PMVogtleCOLPEm Resource

From: Joshi, Ravindra
Sent: Tuesday, September 13, 2011 11:05 AM
To: Aughtman, Amy G.; WES SPARKMAN; MONROE, AMY
Cc: Wright, Donna; Blamey, Alan; Sebrosky, Joseph; McGovern, Denise; Schofer, Fred; Wilson, Jerry; Cruz, Jeffrey
Subject: RE: Handout for 9/19/2011 public meeting
Attachments: Example Consolidated COL Appendix C pages.pdf

Amy, Wes, and Amy

Attached is the handout for the public meeting (conference call of September 19, 2011). Note that this attachment (including this e-mail) will be captured in ADAMS as a publicly available document. As discussed with Amy Aughtman, we will be using the following number to call in for the conference call.

1-866-794-5564, pass code is 1241479.

Ravi Joshi
415-6191

Hearing Identifier: Vogtle_COL_Public
Email Number: 545

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APPENDIX C

VOGTLE ELECTRIC GENERATING PLANT UNIT 3

INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

Table of Contents

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1.0 Introduction

1.1 Definitions

The following definitions apply to terms used in the design descriptions and associated inspections, tests, analyses, and acceptance criteria (ITAAC).

Acceptance Criteria means the performance, physical condition, or analysis result for a structure, system, or component that demonstrates that the design or program commitment is met.

Analysis means a calculation, mathematical computation, or engineering or technical evaluation. Engineering or technical evaluations could include, but are not limited to, comparisons with operating experience or design of similar structures, systems, or components.

As-built means the physical properties of a structure, system, or component following the completion of its installation or construction activities at its final location at the plant site. In cases where it is technically justifiable, determination of physical properties of the as-built structure, system, or component may be based on measurements, inspections, or tests that occur prior to installation, provided that subsequent fabrication, handling, installation, and testing does not alter the properties.

Column Line is the designation applied to a plant reference grid used to define the location of building walls and columns. Column lines may not represent the center line of walls and columns.

Design Commitment means that portion of the design description that is verified by ITAAC.

Design Description means that portion of the design that is certified.

Design Plant Grade means the elevation of the soil around the nuclear island assumed in the design of the AP1000, i.e., floor elevation 100'-0".

Division (for electrical systems or electrical equipment) is the designation applied to a given safety-related system or set of components that is physically, electrically, and functionally independent from other redundant sets of components.

Floor Elevation is the designation applied to name a floor. The actual elevation may vary due to floor slope and layout requirements.

Functional Arrangement (for a system) means the physical arrangement of systems and components to provide the service for which the system is intended, and which is described in the system design description.

Inspect or **Inspection** means visual observations, physical examinations, or reviews of records based on visual observation or physical examination that compare the structure, system, or component condition to one or more design commitments. Examples include walkdowns, configuration checks, measurements of dimensions, or nondestructive examinations.

Inspect for Retrievability of a display means to visually observe that the specified information appears on a monitor when summoned by the operator.

ITAAC number is a unique number based on three character strings. The first string represents the source of the ITAAC where a C or E denotes the ITAAC source is from the combined license or early site permit respectively. No alpha character denotes the ITAAC source is from the DCD. The second string represents the chapter, section, and subsection where the ITAAC table is located within the source document and contains three numbers separated by decimals. If the source document is not numbered, the string is based on the ITAAC table number within this appendix. The third string identifies the location of the ITAAC within the table and will vary in length and composition based on the source table numbering convention.

L_a is the maximum allowable containment leakage as defined in 10 CFR 50 Appendix J.

Physical Arrangement (for a structure) means the arrangement of the building features (e.g., floors, ceilings, walls, and basemat) and of the structures, systems, and components within, which are described in the building design description.

Program Commitment means that portion of the program description that is verified by ITAAC.

Qualified for Harsh Environment means that equipment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of its safety function, for the time required to perform the safety function. These environmental conditions include applicable time-dependent temperature and pressure profiles, humidity, chemical effects, radiation, aging, submergence, and their synergistic effects which have a significant effect on the equipment performance. Equipment identified in the Design Description as being Qualified for Harsh Environment includes the:

a. equipment itself
b. sensors, switches and lubricants that are an integral part of the equipment
c. electrical components connected to the equipment (wiring, cabling and terminations)

Items b and c are Qualified for Harsh Environment only when they are necessary to support operation of the equipment to meet its safety-related function listed in the Design Description table and to the extent such equipment is located in a harsh environment during or following a design basis accident.

Sensor means a transmitter, resistance temperature detector, thermocouple or other transducer, plus associated cables, connectors, preamplifiers, reference junction boxes, or other signal processing equipment that is located in the immediate proximity of the sensor and subject to the same environmental conditions.

Site Grade means the as-built elevation of the soil to the west side of the nuclear island. Adjacent buildings are located on the other sides of the nuclear island.

Tag Number in the ITAACs represents the complete tag number or a portion of the tag number used to identify the actual hardware (or associated software). For instrumentation, the tag number identified in the ITAACs does not include the type of instrument (for example, the Containment Exhaust Fan A Flow Sensor, VFS-11A, does not include the designators FE [flow element] or FT [flow transmitter], which would appear on the actual hardware or in the associated software). This is because the designator VFS-11A and the equipment description

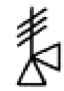
1.3 Figure Legend

The conventions used in this section are for figures described in the design description. The figure legend is provided for information ~~and is not part of the Tier 1 Material~~.

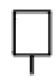
VALVES

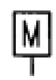
Valve 

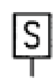
Check Valve 

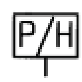
Relief Valve 

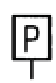
VALVE OPERATORS

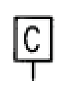
Operator Of Unspecified Type 

Motor Operator 

Solenoid Operator 

Pneumatic/Hydraulic Operator 

Pneumatic Operator 

Squib Valve 

1.4 List of Acronyms and Abbreviations

The acronyms presented in this section are provided for information.

ac	Alternating Current
AC	Acceptance Criteria
ACC	Accumulator
ADS	Automatic Depressurization System
AHU	Air Handling Units
ANS	Alert and Notification System
ASME	American Society of Mechanical Engineers
BTU	British Thermal Unit
CAS	Compressed Air System
CAV	Cumulative Absolute Velocity
CCS	Component Cooling Water System
CDM	Certified Design Material
CDS	Condensate System
CFR	Code of Federal Regulations
CIV	Containment Isolation Valve
CL	Cold Leg
CMT	Core Makeup Tank
CNS	Containment System
COL	Combined Operating License/Combined License
CRDM	Control Rod Drive Mechanism
CSA	Control Support Area
CST	Condensate Storage Tank
CVS	Chemical and Volume Control System
DAC	Design Acceptance Criteria
DAS	Diverse Actuation System
DBA	Design Basis Accident
dc	Direct Current
DC	Design Commitment
DDS	Data Display and Processing System
DOS	Standby Diesel Fuel Oil System
DPU	Distributed Processing Unit
D-RAP	Design Reliability Assurance Program
DTS	Demineralized Water Treatment System
DVI	Direct Vessel Injection
DWS	Demineralized Water Transfer and Storage System
EAL	Emergency Action Level
EAS	Emergency Alert System
ECS	Main ac Power System
EDS	Non-Class 1E dc and Uninterruptible Power Supply System
EFS	Communication System
EGS	Grounding and Lightening Protection System

List of Acronyms and Abbreviations (cont.)

VXS	Annex/Auxiliary Building Nonradioactive Ventilation System
VZS	Diesel Generator Building Ventilation System
WGS	Gaseous Radwaste System
WLS	Liquid Radwaste System
WSS	Solid Radwaste System
ZOS	Onsite Standby Power System

2.0 System Based Design Descriptions and ITAAC

2.1 Reactor

2.1.1 Fuel Handling and Refueling System

Design Description

The fuel handling and refueling system (FHS) transfers fuel assemblies and core components during fueling operations and stores new and spent fuel assemblies in the new and spent fuel storage racks. The refueling machine (RM) and the fuel transfer tube are operated during refueling mode. The fuel handling machine (FHM) is operated during normal modes of plant operation, including startup, power operation, cooldown, shutdown and refueling.

The component locations of the FHS are as shown in Table 2.1.1-2.

1. The functional arrangement of the FHS is as described in the Design Description of this Section 2.1.1.
2. The FHS has the RM, the FHM, and the new and spent fuel storage racks.
3. The FHS preserves containment integrity by isolation of the fuel transfer tube penetrating containment.
4. The RM and FHM/spent fuel handling tool (SFHT) gripper assemblies are designed to prevent opening while the weight of the fuel assembly is suspended from the grippers.
5. The lift height of the RM mast and FHM hoist(s) is limited such that the minimum required depth of water shielding is maintained.
6. The RM and FHM are designed to maintain their load carrying and structural integrity functions during a safe shutdown earthquake.
7. The new and spent fuel storage racks maintain the effective neutron multiplication factor required by 10 CFR 50.68 limits during normal operation, design basis seismic events, and design basis dropped spent fuel assembly accidents over the spent fuel storage racks.

Table 2.1.1-1

Inspections, Tests, Analyses, and Acceptance Criteria

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1	2.1.01.01	1. The functional arrangement of the FHS is as described in the Design Description of this Section 2.1.1.	Inspection of the as-built system will be performed.	The as-built FHS conforms with the functional arrangement as described in the Design Description of this Section 2.1.1.
2	2.1.01.02	2. The FHS has the refueling machine (RM), the fuel handling machine (FHM), and the new and spent fuel storage racks.	Inspection of the system will be performed.	The FHS has the RM, the FHM, and the new and spent fuel storage racks.
3	2.1.01.03	3. The FHS preserves containment integrity by isolation of the fuel transfer tube penetrating containment.	See Tier 1 Material, Table 2.2.1-3, items 1 and 7.	See Tier 1 Material, Table 2.2.1-3, items 1 and 7.
4	2.1.01.04	4. The RM and FHM/spent fuel handling tool (SFHT) gripper assemblies are designed to prevent opening while the weight of the fuel assembly is suspended from the grippers.	The RM and FHM/SFHT gripper assemblies will be tested by operating the open controls of the gripper while suspending a dummy fuel assembly.	The RM and FHM/SFHT gripper assemblies will not open while suspending a dummy test assembly.
5	2.1.01.05	5. The lift height of the RM mast and FHM hoist(s) is limited such that the minimum required depth of water shielding is maintained.	The RM and FHM will be tested by attempting to raise a dummy fuel assembly.	The bottom of the dummy fuel assembly cannot be raised to within 24 ft, 6 in. of the operating deck floor.
6	2.1.01.06.i	6. The RM and FHM are designed to maintain their load carrying and structural integrity functions during a safe shutdown earthquake.	i) Inspection will be performed to verify that the RM and FHM are located on the nuclear island.	i) The RM and FHM are located on the nuclear island.
7	2.1.01.06.ii	6. The RM and FHM are designed to maintain their load carrying and structural integrity functions during a safe shutdown earthquake.	ii) Type test, analysis, or a combination of type tests and analyses of the RM and FHM will be performed.	ii) A report exists and concludes that the RM and FHM can withstand seismic design basis dynamic loads without loss of load carrying or structural integrity functions.
8	2.1.01.07.i	7. The new and spent fuel storage racks maintain the effective neutron multiplication factor required by 10 CFR 50.68 limits during normal operation, design basis seismic events, and design basis dropped spent fuel assembly accidents over the spent fuel storage racks.	i) Analyses will be performed to calculate the effective neutron multiplication factor in the new and spent fuel storage racks during normal conditions.	i) The calculated effective neutron multiplication factor for the new and spent fuel storage racks meets the requirements of 10 CFR 50.68[1] limits under normal conditions.
9	2.1.01.07.ii	7. The new and spent fuel storage racks maintain the effective neutron multiplication factor required by 10 CFR 50.68 limits during normal operation	ii) Inspection will be performed to verify that the new and spent fuel storage racks are located on the	ii) The new and spent fuel storage racks are located on the nuclear island.

Table 2.1.1-1 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
			nuclear island.	
10	2.1.01.07.iii	7. The new and spent fuel storage racks maintain the effective neutron multiplication factor required by 10 CFR 50.68 limits during normal operation	iii) Seismic analysis of the new and spent fuel storage racks will be performed.	iii) A report exists and concludes that the new and spent fuel racks can withstand seismic design basis dynamic loads and maintain the calculated effective neutron multiplication factor required by 10 CFR 50.68(1) limits.
11	2.1.01.07.iv	7. The new and spent fuel storage racks maintain the effective neutron multiplication factor required by 10 CFR 50.68 limits during normal operation	iv) Analysis of the new and spent fuel storage racks under design basis dropped spent fuel assembly loads will be performed.	iv) A report exists and concludes that the new and spent fuel racks can withstand design basis dropped spent fuel assembly loads and maintain the calculated effective neutron multiplication factor required by 10 CFR 50.68(1) limits.

Note:

1. The requirements of 10 CFR 50.68 are summarized as follows:
   - For new fuel storage racks:
     - The effective neutron multiplication factor (K-effective) must not exceed 0.95 when flooded with unborated water and
     - K-effective must not exceed 0.98 with optimum moderator conditions.
   - For spent fuel storage racks:
     - If methodology does not take credit for soluble boron:
       - K-effective must not exceed 0.95 when flooded with unborated water.
     - Or if methodology takes credit for soluble boron:
       - K-effective must not exceed 0.95 when flooded with borated water and
       - K-effective must remain below 1.0 when flooded with unborated water.

Table 2.1.1-2		
Component Name	**Tag No.**	**Component Location**
Refueling Machine	FHS-FH-01	Containment
Fuel Handling Machine	FHS-FH-02	Auxiliary Building
Spent Fuel Storage Racks	FHS-FS-02	Auxiliary Building
New Fuel Storage Racks	FHS-FS-01	Auxiliary Building
Fuel Transfer Tube	FHS-FT-01	Auxiliary Building/Containment

2.1.2 Reactor Coolant System

Design Description

The reactor coolant system (RCS) removes heat from the reactor core and transfers it to the secondary side of the steam generators for power generation. The RCS contains two vertical U-tube steam generators, four sealless reactor coolant pumps (RCPs), and one pressurizer.

The RCS is as shown in Figure 2.1.2-1 and the component locations of the RCS are as shown in Table 2.1.2-5.

1. The functional arrangement of the RCS is as described in the Design Description of this Section 2.1.2.
2. a) The components identified in Table 2.1.2-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.

   b) The piping identified in Table 2.1.2-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.
3. a) Pressure boundary welds in components identified in Table 2.1.2-1 as ASME Code Section III meet ASME Code Section III requirements.

   b) Pressure boundary welds in piping identified in Table 2.1.2-2 as ASME Code Section III meet ASME Code Section III requirements.
4. a) The components identified in Table 2.1.2-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.

   b) The piping identified in Table 2.1.2-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.
5. a) The seismic Category I equipment identified in Table 2.1.2-1 can withstand seismic design basis loads without loss of safety function.

   b) Each of the lines identified in Table 2.1.2-2 for which functional capability is required is designed to withstand combined normal and seismic design basis loads without a loss of its functional capability.

Table 2.3.19-2 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
484	2.3.19.01a	1.a) The EFS has handsets, amplifiers, loudspeakers, and siren tone generators connected as a telephone/page system.	Inspection of the as-built system will be performed.	The as-built EFS has handsets, amplifiers, loudspeakers, and siren tone generators connected as a telephone/page system.
485	2.3.19.01b	1.b) The EFS has sound-powered equipment connected as a system.	Inspection of the as-built system will be performed.	The as-built EFS has sound-powered equipment connected as a system.
486	2.3.19.02a	2.a) The EFS telephone/page system provides intraplant, station-to-station communications and area broadcasting between the MCR and the locations listed in Table 2.3.19-1.	An inspection and test will be performed on the telephone/page communication equipment.	Telephone/page equipment is installed and voice transmission and reception from the MCR are accomplished.
487	2.3.19.02b	2.b) EFS provides sound-powered communications between the MCR, the RSW, the Division A, B, C, D dc equipment rooms (Rooms 12201/12203/12205/ 12207), the Division A, B, C, D I&C rooms (Rooms 12301/12302/ 12304/12305), and the diesel generator building (Rooms 60310/60320) without external power.	An inspection and test will be performed of the sound-powered communication equipment.	Sound-powered equipment is installed and voice transmission and reception are accomplished.

2.3.20 Turbine Building Closed Cooling Water System

No entry for this system.

2.3.21 Secondary Sampling System

No entry for this system.

2.3.22 Containment Leak Rate Test System

No entry. Covered in Section 2.2.1, Containment System.

2.3.23 This section intentionally blank

2.3.24 Demineralized Water Treatment System

No entry for this system.

2.3.25 Gravity and Roof Drain Collection System

No entry for this system.

Table 3.3-7 Nuclear Island Critical Structural Sections
<u>Containment Internal Structures</u>
South west wall of the refueling cavity
South wall of the west steam generator cavity
North east wall of the in-containment refueling water storage tank
In-containment refueling water storage tank steel wall
Column supporting the operating floor
<u>Auxiliary and Shield Building</u>
South wall of auxiliary building (column line 1), elevation 66'-6" to elevation 180'-0"
Interior wall of auxiliary building (column line 7.3), elevation 66'-6" to elevation 160'-6"
West wall of main control room in auxiliary building (column line L), elevation 117'-6" to elevation 153'-0"
North wall of MSIV east compartment (column line 11 between lines P and Q), elevation 117'-6" to elevation 153'-0"
Shield building cylinder, elevation 160'-6" to elevation 266'-3"
RC/SC Shield Building Connections
Shield Building Air Inlet And Tension Ring
Roof slab at elevation 180'-0" adjacent to shield building cylinder
Floor slab on metal decking at elevation 135'-3"
2'-0" slab in auxiliary building (tagging room ceiling) at elevation 135'-3"
Finned floor in the main control room at elevation 135'-3"
Shield building roof, exterior wall of the PCS water storage tank
Shield building roof, tension ring and columns between air inlets
Divider wall between the spent fuel pool and the fuel transfer canal
<u>Nuclear Island Basemat Below Auxiliary Building</u>
Bay between reference column lines 9.1 and 11, and K and L
Bay between reference column lines 1 and 2 and K-2 and N

Figures 3.3-1 through 3.3-14 - Redacted Version, Withheld Under 10 CFR 2.390d

3.4 Initial Test Program

Design Description

This section represents a commitment that combined license applicants referencing the AP1000 certified design will implement an initial test program.

An initial test program is performed during the initial startup of each AP1000 plant. The initial test program consists of a series of tests categorized as construction and installation, preoperational (prior to fuel load), and startup (during and after fuel load). All ITAAC will be completed prior to fuel load; therefore, no ITAAC are performed during the startup test phase of the initial test program.

Table 3.7-3 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
841	3.7.00.01	1. The D-RAP ensures that the design of SSCs within the scope of the reliability assurance program (Table 3.7-1) is consistent with the risk insights and key assumptions (e.g., SSC design, reliability, and availability).	An analysis will confirm that the design of RAP SSCs identified in Table 3.7-1 has been completed in accordance with applicable D-RAP activities.	An analysis report documents that safety-related SSCs identified in Table 3.7-1 have been designed in accordance with a 10 CFR 50 Appendix B quality program. An analysis report documents that non-safety-related SSCs identified in Table 3.7-1 have been designed in accordance with a program that satisfies quality assurance requirements for SSCs important to investment protection.

C.3.8 Piping

C.3.8.1 Piping Rupture Hazards Analysis

Table C.3.8 1 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
842	C.3.8.01.01	Systems, structures, and components (SSCs) that are required to be functional during and following a design basis event shall be protected against or qualified to withstand the dynamic and environmental effects associated with analyses of postulated failures in high and moderate energy piping.	Inspection of the as-designed pipe rupture hazard analysis report will be conducted. The report documents the analyses to determine where protection features are necessary to mitigate the consequence of a pipe break. Pipe break events involving high-energy fluid systems are analyzed for the effects of pipe whip, jet impingement, flooding, room pressurization, and temperature effects. Pipe break events involving moderate-energy fluid systems are analyzed for wetting from spray, flooding, and other environmental effects, as appropriate.	An as-designed pipe rupture hazard analysis report exists and concludes that the analysis performed for high and moderate energy piping confirms the protection of SSCs required to be functional during and following a design basis event.

C.3.8.2 Piping Design

Table C.3.8 2 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
843	C.3.8.02.01	The American Society of Mechanical Engineers (ASME) Code, Section III piping is designed in accordance with the ASME Code, Section III requirements.	Inspection of the ASME Code Design Reports (NCA-3550) and required documents will be conducted for the set of lines chosen to demonstrate compliance.	The ASME Code Design Report(s) (NCA-3550) (certified, when required by the ASME Code) exist and conclude that the design of the piping for lines chosen to demonstrate all aspects of the piping design complies with the requirements of the ASME Code section.

E.3.8.5 Waterproof Membrane

Table E.3.8.5-1 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
844	E.3.8.05.01	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.

3.9 Emergency Planning ITAAC

3.9.1 Emergency Classification System

Table 3.9-1 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Program Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
845	E.3.9.01.01.01	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	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	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

Table 3.9-1 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Program Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
		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]	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.	parameters that can be displayed encompass the values specified in the emergency classification and EAL scheme.
846	E.3.9.01.01.02	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]	1.1.2 An analysis of the EAL technical bases will be performed to verify as-built, site-specific implementation of the EAL scheme.	1.1.2 The EAL scheme is consistent with Regulatory Guide 1.101, *Emergency Planning and Preparedness for Nuclear Power Reactors*.

3.9.2 Not used

3.9.3 Emergency Communications

Table 3.9-3 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Program Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
847	E.3.9.03.00.01	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

Table 3.9-3 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Program Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
				are established between the TSC and radiological monitoring teams.
848	E.3.9.03.00.02	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.

3.9.4 Not used

3.9.5 Emergency Facilities and Equipment

Table 3.9-5 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Program Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
849	E.3.9.05.01.01	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.
850	E.3.9.05.01.02	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.	5.1.2 Communication equipment is installed in the TSC and OSC, and voice transmission and reception are accomplished.
851	E.3.9.05.01.03	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.	5.1.3 The plant parameters listed in Table Annex V2 H-1, *Post Accident Monitoring Values*, can be retrieved and displayed in the TSC.
852	E.3.9.05.01.04	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.	5.1.4 The TSC is located within the protected area, and no major security barriers exist between the TSC and the control room.
853	E.3.9.05.01.05	5.1 The licensee has established a technical support center (TSC) and an onsite operations support	5.1 An inspection of the as-built TSC and OSC will be performed, including a test of the	5.1.5 The OSC is located adjacent to the passage from the annex building to the control

Table 3.9-5 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Program Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
		center (OSC). [H.1]	capabilities.	room..
854	E.3.9.05.01.06	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.	5.1.6 The TSC ventilation system includes a high-efficiency particulate air (HEPA) and charcoal filter, and radiation monitors are installed
855	E.3.9.05.01.07	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.	5.1.7 A reliable and backup electrical power supply is available for the TSC.
856	C.3.9.05.01.08	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.	5.1.8 Controls and displays exist in the TSC to control and monitor the status of the TSC ventilation system including heating and cooling, and the activation of the HEPA and charcoal filter system upon detection of high radiation in the TSC.
857	E.3.9.05.02.01	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.
858	E.3.9.05.02.02	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.	5.2.2 The plant parameters listed in Table Annex V2 H-1, *Post Accident Monitoring Values*, can be retrieved and displayed in the EOF.

3.9.6 Accident Assessment

Table 3.9-6 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Program Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
859	E.3.9.06.00.01	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

Table 3.9-6 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Program Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
				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. 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.
860	E.3.9.06.00.02	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.

Table 3.9-6 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Program Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
861	E.3.9.06.00.03	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.
862	E.3.9.06.00.04	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)
863	E.3.9.06.00.05	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 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.
864	E.3.9.06.00.06	6.6 The means exists to estimate integrated dose from the projected and actual dose rates, and for comparing these estimates with	6.6 An analysis of the methodology contained in the emergency implementing procedures (EIPs) for estimating	6.6 The EIPs and ODCM estimate an integrated dose.

Table 3.9-8 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
				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.
871	E3.9.08.01.02	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.	8.1.2 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*.
872	E3.9.08.01.03	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.	8.1.3 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.

Table V2H-1 Post Accident Monitoring Variables	
Variable	Range/Status
RCS pressure	0-3,300 psig
RCS TH (Wide Range)	50-700°F
RCS TC (Wide Range)	50-700°F
Steam generator water level (wide range)	0-100% of span
Steam generator water level (narrow range)	0-100% of span

Table V2H-1 Post Accident Monitoring Variables	
Variable	Range/Status
Pressurizer level	0-100% of span
Pressurizer reference leg temperature	50-420°F
Neutron flux	10-6- 200% power
Control rod position	0-267 steps
Containment water level	El. 72 ft. to 110 ft. in discrete steps
Core exit temperature	200-2,300°F
PRHR HX inlet temperature	50-650°F
PRHR HX outlet temperature	50-500°F
PRHR flow	700-3,000 gpm
IRWST water level	0-100% of span
RCS subcooling	200°F Sub- cooling to 35°F super heat
Passive containment cooling water flow	0-150 gpm
PCS storage tank water level	5-100% of tank height
IRWST surface temperature	50-300°F
IRWST bottom temperature	50-300°F
Steam line pressure	0-1,200 psig
Startup feedwater flow	0-1,000 gpm
Startup feedwater control valve status	Open/ Closed
Containment pressure	-5 to 10 psig
Containment pressure (extended range)	0 to 240 psig
Containment area radiation (high range)	100-107 R
Reactor vessel hot leg water level	0-100% of span
Plant vent radiation level (3 monitors - gas)	1.0E-7 to 1.0E+5 ìCi/cc
Remotely operated containment isolation valve status	Open/Closed
Hydrogen concentration	0-20%
Class 1E dc switchboard voltages	0-150 VDC
Diesel generator status	On/Off
Diesel generator load	0-6,000 kW
Voltage for diesel-backed buses	0-8,600 V
Power supply to diesel-backed buses	On/Off
RCP bearing water temperature	70-450°F

Table V2H-1 **Post Accident Monitoring Variables**	
Variable	Range/Status
Steam generator blowdown brine radiation level	10-6 - 10-1 μCi/cc
Main steam line radiation level	10-1 - 103 μCi/cc
Technical support center radiation	10-1 - 104 mR/hr
Primary sampling station area radiation level	10-1 - 107 mR/hr

3.9.9 Exercises and Drills

Table 3.9-9
Inspections, Tests, Analyses, and Acceptance Criteria

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
873	E3.9.09.00.01	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.

3.10 Backfill ITAAC

Table 3.10-1
Inspections, Tests, Analyses, and Acceptance Criteria

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
874	E.2.5.04.05.05.01	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.
875	E.2.5.04.05.05.02	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.