

February 23, 2007

Mr. J. A. "Buzz" Miller, Senior Vice President  
Nuclear Development  
Southern Nuclear Operating Company, Inc.  
40 Inverness Center Parkway  
P.O. Box 1295  
Birmingham, AL 35201

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 4 - SOUTHERN  
NUCLEAR OPERATING COMPANY EARLY SITE PERMIT (ESP)  
APPLICATION FOR THE VOGTLE ESP SITE

Dear Mr. Miller:

By letter dated August 14, 2006, Southern Nuclear Operating Company, Inc. (SNC), submitted an application for an early site permit (ESP) for the Vogtle ESP site. Subsequently, Southern Nuclear Operating Company (SNC) submitted changes to the Vogtle ESP application by a letter dated September 13, 2006, and on November 13, 2006, submitted Revision 1 to the application.

The U.S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of your ESP application and has determined that it needs additional information to continue portions of the safety review. Therefore, the NRC staff is requesting additional information with respect to the application. The topics covered in the requests for additional information (RAIs) contained in Enclosure 1 are related to Section 2.3 of the site safety analysis report in the ESP application.

The NRC staff sent the RAIs as a draft via electronic mail on February 15, 2007, and held follow up teleconferences on February 20, 2007, and February 23, 2007. During both teleconferences, the NRC staff addressed all clarification questions, and no major issues resulted from the discussions.

Receipt of the requested information, within 30 days of the date of this letter, will support the NRC's efficient and timely review of the SNC ESP application. Please note that failure to respond in a timely fashion may delay the completion of the staff's safety evaluation report.

J. A. Miller

-2-

If you have any questions or comments concerning this matter, you may contact me at (301) 415-3637 or [cja2@nrc.gov](mailto:cja2@nrc.gov).

Sincerely,

**/RA/**

Christian Araguas, Project Manager  
AP1000 Projects Branch 1  
Division of New Reactor Licensing  
Office of New Reactors

Docket No. 52-011

Enclosure:  
As stated

cc: See next page

J. A. Miller

-2-

If you have any questions or comments concerning this matter, you may contact me at (301) 415-3637 or [cja2@nrc.gov](mailto:cja2@nrc.gov).

Sincerely,

**/RA/**

Christian Araguas, Project Manager  
AP1000 Projects Branch 1  
Division of New Reactor Licensing  
Office of New Reactors

Docket No. 52-011

Enclosure:  
As stated

cc: See next page

DISTRIBUTION:

Public  
CAraguas  
RidsNroLaKGoldstein  
RidsNroDnrlNwe1  
RidsNroDnrl  
RidsRgn2MailCenter  
MNotich  
RidsAcrsAcnwMailCenter  
RidsOgcMailCenter (BPoole)  
MKotzalas  
RKaras  
RBHarvey  
JHoch  
SRMonarque

ADAMS Accession No.: ML070470270

OFFICE	DNRL/NWE1:LA	DNRL/NWE1:PM	TECH ED	OGC:NLO	DNRL/NWE1:BC
NAME	KGoldstein	CAraguas	Helen Chang	BPoole	SCoffin
DATE	2/21/07	2/23/07	02/21/07	2/21/07	2/23/07

**OFFICIAL USE ONLY**

**Requests for Additional Information (RAIs)**  
**for Vogtle ESP SSAR Section 2.3**

RAI Number	Reviewer	Full Text
2.3.1-1	Harvey R. B. Hoch J.	The response to information need 2.3.1-2 enclosed in Southern Nuclear Operating Company, Inc. (SNC), letter AR-07-0059 (dated January 30, 2007) explains the selection criteria for the regional climatological observing stations used in the site safety analysis report (SSAR) to characterize the regional climatology of the Vogtle early site permit (ESP) site. Please include these selection criteria in a future revision to the ESP application.
2.3.1-2	Harvey R. B. Hoch J.	Part I of SSAR Table 1-1 lists the 100-yr snowpack site characteristic value as 10 lb/sq ft. The Vogtle ESP region experienced its heaviest snowfall event on record from February 9 through February 11, 1973. The highest recorded amount of snow in the Vogtle ESP site vicinity, 22 in., occurred at Bamberg, South Carolina. The Southeast Regional Climate Center (SERCC) states that the liquid equivalent of the snowfall at Bamberg was 7.79 in. Assuming 1 in. of liquid water is equivalent to 5.2 lb/sq ft, the associated snowpack during this event was 40.5 lb/sq ft. Please justify why the 100-yr snowpack of 10 lb/sq ft listed as a site characteristic is conservative enough given the impact from this storm.
2.3.1-3	Harvey R. B. Hoch J.	<p>(a) The staff considers the “historical maximum dry-bulb temperature with a mean coincident wet-bulb (MCWB) temperature” DCD site parameter to be equivalent to the “100-yr return period maximum dry-bulb temperature with a MCWB temperature” ESP site characteristic. SSAR Table 1.1 presents a 100-year return period maximum dry-bulb temperature as a site characteristic without a corresponding MCWB temperature. Please provide a “100-year return period maximum dry-bulb temperature with a MCWB temperature” as a site characteristic.</p> <p>(b) Please also provide the following site characteristics: (1) maximum normal (1 percent exceedance) dry-bulb temperature and coincident wet-bulb temperature, and (2) maximum normal (1 percent exceedance) noncoincident wet-bulb temperature.</p>
2.3.3-1	Harvey R. B. Hoch J.	The response to information need 2.3.3-1 enclosed in SNC letter AR-07-0059 (dated January 30, 2007) states that the 5-yr hourly onsite meteorological database submitted in support of the ESP application is being revised and reformatted in response to questions regarding the meteorological database discussed during a site audit conducted on December 6, 2006. Please provide a copy of this revised hourly onsite meteorological database.
2.3.3-2	Harvey R. B.	Part II of SSAR Table 1-1 lists postulated design parameters. Please include the proposed natural draft cooling tower height and

Enclosure

RAI Number	Reviewer	Full Text
	Hoch J.	width as part of this table since this information is used in SSAR Section 2.3.3 to determine the potential impact of the natural draft cooling tower wake effects on the onsite meteorological measurements.
2.3.4-1	Harvey R. B. Hoch J.	The description and reference for the accident atmospheric dispersion factors listed in SSAR Table 1-1 states, in part: "The atmospheric dispersion values presented represent typical site parameter values by reactor vendors." This appears to be an inaccurate statement. Please verify that accident atmospheric dispersion factors listed in Table 1-1 represent site-specific values.
2.3.4-2	Harvey R. B. Hoch J.	SSAR Table 1-2 indicates that SSAR Section 2.3.4 is in compliance with the regulatory requirements of Appendix E to 10 CFR Part 50. Please explain how Appendix E to 10 CFR Part 50 is applicable to the development of the short-term (accident releases) atmospheric dispersion site characteristics presented in SSAR Section 2.3.4. Please also revise the SSAR as appropriate.
2.3.4-3	Harvey R. B. Hoch J.	SSAR Table 1-2 indicates that SSAR Section 2.3.4 conforms with RG 1.78. Please explain how RG 1.78 is applicable to the development of the short-term (accident releases) atmospheric dispersion site characteristics presented in SSAR Section 2.3.4. Please also revise the SSAR as appropriate.
2.3.4-4	Harvey R. B. Hoch J.	Section 2.3.4 of the SSAR states that the 0-2 hr maximum sector-dependent 0.5 percentile $\chi/Q$ values are greater than the corresponding overall site 5 percentile $\chi/Q$ values at the exclusion area boundary (EAB) and low population zone (LPZ). The staff ran the PAVAN computer code using the PAVAN input files provided during a site audit conducted on December 6, 2006 and found that the overall site 5 percentile $\chi/Q$ values at the EAB and LPZ are the limiting values for the site. Please confirm which set of $\chi/Q$ values (the maximum sector 0.5 percentile $\chi/Q$ values or the overall site 5 percentile $\chi/Q$ values) is bounding and revise the SSAR as appropriate.
2.3.4-5	Harvey R. B. Hoch J.	The response to information need 2.3.4-1 enclosed in SNC letter AR-07-0059 (dated January 30, 2007) states that the 5-year hourly onsite meteorological data used as part of the ESP Application is being revised and therefore the PAVAN input files will be affected. Please provide a copy of the updated PAVAN input file.
2.3.5-1	Harvey R. B. Hoch J.	Please provide the basis for calculation of the containment building minimum cross-sectional area and equivalent structural height, since this information has been used as input to the XOQDOQ computer code to derive the long-term (routine release) atmospheric dispersion estimates presented in SSAR Section 2.3.5. Please also revise the SSAR as appropriate.
2.3.5-2	Harvey R. B.	Are the "8.00 Day Decay" $\chi/Q$ values listed in SSAR Table 2.3-17 also "depleted" $\chi/Q$ values; that is, are these the $\chi/Q$ values

Enclosure

RAI Number	Reviewer	Full Text
	Hoch J.	that result from assuming the plume travels downwind with dry deposition, as well as decay with a half-life of 8.00 days? Please clarify and revise the SSAR as appropriate.
2.3.5-3	Harvey R. B. Hoch J.	SSAR Table 1-2 indicates that SSAR Section 2.3.5 complies with the regulatory requirements of Appendix E to 10 CFR Part 50. Please explain how Appendix E to 10 CFR Part 50 is applicable to the development of the long-term (routine release) atmospheric dispersion site characteristics presented in SSAR Section 2.3.5.
2.3.5-4	Harvey R. B. Hoch J.	The response to information need 2.3.5-1 enclosed in SNC letter AR-07-0059 (dated January 30, 2007) states that the 5-yr hourly onsite meteorological data used as part of the ESP application is being revised and therefore the XOQDOQ input files will be affected. Please provide a copy of the updated XOQDOQ input file.
2.3.5-5	Harvey R. B. Hoch J.	<p>Chapter 8 of Revision 21 of the VEGP ODCM (dated October 1, 2003) presents the models used to compute the specific values of meteorological-related parameters that are referenced throughout the VEGP ODCM. ODCM Equations 8.1 and 8.3, which present the algorithms used to calculate <math>\chi/Q</math> values for ground-level releases and elevated releases, respectively, both contain terrain recirculations factor (<math>K_r</math>) that were taken from Appendix A of Reference 15 (i.e., Letter to Southern Company Services from Pickard, Lowe, and Garrick, Inc., Washington, DC, April 27, 1988).</p> <p>(a) Please provide a copy of the terrain recirculation factors used in the VEGP ODCM.</p> <p>(b) Please describe the basis for the derivation of these terrain recirculation factors.</p> <p>(c) Please justify why the terrain recirculation factors used in the VEGP ODCM should not be used in developing the long-term (routine release) atmospheric dispersion factors presented in SSAR Section 2.3.5.</p>
2.3.5-6	Harvey R. B. Hoch J.	Section II.D of Appendix I to 10 CFR Part 50 requires that gaseous radwaste systems for light-water-cooled nuclear power reactors include all items of reasonably demonstrated technology that, when added to the system sequentially and in order of diminishing cost-benefit return, can, for a favorable cost-benefit ratio, effect reductions in dose to the population reasonably expected to be within 50 mi of the reactor. The COL or CP applicant will be required to perform this demonstration at the COL or CP stage. Please provide annual average $\chi/Q$ and $D/Q$ values in all 16 radial sectors from the site boundary to a distance of 50 mi from the proposed facility in accordance with Section 2.3.5 of RS-002.

Enclosure

Vogtle Electric Generating Plant

cc:

Mr. Jeffrey T. Gasser  
Executive Vice President  
Southern Nuclear Operating Company, Inc.  
P.O. Box 1295  
Birmingham, AL 35201-1295

Mr. Louis B. Long  
Vice President Technical Support  
Southern Nuclear Operating Company, Inc.  
P.O. Box 1295  
Birmingham, AL 35201-1295

Mr. Charles R. Pierce  
ESP Project Manager  
P.O. Box 1295  
Birmingham, AL 35201-1295

Mr. Thomas O. McCallum  
ESP Project Manager  
P.O. Box 1295  
Birmingham, AL 35201-1295

Mr. Steven M. Jackson  
Senior Engineer - Power Supply  
Municipal Electric Authority of Georgia  
1470 Riveredge Parkway, NW  
Atlanta, GA 30328-4684

Mr. Reece McAlister  
Executive Secretary  
Georgia Public Service Commission  
244 Washington Street, SW  
Atlanta, GA 30334

Mr. Adrian Heymer  
Nuclear Energy Institute  
Suite 400  
1776 I Street, NW  
Washington, DC 20006-3708

Attorney General  
Law Department  
132 Judicial Building  
Atlanta, GA 30334

Mr. Laurence Bergen  
Oglethorpe Power Corporation  
2100 East Exchange Place  
P.O. Box 1349  
Tucker, GA 30085-1349

Mr. Arthur H. Dombay, Esquire  
Troutman Sanders  
Nations Bank Plaza  
600 Peachtree Street, NE  
Suite 5200  
Atlanta, GA 30308-2216

Resident Inspector  
Vogtle Plant  
8805 River Road  
Waynesboro, GA 30830

Mr. Paul Gunter  
Director of the Reactor Watchdog Project  
Nuclear Information & Resource Service  
1424 16<sup>th</sup> Street, NW, Suite 404  
Washington, DC 20036

Mr. Russell Bell  
Nuclear Energy Institute  
Suite 400  
1776 I Street, NW  
Washington, DC 20006-3708

Mr. James Riccio  
Greenpeace  
702 H Street, NW, Suite 300  
Washington, DC 20001

Mr. Jay M. Gutierrez  
Morgan, Lewis & Bockius, LLP  
1111 Pennsylvania Avenue, NW  
Washington, DC 20004

Mr. Robert E. Sweeney  
IBEX ESI  
4641 Montgomery Avenue  
Suite 350  
Bethesda, MD 20814

Ms. Vanessa E. Quinn, Chief  
Radiological Emergency Preparedness  
Branch  
Nuclear and Chemical Preparedness and  
Protection Division  
Department of Homeland Security  
1800 South Bell Street, Room 837  
Crystal City-Arlington, VA 22202-3546

Mr. Paul Leventhal  
Nuclear Control Institute  
1000 Connecticut Avenue, NW  
Suite 410  
Washington, DC 20036

Mr. David Lochbaum  
Union of Concerned Scientists  
1707 H Street, NW  
Suite 600  
Washington, DC 20006-3919

Mr. Marvin Fertel  
Senior Vice President  
and Chief Nuclear Officer  
Nuclear Energy Institute  
Suite 400  
1776 I Street, NW  
Washington, DC 20006-3708

Mr. Jim Davis  
ESP Project Engineer  
Southern Nuclear Company  
Post Office Box 1295, BIN B056  
Birmingham AL 35201

Mr. O.C. Harper IV  
Vice President - Resources Planning and  
Nuclear Development  
Georgia Power Company  
241 Ralph McGill Boulevard  
Atlanta, GA 30308

Ms. Bentina C. Terry  
Southern Nuclear Operating Company, Inc.  
Bin B-022  
P.O. Box 1295  
Birmingham, AL 35201-1295

Director, Consumers' Utility  
Council Division  
Governor's Office of Consumer Affairs  
2 M.L. King, Jr. Drive  
Plaza Level East; Suite 356  
Atlanta, GA 30334-4600

Resident Manager  
Oglethorpe Power Corporation  
Alvin W. Vogtle Nuclear Plant  
Electronic Mail Distribution

Mr. Thomas P. Miller  
U.S. Department of Energy  
Headquarters - Germantown  
19901 Germantown Road  
Germantown, MD 20874-1290

Mr. Joseph (Buzz) Miller  
Senior Vice President  
Southern Nuclear Operating Company, Inc.  
P.O. Box 1295  
Birmingham, AL 35201-1295

Mr. M. Stanford Blanton, Esquire  
Balch and Bingham, LLP  
P.O. Box 306  
Birmingham, AL 35201

Ms. Sarah J. Lynch - (Meeting Notice Only)  
Senior Analyst  
Natural Resources and Environment  
441 G Street NW  
Washington, DC 20548

Email:

TOMCCALL@southernco.com

CRPIERCE@southernco.com

erg-xl@cox.net

patriciaL.campbell@ge.com

bob.brown@ge.com

mark.beaumont@wsms.com

sfrantz@morganlewis.com

ksutton@morganlewis.com

jgutierrez@morganlewis.com

tom.miller@hq.doe.gov or

tom.miller@nuclear.energy.gov

steven.hucik@ge.com

david.hinds@ge.com

James1.Beard@ge.com

chris.maslak@ge.com

jim@ncwarn.org

pshastings@duke-energy.com

ronald.hagen@eia.doe.gov

lynchs@gao.gov - (Meeting Notice Only)