Vogtle Early Site Permit Application, Response to Request for Additional Information Letter No. 11 Involving Groundwater. (35 Pages)	Drawing Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
08/27/2008	ML082560527	Letter from K.C. Hairston to Lawrence D. Sanders and Patrick A. Moulding re Twelfth Supplemental Disclosures Pursuant to 10CFR2.336 for Contentions EC 1.2 and EC 1.3 Admitted on March 12,2007 (LBP-07-03). (4 Pages)	Letter	Balch & Bingham, LLP Southern Nuclear Operating Co, Inc	Emory Univ School of Law NRC/OGC Turner Environmental Law Clinic	05200011
09/05/2008	ML082540120	Vogtle Early Site Permit Application - Transmittal of Requested 2D SASSI Model Input and Output Files (Referencing RAI # 11). (24 Pages)	Letter Report, Miscellaneous	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011

Document Date	Accession Number	Title	Document Type	Author Affiliation	Addressee Affiliation	Docket Numb
09/10/2008	ML082590049	Vogtle Early Site Permit Application Revision 4 to the Fitness-for-duty Program During Limited Work Authorization. (27 Pages)	Letter License-Fitness for Duty (FFD) Performance Report	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
09/10/2008	ML082590048	Vogtle Early Site Permit Application, Request to Rescind Reinforcing Bar Installation in Limited Work Authorization. (3 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011
09/10/2008	ML082590003	Joseph M. Farley, Units 1 and 2, Edwin I. Hatch, Units 1 and 2, Vogtle, Units 1, 2, 3 and 4 - Management Organization Change. (2 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011 05200025 05200026
09/11/2008	ML082550558	Vogtle ESP Final SER Section 02.5.4 - Stability of Subsurface Materials and Foundations (104 Pages)	Safety Evaluation Report	NRC/NRO/DNRL/AP1 000B1		05200011
09/11/2008	ML082550517	Vogtle ESP Final SER Section 02.5.2 - Vibratory Ground Motion (84 Pages)	Safety Evaluation Report	NRC/NRO/DNRL/AP1 000B1		05200011
09/19/2008	ML082760694	USFWS Log # 08-FA-0473. (1 Pages)	Letter	US Dept of Interior, Fish & Wildlife Service	NRC/NRO	05200011
09/30/2008	ML082830945	Interim Report of Fish Impingement and Entrainment Assessment at the Plant Vogtle Electric Generating Plant (90 Pages)	Report, Miscellaneous	NRC/NRO/DNRL/AP1 000B1		05200011
10/14/2008	ML082940015	Transmittal of Vogtle Early Site Permit Application Reference Changes. (8 Pages)	Letter	Southern Nuclear Operating Co, Inc	NRC/Document Control Desk NRC/NRO	05200011

APPENDIX C

REFERENCES

American Concrete Institute (ACI)

———, ACI-318, "Building Code Requirements for Structural Concrete,"

American National Standards Institute (ANSI)[34]

———, ANSI/ANS 2.8, "Determining Design Basis Flooding at Power Reactor Sites," 1992.

———, ANSI N45.2.11, "Quality Assurance Program Requirements for Nuclear Facilities," 1977.

———, ANSI N45.2.11, "Quality Assurance Requirements for the Design of Nuclear Power Plants," 1974.

American Society of Civil Engineers and Structural Engineering Institute (ASCE/SEI)[35]

———, ASCE/SEI 43-05, "Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities and Commentary," 2005.

———, ASCE/SEI 7-02, "Minimum Design Loads for Buildings and Other Structures," 2002.

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)[36]

———, "2001 ASHRAE Handbook - Fundamentals," July 2001.

---

34 Copies of American National Standards (ANS) publications may be purchased from the American National Standards Institute (ANSI), 1819 L Street, NW, 6th Floor, Washington, DC 20036 [phone: (202) 293-8020)]. Purchase information is available through the ASCE Web site at http://webstore.ansi.org/ansidocstore/.

35 Copies of ASCE publications may be purchased at http://www.asce.org/asce.cfm.

36 Copies of ASHRAE publications may be purchased at http://www.ashrae.org/publications/

American Society of Mechanical Engineers (ASME)[37]

— — — — — ASME NQA-1-2004, "Quality Assurance Requirements for Nuclear Facility Applications," 2004.

— — — — — ASME NQA-1-1994, "Quality Assurance Requirements for Nuclear Facility Applications," 1994.

American Society for Testing and Materials (ASTM)[38]

— — — — — ASTM D1577, "Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56000 ft-lbf/ft^2 (2700 kN-m/m^3)."

— — — — — ASTM D1586-99, "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils," January 10, 1999.

— — — — — ASTM D1587, "Standard Practice for Thin-Walled Rube Sampling of Soils for Geotechnical Purposes," 2000.

— — — — — ASTM D2488, "Standard Practice for Description and Identification of Soils," 2000.

— — — — — ASTM D4044, "Standard Test (Field Procedure) for Instantaneous Change in Head (slug) Tests for Determining Hydraulic Properties of Aquifer," 2002.

— — — — — ASTM D4200, "Standard Practice for Preserving and Transporting Soil Samples."

— — — — — ASTM D4220-95, "Standard Practices for Preserving and Transporting Soil Samples," January 1, 2000.

— — — — — ASTM D4228, "Standard Test Methods for Crosshole Seismic Testing," 2000.

— — — — — ASTM D5578, "Standard Test Method of Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils," 2005.

— — — — — ASTM D 6169, "Standard Guide for Selection of Soil and Rock Sampling Devices Used with Drill Rigs for Environmental Investigations," 2005.

---

37 Copies of American Society of Mechanical Engineers publications may be purchased at Three Park Avenue, New York, NY 10016-5990; phone (212)591-8500; fax (212) 591-8501; www.asme.org.

38 Copies of ASTM publications may be purchased at http://www.astm.org/

Defense Threat Reduction Agency

— — — — — "Hazard Protection and Assessment Capability," HPAC software report, Consequence Assessment Branch (TDOC), April 2005, http://www.dtra.mil/.

Electric Power Research Institute (EPRI)[39]

— — — — —, NP-4726A, "Probabilistic Seismic Hazard Evaluation of Nuclear Power Plant Sites in the Central and Eastern United States," Volumes I through 10, EPRI, 1989.

— — — — —, NP-4726, "Seismic Hazard Methodology for the Central and Eastern United States, Tectonic Interpretations," EPRI: Palo Alto, CA, 1986.

— — — — —, NP-4726, "Probabilistic Seismic Hazard Evaluations at Nuclear Power Plant Sites in the Central and Eastern United States," EPRI: Palo Alto, CA, 1989–1991.

— — — — —, NP-6395-D, "Probabilistic Seismic Hazard Evaluations at Nuclear Plant Sites in the Central and Eastern United States: Resolution of the Charleston Earthquake Issue (2)," EPRI, 1989.

— — — — —, NP-6452-D, "EQHAZARD Primer," Prepared by Risk engineering for Seismicity Owners Group and EPRI, 1989.

— — — — —, TR-102293, "Guidelines for Determining Design Basis Ground Motions," Volumes 1-5, EPRI: Palo Alto, California, May 1993.

— — — — —, TR-1009684, "CEUS Ground Motion Project Final Report," EPRI: Palo Alto, CA, http://www.energiecacouna.ca/pdfs/rapport_seismicite.pdf, 2004.

Johnston, A.C., 1994, "Seismotectonic interpretations and conclusions from the stable continental region seismicity database," in Schneider, J.F., ed., *The earthquakes of stable continental regions-v. 1, Assessment of large earthquake potential: Technical report to Electric Power Research Institute TR-102261-V1*, Palo Alto, California, p. 4-1-4-103, December 1994.

Johnston, A. C., et al., TR-102261-V1, "The Earthquakes of Stable Continental Regions: - Volume 1 - Assessment of Large Earthquake Potential," EPRI: Palo Alto, California, 1994.

Kanter, L.R., "Tectonic interpretation of Stable Continental Crust" in : *The Earthquakes of Stable Continental Regions*, prepared by Johnston, A.C.; Coppersmith, K.J.; Kanter, L.R.; Cornell, C.A., Electric Power Research Institute, pp. 2.1-2.98, 1994.

---

[39] Copies of EPRI standards and reports may be purchased from the Electric Power Research Institute (EPRI), 3420 Hillview Avenue, Palo Alto, California 94304, telephone (800) 313-3774; fax (925) 609-1310.

Federal Aviation Administration (FAA)

_ _ _ _ _, "tony.diana@faa.gov," AGS operations data via e-mail, December 19, 2006. (ADAMS Accession No. ML070990111).

_ _ _ _ _, "mark.ctr.lesko@faa.gov," Flight counts for each Thursday 2003 to 2006 for flights that flew a path along V185 when in vicinity of Vogtle, April 5, 2007. (ADAMS Accession No. ML070960422).

Federal Energy Regulatory Commission

— — — — —, FERC 0119-1, "Engineering Guidelines for the Evaluation of Hydropower Projects," Office of Hydropower Licensing, July 1987, http://www.ferc.gov/industries/hydropower.asp.

State of Georgia

Executive Order 08.25.04.01, issued August 25, 2004, http://www.gov.state.ga.us/ExOrders/.

Executive Order, 02.14.06.01, Georgia Emergency Operations Plan, signed February 14, 2006, http://www.gov.state.ga.us/2006_exec_orders.shtml.

Georgia Radiation Control Act, OCGA § 38-3-22.

Immunity from Liability, OCGA § 38-3-35.

Radiation Control Act, OCGA § 31-13-1-10.

Water Quality Control Act of 1974, OCGA § 12-5-47.

Air Quality Control Act, OCGA § 12-9-1.

Transportation of Hazardous Materials Act, OCGA § 46-11-1.

Emergency Operations Plan (GEOP).

Georgia Radiological Emergency Plan (REP) – Base Plan, Office of Homeland Security, May 2005.

Georgia Radiological Emergency Plan (REP) – Annex D, "Plant Vogtle," Office of Homeland Security, April 2005.

Burke County Emergency Plan

Burke County Emergency Management Radiological Plan

U.S. Department of Energy (DOE) Radiological Assistance Plan (RAP)

National Response Plan (NRP)

Federal Radiological Emergency Response Plan (FRERP)

Rutherford & Associates, Comprehensive Water Supply Management Plan prepared for Burke County and Municipalities: .Girard, Keysville, Midville, Sardis, Vidette, Waynesboro, Georgia, 2000.

Georgia Department of Natural Resources

Huddlestun, P.F. and J.H. Summerour. 1996. The Lithostratigraphic Framework of the Uppermost Cretaceous and Lower Tertiary of Eastern Burke County, Georgia. Bulletin 127. Georgia Department of Natural Resources, Atlanta, Georgia.

Summerour, J.H., E.A. Shapiro, J.A. Lineback, P.F. Huddlestun, and A.C. Hughes. 1994. An Investigation of Tritium in the Gordon and Other Aquifers in Burke County, Georgia. Information Circular 95. Georgia Department of Natural Resources, Atlanta, Georgia.

Summerour, J.H., E.A. Shapiro, and P.F. Huddlestun. 1998. An Investigation of Tritium in the Gordon and Other Aquifers in Burke County, Georgia; Phase II. Information Circular 102. Georgia Department of Natural Resources, Atlanta, Georgia.

Intergovernmental Panel on Climate Change (IPCC)

———, Working Group I Report, "Climate Change 2007: The Physical Science Basis," http://www.ipcc.ch/SPM2feb07.pdf, 2007.

National Climatic Data Center (NCDC)

———, Air Force Combat Climatology Center (AFCCC), "Engineering Weather Data, 2000 Interactive Edition, Version 1.0 (CD-ROM)."

———, "Augusta, Georgia, Integrated Surface Hourly Observations," http://www.ncdc.noaa.gov/oa/climate/climatedata.html#hourly, October 2006.

———, "Augusta, Georgia, 2004 Local Climatological Data, Annual Summary with Comparative Data," NCDC: Asheville, North Carolina, 2005.

———, "Climatography of the United States No. 20 1971-2000," http://www.ncdc.noaa.gov/oa/climate/normals/usnormalsprods.html, October 2006.

———, "Climatology of the United States, No. 81, 1971-2000, U.S. Monthly Climate

Normals," http://cdo.ncdc.noaa.gov/cgi-bin/climatenormals/climatenormals.pl, October 2006.

— — — — —, "Cooperative Summary of the Day (SOD) - Daily Surface Data TD 3200/3210 combined," http://cdo.ncdc.noaa.gov/pls/plclimprod/poemain.accessrouter?datasetabbv=SOD, October 2006.

— — — — —, "Locate Weather Observation Station Record," http://www.ncdc.noaa.gov/oa/climate/stationlocator.html, October 2006.

— — — — —, "Storm Events for Georgia and South Carolina, Tornado Event Summaries," http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms, October 2006.

— — — — —, Storm Event Database, "Storm Events for Georgia, Query Results, Hail Event(s)."

— — — — —, Reported in Burke County, "Georgia Between 01/01/1950 and 07/31/2006," http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms, October 2006.

National Inventory of Dams

Web Site: http://crunch.tec.army.mil/nid/webpages/nid.cfm, Last accessed May 21, 2007.

National Oceanic and Atmospheric Administration (NOAA)

— — — — —, Coastal Services Center, "Historical Hurricane Tracks Storm Query, 1851 through 2004," http://maps.csc.noaa.gov/hurricanes/index.htm, October 2006.

— — — — —, "The Climate Atlas of the United States," http://gis.ncdc.noaa.gov/website/ims-climatls/index.html, October 2006.

— — — — —, Hurricane Research Division, "Frequently Asked Questions: What does "maximum sustained wind" mean? How does it relate to gusts in tropical cyclones?" http://www.aoml.noaa.gov/hrd/tcfaq/D4.html, October 2006.

— — — — —, Hydrometeorological Report No. 53, "Seasonal Variation of 10-Square-Mile Probable Maximum Precipitation Estimates. United States East of the 105th Meridian." NOAA: Washington, DC, April 1980.

National Severe Storms Laboratory (NSSL)

— — — — —, "Severe Thunderstorm Climatology, Total Threat," August 29, 2003, http://www.nssl.noaa.gov/hazard/totalthreat.html, October 2006.

Nuclear Energy Institute (NEI) Technical Reports

———, Technical Report NEI 99-01, "Methodology for Development of Emergency Action Levels," Revision 4, January 2003.

———, Technical Report NEI 07-01, "Methodology for Development of Emergency Action Levels–Advanced Passive Light Water Reactors," Revision 0, February 28, 2007.

Occupational Safety And Health Administration (OSHA)

———, 29 CFR [*Code of Federal Regulations*] Part 1926, "Safety and Health Regulations for Construction," 2000.

State of South Carolina

South Carolina Radiological Emergency Response Plan, June 2004.

South Carolina Emergency Operations Plan–Base Plan.

South Carolina Operational Radiological Emergency Response Plan.

South Carolina Technical Radiological Emergency Response Plan.

South Carolina Code of Regulations 58-1 and 58-101.
Aiken County Plan

Barnwell County Plan

Allendale County Plan

South Carolina Department of Natural Resources

South Carolina Water Plan, Land, Water, and Conservation Division, 2nd Ed., January 2004.

South Carolina Department of Transportation

Chapman, M.C., and Talwani, P., "Seismic Hazard Mapping for Bridge and Highway Design in South Carolina," Report 2002.

Southern Nuclear Operating Company (Vogtle Electric Generating Plan (VEGP))

— — — — —, RAI 2.4.1-1 Response, AR-06-2865, Enclosure Attachment 2, (2007a).

— — — — —, Early Site Permit Application for Vogtle Electric Generating Plant. Part 2, Site Safety Analysis Report, Revision 2 (April 2007a).

— — — — —, Early Site Permit Application for Vogtle Electric Generating Plant. Part 3, Environmental Report, Revision 2, Revision 2 (April 2007b).

— — — — —, Vogtle Early Site Permit Application, Response to Requests for Additional Information Letter No. 6 Involving Hydrology. AR-07-0639, Docket No. 52-011. Enclosures 1, 2 and 3. (April 16, 2007c).

— — — — —, Vogtle Early Site Permit Application, NRC Safety Evaluation Report Open Items. AR-07-1773, Docket No. 52-011. Enclosures 1, 2 ,3, 4 and 5. (October 15, 2007g).

— — — — —, Vogtle Early Site Permit Application, Comments on Draft Environmental Impact Statement. AR-07-2216, Docket No. 52-011. Enclosures 1, and 3. (December 26, 2007f).

— — — — —, Early Site Permit Application for Vogtle Electric Generating Plant. Parts 1, 2, 3, 4 and 5, Safety Analysis Report, Environmental Report, Site Redress Plan and Emergency Plan, Revision 4, (March 2008a).

— — — — —, Early Site Permit Application for Vogtle Electric Generating Plant. Part 2, Site Safety Analysis Report Report, Supplement 4S-2 Additional Hydrology Information. AR-08-0952, Docket No. 52-011. Enclosures 1, 2 and 3, (June 2008b).

— — — — —, Vogtle Early Site Permit Application, Response to Requests for Additional Information Letter No. 11 Involving Groundwater. AR-08-1286, Docket No. 52-011. Enclosures 1, 2 and 3. (August 21, 2008c).

— — — — —, Vogtle Early Site Permit Application, Response to Requests for Additional Information Letter No. 11 Involving Vibratory Ground Motion and Limited Work Authorization. AR-08-1171, Docket No. 52-011. Enclosures 1, 2, 3, 4, and 5. (August 14, 2008d).

— — — — —, Updated Final Safety Analysis Report, Vogtle Electric Generating Plant, Revision 11, May 2003.

— — — — —, "Evacuation Time Estimates for the Vogtle Electric Generating Plant," Innovative Emergency Management, Inc., Report, April 2006.

— — — — —, Vogtle Electric Generating Plant Emergency Plan, Revision 42, Southern Nuclear Operating Company, January 2006.

— — — — —, Vogtle Electric Generating Plant Emergency Plan, Revision 43, Southern

Nuclear Operating Company, May 2006.

———, Vogtle Electric Generating Plant, Annual Radiological Environmental Operating Report for 2004, Southern Company.

Corporate Emergency Plan.

Emergency Communication Plan.

VEGP Security Plan.

VEGP Fire Protection Plan.

Vogtle Emergency Information Brochure.

2006 Plant Vogtle Emergency Information Calendar

Southeast Regional Climate Center (SERCC)

———, "Period of Record Daily Climate Summaries for Georgia and South Carolina," http://www.dnr.sc.gov/climate/sercc/climateinfo/historical/historical.html, October 2006.

———, "Period of Record Daily Climate Summary for Bamberg, SC," http://cirrus.dnr.state.sc.us/cgi-bin/sercc/cliMAIN.pl?sc0448, October 2006.

Vaisala

———, "5-year Flash Density Map - U.S. (1996 - 2001)," http://www.oneac.com/download/files/lightningmap.pdf, October 2006.

U.S. Army Corps of Engineers (USACE)

———, "HEC-RAS: River Analysis System," Computer Model, Version 4.0, Hydrologic Engineering Center, November 2006.

———, HEC-RAS, "HEC-RAS: River Analysis System," Computer Model, Version 3.1.3, Hydrologic Engineering Center, http://www.hec.usace.army.mil/software/hec-ras/documents/userman/cvr_incvr_toc.pdf, May 2005.

———, Water Control Manual, Savannah River Basin: Hartwell, Richard B Russell, and J. Strom Thurmond Projects, Savannah District, 1996.

———, Coastal Engineering Manual, Part II, EM 1110-2-1100, Change 2, July 2006.

———, Engineering and Design – Ice Engineering. EM 1110-2-1612. Department of the Army, Washington, DC, 2002.

———, Cold Regions Research and Engineering Laboratory, 2007a. Ice Jam Database. Georgia query performed on June 11, 2007. File: "Ice Jam Database Search -- Georgia.pdf".

———, Cold Regions Research and Engineering Laboratory, 2007b. Ice Jam Database. North Carolina query performed on June 11, 2007. File: "Ice Jam Database Search – North Carolina.pdf".

———, Cold Regions Research and Engineering Laboratory, 2007c. Ice Jam Database. South Carolina query performed on June 11, 2007. File: "Ice Jam Database Search – South Carolina.pdf".

———, Cold Regions Research and Engineering Laboratory, 2007d. Ice Jam Database. Georgia query result returned on June 11, 2007. File: "Ice Jam Database Search Result -- Georgia.pdf".

———, Cold Regions Research and Engineering Laboratory, 2007e. Ice Jam Database. Georgia query result returned on June 11, 2007. File: "Ice Jam Database Search Result – North Carolina.pdf".

———, Cold Regions Research and Engineering Laboratory, 2007f. Ice Jam Database. South Carolina query result returned on June 11, 2007. File: "Ice Jam Database Search – South Carolina.pdf".

———, Draft Environmental Assessment Findings of No Significant Impact; Drought Contingency Plan Update, Savannah River Basin, Savannah District. (May 2006).

U.S. Atomic Energy Commission (AEC)

———, "Technical Basis for Interim Regional Tornado Criteria," WASH-1300. May 1974.

U.S. Bureau of Reclamation

———, "Predication of Embankment Dam Breach Parameters: A literature Review and Needs Assessment," Dam Safety Office, Water Resources Research Laboratory, Department of Interior, July 1998.

U.S. Census Bureau

http://www:census.gov/population/cencount, September 2006.

U.S. Environmental Protection Agency (EPA)

— — — — —, "Areal Locations of Hazardous Atmospheres," Office of Emergency Management, Washington D.C., February 2007.

— — — — —, EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," May 1992.

— — — — —, "Guideline for Determination of Good Engineering Practice Stack Height," June 1985.

U.S. Geological Survey (USGS)

Bollinger, G.A., Professional Paper 1028-B, "Reinterpretation of the intensity data for the 1886 Charleston, South Carolina, earthquake," in Rankin, D.W., ed., *Studies related to the Charleston, South Carolina, earthquake of 1886-A Preliminary Report*, Reston, VA, p. 17-32, 1977.

Bollinger, G.A., and Wheeler, R.L., Professional Paper 1355, "The Giles County, Virginia, seismic zone-Seismological results and geologic interpretations," Reston, VA, 85 p., 1988.

Bollinger, G. A., Survey Bulletin 2017, "Specification of Source Zones, Recurrence Rates, Focal Depths, and Maximum Magnitudes for Earthquakes Affecting the Savannah River Site in South Carolina," Reston, VA, 1992.

Cherry, G.S. and J.S. Clarke. 2007, "Simulation and Particle-Tracking Analysis of Selected Ground-Water Pumping Scenarios at Vogtle Electric Generation Plant, Burke County, Georgia." U.S. Geological Survey Open-File Report 2007-1363, 51 p., Web-only publication at *"http://pubs.usgs.gov/usgspubs/of/2007/1363.*

Cherry, G.S. 2006. "Simulation and Particle-Tracking Analysis of Ground-Water Flow near the Savannah River Site," Georgia and South Carolina, 2002, and for Selected Ground-Water Management Scenarios, 2002 and 2020. Scientific Investigations Report 2006-5195, [a web-only publication available at http://pubs.usgs.gov/sir/2006/5195/.

Clarke, J.S. and C.T. West. 1997. "Ground-Water Levels, Predevelopment Ground-Water Flow, and Stream-Aquifer Relations in the Vicinity of the Savannah River Site, Georgia and South Carolina." Water-Resources Investigations Report 97-4197, Denver, Colorado.

Clarke, J.S. and C.T. West. 1998. "Simulation of Ground-Water Flow and Stream-Aquifer Relations in the Vicinity of the Savannah River Site, Georgia and South Carolina, Predevelopment through 1992." Water-Resources Investigations Report 98-4062, Denver, Colorado.

Crone, A.J. and R. L. Wheeler, Open-File Report 00-260, "Data for Quaternary Faults, Liquefaction Features, and Possible Tectonic Features in the Central and Eastern United States, East of the Rocky Mountain Front," Reston, Virginia, 2000.

Fanning, J.L. 2003. "Water Use in Georgia by County for 2000 and Water-Use Trends for 1980-2000," Georgia Geologic Survey Information Circular 106, 2003.

Frankel, A., Barnhard, T., Perkins, D., Leyendecker, E.V., Dickman, N., Hanson, S., and Hopper, M., Open-file report 96-532, "National seismic hazard maps: documentation," Reston, VA, 1996.

Frankel, A. D., Peterson, M.D., Mueller, C.S., Haller, K.M., Wheeler, R.L., Leyendecker, E.V., Wesson, R.L., Harmsen, D.C., Cramer, C.H., Perkins, D.M., and Rukstales, K.S., Open-File Report 02-420, "Documentation for the 2002 Update of the National Seismic Hazard Maps," Reston, VA, 2002.

Hamilton, R.M., Behrendt, J.C., and Ackermann, H.D., Professional Paper 1313, "Land multichannel seismic-reflection evidence for tectonic features near Charleston, South Carolina," in Gohn, G.S., ed., *Studies related to the Charleston, South Carolina, earthquake of 1886 - Tectonics and seismicity*, Reston, VA, p. I1 -I18, 1983.

McDowell, R.C., and Houser, B.B., misc. field studies map MF,-1538, " Map showing distribution of small-scale deformation structures in part of the upper coastal plain of South Carolina and adjacent Georgia, 1:250,000 scale," Reston, VA, 1983.

Obermeier, S.F., Pond, E.C., and Olson, S.M., Open-File Report 01-29, "Paleoliquefaction studies in continental settings: geologic and geotechnical factors in interpretations and back-analysis," Reston, VA, 53p, 2001.

Obermeier, S.F., Jacobson, R.B., Smoot, J.P., Weems, R.E., Gohn, G.S., Monroe, J.E., and Powars, D.S., Professional Paper 1504, "Earthquake-induced liquefaction features in the coastal setting of South Carolina and in the fluvial setting of the New Madrid seismic zone," Reston, VA, 44 p., 1 plate, 1990.

Prowell, D.C., O'Connor, B.J., and Rubin, M., Open-File Report 75-680, "Preliminary evidence for Holocene movement along the Belair fault zone near Augusta, Georgia," Reston, VA, 20 p, 1975.

Weems, R.E., Open-File Report 98-0374, "Newly recognized en echelon fall lines in the Piedmont and Blue Ridge provinces of North Carolina and Virginia, with a discussion of their possible ages and origins," Reston, VA, p. 52, 1998.

Weems, R.E., Lemon, E.M., Jr., and Nelson, M.S., Miscellaneous Investigations Series, "Geology of the Pringletown, Ridgeville, Summerville, and Summerville Northwest 7.5-minute quadrangles, Berkeley, Charleston, and Dorchester counties, South Carolina," Reston, VA, 1997.

Wheeler, R.L., Open-File Report 2005-1336, "Known or suggested Quaternary tectonic faulting, Central and Eastern United States; new and updates assessments for 2005," Reston, VA, 2005.

U.S. Nuclear Regulatory Commission (NRC)[40]

SECY-05-0197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria," October 28, 2005, (ADAMS Accession No. ML052770225).

Staff Requirements Memorandum (SRM) SECY-05-0197, "Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria," February 22, 2006. (ADAMS Accession No. ML060530316).

Inspection Report

Inspection Report 05200011/2006001, "Southern Nuclear Operating Company, NRC Inspection of Applicant and Contractor Quality Assurance Activities Involved with Preparation of the Application for an Early Site Permit," (ADAMS Accession No. ML062830466).

NUREG-Series Reports[41]

———, NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants–Final Report," November 1980 (see also, March 2002 addenda).

———, NUREG-0654/FEMA-REP-1, Supplement 2, "Criteria for Emergency Planning in an Early Site Permit Application–Draft Report for Comment," Revision 1, April 1996.

———, NUREG-0696, "Functional Criteria for Emergency Response Facilities," February 1981.

———, Supplement 1 to NUREG-0737, "Requirements for Emergency Response Capability," January 1983.

---

[40] Copies of NRC documents are also available for inspection or copying for a fee from the NRC's Public Document Room at 11555 Rockville Pike, Rockville, MD; the PDR's mailing address is US NRC PDR, Washington, DC 20555; telephone (301) 415-4737 or (800) 397-4209; fax (301) 415-3548; email PDR@nrc.gov.

[41] Copies of NUREG-series reports are available for inspection or copying for a fee from the NRC's Public Document Room at 11555 Rockville Pike, Rockville, MD; the PDR's mailing address is USNRC PDR, Washington, DC 20555; telephone (301) 415-4737 or (800) 397-4209; fax (301) 415-3548; email PDR@nrc.gov. Copies are also available at current rates from the U.S. Government Printing Office, P.O. Box 37082, Washington DC 20402-9328, telephone (202) 512-1800; or from the National Technical Information Service (NTIS) at 5285 Port Royal Road, Springfield, Virginia 22161, online at http://www.ntis.gov, by telephone at (800) 553-NTIS (6847) or (703) 605-6000, or by fax to (703) 605-6900.

— — — — —, NUREG-0800, "Standard Review Plan," Section 17.5, "Quality Assurance Program Description – Design Certification, Early Site Permit and New License Applicants," March 2007.

— — — — —, NUREG-0800, "Standard Review Plan for Review of Safety Analysis Report for Nuclear Power Plants," March 2007.[42]

— — — — —, NUREG-0800, "Standard Review Plan for Review of Safety Analysis Report for Nuclear Power Plants," June 1996.

— — — — —, NUREG-0917, "Nuclear Regulatory Commission Staff Computer Programs for Use with Meteorological Data," September 1981.

— — — — —, NUREG-1488, "Revised Livermore Seismic Hazard Estimates for Sixty-nine Nuclear Power Plant Sites East of the Rocky Mountains," April 1994.

— — — — —, NUREG-1835, "Safety Evaluation Report for an Early Site Permit (ESP) at the North Anna ESP Site," September 2005.

— — — — —, NUREG-1840, "Safety Evaluation Report of Early Site Permit Application in the Matter of System Energy Resources, Inc., a subsidiary of Entergy Corporation, for the Grand Gulf Early Site Permit Site," April 2006.

— — — — —, NUREG-1844, "Safety Evaluation Report for an Early Site Permit (ESP) at the Exelon Generation Company, LLC (EGC) ESP Site," May 2006.

— — — — —, NUREG/CR-0098, "Development of Criteria for Seismic Review of Selected Nuclear Power Plants," May 1978.

— — — — —, NUREG-0570, "Toxic Vapor Concentrations in the Control Room Following a Postulated Accidental Release."

— — — — —, NUREG/CR-2858, "PAVAN: An Atmospheric Dispersion Program for Evaluating Design Basis Accidental Releases of Radioactive Materials from Nuclear Power Stations," November 1982.

— — — — —, NUREG/CR-2919, "XOQDOQ Computer Program for the Meteorological Evaluation of Routine Effluent Releases at Nuclear Power Stations," September 1977.

---

[42] Requests for single copies of Standard Review Plan sections, Branch Technical Positions, (NUREG-0800) (which may be reproduced) should be made to the U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Reproduction and Distribution Services Section, or by fax to (301) 415-2289; or by email to DISTRIBUTION@nrc.gov. Electronic copies of this section are available through the NRC's public Web site at http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0800/, or in the NRC's Agencywide Documents Access and Management System, at http://www.nrc.gov/reading-rm/adams.html, under ADAMS Accession No. ML070550084.

— — — — —, NUREG/CR-4013, "LADTAP II - Technical Reference and User Guide," April 1986.

— — — — —, NUREG/CR-4653, "Gaspar II - Technical Reference and User Guide," March 1986.

— — — — —, NUREG/CR-4461, Revision 2, "Tornado Climatology of the Contiguous United States," PNNL-15112, February 2007.

— — — — —, NUREG/CR-5613, "Paleoliquefaction Features along the Atlantic Seaboard."

— — — — —, NUREG/CR-6372, "Recommendations for Probabilistic Seismic Hazard Analysis: Guidance and Use of Experts," April 1997.

— — — — —, NUREG/CR-6607, "Guidance for Performing Probabilitic Seismic Hazard Analysis for a Nuclear Plant Site: Example Application to the Southeastern United States," October 2002.

— — — — —, NUREG/CR-6769, "Technical Basis for Revision of Regulatory Guidance on Design Ground Motions: Development of Hazard- and Risk-Consistent Seismic Spectra for Two Sites," April 2002.

Draft Regulatory Guides

— — — — —, DG-1143, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants," January 2006.

— — — — —, DG-1145, "Combined License Applications for Nuclear Power Plant (LWR Edition)," September 2006.

Regulatory Guides[43]

— — — — —, RG 1.23, Proposed Revision 1, "Onsite Meteorological Programs," September 1980.

— — — — —, RG 1.27, Revision 2, "Ultimate Heat Sink for Nuclear Power Plants," January 1976.

[43] Regulatory Guides are available electronically through the Electronic Reading Room on the NRC's public Web site at http://www.nrc.gov/reading-rm/doc-collections/reg-guides/. Single copies of regulatory guides may also be obtained free of charge by writing the Reproduction and Distribution Services Section, ADM, USNRC, Washington, DC 20555-0001, or by fax to (301) 415-2289, or by email to DISTRIBUTION@nrc.gov. Copies are available for inspection or copying for a fee from the NRC's Public Document Room at 11555 Rockville Pike, Rockville, MD; the PDR's mailing address is USNRC PDR, Washington, DC 20555; telephone (301) 415-4737 or (800) 397-4209; fax (301) 415-3548; email PDR@nrc.gov. Copies are also available from the National Technical Information Service (NTIS) at 5285 Port Royal Road, Springfield, Virginia 22161, online at http://www.ntis.gov, by telephone at (800) 553-NTIS (6847) or (703) 605-6000, or by fax to (703) 605-6900.

———————, RG 1.59, Revision 2, "Design Basis Floods for Nuclear Power Plants," August 1977.

———————, RG 1.60, Revision 1, "Design Response Spectra for Seismic Design of Nuclear Power Plants," December 1973.

———————, RG 1.70, "Standard Format and Content for Safety Analysis Reports for Nuclear Power Plants," November 1978.
———————, RG 1.76, "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants."

———————, RG 1.78, Revision 1, "Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release," December 2001.

———————, RG 1.91, Revision 1, Evaluations of Explosions Postulated to Occur on Transportation Routes Near Nuclear Power Plants," February 1979.

———————, RG 1.101, Revision 4, "Emergency Planning and Preparedness for Nuclear Power Reactors," July 2003.

———————, RG 1.102, Revision 1, "Flood Protection for Nuclear Power Plants," September 1976.

———————, RG 1.109, Revision 1, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," October 1977.

———————, RG 1.111, Revision 1, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," July 1977.

———————, RG 1.112, "Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents from Light-Water-Cooled Power Reactors," May 1977.

———————, RG 1.113, Revision 1, "Estimating Aquatic Dispersions of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I," April 1977.

———————, RG 1.125, Revision 1, "Physical Models for Design and Operation of Hydraulic Structures and Systems for Nuclear Power Plants," October 1978.

———————, RG 1.132, "Site Investigations for Foundations of Nuclear Power Plants," October 2003.

———————, RG 1.138, "Laboratory Investigations of Soils and Rocks for Engineering

Analysis and Design of Nuclear Power Plants," April 1978.

— — — — —, RG 1.145, Revision 1, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants," November 1982.

— — — — —, RG 1.165, "Identification and Characterization of Seismic Sources and Determination Safe Shutdown Earthquake Ground Motion," March 1997.

— — — — —, RG 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," July 2000.

— — — — —, RG 1.198, "Procedures and Criteria for Assessing Seismic Soil Liquefaction at Nuclear Power Plant Sites," November 2003.

— — — — —, RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," March 2007.

— — — — —, RG 1.208, "A Performance-Based Approach to Define Site-Specific Earthquake Ground Motion," March 2007.

— — — — —, RG 4.2, Revision 2, "Preparation of Environmental Reports for Nuclear Power Stations, " September 2000.

— — — — —, RG 4.4, "Reporting Procedure for Mathematical Models Selected to Predict Heated Effluent Dispersion in Natural Water Bodies," May 1974.

— — — — —, RG 4.7, Revision 2, "General Site Suitability Criteria for Nuclear Power Stations," April 1998.

Other NRC Documents

Letter from K. O'Donohue to J.A. "Buzz" Miller, "Site Visit to Vogtle To Observe Erection of a Mechanically Stabilized Earth (MSE) Demonstration Retaining Wall To Support Early Site Permit Limited Work Authorization, and Combined License Activities (Docket No. 52-011 For ESP and No. 52-025 and 52-026 for COLs)," August 14, 2008, ADAMS Accession No. ML082280539.

Letter from D.B. Matthews to W.E. Cummings, ""Acceptance Review of the AP1000 Design Certification Amendment Application for Revision 16," January 18, 2008, ADAMS Accession No. ML073600743.

Letter from M.S. Lesser to J.A. "Buzz" Miller, "Site Visit to Vogtle To Observe Test Pad Activities To Support Early Site Permit, Limited Work Authorization, and Combined License Pre-Application Activities (Project No. 755)," January 11, 2008, ADAMS Accession No. ML080110651.

"Liquid Radioactive Release Lessons Learned Task Force Final Report," September 1, 2006.

RIS[44] 2004-07, "Release of Final Review Standard (RS)-002, 'Processing Applications for Early Site Permit'," May 19, 2004.

RIS 2005-02, "Clarifying the Process for Making Emergency Plan Changes," February 14, 2005.

"Approval of Change to Nuclear Management Company Quality Assurance Topical Report," September 2, 1005, ADAMS Accession No. ML052430024.

"Smart Application Template for Requesting Emergency Plan Changes Related to On-shift Staffing Levels and Augmentation Times," September 9, 2004, ADAMS Accession No. ML042530011.

"Edwin I. Hatch Nuclear Power Station, Units 1 and 2, Approval of Relief Request RR-27, Third-Year Interval Inservice Inspection Program (TAC Nos. MA6163 and MA6164)." March 20, 2000, ADAMS Accession No. ML003693241.

Memorandum from H.R. Denton to R.R. Maccary, "Site Analysis Branch Position - Winter Precipitation Loads," March 24, 1975.

Review Standard (RS)

———, RS-002, "Processing Applications for Early Site Permits," May 3, 2004,

Westinghouse Electric Company LLC

APP-GW-GL-700, Revision 14, "AP1000 Design Control Document," Cover through Section 7, Instrument and Controls, Page 7.7-25, September 2004, ADAMS Accession No. ML050750282.

APP-GW-GL-700, Revision 16, "AP1000 Design Control Document," 2007, ADAMS Accession No. ML071580939

Westinghouse Savannah River Company (WSRC)

Cumbest, R.J., Stephenson, D.E., Wyatt, D.E., and Maryak, M., WSRC-TR-98-00346, Basement Surface Faulting and Topography for Savannah River Site and Vicinity," 1998.

Cumbest, R.J., Wyatt, D.E., Stephenson, D.E., and Maryak, M., WSRC-TR-2000-00310, "Comparison of Cenozoic faulting at the Savannah River site to fault characteristics of the

[44] Regulatory Issue Summaries (RISs) are available electronically through the Public Electronic Reading Room on the NRC's public Web site at http://www.nrc.gov/reading-rm/doc-collections/gen-comm/reg-issues/. Copies are also available for inspection or copying for a fee from the NRC's Public Document Room at 11555 Rockville Pike, Rockville, MD; the PDR's mailing address: USNRC PDR, Washington, DC 20555; telephone (301) 415-4737 or (800) 397-4209; fax (301) 415-3548; email PDR@nrc.gov.

Atlantic Coast fault province: implications for fault capability," 2000.

Lee, R., "Investigations of Nonlinear Dynamic Properties at the Savannah River Site," *Report No. WSRC-TR-96-0062, Rev. 1*, Aiken, SC, 1996.

Lee, R.C., "Development of MFFF-Specific Vertical-to-Horizontal Seismic Spectral Ratios," Report No. WSRC-TR-2001-00342, Rev. 0, Westinghouse Savannah River Co., Aiken, SC, 2001.

Moos, D., and Zoback, M.D., WSRC-TR-2001-00499, "In situ stress measurements in the NPR Hole, Volume I - results and interpretations," Final Report submitted to Westinghouse Savannah River Company, DOE Contract No. DE-AC09-96SSR18500, 41 p., 1992.

Snipes, D.S., Fallaw, W.C., and Price Jr., V., "The Pen Branch fault: documentation of late Cretaceous and Tertiary faulting in the coastal plain of South Carolina (DRAFT)," Westinghouse Savannah River Company Draft Report, 44 p., January 8, 1989.

Stieve, A., Coruh, C., and Castain, J., WSRC-RP-94-013, "Confirmatory drilling project final report (U)," 298 p., 1994.

Individuals

Abrahamson, N.N., and W.J. Silva, "Empirical response spectral attentuation relations for shallow crustal earthquakes," Bull. Seism. Soc. Am., Empirical Repsonse Spectral Attenutation Relations for Shallow Crustal Earthquakes, Seismological Research Letters, v. 68, n. 1, 94-127, Jan/Feb 1997.

Amick, D., "Paleoliquefaction Investigations Along the Atlantic Seaboard with Emphasis on the Prehistoric earthquake Chronology of Coastal South Carolina," unpub. Ph.D. dissertation, University of South Carolina, selected pages, 1990.

Amick, D., and Gelinas, R., "The search for evidence of large prehistoric earthquakes along the Atlantic seaboard," Science, v. 251, p. 655-658, 1991.

Amick, D., Maurath, G., and Gelinas, R., 1990, "Characteristics of seismically induced liquefaction sites and features located in the vicinity of the 1886 Charleston, South Carolina earthquake," Seismological Research Letters, v. 61, p. 117-130, 1990.

Atkinson, G.M. and Boore, D.M. "Ground-Motion Relations for Eastern North America." *Bulletin of Seismological Society of America*. Vol. 85, No. 1, pp. 17-30. 1995.

T.J. Bander, "PAVAN: An Atmospheric Dispersion Program for Evaluating Design Basis Accidental Releases of Radioactive Materials from Nuclear Power Stations," NUREG/CR-2858, USNRC, November 1982.

Bakun, W. H. and M. G. Hopper, "The 1811-1812 New Madrid, Missouri, and the 1886 Charleston, South Carolina Earthquakes," *Bulletin of the Seismological Society of America,* Vol. 94, No. 1, pp. 64-75, 2004.

Bartholomew, M.J., Brodie, B.M., Willoughby, R.H., Lewis, S.E., and Syms, F.H., "Mid-Tertiary paleoseismites: syndepositional features and section restoration used to indicate paleoseismicity, Atlantic coastal plain, South Carolina and Georgia," Geological Society of America Special Paper 359, pp. 63-74, 2002.

Behrendt, J.C., and Yuan, A., "The Helena Banks strike-slip(?) fault zone in the Charleston, South Carolina, earthquake area-Results from a marine, high-resolution, multichannel, seismic-reflection survey," Geological Society of America Bulletin, v. 98, p. 591-601, 1987.

Berkman, E., "High resolution seismic survey - Pen Branch fault - Savannah River Site, South Carolina," Emerald Exploration Consultants, Inc. Report, Austin, TX, 89 p., 210 fig., 1991.

Chapman, M., Personal Communication, 2005.

Cramer, C.H., "A Seismic Hazard Uncertainty Analysis for the New Madrid Seismic Zone," Engineering Geology, v. 62, p. 251-266, 2001.

Dallmeyer, R.D., Wright, J.E., Secor, D.T., Jr., and Snoke, A.W., "Character of the Alleghenian Orogeny in the Southern Appalachians: Part II. Geochronological constraints on the tectonothermal evolutions of the Eastern Piedmont in South Carolina," Geological Society of America Bulletin. V. 97, pp. 1329-1344, 1986.

Grant, L.B. and Sieh, K., "Paleoseismic Evidence of Clustered Earthquakes on the San Andreas Fault in the Carrizo Plain, California," Journal of Geophysical Research, v. 99, n. B4, p. 6819-6841, 1994.

Hanson, K.L., Bullard, T.F., de Wit, M.W., and Stieve, A.L., "Applications of Quaternary stratigraphic, soil-geomorphic, and quantitative geomorphic analyses to the evaluation of tectonic activity and landscape evolution in the upper Coastal Plain, S.C.," Proceedings, 4th DOE Natural Phenomena Hazards Mitigation Conference, Atlanta, Georgia, v. 2, p. 672-681, 1993.

Henry, V.J., "Summary of results of a seismic survey of the Savannah River adjacent to the Savannah River Plant site, Burke County, Georgia," Georgia Geologic Survey Project Report 24, 22 p., 1995.

Hu, K., S.L. Glassman, and P. Talwani. "Magnitudes of prehistoric earthquakes in the South Carolina Coastal Plain from geotechnical data." *Seismological Research Letters.* 73:979–991, 2002.

Hu, K., Gassman, S.L., and Talwani, P., "In-situ properties of soils at paleoliquefaction sites in the South Carolina Coastal Plain," Seismological Research Letters, v 73, no 6, pp 964-978, 2002.

Johnston, A.C., Reinbold, D.J., and Brewer, S.I., "Seismotectonics of the southern Appalachians," Bulletin of the Seismological Society of America, v. 75, no. 1, p. 339-384, 1985.

Johnston. A. C. and S. C. Chiu, "A comparison of seismicity: The New Madrid and southern Appalachian seismic zones, 1982-1988," in Chiu, S.C., ed., CERI Quarterly Seismological Bulletin, January-March, v. X, no. 1, p.81-90, 1989.

King, E.R., and Zietz, I., "The New York-Alabama lineament: geophysical evidence for a major crustal break in the basement beneath the Appalachian basin," Geology, v. 6. p. 312-318, 1978.

Kramer, S. L., *Geotechnical Earthquake Engineering.* Prentice-Hall, Inc.: Upper Saddle River, NJ, 1996.

Maher, H.D., Jr., "Kinematic history of mylonitic rocks from the Augusta fault zone, South Carolina and Georgia," American Journal of Science, v. 287, p. 795-816, 1987.

Leon, E., "Effect of aging of sediments on paleoliquefaction evaluation in the South Carolina Coastal Plain," unpub., Ph.D. dissertation, University of South Carolina, 181p, 2003.

Leon, E., Gassman, S.L., and Talwani, P., "Effect of soil aging on assessing magnitudes and accelerations of prehistoric earthquakes," Earthquake Spectra, v 21, no 3, pp737-759, 2005.

Maher, H.D., Dallmeyer, R.D., Secor Jr., D.T., and Sacks, P.E., "40-Ar/39-Ar constraints on chronology of August fault zone movement and late Alleghanian extension, southern Appalachian piedmont, South Carolina and Georgia," American Journal of Science, v. 294, p. 428-448, 1994.

Marple, R. T. and P. Talwani, "Evidence for a Buried Fault System in the Coastal Plain of the Carolinas and Virginia - Implications for Neotectonics in the Southeastern United Sates," *Geological Society of America Bulletin, Vol.* 112, No. 2, pp. 200-220, February 2000.

Obermeier, S., personal communication, September 2, 2005.

Obermeier, S.F.,"Using liquefaction-induced features for paleoseismic analysis," in McCalpin, J.P., ed., Paleoseismology: San Diego, Academic Press, p. 331-396, 1996.

Obermeier, S.F., Weems, R.E., Jacobson, R.B., and Gohn, G.S., "Liquefaction evidence for repeated Holocene earthquakes in the coastal region of South Carolina," in Jacob, K.H., and Turkstra, C.J., eds., Earthquake hazards and the design of constructed facilities in the eastern United States: Annals of the New York Academy of Sciences, v. 558, p. 183-195, 1989.

Prowell, D.C., and O'Connor, B.J., "Belair fault zone-Evidence of Tertiary fault displacement in eastern Georgia," Geology, v. 6, p. 681-684, 1978.

Ramsay and Huber, *The Techniques of Modern Structural Geology. Volume 2: Folds and Fractures*, Academic Press, London, 1987.

Savage, J.C., "Criticism of Some Forecasts of the National Earthquake Evaluation Council," Bulletin of the Seismological Society of America, v. 81, n. 3, p. 862-881, 1991.

Schumaker, R.C., "The New York-Alabama lineament: an early lapetian wrench fault?" American Association of Petroleum Geologists Bulletin, v. 84, no.4, p. 1393, 2000.

Sieh, K., Stuiver, M., and Brillinger, D., "A More Precise Chronology of Earthquakes Porduced by the San Andreas fault in Southern California," Journal of Geophysical Research, v. 94, n. B1, p. 603-623, 1989.

Snipes, D.S., Fallaw, W.C., Price Jr., V., and Cumbest, R.J., "The Pen Branch Fault: Documentation of late Cretaceous-Tertiary fdaulting in the Coastal Plain of South Carolina," Southeastern Geology, v. 33, no. 4, p. 195-218, 1993.

Soller, D.R., and Mills, H.H., "Surficial geology and geomorphology, in Horton Jr., J.W., and Zullo, V.A., The Geology of the Carolinas," Carolina Geological Society Fiftieth Anniversary Volume, University of Tennessee Press, Knoxville, pp. 290-308, 1991.

Stevenson, D., and Talwani, P., "2001-2002 Upper Three Runs sequence of earthquakes at the Savannah River site, South Carolina," Seismological Research Letters, v. 75, pp. 107-116, 2004.

Stieve, A., and Stephenson, D., 1995, "Geophysical evidence for post late Cretaceous reactivation of basement structures in the central Savannah River area," Southeastern Geology, v. 35, p. 1-20

Syms, F., "Birdwell elastic properties logs for SRS boreholes DRB-9, DRB-10, and DRB-11," per. comm.,Savannah River Site, August 26, 2005.

Talwani, P., personal communication, September 8, 2005.

Talwani, P., Rawlins, J., and Stephenson, D.E., "The Savannah River plant, South Carolina earthquake of June 9, 1985 and its tectonic setting," Earthquake Notes, v. 56, pp. 101-106, 1985.

Talwani, P. and Schaeffer, W.T., "Recurrence Rates of Large Earthquakes in the South Carolina Coastal Plain Based on Paleoliquefaction Data," Journal of Geophysical Research, v. 106, no. B4, pp. 6621-6642, 2001.

Toro, G.R., "Probabilistic Models of Site Velocity Profiles for Generic and Site-Specific Ground-Motion Amplification Studies," Published as an appendix in Silva, W.J., N. Abrahamson, G. Toro, and C. Costantino (1997). "Description and validation of the stochastic ground motion model." Report submitted to Brookhaven National Laboratory, Associated Universities, Inc. Upton, New York 11973, Contract No. 770573, 1996.

Tuttle, M.P. "The use of liquefaction features in paleoseismology: lessons learned in the New Madrid seismic zone, central United States," *Journal of Seismology.* 5:361–380, 2001.

Wheeler, R.L., "Sources of seismic hazard near the eastern Great Lakes," Geological Society of America Abstracts with Programs, v. 28, no. 3, p. 110, 1996.

Wheeler, R.L., and Johnston, A.C., "Geologic implications of earthquake source parameters in central and eastern North America," Seismological Research Letters, v. 63, no. 4, p. 491-514, 1992.

Other References

Corporate Authors and References

Bechtel Power Corporation, "Theoretical and User's Manual for SHAKE 2000,' prepared by N. Deng and F. Ostandan, San Francisco, CA., 2000.

Bechtel Power Corporation, "Field Review of geologic conditions near the Vogtle site relative to possible extension for the postulated 'Pen Branch fault' into Georgia," report prepared for Georgia Power Company, 195 p., September 15 1989.

Bechtel Power Corporation, "Seismic Analysis Report, Vogtle Nuclear Generating Plant Units 1 and 2," October 1984.

Bechtel Power Corporation - Geology group, "Geologic evaluation of trench exposure - Vogtle electric generating plant," 43 pp., 1984.

Bechtel Power Corporation, "Vogtle Electric Generating Plant, Studies of Postulated Millett Fault," October 1982.

Bowles, J.E., "Foundation Analysis and Design," Third Edition, Mc-Graw-Hill Book Company, New York, 1982

Bechtel Power Corporation - Bechtel 1974b, "Report on Foundation Investigations," Alvin W. Vogtle Nuclear Project, July 1974.

Constantino, Carl J., "Recommendation for Uncertainty Estimates in Shear Modulus Reduction and Hysteretic Damping Relationships," Department of Civil Engineering, City University of New York, 1997.

Davie, J.R., and Lewis, M.R., "Settlement of Two Tall Chimney Foundations," Proceedings, Second International Conference on Case Histories in Geotechnical Engineering, St. Louis, MO, June 1988.

Geomatrix Consultants, Inc., "Preliminary Quaternary and Neotectonic Studies": Savannah River Site, South Carolina, prepared for Lawrence Livermore National Laboratory and Westinghouse Savannah River Company, February 1993.

Lindvall, S.C., and Hartleb, R.D., "Update of Charleston Seismic Source and Integration with EPRI Source Models," Bechtel Engineering Study Report 25144-006-V14-CY06-00006, revision 001, 2006.

Vogtle Electric Generating Plant, Annual Radiological Environmental Operating Report for 2004, Southern Company.

Individual Authors

Dean, C., "Will Warming Lead to a Rise in Hurricanes?" *The New York Times.* p. F01, May 2007.

Eilperin, J., "Scientists Disagree On Link Between Storms, Warming," *Washington Post*, p. A03, August 2006.

Huffines, G. and R. E. Orville, 1999, "Lightning ground flash density and thunderstorm duration in the continental United States: 1989-96." *J. Appl. Meteor*, **38**, 7, 1013-1019.

Kerr, R., "A Tempestuous Birth for Hurricane Climatology." *Science.* Vol 312, pp. 676-678, May 2006.

Mayne, P.W. "Critical State Soil Mechanics for Dummies," Civil & Environmental Engineering, Georgia Institute of Technology, Atlanta, GA, 2006.

Ohya, S., "In Situ P and S Wave Velocity Measurement," Proceeding of In Situ '86, ASCE, New York, NR, 1986.

Peck, R.B., Hanson, W.E., and Thorburn, T.H., "Foundation Engineering," Second Edition, John Wiley and Sons, Inc., New York, 1974.

Skempton, A.W., "Discussion of the Planning and Design of the New Hong Kong Airport," Proceedings of the Institution of Civil Engineers, Vol. 7, pp. 305-307, 1957.

Soubra, A.H., "Upper-Bound Solutions for Bearing Capacity of Foundations," Journal of Geotechnical and Geoenvironmental Engineering, Vol. 125 No. 1, ASCE Publications, Reston, CA, pp. 59-68.

Terzaghi, K., "Evaluation of Coefficients of Subgrade Reaction," Geotechnique, Volume 5, 1955.

Vesic, A.S., "Bearing Capacity of Shallow Foundation," Foundation Engineering Handbook, H.F. Winterkorn and H.Y. Fang, Editors, Van Nostrand Reinhold Company, New York, 1975.

Wang, J. X. L., and J. K. Angell, Air Stagnation Climatology for the United States (1948-1998), NOAA Air Resources Laboratory Atlas No. 1, Air Resources Laboratory, Environmental Research Laboratories, Office of Oceanic and Atmospheric Research, Silver Spring, MD, April 1999.

Witze, A., "Tempers Flare at Hurricane Meeting." *Nature*. Vol. 441, p. 11, May 2006.

Youd, T.L., Idriss, I.M., Andrus, R.D., Arango, I.,Castro, G., Christian, J.T., Dobry, R., Liam Finn, W.D., Harder, L.F., Hynes, Jr., M.E., Ishihara, K., Koester, J.P., Laio, S.S.C., Marcuson, III, W.F., Martin, G.R., Mitchell, J.K., Moriwaki, Y., Power, M.S., Robertson, P.K., Seed, R.B., Stokoe, II, K.H., "Liquefaction Resistance of Soils: Summary Report From the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils," Journal of Geotechnical and Geoenvironmental Engineering, 127 (10). Pp. 817-833, 2001.

APPENDIX D
PRINCIPAL CONTRIBUTORS

Name	Responsibility
Ahn, Hosung	Hydrology
Araguas, Christian	Project Management
Bauer, Laurel	Geology and Seismology
Bagchi, Goutam	Hydrology
Barss, Daniel	Emergency Planning
Brooks, Marc	Security
Cheng, Thomas	Geotechnical Engineering
Concepcion-Robles, Milton	Quality Assurance
Dehmel, Jean-Claude	Normal Radiological Dose Analysis
George, James	Geotechnical Engineering
Gonzalez, Sarah	Geology and Seismology
Hart, Michelle	Accident Analysis
Harvey, R. Brad	Meteorology
Heck, Kenneth	Quality Assurance
Hoch, Joseph	Meteorology
Li, Yong	Geology and Seismology
Ma, John	Structural Engineering
Mazza, Jan	Project Management
McCune, Timothy	Fitness for Duty
McGuire, Josh	Accident Analysis
Monarque, Stephen	Project Management
Moody, Robert	Emergency Planning
Munson, Clifford	Geology and Seismology
Musico, Bruce	Emergency Planning
Patel, Pravin	Structural Engineering
Schaffer, Steven	Normal Radiological Dose Analysis
Shropshire, Alan	Fitness for Duty
Stirewalt, Gerry	Geology and Seismology
Tammara, Seshagiri	Site Hazards
Tegeler, Bret	Structural Engineering
Thompson, Jenise	Geotechnical Engineering
Terry, Tomeka	Geology and Seismology
Wang, Weijung	Geology and Seismology
Zahira Cruz-Perez	Geology and Seismology

Contractors	Technical Area
Brookhaven National Laboratory	Geotechnical Engineering
Department of Homeland Security	Emergency Planning
Pacific Northwest Laboratory	Emergency Planning and Hydrology
US Geologic Survey	Geology and Seismology

APPENDIX E

REPORT BY THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

December 22, 2008

The Honorable Dale E. Klein
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: FINAL REVIEW OF THE VOGTLE ELECTRIC GENERATING PLANT EARLY SITE PERMIT APPLICATION AND LIMITED WORK AUTHORIZATION REQUEST AND THE ASSOCIATED SAFETY EVALUATION REPORT

Dear Chairman Klein:

During the 558th meeting of the Advisory Committee on Reactor Safeguards, December 4-6, 2008, we completed our review of the Vogtle early site permit application submitted by the Southern Nuclear Operating Company (Southern Nuclear or "applicant") and the associated Safety Evaluation Report (SER) prepared by the NRC staff. An interim report on our review of this early site permit application was issued November 20, 2007. We also completed review of the applicant's limited work authorization request for initiating work on the proposed site. Our Subcommittee on Early Site Permits reviewed these matters at its meeting on December 3, 2008. During our reviews, we had the benefit of discussions with representatives of the NRC staff and Southern Nuclear Operating Company. We also had the benefit of the documents referenced.

CONCLUSIONS AND RECOMMENDATION

1. The early site permit and the limited work authorization should be granted.

2. The predicted ground motion response spectrum for the proposed site is not bounded by the certified seismic design response spectrum for the AP1000 reactor. This will have to be addressed in any combined license application for reactors at the proposed site.

3. The requested limited work authorization delineates activities that can be undertaken without degrading the safety of the AP1000 reactors proposed for installation at the site.

DISCUSSION

The Southern Nuclear Operating Company has applied for an early site permit for a location adjacent to the sites of the operating reactors, Vogtle Units 1 and 2. The application is unusual in that it references the certified design for the AP1000 reactor rather than plant parameter envelopes, as has been done by other early site permit applications. Also, the application provides a complete and integrated emergency plan rather than specifying just the major features of such a plan, as has been done in previous early site permit applications.

The permit application, as amended in response to review by the NRC staff, adequately characterizes the proposed site. Seismicity is the most important site safety issue. Seismicity at the proposed site is dominated by the Charleston seismic zone. Together, the work by the applicant as well as the review and critique of this work by the NRC staff have advanced the understanding of the Charleston seismic zone and the potential ground motion at the proposed site.

The predicted ground motion response spectrum at the proposed site is not bounded by the certified seismic design response spectrum for the AP1000 reactor. The design spectrum is exceeded in frequency ranges below one Hertz and above about seven Hertz. These differences between the predicted spectrum and the design spectrum will have to be addressed in any combined license application for reactors at the proposed site.

Surface soils in the east coast piedmont at the proposed site are susceptible to liquefaction in seismic events of sufficient intensity. The applicant plans to excavate the surface soils to a depth of about ninety feet and replace it with an engineering backfill much as was done for Vogtle Units 1 and 2. To expedite this significant engineering undertaking, the applicant has applied for a limited work authorization. Staff review has verified that the engineered backfill, waterproof membrane, and mechanically stabilized earthen walls proposed by the applicant can be safely installed and will yield a site where seismic events will not cause foundations of the AP1000 reactors to slide or overturn.

The complete and integrated emergency plan proposed by the applicant has been found to be adequate. It has been necessary to specify permit conditions on emergency action levels that cannot be completely specified until details of plant design come available. A permit condition has been imposed concerning the applicant's proposal to locate a technical support center for reactors at the proposed site differently than is specified in the AP1000 design.

The applications for the early site permit and the limited work authorization and the reviews of these applications by the NRC staff are adequate. The early site permit and the limited work authorization should be granted.

Dr. Said Abdel-Khalik did not participate in the Committee's deliberations regarding this matter.

Sincerely,

/RA/

William J. Shack
Chairman

References:

1. U.S. Nuclear Regulatory Commission, "Safety Evaluation of the Early Site Permit Application in the Matter of Southern Nuclear Operating Company, for the Vogtle Early Site Permit Site," November 2008 (ML080290280)

2. Letter from Joseph A. Miller, Senior Vice President, Southern Nuclear Operating Company, to U.S. Nuclear Regulatory Commission. "Vogtle Electric Generating Plant Early Site Permit Application (Project No. 737)," dated August 14, 2006 (ML062290246)

3. Letter from Joseph A. Miller, Senior Vice President, Southern Nuclear Operating Company, to U.S. Nuclear Regulatory Commission, "Vogtle Plant Early Site Permit Application, Supplement to Include Limited Work Authorization Activities," dated August16, 2007 (ML072430208)

4. U.S. Nuclear Regulatory Commission, Safety Evaluation with Open Items, "Safety Evaluation Report for the Vogtle Early Site Permit Application," August 2007 (ML071581032)

5. Letter from William J. Shack, Chairman, Advisory Committee on Reactor Safeguards, to Luis A. Reyes, Executive Director for Operations, "Interim Letter Southern Nuclear Operating Company Application for the Vogtle Early Site Permit and the Associated NRC Safety Evaluation Report with Open Items," dated November 20, 2007 (ML073070005)

NRC FORM 335
(9-2004)
NRCMD 3.7

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

1. REPORT NUMBER
(Assigned by NRC, Add Vol., Supp., Rev., and Addendum Numbers, if any.)

NUREG-1923

2. TITLE AND SUBTITLE

Safety Evaluation Report for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant (VEGP) ESP Site

3. DATE REPORT PUBLISHED

MONTH	YEAR
July	2009

4. FIN OR GRANT NUMBER

5. AUTHOR(S)

6. TYPE OF REPORT

Technical

7. PERIOD COVERED *(Inclusive Dates)*

8. PERFORMING ORGANIZATION - NAME AND ADDRESS *(If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)*

Division of New Reactor Licensing
Office of New Reactors
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

9. SPONSORING ORGANIZATION - NAME AND ADDRESS *(If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)*

same as above

10. SUPPLEMENTARY NOTES

Docket 52-011

11. ABSTRACT *(200 words or less)*

This safety evaluation report1 (SER) documents the U.S. Nuclear Regulatory Commission (NRC) staff's technical review of the site safety analysis report (SSAR) and emergency planning information included in the early site permit (ESP) application submitted by Southern Nuclear Operating Company (SNC or the applicant), for the Vogtle Electric Generating Plant (Vogtle or VEGP) site. The SER also documents the NRC staff's technical review of the limited work authorization (LWA) activities for which SNC has requested approval.

By letter dated August 14, 2006, SNC submitted an ESP application for the VEGP site in accordance with Subpart A, "Early Site Permits," of Title 10 of the Code of Federal Regulations (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." The VEGP site is located in Burke County, Georgia, approximately 26 miles southeast of Augusta, Georgia. In its application, SNC seeks an ESP that could support a future application to construct and operate additional nuclear power reactors at the ESP site with a total nuclear generating capacity of up to 6800 megawatts thermal (MWt). The proposed ESP Units 3 and 4 would be built on the VEGP site adjacent to and west of two existing nuclear power reactors operated by SNC. By letter dated August 16, 2007, SNC also submitted an LWA request in accordance with 10 CFR 52.17(c). The activities that SNC requested under its LWA are limited to placement of engineering backfill, retaining walls, lean concrete backfill, mudmats, and waterproof membrane.

This SER presents the results of the staff's review of information submitted in conjunction with the ESP and LWA application.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

Vogtle
ESP
LWA
Vogtle ESP FSER
Vogtle ESP NUREG

13. AVAILABILITY STATEMENT

unlimited

14. SECURITY CLASSIFICATION

(This Page)
unclassified

(This Report)
unclassified

15. NUMBER OF PAGES

16. PRICE

Federal Recycling Program

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

OFFICIAL BUSINESS