

**Southern Nuclear
Operating Company, Inc.**
40 Inverness Center Parkway
Birmingham, Alabama 35242



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U.S. Nuclear Regulatory Commission
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Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4 Combined License Application
Revised Response to Request for Additional Information Letter No. 037

Ladies and Gentlemen:

By letter dated March 28, 2008, Southern Nuclear Operating Company (SNC) submitted an application for combined licenses (COLs) for proposed Vogtle Electric Generating Plant (VEGP) Units 3 and 4 to the U.S. Nuclear Regulatory Commission (NRC) for two Westinghouse AP1000 reactor plants, in accordance with 10 CFR Part 52. During the NRC's detailed review of this application, the NRC identified a need for additional information, involving how certain interfaces with the standard AP1000 design have been met, required to complete their review of the COL application's Final Safety Analysis Report (FSAR) Section 1.8, "Interfaces for Standard Design." By letter dated June 16, 2009, the NRC provided SNC with Request for Additional Information (RAI) Letter No. 037 concerning this information need. That RAI letter contained one RAI question numbered 01-2. By letter dated July 16, 2009, SNC provided a response for this RAI. However, based on teleconference calls with the NRC involving electrical interface requirements and additional follow-up by SNC, the response to RAI number 01-2 is being revised. The enclosure to this letter provides SNC's revised response to this RAI. Please note that Table 1.8-205 shown in the enclosure contains changes that were identified subsequent to the original response.

If you have any questions regarding this letter, please contact Mr. Wes Sparkman at (205) 992-5061.

D092
NRO

Mr. Charles R. Pierce states he is the AP1000 Licensing Manager of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

Charles R. Pierce

Charles R. Pierce

Sworn to and subscribed before me this 23rd day of October, 2009

Notary Public: Deborah A. Javorka

My commission expires: October 24, 2012

CRP/BJS/dmw

Enclosure: Revised Response to NRC RAI Letter No. 037 on the VEGP Units 3 and 4
COL Application Involving Interfaces with Standard AP1000 Design

cc: Southern Nuclear Operating Company

Mr. J. H. Miller, III, President and CEO (w/o enclosure)
Mr. J. T. Gasser, Executive Vice President, Nuclear Operations (w/o enclosure)
Mr. J. A. Miller, Executive Vice President, Nuclear Development (w/o enclosure)
Mr. D. H. Jones, Site Vice President – Vogtle 3 and 4 (w/o enclosure)
Mr. T. E. Tynan, Vice President - Vogtle (w/o enclosure)
Mr. M. K. Smith, Technical Support Director
Mr. D. M. Lloyd, Vogtle 3 and 4 Project Support Director
Mr. M. J. Ajluni, Nuclear Licensing Manager
Mr. W. A. Sparkman, COL Project Engineer
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Nuclear Regulatory Commission

Mr. L. A. Reyes, Region II Administrator
Mr. F.M. Akstulewicz, Deputy Director Div. of Safety Systems & Risk Assess. (w/o enclosure)
Mr. R. G. Joshi, Lead Project Manager of New Reactors
Mr. B. Hughes, Project Manager of New Reactors
Ms. T. E. Simms, Project Manager of New Reactors
Mr. B. C. Anderson, Project Manager of New Reactors
Mr. M. M. Comar, Project Manager of New Reactors
Ms. S. Goetz, Project Manager of New Reactors
Mr. J. M. Sebrosky, Project Manager of New Reactors
Mr. D. C. Habib, Project Manager of New Reactors
Mr. C. P. Patel, Project Manager of New Reactors
Ms. M. A. Sutton, Environmental Project Manager
Mr. M. D. Notich, Environmental Project Manager
Mr. L. M. Cain, Senior Resident Inspector of VEGP

Georgia Power Company

Mr. O. C. Harper, IV, Vice President, Resource Planning and Nuclear Development

Oglethorpe Power Corporation

Mr. M. W. Price, Chief Operating Officer
Mr. K. T. Haynes, Director of Contracts and Regulatory Oversight

Municipal Electric Authority of Georgia

Mr. S. M. Jackson, Vice President, Power Supply

Dalton Utilities

Mr. D. Cope, President and Chief Executive Officer

Bechtel Power Corporation

Mr. J. S. Prebula, Project Engineer (w/o enclosure)
Mr. R. W. Prunty, Licensing Engineer

Tetra Tech NUS, Inc.

Ms. K. K. Patterson, Project Manager

Shaw Stone & Webster, Inc.

Mr. K. B. Allison, Project Manager (w/o enclosure)
Mr. J. M. Oddo, Licensing Manager
Mr. D. C. Shutt, Licensing Engineer

Westinghouse Electric Company, LLC

Mr. W. E. Cummins, Vice President of Regulatory Affairs & Standardization (w/o enclosure)
Mr. N. C. Boyter, Consortium Project Director Vogtle Units 3 & 4 (w/o enclosure)
Mr. S. A. Bradley, Vogtle Project Licensing Manager
Mr. R. B. Sisk, Manager, AP1000 Licensing and Customer Interface
Mr. J. L. Whiteman, Principal Engineer, Licensing & Customer Interface
Mr. D. A. Lindgren, Principal Engineer AP1000 Licensing and Customer Interface

NuStart Energy

Mr. R. J. Grumbir
Mr. E. R. Grant
Mr. B. Hirmanpour
Mr. N. Haggerty
Ms. K. N. Slays

Other NuStart Energy Associates

Ms. M. C. Kray, NuStart
Mr. S. P. Frantz, Morgan Lewis
Mr. P. S. Hastings, NuStart & Duke Energy
Mr. J. A. Bailey, TVA
Ms. A. L. Sterdis, TVA
Mr. J. P. Berger, EDF
Mr. M. W. Gettler, FP&L
Mr. P. Hinnenkamp, Entergy
Mr. G. D. Miller, PG&N
Mr. M. C. Nolan, Duke Energy
Mr. N. T. Simms, Duke Energy
Mr. G. A. Zinke, NuStart & Entergy
Mr. R. H. Kitchen, PGN
Ms. A. M. Monroe, SCE&G
Mr. R. Reister, DOE/PM

Southern Nuclear Operating Company

ND-09-1710

Enclosure

Revised Response to NRC RAI Letter No. 037

on the

VEGP Units 3 and 4 COL Application

Involving

Interfaces with Standard AP1000 Design

FSAR Section 1.8, Interfaces for Standard Design

eRAI Tracking No. 3090

NRC RAI Number 01-2:

The applicant incorporated by reference Section 1.8 of the DCD. This section of the DCD identifies certain interfaces with the standard design that have to be addressed in accordance with 10 CFR 52.47(a)(1)(vii)(Note: following the update to Part 52, this provision has changed to 52.47(a)(25)). As required by 52.79(d)(2), the COL applicant must demonstrate how these interface items have been met. SNC must explicitly identify how these interface items have been met.

SNC Response:

Explicit identification of the FSAR location of information addressing the interface items identified in Section 1.8 of the DCD is provided in new FSAR Table 1.8-205, as shown in the Application Revisions section below. Some clarifying remarks are provided below for a few items that have been addressed by the DCD since the interface item listing was created. During the COL review to develop the new FSAR table, it was also determined that additional information is necessary for a few items.

Item 1.1 and Items 18.14-18.5 – During review for this request, Westinghouse determined that these items have been previously completed within the DCD. Thus, Westinghouse is expected to remove these items in a future revision to the DCD. As such, ~~Note 2 indicates that~~ these items are not ~~further~~ addressed in the COLA.

Item 3.3 – The “trigger” value portion of this information is not currently in Revision 1 of the FSAR, but will be included as shown in the Application Revision section below.

Item 8.2 – This information is not currently in Revision 1 of the FSAR, but will be included as shown in the Application Revision section below.

Item 9.4 – This information is not currently in Revision 1 of the FSAR, but will be included as shown in the Application Revision section below.

Item 11.1 - This information is not currently in Revision 1 of the FSAR, but will be included as shown in the Application Revision section below. Note that there are no liquid waste systems outside the AP1000 design scope and thus, there are no site specific parameters. There is one site specific interface; liquid releases are discharged into the Savannah River.

Item 11.2 - This information is not currently in Revision 1 of the FSAR, but will be included as shown in the Application Revision section below. Note that there are no gaseous waste systems outside the AP1000 design scope and thus, there are no site specific parameters or interfaces.

The information shown below will be incorporated into a future application revision.

This response is PLANT-SPECIFIC.

Associated VEGP COL Application Revisions:

1. COLA Part 2, FSAR Chapter 1, Section 1.8, will be revised to include the following new paragraph at the end of the section with a left margin annotation (LMA) of VEGP SUP 1.8-6:
“DCD Table 1.8-1 presents interface items for the AP1000. FSAR section(s) addressing these interface items are tabulated in Table 1.8-205.”
2. COLA Part 2, FSAR Chapter 1, Section 1.8, will be revised to include the following new table with an LMA of VEGP SUP 1.8-6:

Table 1.8-205
Summary of FSAR Discussions of AP1000 Plant Interfaces

Item No.	Interface	Interface Type	Matching Interface Item	Section or Subsection ⁽¹⁾
1.1	Post accident Radio-Iodine sampling capability per NUREG 0737	Requirement of AP1000	Combined License applicant program	(2)
2.1	Envelope of AP1000 plant site related parameters	Site Interface	Site specific parameters	Table 2.0-201 Table 2.0-202
2.2	External missiles from man-made hazards and accidents	Site Interface	Site specific parameters	ESPA SSAR 2.2.2.6 ESPA SSAR 2.2.3.1 2.2.3.2 3.5
2.3	Maximum loads from man-made hazards and accidents	Site Interface	Site specific parameters	ESPA SSAR 2.2.3.1 2.2.3.2
2.4	Limiting meteorological parameters (χ/Q) for design basis accidents and for routine releases and other extreme meteorological conditions for the design of systems and components exposed to the environment.	Site Interface	Site specific parameters	Table 2.0-201 Table 2.0-202
2.5	Tornado and operating basis wind loadings	Site Interface	Site specific parameters	Table 2.0-201
2.6	External missiles generated by natural phenomena	Site Interface	Site specific parameters	Table 2.0-201
2.7	Snow, ice and rain loads	Site Interface	Site specific parameters	2.3.1.3.4
2.8	Ambient air temperatures	Site Interface	Site specific parameters	Table 2.0-201
2.9	Onsite meteorological measurement program	Requirement of AP1000	Combined License applicant program	2.3.3.4
2.10	Flood and ground water elevations	Site Interface	Site specific parameters	Table 2.0-201
2.11	Hydrostatic loads on systems, components and structures	Site Interface	Site specific parameters	Table 2.0-201

Item No.	Interface	Interface Type	Matching Interface Item	Section or Subsection ⁽¹⁾
2.12	Seismic parameters - peak ground acceleration - response spectra - shear wave velocity	Site Interface	Site specific parameters	Table 2.0-201
2.13	Required bearing capacity of foundation materials	Site Interface	Site specific parameters	Table 2.0-201
3.1	Deleted	N/A	N/A	N/A
3.2	Operating procedures to minimize water hammer	Requirement of AP1000	Combined License applicant procedure	10.3.2.2.1 10.4.7.2.1
3.3	Site seismic sensor location and "trigger" value	Requirement of AP1000	Onsite implementation	3.7.4.2.1 DCD-3.7.4.2
3.4	Depth of overburden	Requirement of AP1000	Onsite implementation	ESPA SSAR 2.5.4.5 3.8.5.1
3.5	Depth of embedment	Requirement of AP1000	Onsite implementation	ESPA SSAR 2.5.4.5 3.8.5.1
3.6	Specific depth of waterproofing	Requirement of AP1000	Onsite implementation	ESPA SSAR 2.5.4.5.7 ESPA SSAR 3.8.5.1 3.8.5.1
3.7	Foundation Settlement Monitoring	Requirement of AP1000	Combined License applicant coordination	ESPA SSAR 2.5.4.10.2
3.8	Lateral earth pressure loads	Not an Interface	N/A	N/A
3.9	Preoperational piping vibration test parameters	Not an Interface	N/A	N/A
3.10	Inservice Inspection requirements and locations	Requirement of AP1000	Combined License applicant program	3.9.6 5.2.4 6.6
3.11	Maintenance of preservice and reference test data for inservice testing of pumps and valves	Requirement of AP1000	Combined License applicant program	3.9.6
3.12	Earthquake response procedures	Requirement of AP1000	Combined License applicant program	3.7.4.4
5.1	Steam Generator Tube Surveillance Requirements	Requirement of AP1000	Combined License applicant program	5.4.2.5
6.1	Inservice Inspection requirements for the containment	Requirement of AP1000	Combined License applicant program	6.6
6.2	Off site environmental conditions assumed for Main Control Room and control support area habitability design	AP1000 Interface	Site specific parameter	ESPA SSAR 2.2.3 2.2.3 6.4
7.1	Listing of all design criteria applied to the design of the I&C systems	Not an Interface	N/A	N/A

Item No.	Interface	Interface Type	Matching Interface Item	Section or Subsection ⁽¹⁾
7.2	Power required for site service water instrumentation	NNS and Not an Interface	N/A	N/A
7.3	Other provisions for site service water instrumentation	NNS and Not an Interface	N/A	N/A
8.1	Listing of design criteria applied to the design of the offsite power system	NNS	Combined License applicant coordination	8.1.4.3
8.2	Offsite ac requirements: - Steady-state load; - Inrush kVA for motors; - Nominal voltage; - Allowable voltage regulation; - Nominal frequency; - Allowable frequency fluctuation; - Maximum frequency decay rate; - Limiting under frequency value for RCP	NNS	Combined License applicant coordination	8.2.2
8.3	Offsite transmission system analysis: - Loss of AP1000 or largest unit; - Voltage operating range; - Transient stability must be maintained and the RCP bus voltage must remain above the voltage required to maintain the flow assumed in Chapter 15 analyses for a minimum of three (3) seconds following a turbine trip.; - The protective devices controlling the switchyard breakers are set with consideration given to preserving the plant grid connection following a turbine trip.	NNS	Combined License applicant analysis	8.2.1.2.1 8.2.2 14.2.9.4.23
8.4	Listing of design criteria applied to the design of onsite ac power systems	NNS and Not an Interface	N/A	N/A
8.5	Onsite ac requirements	NNS and Not an Interface	N/A	N/A
8.6	Diesel generator room coordination	NNS and Not an Interface	N/A	N/A
8.7	Listing of design criteria applied to the design of onsite dc power systems	Not an Interface	N/A	N/A

Item No.	Interface	Interface Type	Matching Interface Item	Section or Subsection ⁽¹⁾
8.8	Provisions of dc power systems to accommodate the site service water system	NNS and Not an Interface	N/A	N/A
9.1	Listing of design criteria applied to the design of portions of the site service water within AP1000	NNS and Not an Interface	N/A	N/A
9.2	Integrated heat load to site service water system	NNS and Not an Interface	N/A	N/A
9.3	Plant cooling water systems parameters	NNS and Not an Interface	N/A	N/A
9.4	Plant makeup water quality limits	NNS	Site specific parameter	9.2.11
9.5	Requirements for location and arrangement of raw and sanitary water systems	NNS	Site implementation	9.2.5 9.2.6 9.2.11
9.6	Ventilation requirements for diesel-generator room	NNS and Not an Interface	N/A	N/A
9.7	Requirements to satisfy fire protection program	AP1000 Interface	Combined License applicant program	9.5.1
11.1	Expected release rates of radioactive material from the Liquid Waste System including: - Location of release points - Effluent temperature - Effluent flow rate - Size and shape of flow orifices	Site Interface	Site specific parameters	11.2
11.2	Expected release rates of radioactive materials from the Gaseous Waste System including: - Location of release points - Height above grade - Height relative to adjacent buildings - Effluent temperature - Effluent flow rate - Effluent velocity - Size and shape of flow orifices	Site Interface	Site specific parameters	11.3
11.3	Expected release rates of radioactive material from the Solid Waste System including: - Location of release points - Material types - Material qualities - Size and shape of material containers	Site Interface	Site specific parameters	11.4.6

Item No.	Interface	Interface Type	Matching Interface Item	Section or Subsection ⁽¹⁾
11.4	Requirements for offsite sampling and monitoring of effluent concentrations	AP1000 Interface	Combined License applicant program	11.5.3 11.5.7
12.1	Identification of miscellaneous radioactive sources	AP1000 Interface	Combined License applicant program	12.2.1.1.10
13.1	Features that may affect plans for coping with emergencies as specified in 10 CFR 50, Appendix O	AP1000 Interface	Combined License applicant program	13.3
13.2	Physical Security Plan consistent with AP1000 plant	AP1000 Interface	Combined License applicant program	13.6
14.1	Identification of special features to be considered in development of the initial test program	Requirement of AP1000	Combined License applicant program	14
14.2	Maintenance of preoperational test data and inservice inspection baseline data	AP1000 Interface	Combined License applicant program	14
16.1	Administrative requirements associated with reliability information maintenance	AP1000 Interface	Combined License applicant program	16.3
16.2	Administrative requirements associated with the Technical Specifications	Requirement of AP1000	Combined License applicant implementation	16.1
16.3	Site and operator related information associated with the Reliability Assurance Program (D-RAP)	Requirement of AP1000	Combined License applicant program	16.2
18.1	Operating staff consistent with Human Factors evaluations	AP1000 Interface	Combined License applicant program	18.6 ⁽²⁾
18.2	Operator training consistent with Human Factors evaluations	AP1000 Interface	Combined License applicant program	18.8 18.10 ⁽²⁾
18.3	Operating Procedures consistent with Human Factors evaluations	AP1000 Interface	Combined License applicant program	18.8 18.10 ⁽²⁾
18.4	Final coordination and integration of human-system interface areas within a specific AP1000-consistent-with Human Factors evaluations	AP1000 Interface	Combined License applicant program	(2)
18.5	Final coordination and integration of Combined License applicant facilities with those of a specific AP1000-consistent-with Human Factors evaluations	AP1000 Interface	Combined License applicant program	(2)

Note 1 – This table supplements DCD Table 1.8-1 by providing additional information in the Section or Subsection column. Section/Subsection designations are FSAR unless otherwise noted.

~~Note 2—Westinghouse has determined that this item has been fully addressed by the DCD. Thus, the item is not addressed by the COLA~~

3. COLA Part 2, FSAR Chapter 3, Subsection 3.7.4.2.1, will be revised to add the following sentence to the end of the existing FSAR added text:

"The trigger value is initially set at 0.01g."

- 3.4. COLA Part 2, FSAR Chapter 8, Subsection 8.2.2, ~~last~~^{second} paragraph of VEGP COL~~SUP~~^{8.2-24}, will be revised from:

"The results of the study conclude that the transmission system remains stable preserving the grid connection, and supporting RCP operation for at least three seconds following a turbine trip under the modeled conditions~~The grid stability analysis confirmed that the interface requirements for steady state load, nominal voltage, allowable voltage regulation, nominal frequency, allowable frequency fluctuation, maximum frequency decay rate, and limiting under frequency value for RCP have been met.~~"

To read:

"Table 8.2-201 confirms that the interface requirements for steady state load, inrush kVA for motors, nominal voltage, allowable voltage regulation, nominal frequency, allowable frequency fluctuation, maximum frequency decay rate, and limiting under frequency value for RCP have been met."

5. COLA Part 2, FSAR Chapter 8, Subsection 8.2.2, VEGP SUP 8.2-4, will be revised from:

"In addition to turbine trip, the grid stability analysis also considered normally-cleared three-phase faults on the transmission system and three-phase faults followed by breaker failure at the VEGP 500 kV and 230 kV switchyards. A 500 kV line out for maintenance with a normally cleared fault on another 500 kV line was also studied. The results demonstrate that the grid remains stable for the loss of the most critical transmission line, the loss of the largest load, and the loss of the largest generating unit. For these contingencies, the generator bus voltages and switchyard voltages (after fault clearing) remain well within the required limits.

The grid stability analysis confirmed that the interface requirements for steady state load, nominal voltage, allowable voltage regulation, nominal frequency, allowable frequency fluctuation, maximum frequency decay rate, and limiting under frequency value for RCP have been met."

To read:

"In addition to turbine trip, the grid stability analysis also considered normally-cleared three-phase faults on the transmission system and three-phase faults followed by breaker failure at the VEGP 500 kV and 230 kV switchyards. A 500 kV line out for maintenance with a normally cleared fault on another 500 kV line was also studied. The results demonstrate that the grid remains stable for the loss of the most critical transmission line, the loss of the largest load, and the loss of the largest generating unit. For these contingencies, the generator bus voltages and switchyard voltages (after fault clearing) remain within acceptable steady state voltage limits."

- 4.6. COLA Part 2, FSAR Chapter 8, will be revised to include the following new Table 8.2-201 with an LMA of VEGP COL 8.2-2:

Table 8.2-201
Grid Stability Interface Evaluation

DCD Table 1.8-1 Item 8.2 Parameter	Westinghouse Offsite AC Requirement	VEGP 3&4 Value Assumed
Steady-state load	"normal running values provided as input to grid stability"	(78.2 + j 41.7) MVA
Inrush kVA for motors	56,712 kVA*	56,712 kVA @ locked rotor power factor (I _{rp}) = 0.15 pu
Nominal voltage	Not provided	1.03 pu (517 kV) 1.02 pu (235 kV)
Allowable voltage regulation	0.95 -1.05 pu steady state ± 20% total for transient 0.15 pu transient dip**	0.95 -1.05 pu steady state ± 20% total for transient 0.15 pu transient dip**
Nominal frequency	60 Hz	60 Hz
Allowable frequency fluctuation	± ½ Hz indefinite	± ½ Hz indefinite
Maximum frequency decay rate	5 Hz/sec	5 Hz/sec

* Based on the inrush of a single 10,000 HP feedwater pump assuming efficiency = 0.95, pf = 0.9, and inrush = 6.5 x FLA

** Applicable to Turbine Trip Only. The maximum allowable voltage dip from the pre-event steady state voltage value during the 3 second turbine trip event transient as measured at the point of connection to the high side of the generator step-up transformer and the reserve auxiliary transformer.

DCD Table 1.8-1 Item 8.2 Parameter	Westinghouse Offsite AC Requirement	VEGP 3&4 Value Calculated
Limiting under frequency value for RCP	≥ 57.7 Hz	> 59.85 Hz

- 5.7. COLA Part 2, FSAR Chapter 9, Section 9.2.11.2.1.1 will be revised to add the following at the end of the last paragraph:

"No additional water treatment is required for the RWS river water subsystem."

- 6.8. COLA Part 2, FSAR Chapter 9, Section 9.2.11.2.1.2 will be revised to add the following at the end of the first paragraph:

"The quality of the water provided by the deep wells is sufficient for the required services. No additional water treatment is required for the RWS well water subsystem."

- ~~7.9.~~ COLA Part 2, FSAR Chapter 11, Section 11.2, will be revised to add the following subsection with LMA of VEGP SUP 11.2-2:

11.2.3 Radioactive Releases

Add the following new paragraph at the end of DCD Subsection 11.2.3:

The only liquid effluent site interface parameter outside of the Westinghouse scope is the release point to the Savannah River.

- ~~8.10.~~ COLA Part 2, FSAR Chapter 11, Section 11.3, will be revised to add the following subsection with LMA of STD SUP 11.3-2:

11.3.3 Radioactive Releases

Add the following new paragraph at the end of DCD Subsection 11.3.3:

There are no gaseous effluent site interface parameters outside of the Westinghouse scope.

ASSOCIATED ATTACHMENTS/ENCLOSURES:

None