From: "Davis, James T." <JTDAVIS@southernco.com>
To: "William Travers" <WDT@nrc.gov>,"Christian Araguas" <CJA2@nrc.gov>,"Jim Dyer" <JED2@nrc.gov>,"Stephanie Coffin" <SMC1@nrc.gov>,"David Matthews" <DBM@nrc.gov>,"Mark Notich" <mdn@nrc.gov>
Date: 2/1/2007 9:15:21 AM
Subject: FW: ESP Meteorological Audit Response Letter & ESP Environmental RAI Response Letter
cc: "Chuck R. Pierce" <CRPIERCE@southernco.com>,"Dana M. Williams" <X2DANAWI@southernco.com>

As a clarification to the emails below, Southern Nuclear ESP/COL Project will continue providing licensing correspondence, including all attachments to Document Control and NRC Project Managers by Fed-X. SNC is making a change
in transmittal of licensing letters to provide electronic copies rather than paper copies to select "cc:" recipients. Please let me know if you have any questions or if this new method of transmittal does not meet your needs.

Thank you,

Jim Davis
Southern Nuclear
ESP Project Engineer
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From: Williams, Dana M.
Sent: Wednesday, January 31, 2007 4:24 PM
To: Beasley, J. Barnie; Gasser, Jeff T.; Tynan, Tom E.; Lloyd, Dale M.; Pierce, Chuck R.; Dyer; Matthews; mdn@nrc.gov; Prebula; Prunty; Travers
Cc: Davis, James T.
Subject: ESP Meteorological Audit Response Letter

Starting today, I will begin distributing our approved NRC letters via email versus hard copies to stay in sync with licensing procedures. Please let me know if you have any questions.

Click on the following attachment to view the approved correspondence:

<<AR-07-0059 Met Data Info Needs Response.pdf>>

Thanks,

Dana Williams
Southern Nuclear Operating Company
Nuclear Development
P 205.992.5934
F 205.992.5296

From: Williams, Dana M.
Sent: Wednesday, January 31, 2007 4:24 PM
To: Beasley, J. Barnie; Gasser, Jeff T.; Tynan, Tom E.; Lloyd, Dale M.; Pierce, Chuck R.; Moorer, Tom C.; 'Dyer'; 'Karen Patterson'; 'Matthews'; 'Prebula'; 'Prunty'; 'Travers'
Subject: ESP Environmental RAI Response Letter

Starting today, I will begin distributing our approved NRC letters via email versus hard copies to stay in sync with licensing procedures. Please let me know if you have any questions.

Click on the following attachment to view the approved correspondence:

<<AR-07-0061 RAI Resp (ER).pdf>>

Thanks,

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Hearing Identifier: Vogtle_Public
Email Number: 222

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Subject: FW: ESP Meteorological Audit Response Letter & ESP Environmental RAI Response Letter
Creation Date: 2/1/2007 9:15:21 AM
From: "Davis, James T." <JTDAVIS@southernco.com>

Created By: JTDAVIS@southernco.com

Recipients "Chuck R. Pierce" <CRPIERCE@southernco.com>,"Dana M. Williams" <X2DANAWI@southernco.com>
"William Travers" <WDT@nrc.gov>
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"Jim Dyer" <JED2@nrc.gov>
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Mime.822	1388970	3/26/2007 1:25:53 PM

Options
Priority: Standard
Reply Requested: No
Return Notification: None
None

Concealed Subject: No
Security: Standard

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SOUTHERN COMPANY
Energy to Serve Your World™

JAN 30 2007

Docket No.: 52-011

AR-07-0059

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

Southern Nuclear Operating Company
Vogtle Early Site Permit Application
Safety Review Site Audit Meteorology Information Needs

Ladies and Gentlemen:

On December 6, 2006, the U.S. Nuclear Regulatory Commission (NRC) performed a meteorology safety review audit at the Vogtle Electric Generating Plant (VEGP) site as part of their overall technical review of the Southern Nuclear Operating Company (SNC) Vogtle Early Site Permit (ESP) Application. Prior to the audit, the NRC provided SNC with a list of information needs required to support the NRC's technical review of the Vogtle ESP application. These information needs were discussed as part of the site audit. SNC's responses to NRC's site meteorology information needs are provided in Enclosures 1 and 2 to this letter.

The SNC licensing contact for this information needs letter is J. T. Davis at (205) 992-7692.

Mr. J. A. (Buzz) Miller states he is a 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 subscripted before me this 30TH *day of* JANUARY, *2007*

Dorothy P. Hofmann
Notary Public

My commission expires: May 1, 2008

JAM/BJS/dmw

Enclosures:

1. Responses to NRC Site Meteorology Information Needs from December 2006 Safety Review Site Audit for Vogtle ESP Application
2. Response Attachments

cc: Southern Nuclear Operating Company
Mr. J. B. Beasley, Jr., President and CEO (w/o enclosures)
Mr. J. T. Gasser, Executive Vice President, Nuclear Operations (w/o enclosures)
Mr. T. E. Tynan, Vice President - Vogtle (w/o enclosures)
Mr. D. M. Lloyd, Vogtle Deployment Director (w/o enclosures)
Mr. C. R. Pierce, Vogtle Development Licensing Manager (w/o enclosures)
Document Services RTYPE: AR01
File AR.01.01.06

Nuclear Regulatory Commission
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Mr. W. D. Travers, Region II Administrator (w/o enclosures)
Mr. D. B. Matthews, Director of New Reactors (w/o enclosures)
Ms. S. M. Coffin, AP1000 Manager of New Reactors (w/o enclosures)
Mr. C. J. Araguas, Project Manager of New Reactors
Mr. M. D. Notich, Environmental Project Manager
Mr. G. J. McCoy, Senior Resident Inspector of VEGP (w/o enclosures)

Georgia Power Company
Mr. O. C. Harper, Vice President, Resource Planning and Nuclear Development (w/o enclosures)

Oglethorpe Power Corporation
Mr. M. W. Price, Chief Operating Officer (w/o enclosures)

Municipal Electric Authority of Georgia
Mr. C. B. Manning, Senior Vice President and Chief Operating Officer (w/o enclosures)

Dalton Utilities
Mr. D. Cope, President and Chief Executive Officer (w/o enclosures)

Bechtel Power Corporation
Mr. J. S. Prebula, Project Engineer (w/o enclosures)
Mr. R. W. Prunty, Licensing Engineer (w/o enclosures)

Southern Nuclear Operating Company

AR-07-0059

Enclosure 1

Responses to

NRC Site Meteorology Information Needs

from

December 2006 Safety Review Site Audit

for the

Vogtle ESP Application

Information Needs from the December 2006 Safety Review Site Audit

The following responses to the numbered Site Meteorology audit information needs (referred to as 'questions' in SNC responses) are discussed below. Where answers change facts and conclusions presented in the ESP application, the application will be revised. Responses that provide clarification detail will be considered for inclusion in the next revision as appropriate.

Due to questions raised during the NRC's Meteorology Audit, the 2001 meteorological data from Plant Vogtle was re-evaluated. As a result of this data evaluation, it was determined that the delta-temperature data, which is used to establish stability class, was invalid during parts of October, November and December 2001. An alternative method (Sigma Theta approach with day/night correction) was used to determine the stability class, which was then converted to delta-temperature and substituted for the invalid data. Use of this alternative data lowered the apparent variability in the 2001 data set. Additional changes were made to edit out a period of bad 60m wind direction in February 1999 and some calm 10m wind speeds in October 2000.

[Please note that figures and tables referenced as attached in NRC information need statements are not included in this submittal letter. Numbered attachments referenced in SNC responses are located in Enclosure 2.]

Section 2.3.1, Regional Climatology

2.3.1-1 Table 2.3-1, referenced in SSAR Section 2.3.1.1, lists characteristics of the eight NWS and Cooperative Observing Stations used for the SSAR regional climate analysis. The elevations shown in the SSAR for Blackville 3W and Springfield appear to be transposed as compared to the elevations reported by the National Climatic Data Center (NCDC).

Response:

The observation is correct. The elevations of the two stations (Blackville 3W and Springfield) had been transposed in the application. Table 2.3-1 has been corrected (see Attachment 1) and will be included in the revision of the ESP Application scheduled for April 2007.

2.3.1-2 Eight climatological observing stations were used to characterize the regional climatology of the Vogtle ESP site. The staff identified a total of seventeen observing stations around (i.e. within a 50 mile radius) the Vogtle ESP site with 13 to 94 years of available data. Please explain the selection process used for the eight observation stations listed in the SSAR.

Response:

The 50-mile radius circle shown in Figure 2.3-1 is only used to provide the reader with a relative indication of the distance between the climate observing stations and the VEGP site. A 50-km (about 31-mile) grid spacing is considered to be a reasonably fine mesh grid in current regional climate modeling and this distance was used as a nominal radius for the station selection process.

The objective of selecting nearby, off-site climatological monitoring stations was to demonstrate that the mean and extreme values observed at those stations were reasonably representative of conditions that might be expected to be observed at the VEGP site. The selection of stations to be included was based upon the following criteria:

- Proximity to the site (i.e., within the general site area - less than or equal to 50 kilometers) as discussed above.
- Selected stations in all directions surrounding the site, to the extent possible.
- Where there exists more than one station in a general direction around the site, a station is selected if it contributes one or more extreme conditions (e.g., rainfall, snowfall, temperatures) for that general direction.

2.3.1-3 Using the eight observing stations identified in SSAR Section 2.3.1.1, regional climatological precipitation statistics of the site are presented in SSAR Section 2.3.1.3.4, "Precipitation Extremes" and summarized in Table 2.3.3, "Climatological Extremes at Selected NWS and Cooperative Observing Stations in the VEGP Site Area." Using climatic data from NCDC, the staff found a higher maximum monthly rainfall observation at Louisville, GA and a higher maximum 24-hr snowfall and maximum monthly snowfall observation at Bamberg, SC as compared to the values in SSAR Table 2.3.3. Please confirm that the values presented are the most extreme values for the proposed Vogtle ESP site.

Response:

In evaluating the NCDC CLIM20 summary for the Louisville 1E cooperative observing station, the overall maximum monthly rainfall attributed to this station is 22.16 inches recorded in October 1990. This value is greater than the maximum monthly values for the other stations reported in Table 2.3.-3. However in examining two other references cited in Section 2.3.1; TD-3200 (Cooperative Summary of the Day) and SERCC (Southeast Regional Climate Center) data summaries, SNC finds the maximum total monthly rainfall for the Louisville 1E station for October 1990 to be only 14.34 inches. The two references corroborate one another and, more importantly, the observations in TD-3200 serve as the basis for many NCDC climate summaries, including CLIM20. Therefore, SNC believes the value of 22.16 inches reported in the CLIM20 to be in error. However, the Louisville IE station has been added to the list of observing stations reported in Table 2.3-3 (Attachment 2) and shown in Figure 2.3-1 (Attachment 3) as a result of an extreme high temperature of 112°F in July 1952 (See Response to Question 2.3.2-5).

Also, upon further evaluation of the Bamberg Station record, this station will be added to Table 2.3-3 and Figure 2.3-1, despite its distance from the VEGP site (i.e., about 43.5 miles, or 70 km), because it contributes both the highest of the maximum daily and maximum monthly snowfall totals in the site area.

2.3.1-4 SSAR Section 2.3.1.3.5 discusses the occurrence of hail near the Vogtle ESP site. This section reports that on average, hail with diameters of 0.75 inches or greater can be expected about 1 day per year, based on statistics reported in The Climatic Atlas of the United States for Burke County, GA, and Barnwell County, SC. Since hail is a point observation, it is commonly underreported in rural areas. The following figures from The Climate Atlas of the United States show a relationship between hail frequency and population size in that highest reported frequencies of hail with diameters of 0.75 inches or greater and 1.00 inches or greater are clustered around major cities. Statistics reported in rural Burke and Barnwell counties may under-represent actual hail occurrence at the Vogtle ESP site. Please justify the appropriateness of the values presented in the SSAR (See Attached Figures).

Response:

Section 2.3.1.3.5 paragraph 3 will be revised (as shown in Attachment 4) to state that the higher frequency of occurrence in relatively more populated areas applies to hail with diameters of 0.75 inch and 1.00 inch or greater, rather than 0.75 inch only as the original text implies. SNC agrees with the NRC observation that under-reporting may occur in rural areas and have, in fact, already addressed this in paragraph 4 of the original text in Section 2.3.1.3.5.

2.3.1-5 SSAR Section 2.3.1.5 states that it is not possible to produce a 100-year return mean coincident wet-bulb (MCWB) temperature for the site because of the statistical approaches utilized. This information will be necessary at the COL stage because MCWB is listed as a Tier 1 Site Parameter in Table 5.0-1 of the AP1000 DCD.

Response:

A mean coincident wet bulb (MCWB) temperature for a 100-year return period cannot, by definition, be determined because the MCWB represents the mean of wet-bulb temperatures that occur when a dry-bulb temperature for a given exceedance probability is recorded in the sequential hourly database used to derive those values. In contrast, the 100-year return period maximum wet-bulb temperature reported in Section 2.3.1.5 was statistically extrapolated from the maximum wet-bulb temperatures reported in a 30-year database for the nearby Augusta NWS station.

A formal clarification has been requested from Westinghouse to elucidate the terminology for their site parameters (MCWB) and the basis for determining the site parameter values. The results of this clarification will be included in a future revision to the ESP Application.

2.3.1-6 SSAR Section 1.1 states that SNC has selected the Westinghouse AP1000 certified reactor design for the VEGP ESP application. Table 5.0-1 of the Tier 1 material in the AP1000 DCD lists the maximum historical wet bulb temperature (noncoincident) site parameter as 81°F. In SSAR Section 2.3.1.5, the 100-year return period maximum wet-bulb temperature (noncoincident) is estimated to be 88°F. Please discuss the potential implications of the Vogtle ESP site 100-year return period maximum wet bulb temperature exceeding the AP1000 DCD maximum historical wet bulb temperature.

Response:

In conversation with Westinghouse, it was determined that the maximum wet-bulb temperature with a 0.4% annual exceedance probability (which for Vogtle is 79°F) appears to correspond most closely to the maximum historical wet-bulb temperature (noncoincident) site parameter in Table 5.0-1 of the Tier 1 material of the AP 1000 DCD (81°F).

A clarification has been requested from Westinghouse to elucidate the terminology for their site parameters and the basis for determining the site parameter values. The results of this clarification will be included in a future revision to the ESP Application.

2.3.1-7 Section 2.3.1 of RS-002 states that data on severe weather phenomena should be based on standard meteorological records from nearby representative stations with long periods of record and the applicability of these data to represent site conditions during the expected period of reactor operation should be substantiated. Please evaluate recent trends in temperature, humidity, and precipitation extremes in the Vogtle ESP site vicinity and discuss if such trends may be indicative of climatic change.

Response:

Initial investigations concerning trends in the Southeast region suggest there exists no consistent long-term climate change in the VEGP site area. Any recent changes in temperatures in the Southeastern United States have been slight and have been only fractional when observed in the Annual Mean Temperatures Anomalies Report for the 1901 – 2003 period. This report indicates a slight cooling trend in the Southeast region. The variation of successive thirty-year temperature normals, beginning in 1930 for the climate zones that surround the site in Georgia and South Carolina, show similar trends. A discussion of long-term climatic changes will be included in the next revision to SSAR Section 2.3.1. Climate change will be addressed in terms of recent climate trends (means and extremes) observed in the site area and region for which data are readily available, and in terms of the magnitude of what is considered to be climate changes and how they relate to the design basis for the facility.

Section 2.3.2, Local Meteorology

2.3.2-1 SSAR Section 2.3.2.2.1, "Wind", uses five years of onsite meteorological data (1998-2002) to create annual and seasonal wind rose plots (i.e., graphical distributions of the direction from which the wind is blowing). A comparison of seasonal wind roses from the original FSAR for Units 1 and 2 of Plant Vogtle (1972-73, 1977-81) to the current wind roses provided in the Vogtle ESP shows some differences. Please explain the differences in wind direction frequency at 60m and 10m, especially during the spring, summer, and winter seasons (See Attached Figures).

Response:

In the VEGS area the winds are somewhat uniform in that the overall peak sector for both the original FSAR and the current 5-year period is the same (west). However, as would be expected, there is some variability between seasons and years. Also, VEGS is a relatively low wind speed site with an average annual wind speed of 2.5 m/s. This contributes to the variability in the wind direction. The data below shows the year to year variability for the 10m level between each of the years of the FSAR period and the 5-year period that is currently being used. This explains the seasonal differences that the NRC has shown in their plots.

Years	Season	Peak Sector	Secondary Peak
1972-73	Winter	W	NE
	Spring	W	WNW
	Summer	SW	SSE
	Fall	NE	E
	Annual	W	WSW
1977-78	Winter	WNW	NW
	Spring	NE	WSW
	Summer	SW	WSW
	Fall	NE	ENE
	Annual	W	WNW
1978-79	Winter	NW	WNW
	Spring	W	WSW
	Summer	S	E
	Fall	NE	ENE
	Annual	NE	E
1980-81	Winter	W	WSW
	Spring	W	WNW
	Summer	W	WSW
	Fall	NE	NNE
	Annual	W	WSW

1998-2002	Winter	W	WSW
	Spring	SW	WSW
	Summer	SW	E
	Fall	ENE	NE
	Annual	W	WSW

At the upper level on the tower the winds are now measured at 60 m (197 ft) where as for the FSAR they were measured at 45 m (148 ft). Based on where the two towers are located, one would expect some differences in wind direction particularly at night. Data recovery during the 1998-2002 period was also better than it was during the FSAR years. This may have contributed to some of the differences.

Overall the wind rose data for the 1998-2002 period is more consistent, but there are still some year-to-year variations, particularly in the seasonal data, as would be expected at a low wind speed site like VEGS.

2.3.2-2 A comparison of wind direction frequency at 10m and 60m for the five year period of onsite meteorological data (1998-2002) shows differences in wind direction frequency between the two observation heights. Please explain these apparent differences (See Attached Figures).

Response:

See response to previous question (Question 2.3.2-1). Also, during the Audit discussion, apparent differences between the monthly wind roses and the seasonal wind roses were noted, particularly for the 60 m level for Summer season. In response to other questions (in particular Question 2.3.3-1), the database of wind speed and direction is being revised and the wind roses reflecting this data are being revised as well. These revised wind roses will be included in the next revision to Section 2.3.2. The revised wind roses will show consistency between the monthly representations and the seasonal summaries.

2.3.2-3 SSAR Section 2.3.2.2.2, "Atmospheric Stability," discusses the frequency of stability classes for the Vogtle ESP site, as calculated from the five years of onsite meteorological data (1998-2002). The following chart displays the frequency of stability classes for each individual year (See Attached Figures). Please explain

(1) the reduction of A Stability Class (Extremely Unstable) frequency from 1998-2000 to 2001-2002 and

(2) the increase of E Stability Class (Slightly Stable) frequency from 2000 to 2001.

Response:

1. The reduction in extremely unstable conditions (A stability) between the 1998-2000 and 2001-2002 is a function of the normal year-to-year variation in meteorological conditions. This trend has continued in more recent years where the average percentage of "A" stability over the last five years (2002-2006) is about 3.2%. Because of the very small tenths of a degree difference between stability classes A to D it is clearer to look at percentages by stability categories

(unstable, neutral and stable). The differences between the first three years and last two year then seem less significant.

2. The increase in E stability class between 2000 and 2001 has been negated in the revised data base. Changes were made to the hourly stability classifications during parts of October, November and December 2001 that primarily affected the C, D and E stability classes. There is now 29.6% E stability for 2001 which is in line with the other years of data.

2.3.2-4 The following plots show the frequency of unstable (stability classes A-C), neutral (stability classes D,E), and stable (stability classes F,G) conditions against the corresponding observation hour for each year 1998-2002. Please explain the following apparent changes in the data from year to year (See Attached Figures).

(1) In the 2001, the number of occurrences of stable (stability classes F, G) conditions increases during the daytime, which is not seen in any other years.

(2) The number of occurrences of unstable (stability classes A-C) decreases in 2001 and 2002 as compared to 1998 through 2000.

Response:

1. The 2001 data base was revised as explained in response to Question 2.3.2-3 (2). The results were to decrease the occurrence of daytime F and G stability class. The resulting 2001 plots will now look much like the other 4 years.
2. This question was answered in response to Question 2.3.2-3 (1).

2.3.2-5 SSAR Section 2.3.2.2.3 states that "extreme maximum temperatures recorded in the vicinity of the VEGP site have ranged from 105oF to 110oF, with the highest reading observed at the Newington 2NE Station on July 13th, 1980." However, the staff found a higher extreme maximum temperature recorded in the vicinity of the VEGP site, 112oF, which occurred at Louisville 1E on July 24th, 1952.

Response:

In evaluating the Louisville 1E station temperature records, SNC agrees with the reported overall maximum temperature value of 112°F. This station will be added to Table 2.3-3 and Figure 2.3-1 because it contributes the highest of the maximum daily temperature records in the site area despite its distance from the VEGP site (i.e., about 37 miles or 60 kilometers) exceeding the selection criteria discussed in response to Question 2.3.1-2.

2.3.2-6 The lowest and highest daily mean temperatures and diurnal temperature ranges for a number of stations in the vicinity of the VEGP site are presented in SSAR section 2.3.2.2.3. The staff found larger ranges for both temperature statistics for the Vogtle ESP site as follows (See Attached Table).

Response:

The diurnal temperature ranges discussed in Section 2.3.2.2.3 and summarized in Table 2.3-5 correspond to the stations originally selected as being representative of the VEGS site. The criteria for the selection of these sites for consideration are discussed in response to Question 2.3.1-2. No follow-up action is required for this information need.

2.3.2-7 Please clarify in SSAR Section 2.3.2.3 whether any terrain modifications are expected to occur as a result of construction of a nuclear power plant (e.g., removal of trees, leveling of ground, installation of lakes and ponds, etc.) and how these terrain modifications may affect local meteorological characteristics.

Response:

While there will be excavation, landscaping, site leveling and clearing associated with the construction of the new units, these alterations to the site terrain would be localized and would not affect the overall meteorological characteristics of the site. A statement to this effect will be included in the next revision to SSAR Section 2.3.2

Section 2.3.3, Onsite Meteorological Measurements Program

2.3.3-1 The staff has reviewed the 1998-2002 hourly VEGP onsite meteorological data provided in support of the Vogtle ESP application and has the following questions:

(1) Please explain the occurrence of 71 hours of delta-temperature data where the calculated lapse rate between 60m and 10m exceeds the autoconvective lapse rate.

(2) Please explain the occurrence of 102 consecutive hours of 60m winds from the north in 1999.

(3) Please explain the following occurrences of consecutive hours of stability classes E and F in 2001.

- **E Stability class (20hr, 22hr, 23hr, 25hr, 28hr, 35hr, 36hr, 41hr,41hr,42hr,48hr,53hr,56hr,56hr,66hr,70hr,74hr,85hr)**
- **F Stability class (19hr, 21hr, 25hr, 30hr, 48hr, 90hr)**

(4) The following plot of temperature measurements implies that many hours of 10m temperature data are listed in degrees Fahrenheit instead of degrees Celsius as specified in the recommended hourly meteorological data format presented in Appendix A to Section 2.3.3 of RS-002 (See Attached Figure).

Response:

1. The hours of auto convective lapse rate were checked during the final review of this five year period. Of the 71 hours originally found, 38 were removed from the data base and coded as bad data.
2. The 102 consecutive hours of north wind direction during February 1999 were removed from the data base and coded as bad data.
3. The problem with consecutive hours of E and F stability during 2001 was fixed as explained in response to Question 2.3.2-3 (2) above.
4. The routine used to format the data and perform the temperature scale conversion has been corrected. As a result of the response to other questions (specifically Items 1 through 3, above) changes have been made to the database of hourly meteorological data. This data is being formatted for a supplemental transmittal to the NRC. The temperature anomalies will be resolved in the revised transmittal.

2.3.3-2 SSAR Section 2.3.3.2 states that one of the only parameters with annual data recoveries less than 90 percent is dew point temperature (i.e., 89.6 percent). Of the five years of meteorological data provided (1998-2002), the SSAR onsite meteorological database includes no dew point temperatures. Should this be stated as relative humidity instead of dew point temperature?

Response:

Appendix A of NUREG 0800 Section 2.3.3 calls for dimensionless moisture as one of the recommended parameters for hourly meteorological database to be submitted to NRC. This was interpreted to be a requirement to report the dimensionless relative humidity. However, during the site audit, NRC indicated a preference to have the dew point temperature in the meteorological data submittal. The database of meteorological data is being revised to address other questions from the audit (in particular, Question 2.3.2-3) the hourly meteorological database will be revised to replace relative humidity with dew point temperature.

2.3.3-3 The 1998-2000 wind direction data range from 0 degrees to 359 degrees whereas the 2001-2002 wind direction data range from 0 to 360 degrees. Please explain the reason for this change in the wind direction ranges.

Response:

There was a change in the data collection program to a Windows version in 2001 that caused the change in wind direction range from 0 to 359 to 0 to 360. The entire 5-year data base has been standardized for a wind direction range from 1-360 degrees.

2.3.3-4 SSAR Section 2.3.3.3 states that "minor structures in the vicinity of the primary meteorological tower have been evaluated as having no adverse effect on the measurements taken at the tower." Please provide a list of distances to nearby obstructions to flow in each downwind sector, including the height of each obstruction.

Response:

During the Site Meteorology Audit the site layout and the area surrounding the meteorological tower was examined by the NRC. The NRC concurred that there were no significant structures or other obstructions vicinity of the tower which would have an adverse affect on the measurements taken at the tower. No further action is required.

2.3.3-5 SSAR Table 2.3-13 provides monthly data recovery statistics for the Vogtle meteorological monitoring program from January 1998 through December 2002. The staff independently verified these data recovery statistics and found some discrepancies as shown in the following table (See Attached Table): Please confirm that the statistics in the SSAR are correct.

Response:

The data in Table 2.3-13 (Attachment 5) has been updated to reflect the revised data base. Revision of this table will be provided in the revision to Section 2.3.3.

Section 2.3.4, Short-Term (Accident) Diffusion Estimates

2.3.4-1 Please provide a copy of the PAVAN computer code input and output file(s) used to generate the EAB and LPZ χ /Q values presented in SSAR Section 2.3.4.

Response:

A copy of the PAVAN input file was provided to the NRC at the time of the audit. In addition, sufficient description of the analysis and results are provided in the ESP Application to allow NRC to complete its confirmatory analysis. It should be noted that, as a result of the response to other questions (particularly Question 2.3.3-1) the database of onsite meteorological data is being revised. This revision affects the Joint Frequency Distributions used in the PAVAN analysis. Upon completion of the analysis revision, the revised input file will be provided to the NRC.

2.3.4-2 The variability shown in the year-to-year comparisons of various meteorological parameter frequencies as discussed in Questions 2.3.2-1 through 2.3.2-4 as well as the meteorological database questions presented in Question 2.3.3-1 create uncertainty as to the representativeness of any given year for making atmospheric dispersion estimates for design basis accidents. Given the variability in the data from year to year, please justify why the short-term (accident) diffusion estimates should not be generated using each annual data set independently and the most conservative resulting χ/Q values listed as site characteristics.

Response:

As a result of the response to Question 2.3.3-1, the database of onsite meteorological data is being revised. The slight year-to-year variability in the revised data justifies the use of the aggregate five years of data (1998 – 2002) in the calculation of the χ/Q values.

Section 2.3.5, Long-Term (Routine) Diffusion Estimates

2.3.5-1 The staff made an independent evaluation of the routine diffusion estimates provided in SSAR Section 2.3.5 and obtained similar results, except for (1) relative deposition (D/Q) at 40 miles and (2) 2.26 day decay undepleted χ/Q value at the 1-2 mile segment boundary. Please confirm that these values in the SSAR are correct.

Response:

The values in SSAR Table 2.3-18 for the relative deposition (D/Q) at 40 miles and 2.26 day decay undepleted χ/Q value at the 1-2 mile segment boundary contained typographical errors. As a result of the response to Question 2.3.3-1, the database of onsite meteorological data is being revised. This revision affects the Joint Frequency Distributions used in the XOQDOQ analysis. Upon completion of the analysis revision, revised output will be accurately reflected in the revision to Section 2.3.5.

2.3.5-2 The variability shown in the year-to-year comparisons of various meteorological parameter frequencies as discussed in Questions 2.3.2-1 through 2.3.2-4 as well as the meteorological database questions presented in Question 2.3.3-1 create uncertainty as to the representativeness of any given year for making atmospheric dispersion estimates for design basis accidents. Given the variability in the data from year to year, please justify why the long-term (routine) diffusion estimates should not be generated using each annual data set independently and the most conservative resulting χ/Q values listed as site characteristics.

Response:

See response to Question 2.3.4-2

Southern Nuclear Operating Company

AR-07-0059

Enclosure 2

Response Attachments

Note: This enclosure contains the following numbered attachments referenced in SNC's responses to the NRC information needs contained in Enclosure 1:

- Attachment 1, Corrected SSAR Table 2.3-1
- Attachment 2, Revised SSAR Table 2.3-3
- Attachment 3, Revised SSAR Figure 2.3-1
- Attachment 4, Revised Paragraph 3 in SSAR Section 2.3.1.3.5
- Attachment 5, Updated SSAR Table 2.3-13

Table 2.3-1 NWS and Cooperative Observing Stations Near the VEGP Site

Station [a]	State	County	Approximate Distance (miles)	Direction Relative to Site	Elevation (feet)
Waynesboro 2NE	GA	Burke	16	WSW	270
Augusta WSO (Bush Field)	GA	Richmond	20	NW	132
Millen 4N	GA	Jenkins	22	SSW	195
Midville Experiment Station	GA	Burke	32	SW	280
Louisville 1E	GA	Jefferson	37	WSW	322
Newington 2NE	GA	Screven	41	SSE	209
Aiken 4NE	SC	Aiken	25	NNE	502
Blackville 3W	SC	Barnwell	29	ENE	324
Springfield	SC	Orangeburg	37	NE	300
Bamberg	SC	Bamberg	44	ENE	165

Notes:

a - Numeric and letter designators following a station name (e.g., Waynesboro 2NE) indicate the station's approximate distance in miles (e.g., 2) and direction (e.g.., northeast) relative to the place name (e.g.., Waynesboro).

Table 2.3-3 Climatological Extremes at Selected NWS and Cooperative Observing Stations in the VEGP Site Area

Parameter	Waynesboro 2NE	Augusta WSO	Millen 4N	Midville Exp Station	Louisville 1E	Newington 2NE	Aiken 4NE	Blackville 3W	Springfield	Bamberg
Maximum Temperature	108 °F [a, b] (7/25/52); (7/14/80)	108 °F [a] (8/21/83)	109 °F [b] (7/24/52)	105 °F [a, b] (7/13/80); (8/21/83) (7/19/86); (7/21/86)	112 °F [a] (7/24/52)	110 °F [a] (7/13/80)	109 °F [a] (8/22/83)	108 °F [a] (8/1/99)	NA [d]	109 °F [a] (7/24/52)
Minimum Temperature	-1 °F [a, b] (1/20/85); (1/21/85)	-1 °F [a] (1/21/85)	0 °F [b] (1/21/85)	-1 °F [a] (1/21/85)	-2 °F [a] (1/21/85)	-1 °F [a] (1/21/85)	-4 °F [a] (1/21/85)	-1 °F [a] (1/21/85)	NA [d]	2 °F [a] (1/21/85)
Maximum 24-hr Rainfall	7.40 in. [a] (10/3/94)	7.30 in. [a] (9/3/98)	8.02 in. [b] (8/29/64)	8.19 in. [a] (10/12/90)	8.60 in. [a] (10/12/90)	5.50 in. [a] (10/10/90)	9.68 in. [a] (4/16/69)	7.53 in. [a] (9/30/59)	7.10 in. [b, c] (9/30/59)	8.02 in. [a, c] (9/23/00)
Maximum Monthly Rainfall	16.99 in. [a, b] (10/94)	14.82 in. [a, b] (10/90)	13.45 in. [b] (8/64)	15.97 in. [b, c] (8/70)	14.76 in. [b, c] (8/91)	15.29 in. [a, b] (7/89)	14.45 in. [a, b] (3/80)	14.67 in. [a, b] (10/90)	17.32 in. [b, c] (6/73)	15.26 in. [a, b] (8/95)
Maximum 24-hr Snowfall	16.0 in. [a, b] (2/10/73)	8.0 in. [a, b] (2/9/73)	14.0 in. [b] (2/10/73)	14.0 in. [b, c] (2/10/73)	14.8 in. [a, b] (2/10/73)	5.0 in. [a, b] (2/10/73)	15.0 in. [a, b] (2/10/73)	17.0 in. [b, c] (2/10/73)	8.0 in. [b, c] (2/11/73)	19.0 in. [a, b] (2/10/73)
Maximum Monthly Snowfall	16.0 in. [a, b] (2/73)	14.0 in. [a, b] (2/73)	15.0 in. [b] (2/68)	14.0 in. [b, c] (2/73)	14.8 in. [a, b] (2/73)	8.0 in. [a, b] (2/73)	15.0 in. [a, b] (2/73)	17.0 in. [b, c] (2/73)	15.0 in. [b, c] (2/73)	22.0 in. [a, b] (2/73)

Sources: a – NCDC 2005b
b – SERCC 2006
c – NCDC 2002c
d – NA = Measurements not made at this station

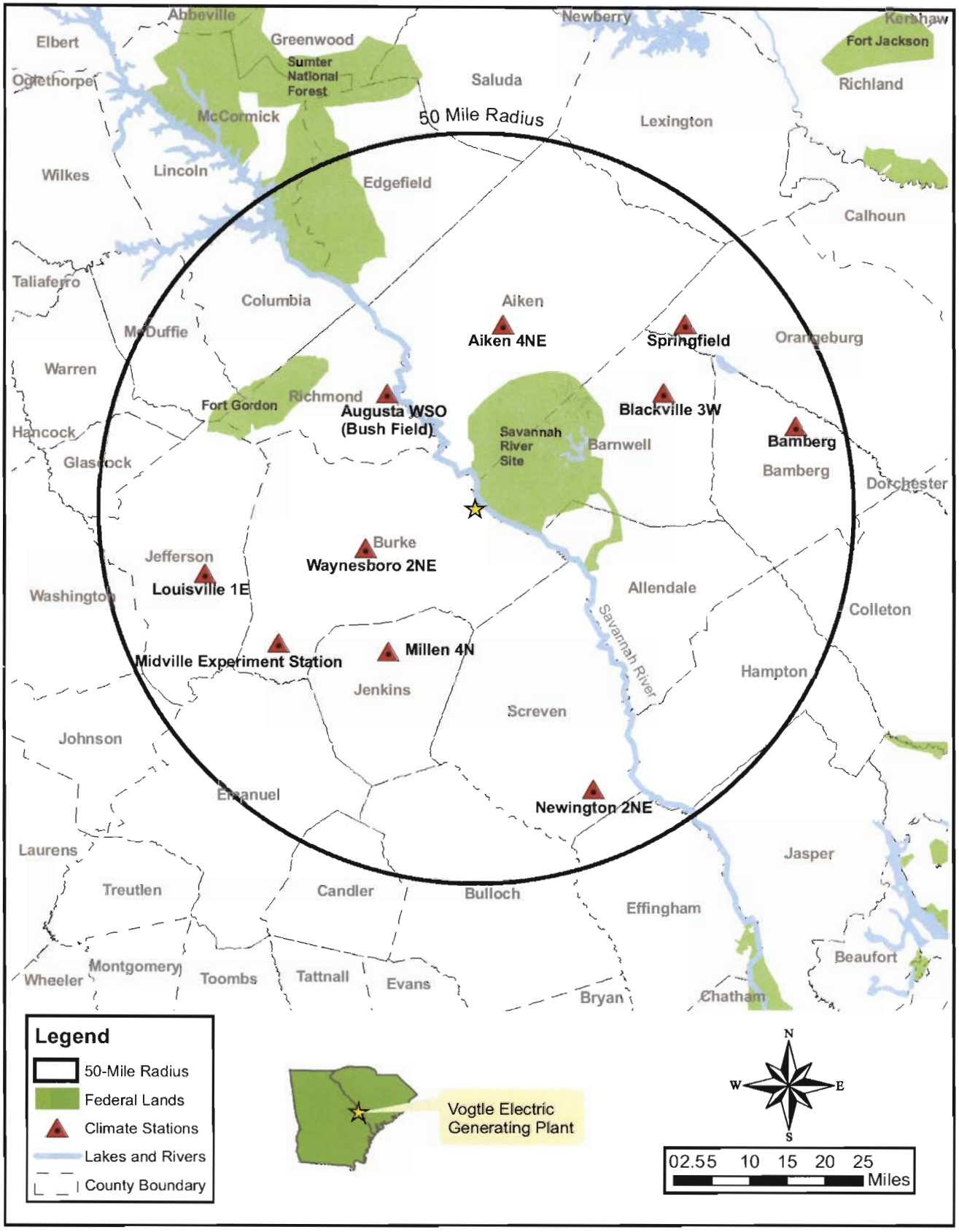

Figure 2.3-1 Climatological Observing Stations Near the VEGP Site

Revised Paragraph 3 in SSAR Subsection 2.3.1.3.5

"However, the annual mean number of days with hail 0.75 in. and 1.0 in. or greater is slightly higher in nearby Richmond and Columbia Counties, Georgia (just to the northwest of the VEGP site), and in Aiken and Edgefield Counties, South Carolina (just to the north and north-northwest of the VEGP site), ranging from 1 to 2 days per year (0.75 in. diameter or greater) and up to 1 day per year (1.0 in. diameter or greater)."

Table 2.3-13 Annual Data Recovery Statistics - VEGP Primary Meteorological Tower (1998-2002)

Parameter	1998	1999	2000	2001	2002
Wind Speed (10m)	99.0	99.0	97.8	95.1	97.1
Wind Speed (60 m)	98.4	98.1	97.7	95.2	96.7
Wind Direction (10 m)	99.1	98.9	98.4	95.2	96.4
Wind Direction (60 m)	88.2	93.3	96.6	95.3	97.6
Δ-Temperature (60m – 10m) [a]	96.6	98.6	97.2	94.9	99.3 [b]
Temperature (10 m)	99.2	98.9	97.8	95.0	97.6 [b]
Dewpoint (10 m)	99.0	98.3	85.5	95.1	89.6
Rainfall	99.5	99.3	99.1	96.3	78.8
Composite Parameters					
WS/WD (10m), ΔT (60m-10m) [a]	96.4	98.3	96.7	94.9	95.3
WS/WD (60m), ΔT (60m-10m) [a]	85.6	91.9	95.0	94.9	96.1

Notes: a - Temperature difference (ΔT) between 10-m and 60-m levels.

b - Data recovery for Δ-Temperature is greater than the 10-m temperature parameter recovery rate due to data substitution by SNC in the 2002 data set for the ΔT parameter only.

J. A. "Buzz" Miller
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SOUTHERN COMPANY
Energy to Serve Your World℠

JAN 30 2007

Docket No.: 52-011

AR-07-0061

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

Southern Nuclear Operating Company
Vogtle Early Site Permit Application
Response to Requests for Additional Information on the Environmental Report

Ladies and Gentlemen:

On October 17-19, 2006, the U.S. Nuclear Regulatory Commission (NRC) performed an onsite audit of the Environmental Report (ER) that was submitted with the Early Site Permit (ESP) Application for the Vogtle site. Approximately one week prior to the audit, the NRC provided Southern Nuclear Operating Company (SNC) with a list of questions to discuss during the audit. SNC dispositioned many of these questions during the audit, and the NRC added some additional questions to the list.

The NRC requested that many of the questions receive formal answers by the second week in December to support the development of their Environmental Impact Statement (EIS). By letter dated December 11, 2006, SNC responded to all but 35 of the questions, with the understanding that the NRC would restructure and reissue the open questions as formal Requests for Additional Information (RAIs). By letter dated December 29, 2006, the NRC provided SNC with 101 RAIs for the ER portion of Vogtle ESP Application, including the 35 open questions from SNC's December 11th letter.

SNC's response to the NRC environmental RAIs is provided in Enclosure 1, 2 and 3 to this letter.

If you have any questions or require additional information regarding this matter, please contact T. C. Moorer at 205-992-5807 or J. T. Davis at (205) 992-7692.

Mr. J. A. (Buzz) Miller states he is a 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 subscripted before me this 30TH *day of* JANUARY, *2007*

Dorothy P. Hoffmann
Notary Public

My commission expires: May 1, 2008

JAM/BJS/dmw

Enclosures:

1. Response to December 29, 2006 Requests for Additional Information on Vogtle ESP Application Environmental Report
2. Reports and Documents Provided in Support of RAI Responses
3. Electronic Files on CDs providing Data and Information Requested by RAIs

cc: Southern Nuclear Operating Company
Mr. J. B. Beasley, Jr., President and CEO (w/o enclosures)
Mr. J. T. Gasser, Executive Vice President, Nuclear Operations (w/o enclosures)
Mr. T. E. Tynan, Vice President - Vogtle (w/o enclosures)
Mr. D. M. Lloyd, Vogtle Deployment Director (w/o enclosures)
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Document Services RTYPE: AR01
File AR.01.01.06

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Oglethorpe Power Corporation
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Municipal Electric Authority of Georgia
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Dalton Utilities
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Tetra Tech NUS, Inc.
Ms. K. K. Patterson, Project Manager (w/o enclosures)

Southern Nuclear Operating Company

AR-07-0061

Enclosure 1

Response to December 29, 2006

Requests for Additional Information

On

Vogtle ESP Application

Environmental Report

Southern Nuclear Operating Company

AR-07-0061

Enclosure 2

Reports and Documents

Provided in Support of

RAI Responses

List of Enclosed Reports/Documents

The following reports/documents are included in this enclosure. The RAI # where the report/document is referenced in Enclosure 1 is noted in parenthesis following the report/document description.

1. Georgia Planning Act of 1989 (OCGA § 50-8-1 et seg.) (E2.2-1)
2. Jurisdictional Water Report (E2.4-1b and E2.4-1e)
3. Transmission Line Macro-corridor Study (E2.4-2c and E2.4-2f)
4. Wildlife Habitat Council 2005 Recertification Application for Joseph M. Farley Nuclear Plant (E2.4-2i)
5. Wildlife Habitat Council 2005 Recertification Application for Edwin I. Hatch Nuclear Plant (E2.4-2i)
6. Wildlife Habitat Council 2006 Recertification Application for Vogtle Electric Generating Plant (E2.4-2i)
7. Land Management Plan for the Vogtle Electric Generating Plant (E2.4-2j)
8. New South Historic and Archaeological Resources Report (E2.5-2)
9. Westinghouse LTR-CRA-06-21, AP1000 Accident Releases and Doses as a Function of Time (E7.1-2)

Southern Nuclear Operating Company

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Enclosure 3

Electronic Files on CDs

Providing Data and Information

Requested by RAIs

AR-07-0061
Enclosure 3
Electronic Files on CD

List of Enclosed Reports/Documents

The following electronic reports/documents are included on the enclosed CD:

Folder Prefix	Description of Folder Contents
E2.4-1e	PDF Maps and Drawing Overlay File
E2.4-2b	VEGP T&E survey locations and GIS files
E4.3-1d	Habitat map and accompanying GIS data vegetation coverage
E3.9-2	GIS data files & Disturbed Area Figure (GIS).PDF
E9.3-3	2002 Final Report, Threatened and Endangered Species Surveys: Joseph M. Farley Nuclear Plant and Associated Transmission Line Corridors (2001-2002)[1]
E9.3-8	1999 Final Report, Threatened and Endangered Species Surveys: E. I. Hatch Nuclear Plant Units 1 and 2[2]

[1] This document provided for information only and is not formatted for ADAMS. However, it is currently in ADAMS via a license renewal submittal.
[2] Same as Footnote No. 1.