UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before the Licensing Board:

G. Paul Bollwerk, III, Chairman
Nicholas G. Trikouros
Dr. James F. Jackson

In the Matter of	Docket No. 52-011-ESP
SOUTHERN NUCLEAR OPERATING CO.	ASLBP No. 07-850-01-ESP-BD01
(Early Site Permit for Vogtle ESP Site)	October 17, 2008

MEMORANDUM AND ORDER
(Providing Initial Questions and Potential Presentation Topics
Associated with Mandatory Hearing on Environmental Matters)

In accord with the Licensing Board's September 19 and October 9, 2008 issuances, what follows provides (1) initial questions that the Board requests be answered in connection with its mandatory hearing-related review of environmental matters; and (2) possible topics for presentations during the environmental portion of the mandatory hearing for this proceeding.[1]

A. Questions Regarding Environmental Matters

The Board's questions are set out in Appendix A to this issuance. As the author of the August 2008 final environmental impact statement (FEIS) relating to the Vogtle early site permit (ESP) application, the NRC staff likely is the principal respondent for these inquiries. Nonetheless, applicant Southern Nuclear Operating Company (SNC) may file responses to

[1] Although Joint Intervenors, which include the Center for a Sustainable Coast, Savannah Riverkeeper, Southern Alliance for Clean Energy, Atlanta Women's Action for New Directions, and Blue Ridge Environmental Defense League, are not parties to the mandatory hearing, as a courtesy they are being served with this issuance.

these questions as well. Any responses should be filed on or before Friday, November 7, 2008.

Based on further Board review of the FEIS and the answers to the questions posed in Appendix A, the Board may have additional questions regarding the environmental portion of the mandatory hearing for this proceeding.

B. Mandatory Hearing Presentation Topics Regarding Environmental Matters

Below are subject matter areas for which the Board currently is contemplating entertaining presentations by staff and SNC witnesses during the environmental portion of the mandatory hearing. These topics may be revised or additional topics added in response to further Board review of the FEIS and the answers to the questions posed in Appendix A.

1. Water Use Impacts

Provide a presentation reviewing the cumulative surface and groundwater impacts associated with the operation of Vogtle Electric Generating Plant (VEGP) Units 1-4. In this review, include the potential impact of other relevant facilities in the area, such as the D-Area Powerhouse and the Urquhart Station. In particular, address these impacts under a range of drought conditions, including the possibility of conditions more severe than Drought Level 3. Address why the limiting conditions used in the evaluation of cumulative impacts, where the evaluations were often limited to Drought Level 3, are conservative in light of recent drought conditions in the VEGP area.

2. Radiological Impacts

Provide a presentation that reviews radiological sources, pathways, and doses to the public from both routine operation and potential accidents for the proposed VEGP Units 3 and 4. Provide the basis and key assumptions that give assurance that the calculated doses are indeed conservative. This should include providing the rationale for accepting the LADTAP II

and GASPAR II computer codes as being adequately conservative models for calculating liquid and gaseous pathway doses. Also review how the staff assured itself that the input data used in the computer calculations was chosen to assure conservative results.

3. Environmental Impact of Alternatives

Provide a presentation reviewing the key environmental impacts of alternatives to the proposed nuclear power units. This should focus on alternative energy sources and sites. It should not include consideration of dry cooling, which is a subject of the contested hearing.

4. Seismic Evaluation

Provide a presentation reviewing the VEGP site seismic evaluation, the safe-shutdown earthquake, the site's geological characteristics important to its seismic response, and the basis for the staff's conclusions that VEGP is a suitable nuclear power plant site from a seismic viewpoint.

5. Limited Work Authorization and Site Redress Plan

Provide a presentation that reviews the prerequisite and actual activities that would be undertaken pursuant to the requested Limited Work Authorization, the anticipated impacts of those activities on the VEGP site, and the specific activities that would be implemented under the Site Redress Plan to mitigate those impacts in the event that the Plan were required to be implemented.

6. Deferrals to COL

Provide a presentation that identifies and reviews the reasons why any subject matter area (e.g., radioactive waste management system, FEIS section 3.2.3) has been deferred to the COL stage.

It is so ORDERED.

FOR THE ATOMIC SAFETY
AND LICENSING BOARD[2]

/RA/

G. Paul Bollwerk, III
CHAIRMAN

Rockville, Maryland

October 17, 2008

[2] Copies of this memorandum and order were sent this date by the agency's E-Filing system to counsel for (1) applicant SNC; (2) Joint Intervenors; and (3) the staff.

APPENDIX A

Licensing Board Questions Associated with Environmental Portion of Vogtle Early Site Permit Mandatory Hearing

Question No.	FEIS Section(s)	FEIS Page(s)	Inquiry:
1	2.3.1.4	2-10	The Final Environmental Impact Statement (FEIS) indicates that the period between 1998 and 2002 was an "abnormally dry period in the southeast." How does this compare to the more recent dry period? If the most recent five years is worse, why was the most recent dry period not used as the basis for analysis?
2	2.3.3	2-13	The FEIS indicates "[m]eteorological data for the period of January 1, 1998, to December 31, 2002, were used to generate atmospheric dispersion factors (X/Q values) to estimate radiological impacts in the areas surrounding the [Vogtle Electric Generating Plant (VEGP)] site." Why was the data limited to this period? What about the last six years?
3	2.3.3	2-13	ANSI/ANS-3.11 indicates that meteorological instruments should be located at a distance at least ten times the height of an obstruction. Applicant Southern Nuclear Operating Company (SNC) indicated in its environmental report (ER) that it performed an analysis to verify the acceptability of the meteorological tower being only 3000 feet (ft.) from the 600 ft. high cooling towers. How did the staff confirm the SNC ER analysis?
4	2.6.1.1	2-20	In connection with the Savannah River water temperature data from 1973 to 1996 referenced on this FEIS page, is there any indication that there is an increasing temperature trend?
5	2.6.1.2, 5.9.2	2-28, 5-67	The FEIS presents key hydraulic properties for the Water Table, Tertiary, and Cretaceous aquifers. How are these properties used in calculating the liquid effluent pathway radiation doses to the maximally exposed individual (MEI) and nearby populations? How did the staff assure itself the parameters used in the dose calculations had adequate conservatism to account for the uncertainties in the measured data on which they are based?
6	2.6.1.2	2-29	The FEIS indicates that "[b]ased on potentiometric contour maps (Southern 2008a), groundwater movement from the VEGP site powerblock region appears to be toward Mallard Pond." What are the implications of this movement with respect to radiological monitoring?

Question No.	FEIS Section(s)	FEIS Page(s)	Inquiry:
7	2.6.3.2	2-42	The FEIS states that "[t]he evidence indicates the primary pathway for tritium pollution of the Water Table aquifer is through recharge of the aquifer by atmospheric deposition of tritium released from the Savannah River Site." What is the evidence that supports this conclusion?
8	2.6.3.3, 5.3.3.1	2-43, 5-17	The FEIS states that thermal monitoring of the VEGP Units 1 and 2 discharge is performed once every five years. Did this monitoring include temperature measurements in the Savannah River thermal plume? If so, were these measurements compared to the thermal plume calculations performed with the CORMIX code to check the accuracy of the calculations?
9	2.8.2.6, 2.8.2.7	2-109 to -112	Please explain why the FEIS impact analysis regarding public services and education does not include South Carolina impacts.
10	5.3.2.2	5-15	The FEIS states that the hydraulic heads of the Cretaceous and Tertiary aquifers in the vicinity of the VEGP site are approximately 160 ft. and 120 ft. above mean sea level, respectively. It also states that pumping drawdown in the Cretaceous aquifer would be less than 40 ft., so that an upward gradient is maintained during pumping. What is a conservative estimate of the cumulative pumping drawdown? How confident is the staff of the conclusion that an upward gradient will always be maintained? How would a reversal of this gradient impact the staff's conclusions regarding potential contamination of the Cretaceous aquifer?
11	5.3.3.1	5-17 to -20	Why were the CORMIX analyses described in this section limited to Drought Level 3 river flow rates? What would be the impact of lower flow rates?
12	5.7.3	5-57	The FEIS references a study by the Institute for Energy and Environmental Research (IEER) that supposedly indicates that only a "small amount" of the radiological contamination in the Savannah River and its organisms can be attributed to the existing VEGP. Where in the IEER report are releases from VEGP addressed? If these releases are not directly addressed, please expand on the rationale for the above conclusion.

Question No.	FEIS Section(s)	FEIS Page(s)	Inquiry:
13	5.9.2.1, G.1.4	5-67, G-2	In FEIS Appendix G, the staff reports it reviewed the annual radiological effluent release reports for the existing VEGP units. The staff states that the highest liquid pathway releases occurred in 2001. What are the key factors that cause variations in the releases from one year to the next and why were the releases highest in 2001?
14	5.9.4	5-72	The FEIS provides the collective occupational dose from the operation of VEGP Units 1 and 2 for the year 2005. It also mentions the need to keep individual doses below the five-rem limit, but provides no data regarding those doses. What were the average and maximum individual worker occupational doses during that year?
15	6.1	6-1 to -14	Is it necessary to analyze the greenhouse gas impacts of facility construction and operation, including those relating to the nuclear fuel cycle?
16	7.2	7-3	Does the FEIS conclusion regarding the small impact to air quality assume simultaneous construction and/or operation of all the facilities discussed in section 7.2?
17	7.3.1.1	7-4	Given the FEIS indicates that "[c]omparable levels for Drought Level 4 are not shown in Table 7-1 because the river discharge is not specified in the Drought Plan but is variable based on inflow conditions," what are the implications of Table 7-1 for lower river discharge rates? Presumably the plants will continue to operate during Drought Level 4. Subsequent analyses evaluated two Drought Level 4 flows. Why are they not included in this table?
18	7.3.1.1	7-5	Same comment for Table 7-2 as Table 7-1. Should it also consider cumulative utilization from other plants and the Savannah River Site (SRS)? Also, what is the basis for acceptability of a given flow percentage?

Question No.	FEIS Section(s)	FEIS Page(s)	Inquiry:
19	7.3.1.1	7-5	The basis for the statements and conclusions in FEIS section 7.3.1.1 that the impacts would be small and mitigation is not warranted does not appear to reflect the cumulative effects of all river users or any Drought Level 4 conditions, only the VEGP site under Drought Level 3 conditions. Explain why the conclusions would be unchanged if the D-Area Powerhouse and Urquhart station, as well as other present and future water users, are included in the analysis assuming the 2000 cubic feet per second (cfs) Drought Level 4 assumption used elsewhere in this section.
20	7.3.1.1	7-6	This section indicates that "the percentage of streamflow reduction in the Savannah River due to the operation of VEGP Units 1 through 4 would be 4.3 percent at 3000 cfs and 6.5 percent at 2000 cfs." Why does this surface water consumption analysis not include the other nearby water users such as the D-Area Powerhouse consumptive use (1.94 cubic meters per second (m^3/s [68.4 cfs]) and the Urquhart Station consumptive use (3.61 m^3/s [127.5 cfs])? At 2000 cfs river flow, the total consumptive use from these sources (129 cfs + 68.4 cfs + 127.5 cfs = 324.9 cfs) apparently would be 16 percent of the streamflow. Is this acceptable? What determines the limits? What is the basis for the 2000 cfs assumption?
21	7.3.2.1	7-12	Please explain the basis for the statement that the impacts under river flow rates below the Drought Level 3 value would not be significantly different from the impacts analyzed under the Drought Level 3 condition. Section 5.3.3.1 does not appear to identify any analyses at the lower flow rates.

Question No.	FEIS Section(s)	FEIS Page(s)	Inquiry:
22	7.5.2	7-23	The FEIS indicates that "[i]n addition to the above analysis, the staff also considered the cumulative impacts to aquatic biota in the Savannah River associated with the normal withdrawal rates for all four units at the VEGP site at two river flow rates below the Drought Level 3 values. Even assuming river flows of 3000 cfs and 2000 cfs, rather than the Drought Level 3 case of 3800 cfs river flow, the percentage of water withdrawn from the Savannah River due to the operation of VEGP Units 1 through 4 would be 5.8 percent at 3000 cfs and 8.7 percent at 2000 cfs." This analysis does not include the other major water users. Please explain why the conclusions would be unchanged if these other water users (present and future) were included?
23	9.2	9-3	The FEIS states that "[f]or analysis of energy alternatives, [SNC] assumed a bounding electrical output target value of 2234 megawatts electric (MW[e]) (Southern 2008). The staff also used this level of output in its analysis of energy alternatives." Does this mean that the analysis is applicable to any plant size smaller than the proposed two new VEGP units? For example, explain whether the analysis would still be applicable if only one of the two reactors were built.
24	9.2.4	9-23	The combination of alternatives discussion assumes 60 MW of wind energy. What was the basis for this choice? What are the factors regarding wind energy generation that limit the plant size? Is there a wind energy limit for this site that precludes considering it as base load capacity?
25	9.3	9-25 to -27	While once-through cooling seemingly is not suitable for this site, other options, such as cooling ponds, might be reasonable alternatives. Why were such alternatives not evaluated?
26	9.4.2	9-28 to -29	What was the basis for the staff's conclusion that SNC's methodology for selecting alternative sites was reasonable? Did the staff confirm there were no feasible sites in Mississippi that needed to be evaluated? What was the rationale for accepting the SNC approach of excluding non-nuclear sites from further evaluation, despite the possibility such sites might have been judged more favorably regarding such relevant criteria as water availability during a drought?

Question No.	FEIS Section(s)	FEIS Page(s)	Inquiry:
27	9.5.1.2, 9.5.2.2, 9.5.3.2	9-33, 9-50, 9-70	The water use and quality evaluations for all sites were based upon the 7Q10 flow. Why was the maximum expected drought condition not evaluated for each of these sites and then compared to the VEGP site?
28	10.0	10-1	The last paragraph of this section indicates the staff performed its own independent review of the alternative sites analysis in applicant SNC's ER. Please describe the manner in which the staff performed this independent review.
29	11.6.2.1	11-16	Please explain the basis upon which the staff has concluded that the estimated construction capital costs for Units 3 and 4 ($7.1 to $7.8 billion) are valid given the seemingly higher cost estimates for other AP1000 facilities, such as the proposed new Turkey Point facilities recently referenced by the Licensing Board in the Bellefonte combined operating license proceeding, LBP-08-16, 68 NRC __, __ (slip op. at 67) (Sept. 12, 2008)?
30			Are there any ESP license conditions that the staff will impose to address environmental matters associated with the VEGP site and, if so, what are they?

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
SOUTHERN NUCLEAR OPERATING COMPANY	)	Docket No. 52-011-ESP
	)	
	)	
(Early Site Permit for the Vogtle ESP Site)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing LB MEMORANDUM AND ORDER (PROVIDING INITIAL QUESTIONS AND POTENTIAL PRESENTATION TOPICS ASSOCIATED WITH MANDATORY HEARING ON ENVIRONMENTAL MATTERS) have been served upon the following persons by Electronic Information Exchange.

Office of Commission Appellate
Adjudication
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: ocaamail@nrc.gov

Administrative Judge
G. Paul Bollwerk, III, Chair
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: gpb@nrc.gov

Administrative Judge
Nicholas G. Trikouros
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: ngt@nrc.gov

Administrative Judge
James Jackson
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: jackson538@comcast.net

Ann P. Hodgdon, Esq.
Kathryn L. Winsberg, Esq.
Marcia Carpentier, Esq.
Office of the General Counsel
Mail Stop - O-15 D21
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: aph@nrc.gov; klw@nrc.gov; mxc7@nrc.gov

Kenneth C. Hairston, Esq.
M. Stanford Blanton, Esq.
Peter D. LeJeune, Esq.
Balch & Bingham LLP
1710 Sixth Avenue North
Birmingham, Alabama 35203-2014
E-mail: kchairston@balch.com; sblanton@balch.com; plejeune@balch.com

Docket No. 52-011-ESP
LB MEMORANDUM AND ORDER (PROVIDING INITIAL QUESTIONS AND POTENTIAL PRESENTATION TOPICS ASSOCIATED WITH MANDATORY HEARING ON ENVIRONMENTAL MATTERS)

Moanica M. Caston, Esq.
Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
P.O. Box 1295, Bin B-022
Birmingham, AL 35201-1295
E-mail: mcaston@southernco.com

Diane Curran, Esq.
Harmon, Curran, Spielberg & Eisenberg, L.L.P.
1726 M Street, NW, Suite 600
Washington, DC 20036
E-mail: dcurran@harmoncurran.com

Kathryn M. Sutton, Esq.
Steven P. Frantz, Esq.
Paul M. Bessette, Esq.
Mary Freeze, Admin. Assist.
Morgan, Lewis & Bockius, LLP
Co-Counsel for Southern Nuclear Operating Company, Inc.
1111 Pennsylvania Ave., NW
Washington, DC 20004
E-mail: ksutton@morganlewis.com
sfrantz@morganlewis.com
pbessette@morganlewis.com
mfreeze@morganlewis.com

Margaret Parish
Law Clerk
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: map4@nrc.gov

Lawrence D. Sanders, Esq.
Turner Environmental Law Clinic
Emory University School of Law
1301 Clifton Road
Atlanta, GA 30322
E-mail: masbill@law.emory.edu;
lawrence.sanders@emory.edu

C. Grady Moore, III, Esq.
Balch & Bingham, LLP
1901 6TH Avenue, Suite 2600
Birmingham, AL 35203
E-mail: gmoore@balch.com

Docket No. 52-011-ESP
LB MEMORANDUM AND ORDER (PROVIDING INITIAL QUESTIONS AND POTENTIAL PRESENTATION TOPICS ASSOCIATED WITH MANDATORY HEARING ON ENVIRONMENTAL MATTERS)

Charles R. Pierce
Southern Company Services, Inc.
600 North 18th Street, BIN B056
Birmingham, AL 35291-0300
E-mail: crpierce@southernco.com

Pillsbury Winthrop Shaw Pittman, LLP
2300 N. Street, N.W.
Washington, DC 20037-1128
Robert B. Haemer, Esq.
Maria Webb, Paralegal
E-mail:
mailto:David.Lewis@pillsbury.comrobert.haemer@pillsburylaw.com;

Eckert Seamans Cherin & Mellott, LLC
600 Grant Street, 44th Floor
Pittsburgh, PA 15219
Counsel for Westinghouse Electric Company, LLC
Barton Z. Cowan
E-mail: teribart61@aol.com

[Original signed by Evangeline S. Ngbea]

Office of the Secretary of the Commission

Dated at Rockville, Maryland
this 17th day of October 2008