PMVogtleCOLPEm Resource

From: Javorka, Deborah A. [DAJavork@southernco.com]
Sent: Friday, October 23, 2009 4:24 PM
To: Miller, James H., III; Gasser, Jeff T.; Miller, Buzz (Joseph); Jones, David H.; Tynan, Tom E.; Smith, Michael K.; Lloyd, Dale M.; Ajluni, Mark J.; Sparkman, Wesley A.; Sweeney, Brian J.; Aughtman, Amy G.; Reyes, Luis; Akstulewicz, Frank; Joshi, Ravindra; Hughes, Brian; Simms, Tanya; Anderson, Brian; Comar, Manny; Notich, Mark; Cain, Loyd; Harper, Oscar C.; Mr. J.S. Prebula; Mr. R.W. Prunty; Mr. K.B. Allison; Mr. J.M. Oddo; Mr. D.C. Shutt; Mr. E. Cummins; Norm Boyter; Sam Bradley; Mr. R.B. Sisk; Mr. J.L. Whiteman; Mr. D.A. Lindgren (lindg1da@westinghouse.com); Mr. R.J. Grumbir; Mr. E. Grant ; Mr. B. Hirmanpour; neilhaggerty@comcast.net; Ms. K.N. Slays; Pierce, Chuck R.
Cc: Williams, Dana M.
Subject: SNC Letter ND-09-1709 - SNC VEGP Units 3&4 Combined License Application Revised Response to RAI Letter No. 034
Attachments: ND-09-1709.pdf

Importance: High

An electronic copy of Southern Nuclear's letter, ND-09-1709 dated October 23, 2009 is attached.
A hard copy has been transmitted to the NRC Document Control Desk via FedEx. Thanks!

Deborah Javorka
Southern Nuclear Operating Company
Nuclear Development / Project Controls
42 Inverness Center Parkway - Bin B236
Birmingham, AL 35242
dajavork@southernco.com
Phone: (205) 992-5187
Fax: (205) 992-5296

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Subject: SNC Letter ND-09-1709 - SNC VEGP Units 3&4 Combined License Application Revised Response to RAI Letter No. 034
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From: Javorka, Deborah A.

Created By: DAJavork@southernco.com

Recipients:
"Williams, Dana M." <DANAWILL@SOUTHERNCO.COM>
Tracking Status: None
"Miller, James H., III" <JHMILLER@southernco.com>
Tracking Status: None
"Gasser, Jeff T." <JTGASSER@southernco.com>
Tracking Status: None
"Miller, Buzz (Joseph)" <JAMILLER@southernco.com>
Tracking Status: None
"Jones, David H." <DAHJONES@southernco.com>
Tracking Status: None
"Tynan, Tom E." <TETYNAN@southernco.com>
Tracking Status: None
"Smith, Michael K." <MKSmith@southernco.com>
Tracking Status: None
"Lloyd, Dale M." <DMLLOYD@southernco.com>
Tracking Status: None
"Ajluni, Mark J." <MJAJLUNI@southernco.com>
Tracking Status: None
"Sparkman, Wesley A." <WASPARKM@southernco.com>
Tracking Status: None
"Sweeney, Brian J." <X2SWEENE@southernco.com>
Tracking Status: None
"Aughtman, Amy G." <AGAUGHTM@SOUTHERNCO.COM>
Tracking Status: None
"Reyes, Luis" <Luis.Reyes@nrc.gov>
Tracking Status: None
"Akstulewicz, Frank" <Frank.Akstulewicz@nrc.gov>
Tracking Status: None
"Joshi, Ravindra" <Ravindra.Joshi@nrc.gov>
Tracking Status: None
"Hughes, Brian" <Brian.Hughes@nrc.gov>
Tracking Status: None
"Simms, Tanya" <Tanya.Simms@nrc.gov>
Tracking Status: None
"Anderson, Brian" <Brian.Anderson@nrc.gov>
Tracking Status: None
"Comar, Manny" <Manny.Comar@nrc.gov>
Tracking Status: None
"Notich, Mark" <Mark.Notich@nrc.gov>
Tracking Status: None

"Cain, Loyd" <Loyd.Cain@nrc.gov>
Tracking Status: None
"Harper, Oscar C." <OCHARPER@southernco.com>
Tracking Status: None
"Mr. J.S. Prebula" <jprebula@bechtel.com>
Tracking Status: None
"Mr. R.W. Prunty" <rwprunty@bechtel.com>
Tracking Status: None
"Mr. K.B. Allison" <kenneth.allison@shawgrp.com>
Tracking Status: None
"Mr. J.M. Oddo" <john.oddo@shawgrp.com>
Tracking Status: None
"Mr. D.C. Shutt" <daniel.shutt@shawgrp.com>
Tracking Status: None
"Mr. E. Cummins" <cumminwe@westinghouse.com>
Tracking Status: None
"Norm Boyter" <boyternc@westinghouse.com>
Tracking Status: None
"Sam Bradley" <bradlesa@westinghouse.com>
Tracking Status: None
"Mr. R.B. Sisk" <sisk1rb@westinghouse.com>
Tracking Status: None
"Mr. J.L. Whiteman" <whitemjl@westinghouse.com>
Tracking Status: None
"Mr. D.A. Lindgren (lindg1da@westinghouse.com)" <lindg1da@westinghouse.com>
Tracking Status: None
"Mr. R.J. Grumbir" <rgrumbir@gmail.com>
Tracking Status: None
"Mr. E. Grant " <eddie.grant@excelservices.com>
Tracking Status: None
"Mr. B. Hirmanpour" <Bob.Hirmanpour@excelservices.com>
Tracking Status: None
"neilhaggerty@comcast.net" <neilhaggerty@comcast.net>
Tracking Status: None
"Ms. K.N. Slays" <Kim.Slays@duke-energy.com>
Tracking Status: None
"Pierce, Chuck R." <CRPIERCE@southernco.com>
Tracking Status: None

Post Office: FMXAPEX81PR.southernco.com

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

SOUTHERN COMPANY
Energy to Serve Your World™

OCT 23 2009

Docket Nos.: 52-025
52-026

ND-09-1709

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4 Combined License Application
Revised Response to Request for Additional Information Letter No. 034

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 the offsite electrical power system, required to complete their review of the COL application's Final Safety Analysis Report (FSAR) Section 8.2, "Offsite Power System." By letter dated April 22, 2009, the NRC provided SNC with Request for Additional Information (RAI) Letter No. 034 concerning this information need. That RAI letter contained two RAI questions numbered 08.02-10 and -11. By letter dated May 22, 2009, SNC provided a response for these RAIs. However, based on teleconference calls with the NRC involving electrical interface requirements and additional follow-up by SNC, the responses to RAI numbers 08.02-10 and -11 are being revised. The enclosure to this letter provides SNC's revised response to these RAIs.

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

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. Jaworka

My commission expires: October 24, 2012

CRP/BJS/dmw

Enclosure: Revised Response to NRC RAI Letter No. 034 on the VEGP Units 3 and 4 COL Application Involving The Electrical Switchyard

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
Document Services RTYPE: AR01.1053
File AR.01.02.06

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-09-1709

Enclosure

Revised Response to NRC RAI Letter No. 034

on the

VEGP Units 3 and 4 COL Application

Involving

The Electrical Switchyard

FSAR Section 8.2, Offsite Power System

eRAI Tracking No. 2339

NRC RAI Number 08.02-10:

(RAI-SRP 8.2-EEB-11) - VEGP existing Units 1 and 2, and proposed Unit 3 share a common switchyard. Please demonstrate that such sharing will not significantly impair the ability of the switchyard components to perform their functions and that the capacity of incoming lines for each required circuit and other switchyard components will be adequately designed for the operation of the other Units.

SNC Response:

As discussed in VEGP Units 3 and 4 FSAR, sections 8.1 and 8.2, VEGP Unit 3 will be connected to the existing Units 1 and 2, 230/500kV switchyard, and Unit 4 will be connected to a new 500 kV switchyard which is connected to the existing 500 kV portion of the Units 1 and 2, 230/500kV switchyard.

The circuit capacity ratings for the transmission system supplying the Vogtle 500kV and 230kV switchyards are based on accepted engineering practices and comply with North American Electric Reliability Corporation (NERC) standards. The combined output of the four Vogtle units represents approximately 4500 MW of generation to be exported to system loads from the site. Transmission planning studies were performed consistent with or exceeding NERC requirements. The studies concluded that the transmission system, including the modifications planned to support the addition of Units 3 and 4 as described further below, will accommodate the power output from Vogtle Units 1, 2, 3 and 4.

The Vogtle offsite power source was also studied under varying combinations of a single unit off-line combined with a single transmission system element out-of-service. A limiting case was studied which assumed all four Vogtle units were off-line with all transmission elements in service. Three of the four units were assumed to be "tripped" carrying station service loads. The fourth unit was assumed to be in a design basis accident with the appropriate station service load modeled. The study results indicate the resulting transmission system voltages are within the allowable ranges and the loadings on the transmission facilities supplying the Vogtle 230kV and 500kV switchyards are within their ratings.

The addition of these two new AP1000 units requires numerous design changes to the existing switchyard, protective relaying and transmission system at the Vogtle site. The types of design changes that are required to support the addition of Units 3 and 4 include, but are not limited to:

- Replacing numerous 230 kV and 500 kV breakers in the existing 230/500 kV switchyard with higher capacity independent pole-operated breakers.
- Adding one 2% 230 kV series reactor on the low side of each of the two existing 500/230kV transformer banks.
- Modifying the existing 500kV switchyard by converting the 500kV bus to a breaker-and-a-half configuration.

- Adding a new 500kV switchyard to the existing 230/500 kV switchyard with a breaker-and-a-half configuration.

- Rerouting the West McIntosh and Scherer lines to the new 500 kV switchyard.

- Construction of a new 230kV switchyard along the Augusta Newsprint transmission line to serve the new Reserve Auxiliary Transformers (RATs) for Units 3 and 4.

These and other design changes to the switchyard, protective relaying and the studies performed on the transmission system will ensure that the required circuits and switchyard components for all four units can adequately perform their intended functions under normal, abnormal and accident conditions.

This response is PLANT-SPECIFIC.

NRC RAI Number 08.02-11:

(RAI-SRP 8.2-EEB-12) - The applicant's response to RAI 08.02-9 in a letter dated January 16, 2009, cited language in its FSAR, Section 8.2.2, where the load flow case assumptions are discussed. The applicant stated that the scheduled voltages are the worst expected voltages. These worst expected voltages will be at 15% from the pre-trip steady-state voltages. However, VEGP's response to RAI 08.02-5 states that after the loss of the largest unit in the area, the voltage will recover to a value well-within the Westinghouse requirement of +/- 20% for a transient event. Provide clarification on what is the actual worst expected switchyard voltage under any operating condition. Explain the discrepancies between these two responses.

SNC Response:

~~There are no discrepancies between the responses previously provided in RAI 08.02-5 and RAI 08.02-09.~~ Steady state and transient voltage requirements for the grid stability analysis were provided by Westinghouse. Southern Transmission Planning understood that the +/- 20% applied to transients for all grid stability studies, including faulted transmission system stability studies. However, after additional discussions and correspondence with Westinghouse, the allowable voltage fluctuation value of +/- 20% total for the transient was not intended to be used as acceptance criteria for transients other than the turbine trip. Further, this +/- 20% value is based on the total allowable voltage drop at the RCP motor, not the high side of the GSU and RATs. Therefore the +/- 20% should not have been included as an offsite power interface requirement. The results of the steady state and transient studies are summarized as follows:

- Under steady state conditions (no line faults, load losses, transients, or unit trips) the minimum pre-trip scheduled switchyard voltages at the Vogtle 230 kV and 500 kV switchyards are as described in the response to RAI 08.02-9 (235 kV and 517 kV). While maintaining the scheduled voltage, the steady-state generator bus voltage is maintained within the Westinghouse requirement of 0.95 p.u. to 1.05 p.u.

- To ensure adequate voltage is maintained to the reactor coolant pumps for 3 seconds following a turbine trip event, Westinghouse also requires that the voltage at the high side of the generator step-up transformer (GSU) and reserve auxiliary transformers (RATs) not drop more than 0.15 p.u. ~~15%~~ from the pre-trip steady state voltage. A grid

stability study for VEGP Units 3 and 4 was performed which concluded that during a turbine trip event, the voltage at the high side of the GSU and RATs would drop a maximum of 0.05 p.u.~~5%~~ on a transient basis and recover to an acceptable post-trip steady state value. Therefore, the turbine trip event is well within the Westinghouse requirement.

- In addition to the turbine trip event discussed above, SNC also evaluated other~~During~~ transients, such as a loss of the most critical transmission line or fault on a transmission line~~ the Westinghouse requirement is to maintain the generator bus voltage within +/- 20%~~. The most significant transient was determined to be a fault on the West McIntosh 500 kV line. During this transient, after the fault clears (within approximately 6 cycles), generator bus voltage recovers to an acceptable steady state voltage~~within 0.8 p.u. and returns to the pre-transient voltage within seconds, thereby satisfying the Westinghouse requirement~~.

  In summary, only during short term transient conditions does the generator bus voltage or switchyard voltage drop below the steady state voltage stated above. All Westinghouse voltage requirements are met as described in FSAR subsection 8.2.2, Grid Stability.

This response is PLANT-SPECIFIC.