PMVogtleCOLPEm Resource

From: Williams, Dana M. [DANAWILL@SOUTHERNCO.COM]
Sent: Friday, November 20, 2009 3:57 PM
To: Lloyd, Dale M.; Smith, Michael K.; Pierce, Chuck R.; Ajluni, Mark J.; Sparkman, Wesley A.; Joshi, Ravindra; Hughes, Brian; Simms, Tanya; Anderson, Brian; Comar, Manny; Ms. S. Goetz ; Mr. J. M. Sebrosky; Mr. D.C. Habib; Mr. C.P. Patel; Mr. M. A. Sutton; Notich, Mark; Cain, Loyd; Harper, Oscar C.; Mr. M.W. Price; Mr. K.T. Haynes; Jackson, S. (MEAG); Cope, D. (Dalton Utilities); Mr. R.W. Prunty; Mr. K.K. Patterson; Mr. J.M. Oddo; Mr. D.C. Shutt; Mr. S.A. 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; neil.haggerty@excelservices.com; Ms. K.N. Slays
Cc: Sweeney, Brian J.
Subject: SNC Letter ND-09-1834 Transmitting Supplemental Response to RAI Letter No. 021 Related to Radiation Protection
Attachments: ND-09-1834.pdf

An electronic copy of Southern Nuclear's letter, ND-09-1834 , dated November 20, 2009 is attached. In addition, a hard copy has been transmitted the Nuclear Regulatory Commission Document Control Desk.

Thank you,

Dana M. Williams
Southern Nuclear Operating Company
Nuclear Development
42 Inverness Center Parkway
Bin B237
Birmingham, AL 35242
P 205.992.5934
F 205.992.5296

Hearing Identifier: Vogtle_COL_Public
Email Number: 283

Mail Envelope Properties (C8CE669ABE8AB646AD06AC86BF039E6EA4BCBC2C)

Subject: SNC Letter ND-09-1834 Transmitting Supplemental Response to RAI Letter No. 021 Related to Radiation Protection
Sent Date: 11/20/2009 3:56:36 PM
Received Date: 11/20/2009 3:57:48 PM
From: Williams, Dana M.

Created By: DANAWILL@SOUTHERNCO.COM

Recipients:
"Sweeney, Brian J." <X2SWEENE@southernco.com>
Tracking Status: None
"Lloyd, Dale M." <DMLLOYD@southernco.com>
Tracking Status: None
"Smith, Michael K." <MKSmith@southernco.com>
Tracking Status: None
"Pierce, Chuck R." <CRPIERCE@southernco.com>
Tracking Status: None
"Ajluni, Mark J." <MJAJLUNI@southernco.com>
Tracking Status: None
"Sparkman, Wesley A." <WASPARKM@southernco.com>
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
"Ms. S. Goetz " <'sujata.goetz@nrc.gov'>
Tracking Status: None
"Mr. J. M. Sebrosky" <'joseph.sebrosky@nrc.gov'>
Tracking Status: None
"Mr. D.C. Habib" <'donald.habib@nrc.gov'>
Tracking Status: None
"Mr. C.P. Patel" <'chandu.patel@nrc.gov'>
Tracking Status: None
"Mr. M. A. Sutton" <'mallecia.sutton@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. M.W. Price" <'mike.price@opc.com'>
Tracking Status: None

"Mr. K.T. Haynes" <'Kim.Haynes@OPC.com'>
Tracking Status: None
"Jackson, S. (MEAG)" <sjackson@meagpower.org>
Tracking Status: None
"Cope, D. (Dalton Utilities)" <dcope@dutil.com>
Tracking Status: None
"Mr. R.W. Prunty" <rwprunty@bechtel.com>
Tracking Status: None
"Mr. K.K. Patterson" <Karen.Patterson@ttnus.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. S.A. 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
"neil.haggerty@excelservices.com" <neil.haggerty@excelservices.com>
Tracking Status: None
"Ms. K.N. Slays" <Kim.Slays@duke-energy.com>
Tracking Status: None

Post Office: FMXAPEX82PR.southernco.com

Files	**Size**	**Date & Time**
MESSAGE	429	11/20/2009 3:57:48 PM
ND-09-1834.pdf	822008	

Options

Priority:	Standard
Return Notification:	No
Reply Requested:	No
Sensitivity:	Normal
Expiration Date:	
Recipients Received:	

J. A. "Buzz" Miller
Executive Vice President
Nuclear Development

Southern Nuclear Operating Company, Inc.
42 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201

Tel 205.992.5754
Fax 205.992.6165

SOUTHERN COMPANY

NOV 20 2009

Docket Nos.: 52-025
52-026

ND-09-1834

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
Supplemental Response to Request for Additional Information Letter No. 021
Related to Radiation Protection

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 radiation protection, required to complete their review of the COL application's Final Safety Analysis Report (FSAR) Section 12.4, "Dose Assessment." By letter dated December 19, 2008, the NRC provided SNC with Request for Additional Information (RAI) Letter No. 021 concerning this radiation protection information need. That RAI letter contained three RAI questions numbered 12.03-12.04-1, -2 and -3. By letter dated January 16, 2009, SNC provided a response to these RAIs. SNC is supplementing its response to RAIs 12.03-12.04-1 and -2 based on NRC feedback provided in a phone call on October 20, 2009. The enclosure to this letter provides SNC's supplemental response to these RAIs.

If you have any questions regarding this letter, please contact Mr. Wes Sparkman at (205) 992-5061 or Ms. Amy Aughtman at (205) 992-5805.

Mr. J. A. (Buzz) Miller states he is an Executive Vice President 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

Joseph A. (Buzz) Miller

Sworn to and subscribed before me this 20th *day of* November, *2009*

Notary Public: Dana M. Williams

My commission expires: 12/29/2010

JAM/BJS/dmw

Enclosure: Supplemental Response to NRC RAI Letter No. 021 on the VEGP Units 3 & 4 COL Application Involving Radiation Protection

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. D. H. Jones, Site Vice President, Vogtle 3 & 4 (w/o enclosure)
Mr. T. E. Tynan, Vice President - Vogtle (w/o enclosure)
Mr. D. M. Lloyd, Vogtle 3 & 4 Project Support Director
Mr. M. K. Smith, Technical Support Director
Mr. C. R. Pierce, AP1000 Licensing Manager
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, Executive Vice President and 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-09-1834

Enclosure

Supplemental Response to NRC RAI Letter No. 021

on the VEGP Units 3 & 4 COL Application

Involving

Radiation Protection

FSAR Section 12.4, Dose Assessment

eRAI Tracking Nos. 1748, 1751 and 1752

NRC RAI Number 12.03-12.04-1:

Vogtle COL FSAR Section 12.4.1.9 provides a description of the potential sources of exposure to construction workers. The dose limits to the workers are reviewed by the staff to ensure compliance with 10 CFR 20.1301. 10 CFR 20.1301 (a)(1) states "Each licensee shall conduct operations so that the total effective dose equivalent to individual members to the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year."

Review of related Vogtle SCOL documents to support an independent assessment of compliance with the regulations, requires the staff to request additional information to make a determination of reasonable assurance. The supplemental information item VEGP SUP 12.4-1 provides information regarding dose to construction workers in the new FSAR Subsection 12.4.1.9 (Subsections 12.4.1.9.1 through 12.4.1.9.4). The information provided in FSAR Section 12.4.1.9.1-4 is not sufficient for the staff to validate and verify the estimated doses for Unit 3 and 4 construction workers. NRC staff is unable to make a determination that the application meets the acceptance criteria in SRP 12.3-4 and complies with the dose limits to a member of the public in 10 CFR 20.1301 and 1302.

The SCOL applicant used two years of environmental monitoring data (TLD measurements) to evaluate the potential direct radiation dose to construction workers associated with Units 1 and 2 operations. Provide the rationale as to why this two- year data set is representative of the average annual dose that would be received by a construction worker at this location. If the applicant has determined that the data set is applicable, describe the detection level and error bounds for doses based on the TLD measurements. Provide the information necessary to reproduce the calculations or reference where the information was obtained so that it is available to the staff to make an independent determination of construction worker dose estimates. Revise FSAR Section 12.4, as appropriate, to include the necessary information (e.g., rationale for using one year TLD data).

SNC Response:

The VEGP Units 1 and 2 TLD data from 2003 was used to calculate the estimated direct radiation dose to construction workers because it was the most complete and representative data set at the time the Vogtle Early Site Permit Application (ESPA) was submitted. The VEGP Units 3 and 4 COL Application discussion of construction worker's radiation exposure was first presented in the Vogtle ESPA Environmental Report. This data set from 2003 was determined to be representative because of the plant capacity factor of 95 percent for that year and the location of the TLD measurements at the protected area fence-line nearest the proposed construction site. The TLD data set for 2003 included the semi-annual TLD measurement results from the chosen locations (close to the construction site) and the quarterly TLD measurement results at the background levels, therefore the data for 2003 was determined to be the most complete. Evaluations using more recent TLD data from 2006 yield similar results to the 2003 TLD data (see Reference 1). The TLD measurements used to determine the dose estimate for construction workers is available in Southern Nuclear Operating Company (SNC) correspondence to the NRC, References 1, 2 and 3.

The TLD data used to estimate radiation exposure to construction workers is part of the VEGP Units 1 and 2 Environmental/Area Monitoring TLDs Program. These TLDs are processed and

evaluated by the dosimetry processor lab's internal quality control program and procedures for Environmental/Area Monitoring TLDs.

References:

1. Southern Nuclear Operating Company, Inc. (Southern). 2007a. Vogtle Early Site Permit Application Environmental Site Audit Information Needs - 2nd Round. Letter Report AR-07-0924 from Southern Nuclear Operating Company (Birmingham, Alabama) to the U.S. Nuclear Regulatory Commission (Washington, D.C.), May 10, 2007. Southern Company, Birmingham, Alabama. Accession No. **ML071510102**.

2. Southern Nuclear Operating Company, Inc. (Southern). 2007b. Southern Nuclear Operating Company, Vogtle Early Site Permit Application, Response to Requests for Additional Information on the Environmental Report. Letter report AR-07-0061 from Southern Nuclear Operating Company (Birmingham, Alabama) to the U.S. Nuclear Regulatory Commission (Washington D.C.), January 31, 2007. Southern Company, Birmingham, Alabama. Accession No. **ML070460323**.

3. Southern Nuclear Operating Company, Inc. (Southern). 2004a. Offsite Dose Calculation Manual for Southern Nuclear Operating Company Vogtle Electric Generating Plant, Version 22 June 25, 2004, Southern Company, Birmingham, Alabama. Accession No. **ML070360150**.

Associated VEGP COL Application Revisions:

COLA Part 2, FSAR Chapter 12, Subsection 12.4.1.9.3.1 will be revised to add the following to Units 1 and 2 External Radiation Exposure, at the beginning of the first paragraph:

"TLD data from 2003 is representative of annual results from Units 1 and 2, based on the completeness of the data set and having operated with a 95 percent plant capacity factor for that year."

NRC RAI Number 12.03-12.04-2:

Vogtle COL FSAR section 12.4.1.9 provides a description of the potential sources of exposure to construction workers. The dose limits to the workers are reviewed by the staff to ensure compliance with 10CFR20.1301. 10 CFR 20.1301 (a)(1) states "Each licensee shall conduct operations so that the total effective dose equivalent to individual members to the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year."

Review of related Vogtle SCOL documents to support an independent assessment of compliance with the regulations requires the staff to request additional information to make a determination of reasonable assurance. The supplemental information item VEGP SUP 12.4-1 provides information regarding dose to construction workers in the new FSAR Subsection 12.4.1.9 (Subsections 12.4.1.9.1 through 12.4.1.9.4). The information provided in FSAR Section 12.4.1.9.1-4 is not sufficient for the staff to validate and verify the estimated doses for Unit 3 and 4 construction workers. NRC staff is unable to make a determination that the application meets the acceptance criteria in SRP 12.3-4 and complies with the dose limits to a member of the public as specified in 10 CFR 20.1301 and 1302.

In FSAR section 12.4, the applicant addresses the direct dose component from Unit 3 to Unit 4 construction workers. The dose presented is based on an assumption that the Unit 3 dose to a Unit 4 construction worker would be 1/2 that determined from Units 1 and 2, which is based on TLD data. The applicant has not provided sufficient information to substantiate this assumption. The SCOL applicant should describe the basis for the estimated dose contribution from Unit 3 to a Unit 4 construction worker and/or provide an explanation of the sources of that dose. The applicant should include the applicability of radiation sources and the different location for Unit 4 construction workers as opposed to Unit 3 construction workers relative to their distance from Units 1 and 2.

The SCOL applicant's description of external exposure to the construction workers for Unit 3 includes a 15 millirem per year contribution from the Independent Spent Fuel Storage Installation (ISFSI). However, the dose to construction workers for Unit 4 does not include this ISFSI dose contribution. The applicant only states that the ISFSI will be placed west of Unit 2 and does not provide any other specific information that is necessary for evaluating the ISFSI dose contribution to Unit 3 and 4 construction workers. Please provide a detailed description of where the ISFSI is to be placed and/or update Figure 1.1-202 to indentify its intended placement. The applicant is also requested to describe the basis used for estimating the dose contribution from the proposed ISFSI.

SNC Response:

The source and bases of the TLD measurements used to estimate the dose to VEGP Units 3 and 4 construction workers from VEGP Units 1 and 2 is identified in the previous response (see RAI 12.03-12.04-1 discussion). The TLD measurements from the existing units (3625 MWt each) were estimated to be 33.5 mrem per year per unit. It is recognized that the distance from Units 1 and 2 to the construction workers is greater than the distance from the 3400 MWt Unit 3 to the construction workers on Unit 4.

For Unit 3, the radiation exposure at the site boundary is considered in DCD Subsection 12.4.2, which is incorporated by reference into the FSAR. As stated in that section and as concluded by the staff in the AP1000 Final Safety Evaluation Report (NUREG 1793), direct radiation from the containment and other plant buildings is negligible. Additionally, there is no contribution from refueling water since the refueling water is stored inside the containment instead of in an outside storage tank. Therefore, the direct radiation to Unit 4 construction workers from Unit 3 is negligible. For conservatism, the annual dose to a Unit 4 construction worker from Unit 3 direct radiation was assumed to be the same as the contribution from one existing unit (i.e., 1/2 that determined from Units 1 and 2).

In the VEGP FSAR Revision 0, the 15 mrem per year contribution from the ISFSI was based on data taken from TLDs located 300 feet away in a direct line of sight of the ISFSI. The 15 mrem dose projection took into consideration TLDs located over 600 feet away from the ISFSI which were the lowest readings onsite and represented background dose. The new location of the ISFSI, as specified in Revision 1 of the FSAR Subsection 12.4.1.9.2.1 and shown in FSAR Figure 1.1-202, is east of the Units 1 and 2 Protected Area which is greater than 600 feet away from the Units 3 and 4 construction area. Based on this distance of greater than 600 feet, the dose to construction workers from the planned ISFSI is expected to be negligible.

For consistency in describing the dose contributions of the ISFSI to construction workers as presented in the Early Site Permit Application (ESPA), the basis of the evaluation is contained in

ESPA Environmental Report RAI E4.5.3-1 response (Reference 1), as modified by the updated information above.

Reference:

1. Southern Nuclear Operating Company, Inc. (Southern). 2007b. Southern Nuclear Operating Company, Vogtle Early Site Permit Application, Response to Requests for Additional Information on the Environmental Report. Letter report AR-07-0061 from Southern Nuclear Operating Company (Birmingham, Alabama) to the U.S. Nuclear Regulatory Commission (Washington D.C.), January 31, 2007. Southern Company, Birmingham, Alabama. Accession No. **ML070460323**.