Stephen A. Byrne
Senior Vice President
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SCE&G®
A SCANA COMPANY

June 24, 2009
NND-09-0170

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

ATTN: Document Control Desk

Subject: Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Application (COLA) - Docket Numbers 52-027 and 52-028 Response to NRC Request for Additional Information (RAI) Letter No. 048

Reference: Letter from Chandu P. Patel (NRC) to Alfred M. Paglia (SCE&G), Request for Additional Information Letter No. 048 Related to SRP Section 2.3.1 for the Virgil C. Summer Nuclear Station Units 2 and 3 Combined License Application, dated May 27, 2009.

The enclosure to this letter provides the South Carolina Electric & Gas Company (SCE&G) responses to the RAI items included in the above referenced letter. The enclosure also identifies any associated changes that will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA.

Should you have any questions, please contact Mr. Al Paglia by telephone at (803) 345-4191, or by email at apaglia@scana.com.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 24TH day of JUNE, 2009.

Sincerely,

Stephen A. Byrne
Senior Vice President
Generation

AMM/SAB/am

Enclosure

D083
NRO

c (w/o enclosure):
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John Zeiler
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NRC RAI Letter No. 048 Dated May 27, 2009

SRP Section: 02.03.01 – Regional Climatology

Questions from Siting and Accident Consequences Branch (RSAC)

NRC RAI Number: 02.03.01-1

In accordance with NUREG-0800, Regulatory Guide 1.206, and Regulatory Guide 1.76:

> Provide annual frequencies (and supporting data) of reported tornadoes in the vicinity (i.e., surrounding counties) of the proposed site. This data should include the magnitude (i.e., F1, F2, etc), date, and county in which the tornado was reported.

VCSNS RESPONSE:

There were 124 tornadoes that occurred in the surrounding (Saluda, Chester, Lancaster, Newberry, Lexington, Kershaw, Richland, Union and Fairfield) counties during the period from January 1950 through August 2003 (Reference 1). This period of record was selected to match the existing analysis taken from NUREG/CR-4461. Based on the 124 tornadoes during the period of record of about 54 years the annual frequency would be about 2.3 tornadoes per year within approximately 50 miles of VCSNS.

It should be noted that, the period from June 1, 1995 (when the KCAE Columbia Doppler radar was commissioned, Reference 2) through August 31, 2003 represents 26.6% of the 124 total tornado occurrences, even though this is only 15.4% of the total time period. This demonstrates a strong spatial (Reference 3) and temporal bias of detection towards the Doppler radar. The spatial distribution of tornadoes shows a wide variation in the number of events between counties.

The annual frequency distribution of tornadoes shows a wide variation in the number of events between counties. This association is due as much to the uneven sizes and population density of the counties being sampled, as to the spatial distribution of tornadoes. The methodology presented in NUREG/CR-4461 uses a larger area to average out spatial unevenness. This is more appropriate than listing by counties. The use of the county data for reporting of spatial or temporal frequency for tornado occurrences misrepresents trends due to sampling biases inherent in tornado observations.

Tornadoes That Occurred In Counties Surrounding VCSNS (Saluda, Chester, Lancaster, Newberry, Lexington, Kershaw, Richland, Union and Fairfield) During the Period From January 1950 Through August 2003[a]

County	Location or County	Date	Time[b]	Magnitude
Saluda	1 SALUDA	3/13/1955	2100	F2
Saluda	2 SALUDA	11/22/1992	1755	F3
Saluda	3 SALUDA	11/22/1992	1800	F2
Saluda	4 Ward	5/7/1998	7:12 PM	F1
Saluda	5 Saluda	6/2/1998	10:28 AM	F0
Saluda	6 Saluda	4/24/1999	3:39 PM	F0
Saluda	7 Ward	5/6/2003	12:45 AM	F0
Chester	1 CHESTER	4/6/1955	1230	F1
Chester	2 CHESTER	5/15/1975	1200	F1
Chester	3 CHESTER	4/19/1981	1845	F1
Chester	4 Lowrys	4/16/1994	0111	F2
Chester	5 Chester	8/16/1994	1755	F1
Chester	6 Chester 9 Wnw	5/1/1995	2305	F0
Chester	7 Richburg	5/29/1996	5:00 PM	F1
Chester	8 Ft Lawn	7/24/1997	12:00 AM	F1
Chester	9 Chester	6/4/1998	5:30 PM	F0
Lancaster	1 LANCASTER	4/5/1957	1930	F1
Lancaster	2 LANCASTER	4/8/1957	1600	F4
Lancaster	3 LANCASTER	10/1/1969	2245	F0[c]

County	Location or County	Date	Time[(b)]	Magnitude
Lancaster	4 LANCASTER	3/4/1977	1120	F1
Lancaster	5 LANCASTER	3/28/1984	1725	F4
Lancaster	6 LANCASTER	6/16/1989	1715	F1
Lancaster	7 LANCASTER	9/22/1989	0045	F1
Newberry	1 NEWBERRY	4/5/1957	0714	F1
Newberry	2 NEWBERRY	3/30/1960	1906	F2
Newberry	3 NEWBERRY	4/18/1969	1600	F1
Newberry	4 NEWBERRY	12/13/1973	1425	F3
Newberry	5 NEWBERRY	12/13/1973	1503	F3
Newberry	6 NEWBERRY	12/13/1973	1616	F2
Newberry	7 NEWBERRY	12/13/1973	1645	F2
Newberry	8 NEWBERRY	5/15/1975	1350	F1
Newberry	9 NEWBERRY	3/28/1984	1620	F2
Newberry	10 NEWBERRY	3/28/1984	1645	F3
Newberry	11 NEWBERRY	5/23/1988	1540	F0
Newberry	12 NEWBERRY	11/22/1992	1830	F3
Newberry	13 NEWBERRY	11/22/1992	1913	F2
Newberry	14 NEWBERRY	8/16/1994	1332	F1
Newberry	15 Prosperity	1/14/1995	0814	F0
Newberry	16 Pomaria	1/14/1995	0829	F0
Newberry	17 ?	5/15/1995	1553	F0

County	Location or County	Date	Time[b]	Magnitude
Newberry	18 Chappells	4/24/1999	3:37 PM	F0
Newberry	19 Silverstreet	11/11/2002	6:42 AM	F1
Newberry	20 Pomaria	11/11/2002	7:35 AM	F1
Lexington	1 LEXINGTON	4/5/1957	0645	F2
Lexington	2 LEXINGTON	9/28/1963	1800	F1
Lexington	3 LEXINGTON	1/10/1972	1405	F1
Lexington	4 LEXINGTON	2/22/1974	0400	F1
Lexington	5 LEXINGTON	2/11/1981	0015	F1
Lexington	6 LEXINGTON	2/21/1989	0800	F1
Lexington	7 To 4 Ene	2/22/1993	0115	F1
Lexington	8 Gilbert	8/16/1994	1200	F2
Lexington	9 LEXINGTON	8/16/1994	1216	F0
Lexington	10 Of Lexington	8/16/1994	1227	F2
Lexington	11 Lexington	8/16/1994	1235	F3
Lexington	12 Columbia	8/16/1994	1253	F0
Lexington	13 Lextington	8/16/1994	1335	F3
Lexington	14 Pelion	1/14/1995	1156	F1
Lexington	15 Gaston	11/2/1995	1545	F3[c]
Lexington	16 Cayce	11/7/1995	1515	F0
Lexington	17 South Congaree	11/7/1995	1523	F0[c]
Lexington	18 Lexington	11/7/1995	1530	F1

County	Location or County	Date	Time[b]	Magnitude
Lexington	19 Gaston	7/23/1997	10:53 PM	F2
Kershaw	1 KERSHAW	8/29/1964	1600	F1
Kershaw	2 KERSHAW	8/16/1965	1540	F0[c]
Kershaw	3 KERSHAW	4/7/1967	1420	F1
Kershaw	4 KERSHAW	4/18/1969	1345	F1
Kershaw	5 KERSHAW	4/18/1969	1705	F2
Kershaw	6 KERSHAW	5/4/1978	1700	F1
Kershaw	7 KERSHAW	3/6/1983	1800	F1
Kershaw	8 KERSHAW	3/28/1984	1720	F4
Kershaw	9 KERSHAW	2/16/1990	1324	F0
Kershaw	10 KERSHAW	8/16/1994	1400	F0
Kershaw	11 Camden	3/16/1996	10:38 PM	F0
Kershaw	12 Cassatt	5/29/1996	6:44 PM	F0
Kershaw	13 Camden	7/23/1997	11:48 PM	F2
Kershaw	14 Bethune	7/24/1997	12:20 AM	F1
Richland	1 RICHLAND	6/11/1955	1030	F0
Richland	2 RICHLAND	7/3/1964	0125	F2
Richland	3 RICHLAND	8/29/1964	1515	F2
Richland	4 RICHLAND	3/26/1965	915	F0
Richland	5 RICHLAND	5/29/1967	1800	F2
Richland	6 RICHLAND	11/24/1967	1810	F1

County	Location or County	Date	Time[b]	Magnitude
Richland	7 RICHLAND	5/12/1971	1530	F1
Richland	8 RICHLAND	1/10/1972	1405	F1
Richland	9 RICHLAND	11/12/1975	1915	F2
Richland	10 RICHLAND	5/15/1976	130	F2
Richland	11 RICHLAND	6/19/1977	2000	F1
Richland	12 RICHLAND	5/20/1980	1010	F1
Richland	13 RICHLAND	2/11/1981	0000	F1
Richland	14 RICHLAND	4/20/1981	1505	F1
Richland	15 RICHLAND	8/31/1987	1515	F2
Richland	16 RICHLAND	6/16/1989	1500	F0
Richland	17 Mcentire	8/16/1994	1230	F0
Richland	18 Balentine	8/16/1994	1318	F1
Richland	19 Near Ballentine	1/6/1995	2210	F1
Richland	20 Columbia	10/27/1995	1745	F0[c]
Richland	21 Columbia	11/7/1995	1521	F0[c]
Richland	22 Columbia	7/23/1997	11:14 PM	F1
Richland	23 Columbia	7/23/1997	11:32 PM	F0
Richland	24 Ft Jackson	3/16/2000	3:30 PM	F0
Richland	25 Mc Entire Ang	3/16/2000	5:52 PM	F0
Richland	26 Eastover	3/29/2001	4:12 PM	F0

County	Location or County	Date	Time[(b)]	Magnitude
Richland	27 Ft Jackson	6/13/2001	1:22 PM	F0
Union	1 UNION	4/8/1957	1500	F2
Union	2 UNION	8/17/1985	1315	F0
Union	3 UNION	6/4/1992	1050	F0
Union	4 UNION	6/4/1992	1115	F0
Union	5 Southside To	4/15/1993	1626	F2
Union	6 Union	7/26/1996	4:25 PM	F0
Union	7 Carlisle	6/6/1998	4:10 PM	F1
Union	8 Adamsburg	5/25/2000	7:00 PM	F1
Union	9 Carlisle	6/9/2001	2:15 PM	F0
Fairfield	1 FAIRFIELD	3/6/1983	1730	F1
Fairfield	2 FAIRFIELD	3/28/1984	1653	F3
Fairfield	3 FAIRFIELD	3/28/1984	1700	F4
Fairfield	4 FAIRFIELD	11/22/1992	1945	F0
Fairfield	5 FAIRFIELD	11/22/1992	2012	F0
Fairfield	6 FAIRFIELD	5/4/1993	1745	F0
Fairfield	7 Strother To	8/16/1994	1343	F0
Fairfield	8 Ridgeway	8/16/1994	1530	F2
Fairfield	9 Winnsboro	8/16/1994	1644	F0
Fairfield	10 Centerfield	1/6/1995	2214	F1
Fairfield	11 Ridgeway	3/16/1996	10:17 PM	F0

County	Location or County	Date	Time[(b)]	Magnitude
Fairfield	12 Jenkinsville	7/22/2000	1:15 PM	F0

(a) The period from June 1, 1995, when the KCAE Columbia Doppler radar was commissioned through August 31, 2003 represents 26.6% of the 124 total tornado occurrences, even though this is only 15.4% of the total time period. This causes a strong spatial and temporal bias of detection towards the Doppler radar.

(b) Times in the NCDC Storm Events database are in Central Standard Time for 1950 through 1995. After 1996, the database switches to using Local Standard Time.

(c) Values were modified to reflect magnitudes cited in FSAR Reference 212 that were not available from the NCDC Storm Events Database.

References for the Response:

1. Storm Events, National Climatic Data Center, web site: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms, Accessed May 2009.

2. NCDC: Weather Station, National Climatic Data Center, web site: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~StnSrch~StnID~20017442#DIGITAL, Accessed June 15th, 2009

3. South Carolina Association of Counties, Land Area and Population Density, http://www.sccounties-scac.org/profiles/LandArea.htm, Accessed June 2nd, 2009.

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

The following changes to the FSAR will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA:

The following text will be added to the FSAR in Subsection 2.3.1.3.2 on page 2.3-8.

There were 124 tornadoes (see Table 2.3-227) that occurred in the surrounding (Saluda, Chester, Lancaster, Newberry, Lexington, Kershaw, Richland, Union and Fairfield) counties during the period from 1950-August 2003 (Reference 250). Based on the 124 tornadoes during the period of record of about 54 years the annual frequency would be about 2.3 tornadoes per year within approximately 50 miles of VCSNS. This period of record was selected to follow the period of record from NUREG/CR-4461, from which the design basis tornado characteristics given in Table 2.0-201 were selected.

Add the above table "Tornadoes That Occurred In Counties Surrounding VCSNS (Saluda, Chester, Lancaster, Newberry, Lexington, Kershaw, Richland, Union and Fairfield) During the Period From January 1950 Through August 2003" to the tables in FSAR Section 2.3 as Table 2.3-227.

Add the following reference to FSAR Section 2.3:

250. Storm Events, National Climatic Data Center, web site: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms, Accessed May 2009.

ASSOCIATED ATTACHMENTS:

None

NRC RAI Letter No. 048 Dated May 27, 2009

SRP Section: 02.03.01 – Regional Climatology

Questions from Siting and Accident Consequences Branch (RSAC)

NRC RAI Number: 02.03.01-2

Please justify why the extreme wind basic wind speed site characteristic value for safety-related structures is not based on the most severe hurricanes that have been historically reported for the site and surrounding area.

10 CFR 52.79(a)(1)(iii) states, in part, that the COL application must contain the meteorological characteristics of the proposed site with appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area and with sufficient margin for the limited accuracy, quantity, and time in which the historical data have been accumulated.

FSAR Section 2.3.1.3.3 states that Hurricane Hugo (1989) was observed to have a maximum wind gust of 95 knots (109 mph). However, FSAR Table 2.0-201 shows that the Operating Basis Wind Speed is 102 mph (100-year return period 3-second gust). Please either correct this apparent discrepancy in the FSAR or explain why the recorded wind gust from Hurricane Hugo (1989) should not be considered to be the most severe wind speed recorded in the region surrounding VCSNS.

VCSNS RESPONSE:

The FSAR will be revised to discuss this apparent inconsistency in Subsection 2.3.1.

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

The following changes to the FSAR will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA:

After the paragraph on page 2.3-7 (Subsection 2.3.1.3.1) that starts "Subsection 2.3.1.3.3 ...", add the following:

The Shaw Air Force Base (AFB) wind speed for Hurricane Hugo was provided as a data point because it was a source for tropical cyclones and demonstrated the unusual nature of this hurricane; however, the Shaw AFB observation is not representative of the maximum wind speed that would be observed at the site. Shaw AFB is located approximately 50 miles to the southeast of the VCSNS site, and due to its location relative to the storm path, it received the strongest of the hurricane's winds that existed

at the time. The VCSNS site received winds that were on the weaker, western side of the storm. Hurricane Hugo was noteworthy for rapid inland movement and a widespread circulation. This suggests that the winds for Hugo were stronger inland than for most storms. Hurricanes that move inland decrease in wind speed, and winds continue to decrease in intensity as the storm moves further inland due to friction and loss of warm moist inflow air. Shaw AFB is positioned closer to the coast than the site is located. Hugo had observed winds of 109 mph as it passed Shaw AFB, followed by a rapid decrease in storm intensity to 70 mph at Columbia (Reference 212). Therefore Hugo had decreased in storm intensity below the site characteristic value at Columbia. While maximum wind gusts of 109 mph were reported at Shaw AFB, the maximum wind gusts associated with Hurricane Hugo at the site were much lower due to the location of the VCSNS site. On this basis it is concluded that historical Hurricane winds that have occurred around the site would not exceed the design basis wind speed of 102 mph given above.

ASSOCIATED ATTACHMENTS:

None

NRC RAI Letter No. 048 Dated May 27, 2009

SRP Section: 02.03.01 – Regional Climatology

Questions from Siting and Accident Consequences Branch (RSAC)

NRC RAI Number: 02.03.01-3

Address, in FSAR Section 2.3.1, the extreme frozen winter precipitation event and extreme liquid winter precipitation event as site characteristics in accordance with the Interim Staff Guidance (ISG) DC/COL-ISG-07, "Interim Staff Guidance on Assessment of Normal and Extreme Winter Precipitation Loads on the Roofs of Seismic Category I Structures" (ML081990438) and provide a discussion for the site characteristic values chosen.

VCSNS RESPONSE:

The information requested has been provided in a letter from Ronald B. Clary to the Document Control Desk dated March 26, 2009, letter number NND-09-0060, "Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Application (COLA) - Docket Numbers 52-027 and 52-028 Voluntary Submittal to Provide Updated Meteorological Information for Final Safety Analysis Report (FSAR) Section 2.3". This submittal contains a revised FSAR Section 2.3, and the information requested by this RAI can be found in this updated FSAR Subsection 2.3.1.3.4.

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

The following changes to the FSAR will be incorporated in Revision 1 of the VCSNS Units 2 and 3 COLA:

See FSAR Subsection 2.3.1.3.4 provided to the NRC on March 26, 2009 in NND-09-0060, "Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Application (COLA) - Docket Numbers 52-027 and 52-028 Voluntary Submittal to Provide Updated Meteorological Information for Final Safety Analysis Report (FSAR) Section 2.3".

ASSOCIATED ATTACHMENTS:

None

NRC RAI Letter No. 048 Dated May 27, 2009

SRP Section: 02.03.01 – Regional Climatology

Questions from Siting and Accident Consequences Branch (RSAC)

NRC RAI Number: 02.03.01-4

This RAI refers to FSAR Section 2.3.1.5, "Air Temperature Site Characteristics", and FSAR Table 2.0-201:

The VCSNS site characteristic values to be compared with the AP1000 maximum safety and minimum safety air temperature site parameter values should either be 100-year return period values or historic extreme values, whichever are bounding.

10 CFR 52.79(a)(1)(iii) states in part that COL applications must identify the meteorological characteristics of the proposed site with appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated.

Temperatures based on a 100-year return period are considered to provide sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated as required by the regulation.

1. FSAR Section 2.3.1.5 states, in the last paragraph, "Based on the linear regression analyses of these data sets for a 100-year return period, the maximum dry bulb temperature is estimated to be 112.4°F, the minimum dry bulb temperature is estimated to be approximately -8.9°F, and the maximum wet bulb temperature is estimated to be 87.3°F."

> Please explain why these results are not used for the site characteristic values in FSAR Table 2.0-201, considering that they are more extreme than the values currently shown. Update FSAR Table 2.0 and FSAR Section 2.3.1.5 as necessary.

2. FSAR Section 2.3.1.5 states that "This record low temperature ... represents an overall, historical minimum temperature."

Please update the FSAR to include the period of record for this observation site (Chester 1NW).

VCSNS RESPONSE:

1. The evaluations that were performed to determine the site parameters utilized the design specifications outlined within the AP1000 DCD. The results reported in FSAR Table 2.0-201 were considered to be the site specific parameters that reflected the design requirements necessary to compare with the Westinghouse DCD criteria of evaluation given on Table 2-1 of the AP 1000 DCD. The historical limit (0% exceedance) value was determined and used for a direct comparison to the reported values for consistency. The maximum safety wet bulb temperature during the time period, persisting for at least 2-hours was 82.5°F (FSAR References 217 and 207). This value is cited in the FSAR Subsection 2.3.1.5.

   The FSAR has provided the environmental conditions that are directly comparable to the design requirements of the AP1000 DCD values. 10 CFR 52.79(a)(1)(iii) states that COL applications must identify the meteorological characteristics of the proposed site with appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area with sufficient margin for the limited accuracy, quantity, and period of time in which historical data have been accumulated. For the VCSNS site, the most extreme historical observations are those associated with the 0% exceedance values listed in FSAR Table 2.0-201 and in FSAR Subsection 2.3.1.5. The 30-year period takes into account the slow changes in climate while capturing extremes and other infrequent occurrences. The period evaluated meets the generally accepted condition for climate period for finding representative values (Reference 1).

   The 100-year return period value was computed and reported but was not compared to the DCD because the evaluation criterion is specified as a 0% exceedance (historical maximum) value.

2. The period of record for Chester is July 1948 – June 2006 (Reference 2).

References for the Response:

1. *Glossary of Meteorology*. 2nd edition, Boston: American Meteorological Society, 2000.

2. Weather Stations, National Climatic Data Center, web site: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwDI~StnSrch~StnID~20017515, accessed on 5 June 2009

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

The following changes to the FSAR will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA:

Revise the 6th from the last paragraph in FSAR Subsection 2.3.1.5 as follows:

Record minimum temperatures observed in the VCSNS site area are presented in Table 2.3-203 and summarized in Subsection 2.3.2.2.4. Among the 14 NWS and Cooperative observer network stations listed in Table 2.3-201, the overall lowest temperature recorded was –5°F at a station (Chester 1NW) (References 214 and 222) located about 30 miles to the north of the site. The period of record for Chester 1NW is July 1948 – June 2006.

ASSOCIATED ATTACHMENTS:

None

NRC RAI Letter No. 048 Dated May 27, 2009

SRP Section: 02.03.01 – Regional Climatology

Questions from Siting and Accident Consequences Branch (RSAC)

NRC RAI Number: 02.03.01-5

NUREG-0800, Section 2.3.1, Acceptance Criteria #2 states, in part, the applicability of severe weather phenomena data to represent site conditions during the expected period of reactor operation should be substantiated. SRP 2.3.1 Review Procedure #3 states, in part, current literature on possible changes in the weather in the site region should be reviewed to be confident that the methods used to predict weather extremes are reasonable.

Please include in FSAR Section 2.3.1.7, "Climate Changes", a brief discussion on the potential effects of global climate change on the future regional conditions near the site. Include in this discussion any proposed site characteristics that may be altered or affected due to the potential of climate change.

VCSNS RESPONSE:

The following discussion will be added to the end of FSAR Subsection 2.3.1.7, "Climate Changes".

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

The following changes to the FSAR will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA:

Add the following to the end of FSAR Subsection 2.3.1.7, "Climate Changes".

General predictions on global and US climatic changes expected during the period of reactor operation are uncertain on the regional scale. Until higher resolution, more sophisticated, Global Climate Models (GCM's) can be developed it will be difficult to determine with certainty the characteristic changes that will occur in the site region. VCSNS is in a region where forecasts show little agreement between various modeling scenarios with respect to the relative changes in modeled climatic quantities (Reference 251). Many of the environmental quantities used for design purposes are not reported in the literature from GCM output. It is unclear, and may be speculative, as to how the general large scale trends in these climatic quantities would translate to design criteria in the site region, specifically with respect to the extreme values.

The historic data record provides the climatic trends and severe natural phenomena that are included in the site characterization. A margin of safety is provided by the difference between the site characteristics and the DCD site parameters, used for design. This margin accounts for limitations to the accuracy, quantity and period of time in which the historical data have been accumulated, in addition to the potential for increases due to changes in the climate. However, there is considerable uncertainty from GCM output as to how this will impact the characteristic quantities of the site area.

Future changes in the climate of the site region would potentially impact environmental conditions. The increases in the air temperature can be reasonably expected to remain below the DCD (Tier 2, Table 2.0-1) 0% exceedance dry bulb temperature of 115^0F, due to the margin of safety from the site value of 105.1^0F to 115^0F (9.9^0F) given that the best estimate of future temperature change is about 7.2^0F (4^0C) based on Table TS.6, Page 70 of the Technical Summary for Reference 251.

GCM forecasts indicate more showery precipitation, leading to increased surface runoff, which would tend to provide more water available for recharge of the Monticello Reservoir and/or higher water levels in the Broad River. The site placement on top of the hills above the Broad River provides a margin of safety for the VCSNS plant by keeping it above the flood plain.

Regional forecasts are extremely uncertain at this point. The hierarchies of GCM forecasts available have little certainty with respect to many forecast parameters. The current generation of models used to produce climate forecasts are not regional models. The current generation of climate models relies on extensive parameterizations for processes that are not well understood physically. Uncertainties of future model inputs (such as future greenhouse gas reductions), make the use of regionalized GCM output highly speculative at best.

Add the following reference to FSAR Section 2.3:

251. IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 996 pp.

ASSOCIATED ATTACHMENTS:

None