

# APPENDIX A

## PERMIT CONDITIONS, COL ACTION ITEMS, SITE CHARACTERISTICS, BOUNDING PARAMETERS, AND INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

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## 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
<b>2.5 – Geology, Seismology, and Geotechnical Engineering</b>		
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.
<b>13.3 – Emergency Planning</b>		
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.

<b>Permit Condition No.</b>	<b>SER Section</b>	<b>Description</b>
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.
<b>15.0 – Accident Analysis</b>		
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 $\chi/Q$ 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
<b>2.2 – Nearby Industrial, Transportation, and Military Facilities</b>			
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.
<b>2.3 – Meteorology</b>			
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.	
<b>2.4 – Hydrology</b>			
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.
<b>13.6 – Industrial Security</b>			
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
<b>2.1 - Geography and Demography</b>		
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	<p>- 2-2/3 miles (minimum allowable distance)</p> <p>- 26 miles (Augusta, GA) (current actual distance)</p>	<p>- The minimum allowable distance from the reactor to the nearest boundary of a densely populated center containing more than about 25,000 residents.</p> <p>- The current distance from the reactor to the nearest boundary of a densely populated center containing more than about 25,000 residents.</p>

Site Characteristic	Value	Definition	
<b>2.3 - Meteorology</b>			
<b>Ambient Air Temperature and Humidity</b>			
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
<b>Site Temperature Basis for AP1000</b>		
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.
<b>Basic Wind Speed</b>		
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)
<b>Tornado</b>		
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. <sup>2</sup>	Decrease in ambient pressure from normal atmospheric pressure resulting from passage of the tornado
Rate of Pressure Drop	1.2 lbf/in. <sup>2</sup> /s	Rate of pressure drop resulting from the passage of the tornado
<b>Winter Precipitation</b>		
100-Year Snowpack	10 lb/ft <sup>2</sup>	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)
<b>Short-Term (Accident Release) Atmospheric Dispersion</b>		
0-2 hr $\chi/Q$ Value @ EAB	$3.49 \times 10^{-4}$ s/m <sup>3</sup>	The 0-2 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the EAB.
0-8 hr $\chi/Q$ Value @ LPZ outer boundary	$7.04 \times 10^{-5}$ s/m <sup>3</sup>	The 0-8 hour atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ.
8-24 hr $\chi/Q$ Value @ LPZ outer boundary	$5.25 \times 10^{-5}$ s/m <sup>3</sup>	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 $\chi/Q$ Value @ LPZ outer boundary	$2.77 \times 10^{-5} \text{ s/m}^3$	The 1-4 day atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ.
4-30 day $\chi/Q$ value @ LPZ outer boundary	$1.11 \times 10^{-5} \text{ s/m}^3$	The 4-30 day atmospheric dispersion factor to be used to estimate dose consequences of accidental airborne releases at the LPZ.
<b>Long-Term (Routine Release) Atmospheric Dispersion</b>		
Annual Average Undepleted/No Decay $\chi/Q$ Value @ EAB, northeast, 0.5 mile	$5.5 \times 10^{-6} \text{ s/m}^3$	The maximum annual average EAB undepleted/no decay $\chi/Q$ value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/2.26-Day Decay $\chi/Q$ Value @ EAB, northeast, 0.5 mile	$5.5 \times 10^{-6} \text{ s/m}^3$	The maximum annual average EAB undepleted/2.26 day decay $\chi/Q$ value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Depleted/8.00-Day Decay $\chi/Q$ Value @ EAB, northeast, 0.5 mile	$5.0 \times 10^{-6} \text{ s/m}^3$	The maximum annual average EAB depleted/8.00 day decay $\chi/Q$ 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	$1.7 \times 10^{-8} \text{ 1/m}^2$	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 $\chi/Q$ Value @ Nearest Resident, northeast, 0.67 mile	$3.4 \times 10^{-6} \text{ s/m}^3$	The maximum annual average resident undepleted/no decay atmospheric dispersion factor ( $\chi/Q$ ) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/2.26-Day Decay $\chi/Q$ Value @ Nearest Resident, northeast, 0.67 mile	$3.4 \times 10^{-6} \text{ s/m}^3$	The maximum annual average resident undepleted/2.26-day decay $\chi/Q$ value for use in determining gaseous pathway doses to the maximally exposed individual.

<b>Site Characteristic</b>	<b>Value</b>	<b>Definition</b>
Annual Average Depleted/8.00-Day Decay $\chi/Q$ Value @ Nearest Resident, northeast, 0.67 mile	$3.0 \times 10^{-6} \text{ s/m}^3$	The maximum annual average resident depleted/8.00-day decay $\chi/Q$ 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	$1.0 \times 10^{-8} \text{ 1/m}^2$	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 $\chi/Q$ Value @ Nearest Meat Animal, northeast, 0.67 mile	$3.4 \times 10^{-6} \text{ s/m}^3$	The maximum annual average meat animal undepleted/no decay atmospheric dispersion factor ( $\chi/Q$ ) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/2.26-Day Decay $\chi/Q$ Value @ Nearest Meat Animal, northeast, 0.67 mile	$3.4 \times 10^{-6} \text{ s/m}^3$	The maximum annual average meat animal undepleted/2.26-day decay $\chi/Q$ value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Depleted/8.00-Day Decay $\chi/Q$ Value @ Nearest Meat Animal, northeast, 0.67 mile	$3.0 \times 10^{-6} \text{ s/m}^3$	The maximum annual average meat animal depleted/8.00-day decay $\chi/Q$ 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	$1.0 \times 10^{-8} \text{ 1/m}^2$	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 $\chi/Q$ Value @ Nearest Vegetable Garden, northeast, 0.67 mile	$3.4 \times 10^{-6} \text{ s/m}^3$	The maximum annual average vegetable garden undepleted/no decay atmospheric dispersion factor ( $\chi/Q$ ) value for use in determining gaseous pathway doses to the maximally exposed individual.
Annual Average Undepleted/2.26-Day Decay $\chi/Q$ Value @ Nearest Vegetable Garden, northeast, 0.67 mile	$3.4 \times 10^{-6} \text{ s/m}^3$	The maximum annual average vegetable garden undepleted/2.26-day decay $\chi/Q$ value for use in determining gaseous pathway doses to the maximally exposed individual.

Site Characteristic	Value	Definition
Annual Average Depleted/8.00-Day Decay $\chi/Q$ Value @ Nearest Vegetable Garden, northeast, 0.67 mile	$3.0 \times 10^{-6} \text{ s/m}^3$	The maximum annual average vegetable garden depleted/8.00-day decay $\chi/Q$ 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	$1.0 \times 10^{-8} \text{ 1/m}^2$	The maximum annual average vegetable garden relative deposition factor (D/Q) value for use in determining gaseous pathway doses to the maximally exposed individual.
<b>2.4 - Hydrology</b>		
<b>Hydrology</b>		
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.
<b>2.5 – Geology, Seismology, and Geotechnical Engineering</b>		
<b>Basic Geologic and Seismic Information</b>		
Capable Tectonic Structures	none	No fault displacement potential within the investigative area.
<b>Vibratory Ground Motion</b>		
Ground Motion Response Spectra (Site Safe Shutdown Earthquake)	Appendix A Figure A3-2	Site specific response spectra.
<b>Stability of Subsurface Materials and Foundations</b>		
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.

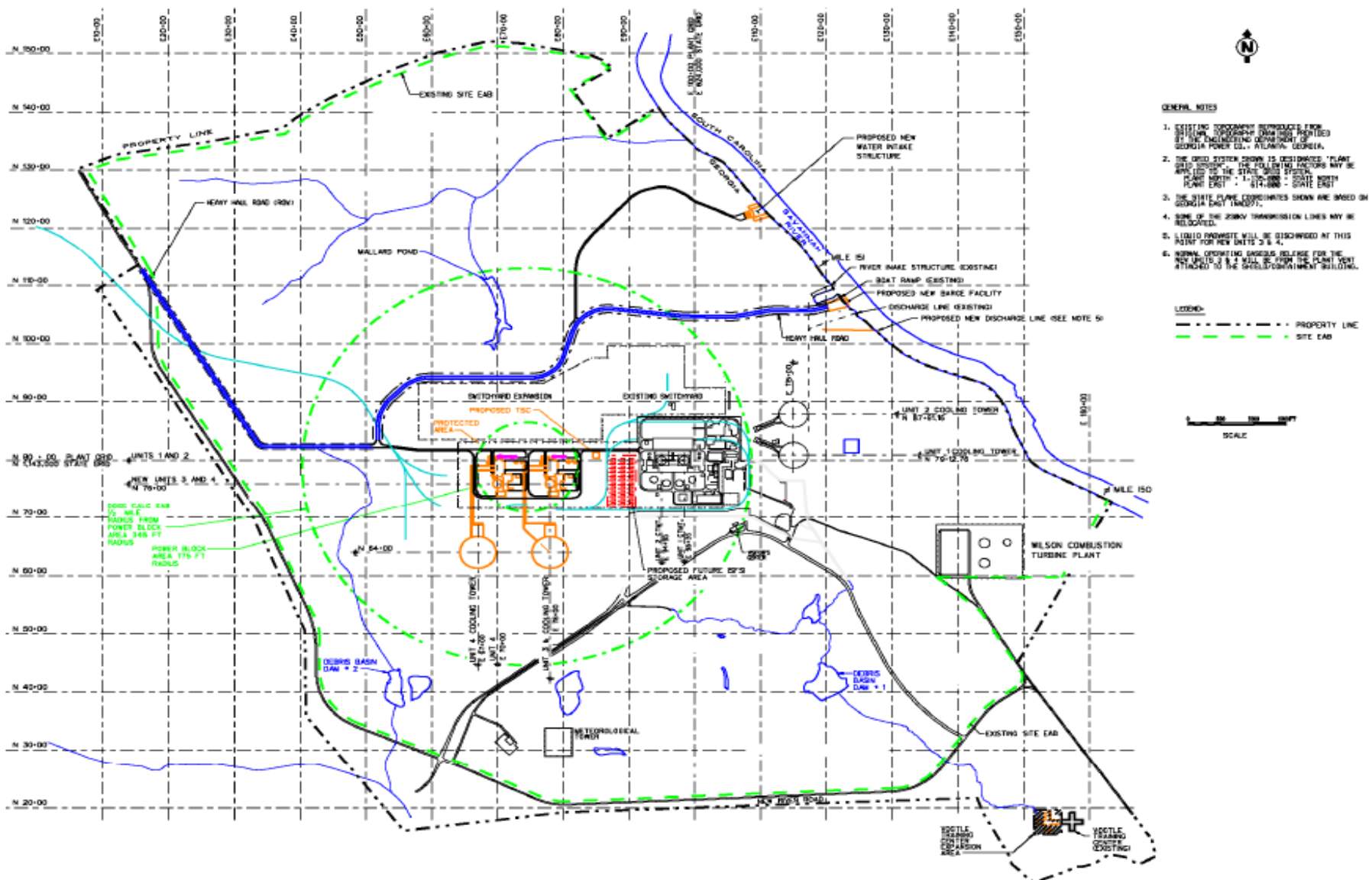


Figure A3-1 (Figure 2.4.14-1) – The proposed facility boundary for the VEGP site (Taken from SSAR Figure 1-4)

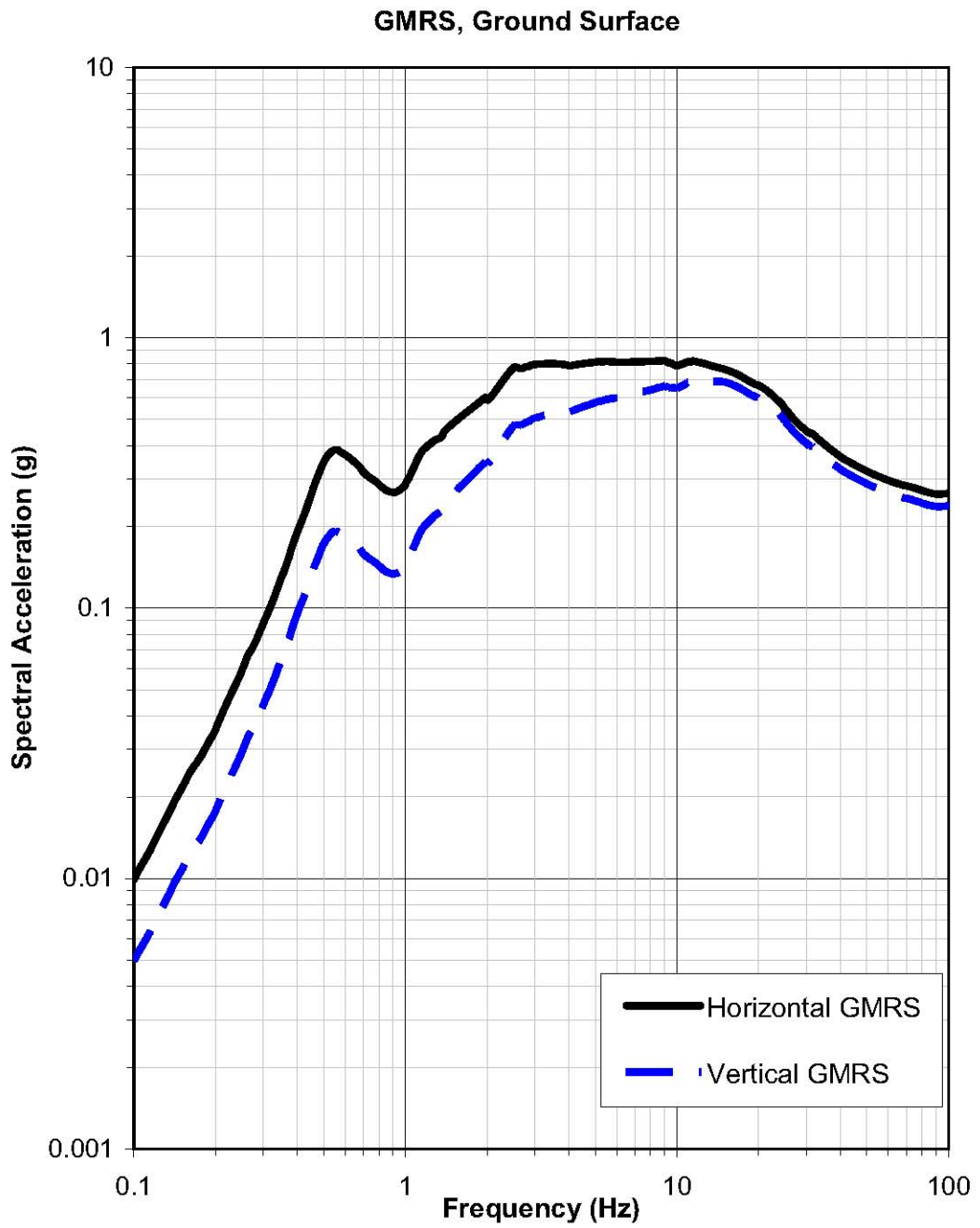


Figure A3-2 (SER Figure 2.5.2-25) - Plots of the horizontal and vertical GMRS (reproduced from SSAR Figure 2.5.2-44b).

**Part A: Soil Shear-Wave Velocities (ESP)**

<b>Geologic Formation</b>	<b>Depth (feet)</b>	<b>V<sub>s</sub> (fps)</b>
<b>Compacted Backfill</b>	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	
<b>Blue Bluff Marl (Lisbon Formation)</b>	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
<b>Lower Sand Stratum (Still Branch)</b>	123 to 149	2,650
	149 to 156	2,000
(Congaree)	156 to 216	1,650
(Snapp)	216 to 331	1,950
(Black Mingo)	331 to 438	2,050
(Steel Creek)	438 to 477	2,350
(Gaillard/Black Creek)	477 to 587	2,650
(Pio Nono)	587 to 798	2,850
(Cape Fear)	798 to 858	2,870
<b>Dunbarton Triassic Basin &amp; Paleozoic Crystalline Rock</b>	858 to 1,049	2,710
	> 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**

Depth (ft)	Vs (ft/s)	
	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.

Depth (ft)	Vs (ft/s)	
	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 to 1,900	8,414	8,976
> 1,900	9,200	9,200

Rock Vs profile corresponding to the location of B-1003.

Depth (ft)	Vs (ft/s)	
	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 <sub>s</sub> (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
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
<b>2.4 – Hydrology</b>		
Plant Grade	220 feet MSL	Finished plant grade at the ESP site.
<b>15.0 – Accident Analysis</b>		
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**

Isotope	Activity Release (Ci)				Total
	0-2 hr	2-8 hr	8-24 hr	24-72 hr	
Kr-85m	6.86E-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	8.60E-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	1.18E+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
<b>Total</b>	<b>2.15E+02</b>	<b>8.16E+01</b>	<b>1.68E+02</b>	<b>3.56E+02</b>	<b>8.21E+02</b>

**Table A4-1 (SSAR Table 15-2)**

**Activity Releases for Steam System Piping Failure with Accident-Initiated Iodine Spike**

Isotope	Activity Release (Ci)				Total
	0-2 hr	2-8 hr	8-24 hr	24-72 hr	
Kr-85m	6.86E-02	1.14E-01	6.80E-02	6.18E-03	2.57E-01
Kr-85	2.82E-01	8.46E-01	2.25E+00	6.69E+00	1.01E+01
Kr-87	2.76E-02	1.34E-02	5.29E-04	8.60E-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	1.18E+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	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	1.82E-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	2.06E+02
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
<b>Total</b>	<b>2.51E+02</b>	<b>4.03E+02</b>	<b>5.78E+02</b>	<b>9.20E+02</b>	<b>2.15E+03</b>

**Table A4-2 (SSAR Table 15-3)**

### Activity Releases for Reactor Coolant Pump Shaft Seizure

Isotope	Activity Release (Ci)				Total
	No Feedwater	Feedwater Available			
	0-1.5 hr	0-2 hr	2-8 hr	6-8 hr	
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	2.08E+02	2.62E+02	3.20E+02	6.05E+01	5.82E+02
Xe-131m	3.77E+00	5.03E+00	1.49E+01	4.95E+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	2.68E-06	3.30E+01
Xe-135	1.59E+02	2.08E+02	4.64E+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	1.46E+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	4.86E+01	6.86E+00	8.29E+01	3.64E+01	8.98E+01
I-134	2.88E+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	6.08E+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	2.91E-02
<b>Total</b>	<b>1.62E+03</b>	<b>1.84E+03</b>	<b>3.99E+03</b>	<b>1.23E+03</b>	<b>5.82E+03</b>

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 Assem  
Ejection Accidents**

Isotope	Activity Release (Ci)					Total
	0-2 hr	2-8 hr	8-24 hr	24-96 hr	96-720 hr	
Kr-85m	1.12E+02	6.48E+01	3.87E+01	1.77E+00	2.51E-05	2.18E+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	2.88E+01	1.16E+02	1.69E+02
Xe-133m	2.67E+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	6.96E-01	8.67E-02	3.42E-02	1.91E+00
<b>Total</b>	<b>3.23E+03</b>	<b>2.62E+03</b>	<b>3.56E+03</b>	<b>4.53E+03</b>	<b>8.93E+03</b>	<b>2.29E+04</b>

**Table A4-4 (SSAR Table 15-5)**

**Activity Releases for Failure of Small Lines Carrying Primary Coolant Outside Containment**

Isotope	Activity Release (Ci)
	0-2 hr
Kr-85m	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	9.28E+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	6.16E+00
Cs-137	3.00E+00
Cs-138	2.21E+00
<b>Total</b>	<b>3.02E+03</b>

**Table A4-5 (SSAR Table 15-6)**



**Activity Releases for Steam Generator Tube Rupture with Pre-Existing Iodine Spike**

Isotope	Activity Release (Ci)			
	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	1.48E+02
Xe-133m	1.24E+02	5.91E+01	6.61E-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	1.79E+00	5.39E-02	2.68E-01	2.12E+00
I-131	1.21E+02	5.27E+00	3.06E+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	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-06	5.73E-07	5.64E-01
<b>Total</b>	<b>1.07E+04</b>	<b>4.85E+03</b>	<b>9.14E+01</b>	<b>1.56E+04</b>

**Table A4-6 (SSAR Table 15-7)**

**Activity Releases for Steam Generator Tube Rupture with Accident-Initiated Iodine Spike**

Isotope	Activity Release (Ci)			
	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	1.48E+02
Xe-133m	1.24E+02	5.91E+01	6.61E-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	8.87E-01	1.62E-01	8.24E-01	1.87E+00
I-131	4.36E+01	1.14E+01	6.76E+01	1.23E+02
I-132	1.47E+02	4.86E+00	1.29E+01	1.65E+02
I-133	9.33E+01	2.00E+01	1.08E+02	2.22E+02
I-134	5.59E+01	6.04E-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	6.05E-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-06	5.73E-07	5.64E-01
<b>Total</b>	<b>1.05E+04</b>	<b>4.88E+03</b>	<b>2.40E+02</b>	<b>1.56E+04</b>

**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**

Isotope	Activity Release (Ci)					Total
	1.4-3.4 hr	0-8 hr	8-24 hr	24-96 hr	96-720 hr	
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	6.80E+02	1.14E+03	2.96E-01	6.79E-08	0.00E+00	1.14E+03
I-135	2.56E+03	4.89E+03	1.58E+02	6.09E+00	3.16E-03	5.06E+03
Kr-85m	1.42E+03	3.77E+03	1.87E+03	8.56E+01	1.22E-03	5.73E+03
Kr-85	8.31E+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	4.09E-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	8.68E+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	5.38E+02	2.57E+01	9.11E+00	7.74E+01	6.50E+02
Cs-136	7.33E+01	1.52E+02	7.16E+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	4.80E+01	2.29E+00	5.67E-01	7.82E-01	5.16E+01
Sb-129	5.10E+01	8.94E+01	1.51E+00	4.95E-03	4.90E-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	3.83E+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**

Isotope	Activity Release (Ci)					Total
	1.4-3.4 hr	0-8 hr	8-24 hr	24-96 hr	96-720 hr	
Te-129	1.88E+01	2.83E+01	2.60E-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	1.85E+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	1.81E+02	5.46E+00	1.35E-01	7.06E-04	1.87E+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	1.63E+02	3.25E+02	1.61E+01	5.11E+00	2.17E+01	3.68E+02
Mo-99	2.15E+01	4.25E+01	1.98E+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	8.18E+00	1.44E+01	2.48E-01	8.86E-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	7.78E+00	3.88E-01	1.32E-01	8.45E-01	9.15E+00
Ce-143	3.46E+00	6.78E+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	1.83E-02	9.21E-04	3.27E-04	2.82E-03	2.24E-02
Pu-239	8.06E-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	8.87E+01	4.08E+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-05	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**

Isotope	Activity Release (Ci)					Total
	1.4-3.4 hr	0-8 hr	8-24 hr	24-96 hr	96-720 hr	
Y-93	1.21E+00	2.28E+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	3.55E-01	3.78E+00
Zr-95	1.59E+00	3.18E+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	2.38E-02	9.82E-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	1.23E+00	6.06E-02	1.90E-02	7.29E-02	1.38E+00
Pr-143	1.39E+00	2.78E+00	1.37E-01	4.40E-02	1.94E-01	3.15E+00
Am-241	1.20E-04	2.39E-04	1.20E-05	4.27E-06	3.88E-05	2.92E-04
Cm-242	2.82E-02	5.65E-02	2.83E-03	9.98E-04	8.08E-03	6.84E-02
Cm-244	3.46E-03	6.93E-03	3.48E-04	1.24E-04	1.06E-03	8.47E-03
<b>Total</b>	<b>3.53E+04</b>	<b>9.85E+04</b>	<b>1.35E+05</b>	<b>2.15E+05</b>	<b>4.30E+05</b>	<b>8.79E+05</b>

**Table A4-8 Cont. (SSAR Table 15-9 cont)**

### Activity Releases for Fuel Handling Accident

Activity Release (Ci)	
Isotope	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	9.88E+04
Xe-135m	1.28E+03
Xe-135	2.48E+04
I-130	2.51E+00
I-131	3.78E+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	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, <i>Hot Initiating Condition Matrix, Modes 1, 2, 3, and 4</i> ; Table V2 D.2-2, <i>Cold Initiating Condition Matrix, Modes 5, 6, and De-fueled</i> 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, <i>Post Accident Monitoring Variables</i> , 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, <i>Emergency Planning and Preparedness for Nuclear Power Reactors</i> .
3.0 Emergency Communications	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.	<p>5.1.1 The TSC has at least 2,175 square feet of floor space.</p> <p>5.1.2 Communication equipment is installed in the TSC and OSC, and voice transmission and reception are accomplished.</p> <p>5.1.3 The plant parameters listed in Table Annex V2 H-1, <i>Post Accident Monitoring Values</i>, can be retrieved and displayed in the TSC.</p> <p>5.1.4 The TSC is located within the protected area, and no major security barriers exist between the TSC and the control room.</p> <p>5.1.5 The OSC is located adjacent to the passage from the annex building to the control room.</p> <p>5.1.6 The TSC ventilation system includes a high-efficiency particulate air (HEPA) and charcoal filter, and radiation monitors are installed.</p> <p>5.1.7 A reliable and backup electrical power supply is available for the TSC.</p>

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, <i>Post Accident Monitoring Values</i> , 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
			<p>5. Demonstrate the ability to develop dose projections.</p> <p>6. Demonstrate the ability to make the decision whether to issue radio-protective drugs (KI) to emergency workers.</p> <p>7. Demonstrate the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development.</p>
	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.	<p>6.4 The following parameters are displayed in the TSC and control room:</p> <ul style="list-style-type: none"> <li>• Wind speed (at 10 and 60 meters)</li> <li>• Wind direction (at 10 and 60 meters)</li> <li>• Standard deviation of horizontal wind direction (at 10 meters)</li> <li>• Vertical temperature difference (between 10 and 60 meters)</li> <li>• Ambient temperature (at 10 meters)</li> <li>• Dew-point temperature (at 10 meters)</li> <li>• Precipitation (at the tower base)</li> </ul>
	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: <ul style="list-style-type: none"> <li>• Employees not having emergency assignments</li> <li>• Visitors</li> <li>• Contractor and construction personnel</li> <li>• Other persons who may be in the public access areas, on or passing through the site, or within the owner controlled area</li> </ul> [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.  <i>A. Accident Assessment and Classification</i>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the exercise</p> <p>Standard Criteria:</p> <p>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.</p> <p><i>B. Notifications</i></p> <p>1. Demonstrate the ability to alert, notify, and mobilize site emergency response personnel.</p> <p>Standard Criteria:</p> <p>a. Complete the designated checklist and perform the announcement within 5 minutes of the initial event classification for an Alert or higher.</p> <p>b. Activate the emergency recall system within 5 minutes of the initial event classification for an Alert or higher.</p> <p>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.</p> <p>Standard Criteria:</p> <p>a. Transmit information using the designated checklist, in accordance with approved emergency implementing procedures (EIPs), within 15 minutes of event classification.</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>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.</p> <p>c. Transmit information using the designated checklist within 60 minutes of event classification for an initial notification of the NRC.</p> <p>3. Demonstrate the ability to warn or advise onsite individuals of emergency conditions.</p> <p>Standard Criteria:</p> <p>a. Initiate notification of onsite individuals (via plant page or telephone), using the designated checklist within 15 minutes of notification.</p> <p>4. Demonstrate the capability of the Prompt Notification System (PNS), for the public, to operate properly when required.</p> <p>Standard Criteria:</p> <p>a. 90% of the sirens operate properly, as indicated by the Whelen feedback system.</p> <p>b. A NOAA tone alert radio is activated.</p> <p><i>C. Emergency Response</i></p> <p>1. Demonstrate the capability to direct and control emergency operations.</p> <p>Standard Criteria:</p> <p>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</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>minutes from TSC activation.</p> <p>2. Demonstrate the ability to transfer emergency direction from the control room (simulator) to the TSC within 30 minutes from activation.</p> <p>Standard Criteria:</p> <p>a. Briefings were conducted prior to turnover responsibility. Personnel document transfer of duties.</p> <p>3. Demonstrate the ability to prepare for around-the-clock staffing requirements.</p> <p>Standard Criteria:</p> <p>a. Complete 24-hour staff assignments.</p> <p>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.</p> <p>Standard Criteria:</p> <p>a. Protected area personnel assembly and accountability completed within 30 minutes of the Alert or higher emergency declaration via public address announcement.</p> <p><i>D. Emergency Response Facilities</i></p> <p>1. Demonstrate activation of the operational support center (OSC), and full functional operation of the TSC and EOF within 60 minutes of activation.</p> <p>Standard Criteria:</p> <p>a. The TSC, OSC, and EOF are activated within about 60 minutes of the initial notification.</p>



Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>2. Demonstrate the adequacy of equipment, security provisions, and habitability precautions for the TSC, OSC, EOF, and emergency news center (ENC), as appropriate.</p> <p>Standard Criteria:</p> <p>a. Demonstrate the adequacy of the emergency equipment in the emergency response facilities, including availability and general consistency with emergency implementing procedures (EIPs).</p> <p>b. The Security Shift Captain implements and follows applicable EIPs.</p> <p>c. The Health Physics Supervisor (TSC) implements the designated checklist if an onsite or offsite release has occurred.</p> <p>3. Demonstrate the adequacy of communications for all emergency support resources.</p> <p>Standard Criteria:</p> <p>a. Emergency response communications listed in emergency implementing procedures (EIPs) are available and operational.</p> <p>b. Communications systems are tested in accordance with TSC, OSC, and EOF activation checklists.</p> <p>c. Emergency response facility personnel are able to operate all specified communication systems.</p> <p>d. Clear primary and backup communications links are established and maintained for the duration of the exercise.</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p><i>E. Radiological Assessment and Control</i></p> <p>1. Demonstrate the ability to obtain onsite radiological surveys and samples.</p> <p>Standard Criteria:</p> <p>a. HP Technicians demonstrate the ability to obtain appropriate instruments (range and type) and take surveys.</p> <p>b. Airborne samples are taken when the conditions indicate the need for the information.</p> <p>2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers.</p> <p>Standard Criteria:</p> <p>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).</p> <p>b. Exposure records are available, either from the ALARA computer or a hard copy dose report.</p> <p>c. Emergency workers include Security and personnel within all emergency facilities.</p> <p>3. Demonstrate the ability to assemble and deploy field monitoring teams within 60 minutes from the decision to do so.</p> <p>Standard Criteria:</p> <p>a. One field monitoring team is ready to be deployed within 60 minutes of being requested from the OSC, and no later</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>than 90 minutes from the declaration of an Alert or higher emergency.</p> <p>4. Demonstrate the ability to satisfactorily collect and disseminate field team data.</p> <p>Standard Criteria:</p> <p>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.</p> <p>b. Satisfactory data dissemination is from the field team to the Dose Assessment Supervisor, via the field team communicator and field team coordinator.</p> <p>5. Demonstrate the ability to develop dose projections.</p> <p>Standard Criteria:</p> <p>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).</p> <p>6. Demonstrate the ability to make the decision whether to issue radioprotective drugs (KI) to emergency workers.</p> <p>Standard Criteria:</p> <p>a. KI is taken (simulated) if the estimated dose to the thyroid will exceed 25 rem committed dose equivalent (CDE).</p> <p>7. Demonstrate the ability to develop appropriate protective action</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>recommendations (PARs) and notify appropriate authorities within 15 minutes of development.</p> <p>Standard Criteria:</p> <p>a. Total effective dose equivalent (TEDE) and CDE dose projections from the dose assessment computer code are compared to emergency implementing procedures (EIPs).</p> <p>b. PARs are developed within 15 minutes of data availability.</p> <p>c. PARs are transmitted to responsible State and local government agencies via voice or fax within 15 minutes of PAR development.</p> <p><i>F. Public Information</i></p> <p>1. Demonstrate the capability to develop and disseminate clear, accurate, and timely information to the news media, in accordance with EIPs.</p> <p>Standard Criteria:</p> <p>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.</p> <p>b. Follow-up information is provided, at a minimum, within 60 minutes of an emergency classification or PAR change.</p> <p>2. Demonstrate the capability to establish and effectively operate rumor control in a coordinated fashion.</p> <p>Standard Criteria:</p> <p>a. Calls are answered in a timely</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>manner with the correct information, in accordance with EIPs.</p> <p>b. Calls are returned or forwarded, as appropriate, to demonstrate responsiveness.</p> <p>c. Rumors are identified and addressed.</p> <p><i>G. Evaluation</i></p> <p>1. Demonstrate the ability to conduct a post-exercise critique, to determine areas requiring improvement and corrective action.</p> <p>Standard Criteria:</p> <p>a. An exercise time line is developed, followed by an evaluation of the objectives.</p> <p>b. Significant problems in achieving the objectives are discussed to ensure understanding of why objectives were not fully achieved.</p> <p>c. Recommendations for improvement in non-objective areas are discussed.</p> <p>8.1.2 Onsite emergency response personnel are mobilized in sufficient number to fill the emergency positions identified in emergency plan Section B, <i>VEGP Emergency Organization</i>, and they successfully perform their assigned responsibilities as outlined in Acceptance Criterion 8.1.1.D, <i>Emergency Response Facilities</i>.</p> <p>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</p>

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, <i>Hot Initiating Condition Matrix, Modes 1, 2, 3, and 4</i> ; Table V2 D.2-2, <i>Cold Initiating Condition Matrix, Modes 5, 6, and De-fueled</i> ; 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, <i>Post Accident Monitoring Variables</i> , 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, <i>Emergency Planning and Preparedness for Nuclear Power Reactors</i> .
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, <i>Post Accident Monitoring Values</i> , 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, <i>Post Accident Monitoring Values</i> , 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
			<p>Classification</p> <p>1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the drill.</p> <p>B. Radiological Assessment and Control</p> <p>1. Demonstrate the ability to obtain onsite radiological surveys and samples.</p> <p>2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers.</p> <p>3. Demonstrate the ability to assemble and deploy field monitoring teams within 60 minutes from the decision to do so.</p> <p>4. Demonstrate the ability to satisfactorily collect and disseminate field team data.</p> <p>5. Demonstrate the ability to develop dose projections.</p> <p>6. Demonstrate the ability to make the decision whether to issue radio-protective drugs (KI) to emergency workers.</p> <p>7. Demonstrate the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development.</p>
	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: <ul style="list-style-type: none"> <li>• Wind speed (at 10 and 60 meters)</li> <li>• Wind direction (at 10 and 60 meters)</li> <li>• Standard deviation of horizontal wind direction (at 10 meters)</li> <li>• Vertical temperature difference (between 10 and 60 meters)</li> <li>• Ambient temperature (at 10 meters)</li> <li>• Dew-point temperature (at 10 meters)</li> <li>• Precipitation (at the tower base)</li> </ul>
	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.
<b>7.0 Protective Response</b>			
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
<p>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.</p>	<ul style="list-style-type: none"> <li>• Employees not having emergency assignments</li> <li>• Visitors</li> <li>• Contractor and construction personnel</li> <li>• Other persons who may be in the public access areas, on or passing through the site, or within the owner controlled area</li> </ul> <p>[J.1]</p>	<p>dismissal will be performed during a drill.</p>	<p>emergency direction from the control room (simulator) to the technical support center (TSC) within 30 minutes of activation.</p> <p>7.1.3 Demonstrate the ability to prepare for around-the-clock staffing requirements.</p> <p>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.</p> <p>7.1.5 Demonstrate the ability to perform site dismissal.</p>
<p>8.0 Exercises and Drills</p>			
<p>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.</p>	<p>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]</p>	<p>8.1 A limited participation exercise (test) will be conducted within the specified time periods of 10 CFR Part 50, Appendix E.</p>	<p>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.</p> <p><i>A. Accident Assessment and Classification</i></p> <p>1. Demonstrate the ability to identify initiating conditions, determine emergency action level (EAL) parameters, and correctly classify the emergency throughout the exercise</p> <p>Standard Criteria:</p> <p>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.</p> <p><i>B. Notifications</i></p> <p>1. Demonstrate the ability to alert, notify, and mobilize site emergency</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>response personnel.</p> <p>Standard Criteria:</p> <p>a. Complete the designated checklist and perform the announcement within 5 minutes of the initial event classification for an Alert or higher.</p> <p>b. Activate the emergency recall system within 5 minutes of the initial event classification for an Alert or higher.</p> <p>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.</p> <p>Standard Criteria:</p> <p>a. Transmit information using the designated checklist, in accordance with approved emergency implementing procedures (EIPs), within 15 minutes of event classification.</p> <p>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.</p> <p>c. Transmit information using the designated checklist within 60 minutes of event classification for an initial notification of the NRC.</p> <p>3. Demonstrate the ability to warn or advise onsite individuals of emergency conditions.</p> <p>Standard Criteria:</p> <p>a. Initiate notification of onsite individuals (via plant page or telephone) using the designated checklist, within</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>15 minutes of notification.</p> <p><i>C. Emergency Response</i></p> <p>1. Demonstrate the capability to direct and control emergency operations.</p> <p>Standard Criteria:</p> <p>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.</p> <p>2. Demonstrate the ability to transfer emergency direction from the control room (simulator) to the TSC within 30 minutes from activation.</p> <p>Standard Criteria:</p> <p>a. Briefings were conducted prior to turnover responsibility. Personnel document transfer of duties.</p> <p>3. Demonstrate the ability to prepare for around-the-clock staffing requirements.</p> <p>Standard Criteria:</p> <p>a. Complete 24-hour staff assignments.</p> <p>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.</p> <p>Standard Criteria:</p> <p>a. Protected area personnel assembly and accountability completed within 30 minutes of the Alert or higher emergency declaration via public address announcement.</p> <p><i>D. Emergency Response Facilities</i></p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>1. Demonstrate timely activation of the OSC.</p> <p>Standard Criteria:</p> <p>a. The OSC is activated within about 60 minutes of the initial notification.</p> <p>2. Demonstrate the adequacy of equipment, security provisions, and habitability precautions for the OSC, as appropriate.</p> <p>Standard Criteria:</p> <p>a. Demonstrate the adequacy of the emergency equipment in the emergency response facilities, including availability and general consistency with emergency implementing procedures (EIPs).</p> <p>b. The Security Shift Captain implements and follows applicable EIPs.</p> <p>c. The Health Physics Supervisor (TSC) implements the designated checklist if an onsite or offsite release has occurred.</p> <p>3. Demonstrate the adequacy of communications for all emergency support resources.</p> <p>Standard Criteria:</p> <p>a. Emergency response communications listed in emergency implementing procedures (EIPs) are available and operational.</p> <p>b. Communications systems are tested in accordance with OSC activation checklist.</p> <p>c. Emergency response facility</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>personnel are able to operate all specified communication systems.</p> <p>d. Clear primary and backup communications links are established and maintained for the duration of the exercise.</p> <p><i>E. Radiological Assessment and Control</i></p> <p>1. Demonstrate the ability to obtain onsite radiological surveys and samples.</p> <p>Standard Criteria:</p> <p>a. HP Technicians demonstrate the ability to obtain appropriate instruments (range and type) and take surveys.</p> <p>b. Airborne samples are taken when the conditions indicate the need for the information.</p> <p>2. Demonstrate the ability to continuously monitor and control radiation exposure to emergency workers.</p> <p>Standard Criteria:</p> <p>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).</p> <p>b. Exposure records are available, either from the ALARA computer or a hard copy dose report.</p> <p>c. Emergency workers include Security and personnel within all emergency facilities.</p> <p>3. Demonstrate the ability to assemble</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>and deploy field monitoring teams within 60 minutes from the decision to do so.</p> <p>Standard Criteria:</p> <p>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.</p> <p>4. Demonstrate the ability to satisfactorily collect and disseminate field team data.</p> <p>Standard Criteria:</p> <p>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.</p> <p>b. Satisfactory data dissemination is from the field team to the Dose Assessment Supervisor, via the field team communicator and field team coordinator.</p> <p>5. Demonstrate the ability to develop dose projections.</p> <p>Standard Criteria:</p> <p>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).</p> <p>6. Demonstrate the ability to develop appropriate protective action recommendations (PARs) and notify appropriate authorities within 15 minutes of development.</p>

Planning Standard	EP Program Elements (From NUREG-0654/FEMA-REP-1)	Inspections, Tests, Analyses	Acceptance Criteria
			<p>Standard Criteria:</p> <p>a. Total effective dose equivalent (TEDE) and CDE dose projections from the dose assessment computer code are compared to emergency implementing procedures (EIPs).</p> <p>b. PARs are developed within 15 minutes of data availability.</p> <p>c. PARs are transmitted to responsible State and local government agencies via voice or fax within 15 minutes of PAR development.</p> <p>8.1.2 Onsite emergency response personnel are mobilized in sufficient number to fill the emergency positions identified in emergency plan Section B, <i>VEGP Emergency Organization</i>, and they successfully perform their assigned responsibilities as outlined in Acceptance Criterion 8.1.1.D, <i>Emergency Response Facilities</i>.</p> <p>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.</p>
<p><b>9.0 Implementing Procedures</b>            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.</p>	<p>9.1 The licensee has submitted detailed implementing procedures for its emergency plan no less than 180 days prior to fuel load.</p>	<p>9.1 An inspection of the submittal letter will be performed.</p>	<p>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.</p>