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November 25, 2008

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

Subject: Duke Energy Carolinas, LLC.
William States Lee III Nuclear Station - Docket Nos. 52-018 and 52-019
AP1000 Combined License Application for the
William States Lee III Nuclear Station Units 1 and 2
Response to Request for Additional Information
(RAI No. 447)
Ltr# WLG2008.11-08

Reference: Letter from Brian Hughes (NRC) to Peter Hastings (Duke Energy), *Request for Additional Information Letter No. 035 Related To SRP Section 2.3.2 for the William States Lee III Units 1 And 2 Combined License Application*, dated October 19, 2008

This letter provides the Duke Energy response to the Nuclear Regulatory Commission's requests for additional information (RAIs) included in the referenced letter.

Responses to the NRC information requests described in the referenced letter are addressed in separate enclosures, which also identify associated changes, when appropriate, that will be made in a future revision of the Final Safety Analysis Report for the Lee Nuclear Station. In addition, a compact disk containing requested information is included as Attachment 1 of the response to RAI 02.03.02-001.

If you have any questions or need any additional information, please contact Peter S. Hastings, Nuclear Plant Development Licensing Manager, at 980-373-7820.

Bryan J. Dolan
Vice President
Nuclear Plant Development

D093
NRO

Enclosures:

1) Duke Energy Response to Request for Additional Information Letter 035, RAI 02.03.02-001
2) Duke Energy Response to Request for Additional Information Letter 035, RAI 02.03.02-002
3) Duke Energy Response to Request for Additional Information Letter 035, RAI 02.03.02-003
4) Duke Energy Response to Request for Additional Information Letter 035, RAI 02.03.02-004
5) Duke Energy Response to Request for Additional Information Letter 035, RAI 02.03.02-005
6) Duke Energy Response to Request for Additional Information Letter 035, RAI 02.03.02-006
7) Duke Energy Response to Request for Additional Information Letter 035, RAI 02.03.02-007
8) Duke Energy Response to Request for Additional Information Letter 035, RAI 02.03.02-008
9) Duke Energy Response to Request for Additional Information Letter 035, RAI 02.03.02-009

AFFIDAVIT OF BRYAN J. DOLAN

Bryan J. Dolan, being duly sworn, states that he is Vice President, Nuclear Plant Development, Duke Energy Carolinas, LLC, that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this supplement to the combined license application for the William States Lee III Nuclear Station and that all the matter and facts set forth herein are true and correct to the best of his knowledge.

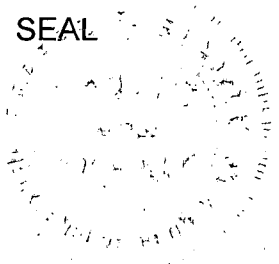
Bryan J. Dolan

Subscribed and sworn to me on November 25, 2008

Notary Public

My commission expires: June 26, 2011

SEAL



xc (w/o enclosures):

Michael Johnson, Director, Office of New Reactors
Gary Holahan, Deputy Director, Office of New Reactors
David Matthews, Director, Division of New Reactor Licensing
Scott Flanders, Director, Site and Environmental Reviews
Glenn Tracy, Director, Division of Construction Inspection and Operational Programs
Charles Ader, Director, Division of Safety Systems and Risk Assessment
Michael Mayfield, Director, Division of Engineering
Luis Reyes, Regional Administrator, Region II
Loren Plisco, Deputy Regional Administrator, Region II
Thomas Bergman, Deputy Division Director, DNRL
Stephanie Coffin, Branch Chief, DNRL

xc (w/ enclosures):

Brian Hughes, Senior Project Manager, DNRL

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 035

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.02-001

NRC RAI:

Please revise FSAR Sections 2.3.2.1.2, 2.3.2.1.3, 2.3.2.2, 2.3.2.3, and 2.3.2.3.1 based on at least two years of consecutive onsite meteorological data, as specified in Regulatory Guide 1.23, Revision 1 or justify an alternative method.

Duke Energy Response:

Revision of the suggested subsections would create an inconsistency in the FSAR unless all sections that use the onsite data are revised. An alternative approach involves demonstrating that the first year of meteorological data is representative when compared with the full two years of consecutive hourly onsite meteorological data. The Lee Nuclear Station meteorological data for December 1, 2005 through November 30, 2007 (two full years) is provided in Attachment 1 in the format required by Regulatory Guide 1.23, Revision 1. Attachment 2 contains the new Appendix 2CC to FSAR Chapter 2 that will provide the evaluation of the first two years of meteorological data. This appendix also demonstrates that the first year of data is consistent with the full two-year data set.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

FSAR Chapter 2 Appendix 2CC

Attachments:

1) Lee Nuclear Station Meteorological Data (On Enclosed CD)
2) New FSAR Chapter 2 Appendix 2CC

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 02.03.02-001

Lee Nuclear Station Meteorological Data

(December 1, 2005 through November 30, 2007)

On Enclosed CD

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 2 to RAI 02.03.02-001

New FSAR Chapter 2 Appendix 2CC

COLA Part 2, FSAR, Chapter 2 is revised by adding a new Appendix 2CC as follows:

APPENDIX 2CC
EVALUATION OF METEOROLOGICAL DATA

2CC.1 Purpose

This Appendix provides an evaluation of the second year of Lee Nuclear Station meteorological data and a comparison with the first year of meteorological data. In addition, comparison of the site data with data covering a longer period of record from the nearest local National Weather Service station demonstrates how well the site data represents the long-term conditions at the Lee Nuclear Station site. Because the one-year and two-year data sets are consistent and representative of the long-term conditions, there is no need to update the data and values currently provided in FSAR Section 2.3.

2CC.2 Data Evaluation

The second year of meteorological data was used to demonstrate how representative the first year of data (12/1/2005 - 11/30/2006) is of conditions at the site. The complete two year data set (12/1/2005 - 11/30/2007) was used in these evaluations. Additional long-term meteorological data was obtained from the Greenville-Spartanburg (GSP) Local Climatic Data (LCD) Summary (Reference 2CC-201). The 30-year normals provided in the GSP LCD are based on data from 1971-2000. The meteorological parameters evaluated consist of temperature, relative humidity, precipitation, stability class, wind speed frequency, and wind direction frequency. Joint frequency distributions of wind speed, wind direction, and atmospheric stability for both the first year of Lee Nuclear Station site data and the complete 2-year data set are also provided.

Temperature and Moisture

The first parameter considered is the site temperature. Table 2CC-201 compares temperatures from the Greenville-Spartanburg (GSP) Local Climatic Data Summary with the first year of Lee Nuclear Station data and the complete two-year Lee Nuclear Station data set. A comparison of the monthly mean dry bulb temperatures is also given in Figure 2CC-201. As seen, the annual mean daily maximum temperature is slightly higher for the two-year Lee Nuclear Station data set than for either the GSP weather station data or the Lee Nuclear Station one-year data set. Likewise, the annual mean daily minimum temperature is slightly lower for the two-year data set. It appears that Lee Nuclear Station is potentially warmer than GSP in January, early spring (March/April), and August, but cooler than GSP in May-July. The mean monthly dry bulb temperature is in good agreement between the three data sets. The annual average mean temperature is within a one-half degree (° F) temperature range for the three data sets.

Moisture content of the air can be characterized with measurements of wet bulb temperature, dew point temperature, and relative humidity. The annual wet bulb temperatures are also in good agreement. The comparison of the average wet bulb temperature for the three data sets is given in Figure 2CC-202. Table 2CC-201 shows that the annual average wet bulb temperature for GSP is within one degree (° F) of the Lee Nuclear Station wet bulb temperatures. The dew point temperatures are also in good agreement with the annual average Lee Nuclear Station dew point temperature, and are within one degree (° F) of the GSP annual average dew point temperature. Dew point temperatures are compared graphically in Figure 2CC-203. The Lee Nuclear Station wet-bulb and dew point temperatures indicate higher air moisture content at Lee Nuclear Station than at GSP potentially during the months of January, March, April, and August. These are the same months as when Lee Nuclear Station

temperatures appear to trend warmer than GSP, and thus can achieve a higher capacity to hold water vapor. The Lee Nuclear Station relative humidity was calculated from the measured 10 m dry bulb temperature and dew point temperature. The comparison of the relative humidity for the three data sets is given in Figure 2CC-204. Relative humidity is not the best indicator of moisture content in the air, as can be seen by the slightly larger spread between the data sets. However, the annual average relative humidity is consistent among the three data sets as shown in Table 2CC-201, and the data sets exhibit similar annual trends. Based on these results, it is concluded that the dry bulb temperatures, wet bulb temperatures, dew point temperatures, and relative humidity values from the Lee Nuclear Station first year data, presented in FSAR Section 2.3, are consistent with the two-year Lee Nuclear Station data set. In addition, the comparison with longer-term data from GSP demonstrates that either Lee Nuclear Station data set is sufficiently representative of long term conditions that would be expected at the Lee Nuclear Station site, allowing for typical annual variability.

Stability Class

The frequency of occurrence for each stability class was determined for the first year of Lee Nuclear Station meteorological data (12/1/2005 - 11/30/2006) and the complete two-year data set (12/1/2005 - 11/30/2007). The comparison between these data sets is shown on Figure 2CC-205. This figure shows that the percentage frequency of unstable conditions (stability classes A, B, and C) for the first year data set was around 24% and the percentage frequency for the two year data set decreased to about 22%. The percentage frequency of neutral conditions (stability class D) increased from 24.6% for the first year of data to 26.1% for the two year data set. The percentage frequency of stable conditions (stability classes E, F, and G) increased only slightly from 51.3% for the first year of data to 51.6% for the two-year data set. In summary, the complete two-year data set had slightly fewer unstable conditions and more neutral conditions than are present in the first year data set. Stable conditions are similarly represented with either the one-year or two-year datasets. The effect of these variabilities relative to atmospheric dispersion and depositions would be relatively minor.

Precipitation Comparison

The comparison of the monthly and annual precipitation totals are as expected considering the drought conditions during the 2005-2007 time period (Reference 2CC-202). As seen in Table 2CC-202, the long term annual precipitation total is 50.2 inches for GSP and the recent precipitation totals at the Lee Nuclear Station site are much less (39.7 inches for the first year data and 32.7 inches for the two-year data set). To some extent, geographical influences on the spatial distribution of precipitation may also be a factor, as GSP is located in the western side of the Carolinas piedmont region and closer to the foothills than is the Lee Nuclear Station site.

Wind Speed Frequency

The joint frequency distributions of wind speed, wind direction, and atmospheric stability for the first year of Lee Nuclear Station meteorological data set measured at the 10-m level are provided in Table 2CC-203. Table 2CC-204 provides the joint frequency distribution for all stability classes combined at the 10-m level based on the first year of Lee Nuclear Station data. The annual average wind speed based on Table 2CC-204 and Table 2CC-206 is 2.2 m/sec (4.9 mph) from both data set periods.

Joint frequency distributions of wind speed, wind direction, and atmospheric stability for the complete two-year Lee Nuclear Station data set at the 10-m level are provided in Table 2CC-205. The joint frequency distribution for all stability classes combined at the 10-m level based on the two-year Lee Nuclear Station data set is given in Table 2CC-206. The annual average wind speed based on Table 2CC-206 is 2.2 m/sec (4.9 mph).

The comparison of the wind speed percentage frequency at the lower (10-m) measurement level for the first year and the two-year data set is given in Figure 2CC-206. This comparison shows that the datasets agreed very well and there is no significant difference in the wind speed percentage frequency for either period. The most common wind speed is in the 1.5 through 5.4 mph range.

The joint frequency distributions of wind speed, wind direction, and atmospheric stability for the first year of Lee Nuclear Station meteorological data set measured at the 60-m level are provided in Table 2CC-207. Table 2CC-208 provides the joint frequency distribution for all stability classes combined at the 60-m level based on the first year of Lee Nuclear Station data.

Joint frequency distributions of wind speed, wind direction, and atmospheric stability for the complete two-year Lee Nuclear Station data set at the 60-m level are provided in Table 2CC-209. The joint frequency distribution for all stability classes combined at the 60-m level based on the two-year Lee Nuclear Station data set is given in Table 2CC-210.

The wind speed percentage frequency at the upper (60-m) measurement level is also consistent between the two Lee Nuclear Station data sets. Figure 2CC-207 provides the comparison between the data sets. Comparing the first year data set with the two-year data set shows that both datasets display very similar frequencies of wind speed classes. As expected, the 60-m wind speed frequency distribution is shifted toward the higher wind speeds than are the 10-m level winds.

Wind Direction Frequency

The wind direction frequency distribution at the lower (10-m) level is given in Figure 2CC-208. This figure shows that the wind direction frequency is consistent between the two data sets. This figure also shows that there is the same prevalent NW wind direction at 10-m, and a secondary max from the SSW - SW sectors. This is also shown in the joint frequency distribution presented in Tables 2CC-204 and 2CC-206.

The wind direction frequency distribution at the upper level (60-m) is given in Figure 2CC-209. This figure shows that the wind direction is consistent between the data sets and that the prevailing wind directions at this elevation are in the SSW – SW and the NE - NNE directions. This is also shown in the joint frequency distribution presented in Tables 2CC-208 and 2CC-210.

2CC.3 Conclusion

Based on the information presented in this Appendix, it is concluded that the two-year meteorological data set is consistent with the first year data set and the nearby historic data set. The atmospheric stability class percentage frequency, wind speed frequency, and the wind direction frequency are consistent for the two data sets. These comparisons demonstrate that the first year of data is consistent with the complete two-year Lee Nuclear Station data set and is representative of longer-term conditions at the site. No anomalous behavior was observed between the first year and second year of data, or comparison to the normal conditions observed at the NWS office at Greer, SC (GSP). No changes are needed to FSAR Section 2.3 based on the collection of the second year of meteorological data.

References:

2CC-201 National Climatic Data Center (NCDC) Local Climatic Data Annual Summary with Comparative Data, Greenville–Spartanburg (Greer), South Carolina (Station ID GSP), 2007.

2CC-202 South Carolina State Climatology Office, Regional Drought Monitor, https://www.dnr.sc.gov/drought/, accessed 10/22/2008.

TABLE 2CC-201
TEMPERATURE AND HUMIDITY COMPARISON

Temperature (°F)	POR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean Daily Maximum (GSP LCD)	45.0	51.1	54.7	63.6	72.3	79.3	85.5	88.6	87.3	81.3	71.9	62.5	53.5	71.0
Mean Daily Maximum (Lee 1-yr)		57.7	53.6	62.7	76.0	77.1	84.6	87.9	87.4	78.1	68.8	62.9	51.5	70.7
Mean Daily Maximum (Lee 2-yr)		55.6	52.7	65.7	73.2	77.7	83.9	86.6	91.0	81.4	72.2	62.8	55.1	71.5
Mean Daily Minimum (GSP LCD)	45.0	31.2	33.1	40.3	48.0	56.5	64.4	68.7	67.8	61.4	49.6	40.5	33.7	49.6
Mean Daily Minimum (Lee 1-yr)		37.3	33.5	41.1	51.9	54.9	63.7	68.7	69.8	61.6	47.9	39.9	30.7	50.1
Mean Daily Minimum (Lee 2-yr)		36.0	30.4	44.4	46.1	53.2	58.3	61.2	71.7	62.2	54.1	37.1	34.9	49.1
Mean Dry Bulb (GSP LCD)	45.0	41.1	43.9	52.0	60.1	67.9	75.1	78.7	77.6	71.4	60.7	51.5	43.6	60.3
Mean Dry Bulb (Lee 1-yr)		47.1	43.6	52.2	64.0	65.8	73.6	77.7	77.5	69.1	57.7	50.8	40.5	60.0
Mean Dry Bulb (Lee 2-yr)		45.7	42.3	54.5	61.4	66.2	72.7	75.9	79.8	71.2	61.1	50.1	43.4	60.4
Mean Wet Bulb (GSP LCD)	24.0	36.5	38.7	44.7	51.6	60.2	67.3	70.8	70.2	64.2	54.6	45.8	38.3	53.6
Mean Wet Bulb (Lee 1-yr)		43.6	38.8	45.7	56.2	59.5	67.0	71.5	72.2	64.4	53.1	46.1	37.0	54.6
Mean Wet Bulb (Lee 2-yr)		41.9	37.3	47.7	53.7	59.3	66.2	69.4	72.6	64.9	56.1	45.0	39.5	54.5
Mean Dew Point (GSP LCD)	24.0	30.3	32.4	38.1	45.8	56.3	64.2	68.2	67.8	61.3	50.7	41.1	32.7	49.1
Mean Dew Point (Lee 1-yr)		37.4	29.1	35.7	48.4	54.6	63.3	68.6	69.9	61.7	48.3	40.0	30.4	48.9
Mean Dew Point (Lee 2-yr)		34.9	25.9	37.8	44.7	53.8	62.6	66.2	69.2	61.0	51.6	37.7	32.5	48.1
Humidity (%)														
Normal Humidity (GSP LCD)	30.0	67.0	64.0	63.0	62.0	69.0	72.0	73.0	76.0	75.0	71.0	70.0	68.0	69.0
Average Humidity (Lee 1-yr)		71.9	61.8	58.4	62.6	71.2	74.0	76.7	79.9	79.6	74.9	70.6	71.5	71.1
Average Humidity (Lee 2-yr)		70.3	58.0	58.2	60.1	69.0	74.3	75.0	73.9	73.7	74.8	67.0	70.1	68.7

NOTE: POR is the period of record for the GSP data set.

TABLE 2CC-202
PRECIPITATION COMPARISON

		Precipitation (in)												
	POR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Normal (GSP LCD)	30	4.41	4.24	5.31	3.54	4.59	3.92	4.65	4.08	3.97	3.88	3.79	3.86	50.2
Lee (1-yr)		3.71	1.05	1.09	2.34	2.67	4.89	3.69	4.3	2.89	3.47	4.63	4.99	39.7
Lee (2-yr)		3.59	1.94	2.59	3.21	1.88	3.75	2.2	2.6	1.83	2.76	2.64	3.8	32.7

TABLE 2CC-203
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
Page 1 of 7

Stability Class A HRS

	Wind Speed (m/sec)												
Dir	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	Total
N	0	0	0	0	2	5	10	6	7	2	2	0	35
NNE	0	0	0	0	0	7	11	16	3	1	2	0	40
NE	0	0	0	0	0	13	29	16	2	1	0	0	61
ENE	0	0	0	1	3	8	24	16	3	0	0	0	55
E	0	0	0	1	1	8	22	3	0	0	0	0	35
ESE	0	0	0	1	3	15	10	0	0	0	0	0	29
SE	0	0	0	2	1	13	19	3	0	0	0	0	38
SSE	0	0	0	1	3	15	30	11	2	0	2	0	64
S	0	0	0	0	2	13	22	15	3	3	1	0	59
SSW	0	0	0	0	3	8	24	35	20	16	5	2	113
SW	0	0	0	0	1	1	16	33	21	25	11	2	110
WSW	0	0	0	0	2	3	12	26	12	7	2	0	65
W	0	0	0	1	0	3	6	2	10	1	0	0	24
WNW	0	0	1	0	4	2	11	8	10	6	10	3	57
NW	0	0	0	0	1	2	11	6	8	9	9	1	49
NNW	0	0	0	0	0	4	6	5	2	4	0	0	22
Calm	0	0	0										
Total	0	0	1	7	27	122	264	201	105	76	46	8	857

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-203
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
Page 2 of 7

Stability Class B HRS

	Wind Speed (m/sec)												
Dir	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	Total
N	0	0	0	1	1	4	5	12	10	1	0	0	35
NNE	0	0	0	0	0	8	13	7	4	3	1	0	37
NE	0	0	0	0	3	15	10	9	3	1	0	0	41
ENE	0	0	0	2	7	3	15	5	0	0	0	0	32
E	0	0	0	2	0	6	11	1	0	0	0	0	21
ESE	0	0	0	0	2	3	7	1	0	0	0	0	13
SE	0	0	0	1	0	8	6	0	0	0	0	0	16
SSE	0	0	0	2	4	7	13	1	0	0	1	0	29
S	0	0	0	1	4	8	17	6	0	1	0	0	37
SSW	0	0	0	0	0	3	13	16	15	7	3	2	59
SW	0	0	0	0	0	4	13	21	23	16	7	1	85
WSW	0	0	0	0	0	4	16	19	9	6	5	0	59
W	0	0	0	0	1	0	7	7	4	5	1	0	26
WNW	0	0	0	0	0	4	10	8	6	7	5	3	45
NW	0	0	0	0	1	9	12	5	3	9	3	0	44
NNW	0	0	1	1	1	0	4	4	5	2	0	1	20
Calm	0	0	0										
Total	0	0	1	10	25	88	175	123	83	59	27	7	599

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-203
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
Page 3 of 7

Stability Class C HRS

	Wind Speed (m/sec)												
Dir	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	Total
N	0	0	1	1	2	7	10	2	4	1	1	0	30
NNE	0	0	0	0	3	2	11	10	5	3	0	0	35
NE	0	0	0	2	3	12	21	7	3	0	0	0	49
ENE	0	0	0	2	3	6	12	7	1	0	0	0	32
E	0	0	0	0	1	10	2	2	0	0	0	0	16
ESE	0	0	0	0	2	8	6	1	0	0	0	0	18
SE	0	0	0	3	4	16	10	0	0	0	0	0	33
SSE	0	0	0	0	5	13	18	5	0	1	0	0	42
S	0	0	1	0	2	5	24	4	2	3	0	0	41
SSW	0	0	0	0	0	2	21	12	10	5	4	1	56
SW	0	0	1	0	2	3	18	17	11	4	16	7	79
WSW	0	0	0	1	3	5	24	15	7	4	0	2	61
W	0	0	0	1	1	2	11	4	2	1	2	0	25
WNW	0	0	0	3	0	1	10	9	5	3	4	1	37
NW	0	0	0	0	0	9	16	4	4	6	2	0	41
NNW	0	0	0	1	0	2	9	5	1	4	0	1	24
Calm	0	0	0										
Total	0	0	3	15	32	106	224	106	57	36	29	12	620

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-203
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
Page 4 of 7

Stability Class D HRS

	Wind Speed (m/sec)												
Dir	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	Total
N	0	0	6	8	16	25	59	32	17	9	2	0	174
NNE	0	0	7	8	15	27	78	52	24	6	2	0	219
NE	0	0	4	7	12	26	65	34	11	5	1	0	167
ENE	0	1	9	18	12	25	40	20	5	1	0	0	132
E	0	0	9	7	10	18	22	7	2	0	0	0	76
ESE	0	1	9	6	15	24	12	2	0	1	0	0	70
SE	0	0	4	10	26	32	25	2	5	0	0	0	105
SSE	1	0	6	8	16	36	52	6	8	3	4	3	144
S	0	0	6	5	21	48	64	25	12	3	5	0	190
SSW	0	0	5	3	7	23	79	38	34	17	2	0	208
SW	0	1	3	4	9	17	48	39	27	26	16	1	191
WSW	0	0	3	5	3	17	27	20	16	5	10	3	109
W	0	0	3	6	3	10	19	12	6	3	1	0	64
WNW	0	2	4	6	7	9	18	13	13	6	7	3	90
NW	0	1	6	10	22	26	34	16	15	10	4	5	149
NNW	0	1	6	10	13	25	31	22	10	9	2	1	132
Calm	0	0	0										
Total	1	7	93	124	207	386	672	341	206	106	57	17	2218

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-203
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
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Stability Class E HRS

	Wind Speed (m/sec)												
Dir	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	Total
N	0	4	22	12	17	27	18	7	2	2	1	0	112
NNE	0	3	10	12	21	16	11	6	1	0	0	0	81
NE	0	5	15	20	18	20	16	7	1	0	0	0	100
ENE	0	6	21	6	15	15	8	0	0	0	0	0	70
E	0	6	22	23	21	18	3	0	0	0	0	0	92
ESE	0	3	21	21	18	13	3	1	0	0	0	0	80
SE	0	0	19	23	27	25	16	0	0	0	0	0	109
SSE	0	0	7	19	27	32	23	5	1	1	0	0	115
S	0	0	5	9	15	44	66	25	0	0	0	0	164
SSW	0	2	3	12	9	12	42	25	21	8	0	0	136
SW	0	1	6	8	3	16	27	30	27	9	2	0	129
WSW	0	0	5	10	2	19	25	18	10	3	0	0	92
W	0	2	7	3	2	13	20	11	2	0	0	0	61
WNW	0	0	9	16	19	28	39	11	7	4	0	0	134
NW	0	1	9	34	38	41	40	24	6	0	1	0	196
NNW	0	5	21	18	27	29	32	24	3	0	1	0	160
Calm	5	5	0										
Total	5	39	202	247	277	367	390	195	82	28	5	0	1836

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-203
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
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Stability Class F HRS

	Wind Speed (m/sec)												
Dir	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	Total
N	1	10	20	9	7	3	3	0	0	0	0	0	54
NNE	1	9	13	5	5	5	1	0	0	0	0	0	40
NE	1	11	9	8	7	3	0	0	0	0	0	0	40
ENE	1	10	21	13	5	0	1	0	0	0	0	0	52
E	0	7	30	15	5	2	0	0	0	0	0	0	59
ESE	1	10	20	25	6	3	0	0	0	0	0	0	65
SE	0	1	15	16	18	15	3	0	0	0	0	0	66
SSE	0	3	6	13	16	12	7	0	1	0	0	0	59
S	1	1	7	3	6	7	18	2	0	0	0	0	46
SSW	0	0	5	3	5	3	8	2	0	1	0	0	28
SW	0	0	2	3	6	6	1	0	0	0	0	0	19
WSW	0	2	7	6	1	6	6	0	0	0	0	0	29
W	0	3	4	1	3	3	4	1	0	0	0	0	20
WNW	0	5	22	13	17	26	27	2	1	0	0	0	113
NW	1	5	28	34	50	48	36	3	0	0	0	0	205
NNW	0	5	22	20	19	10	8	2	0	0	0	0	86
Calm	5	5	0										
Total	12	85	231	189	176	153	124	12	2	1	0	0	986

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-203
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
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Stability Class G HRS

	Wind Speed (m/sec)												
Dir	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	Total
N	3	23	37	20	2	1	0	0	0	0	0	0	86
NNE	2	32	17	8	1	0	0	0	0	0	0	0	60
NE	2	25	26	5	4	0	1	0	0	0	0	0	63
ENE	3	25	36	7	1	0	0	0	0	0	0	0	73
E	4	19	39	18	17	2	0	0	0	0	0	0	98
ESE	3	12	40	25	13	2	0	0	0	0	0	0	96
SE	1	21	41	19	12	9	2	0	0	0	0	0	106
SSE	1	6	17	11	8	4	0	0	0	0	0	0	48
S	0	7	2	3	2	1	1	0	0	0	0	0	17
SSW	0	0	2	1	1	2	1	0	0	0	0	0	7
SW	0	2	2	1	0	1	0	0	0	0	0	0	6
WSW	0	4	5	2	1	0	0	0	0	0	0	0	12
W	0	2	8	8	3	1	3	0	0	0	0	0	26
WNW	2	10	20	21	28	44	27	1	0	0	0	0	152
NW	4	23	60	83	121	180	90	0	0	0	0	0	561
NNW	2	26	58	51	23	9	1	0	0	0	0	0	170
Calm	63	63	0										
Total	91	237	411	283	238	257	126	1	0	0	0	0	1645

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-204
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
(ALL STABILITY CLASSES COMBINED)
10-M MEASUREMENT LEVEL

	Wind Speed (m/sec)													
Dir	**<=0.50**	**<=0.75**	**<=1.00**	**<=1.25**	**<=1.5**	**<=2.00**	**<=3.00**	**<=4.00**	**<=5.00**	**<=6.00**	**<=8.00**	**<10.00**	Total	Mean Speed
N	4	37	86	52	47	73	106	60	40	16	6	0	526	2.1
NNE	3	45	48	34	45	65	126	91	37	13	5	0	513	2.3
NE	3	41	54	42	48	89	142	74	21	7	1	0	522	2.1
ENE	4	42	87	50	47	57	100	48	9	1	0	0	445	1.7
E	4	32	100	65	55	64	60	13	2	0	0	0	397	1.4
ESE	4	27	90	78	59	68	39	5	0	1	0	0	372	1.3
SE	1	22	79	74	88	118	81	5	5	0	0	0	472	1.5
SSE	2	9	36	55	79	120	143	29	12	5	7	3	501	2.0
S	1	8	22	22	52	126	211	77	18	10	6	0	553	2.3
SSW	0	2	16	20	26	54	189	128	99	54	15	5	607	3.2
SW	0	4	15	17	22	48	122	140	109	80	52	11	618	3.7
WSW	0	6	21	25	12	54	110	96	55	26	18	5	428	3.1
W	0	7	23	21	13	33	70	38	25	10	4	0	246	2.6
WNW	2	18	56	59	75	114	143	54	44	27	27	10	628	2.5
NW	5	30	104	162	233	316	240	58	36	35	20	6	1245	2.0
NNW	2	37	108	100	83	80	92	62	22	20	3	3	612	1.9
Calm	74												74	
Total	36	369	943	874	982	1479	1976	979	535	306	164	45	8760	2.2

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-205
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
Page 1 of 7

STABILITY CLASS A HRS

	Wind Speed (m/sec)													
DIR	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<=10.00	<=12.00	TOTAL
N	0	0	0	0	1	3	5	4	6	2	1	0	0	22
NNE	0	0	0	0	0	4	7	11	3	2	1	0	0	27
NE	0	0	0	0	0	7	17	16	2	1	0	0	0	43
ENE	0	0	0	1	2	5	14	16	4	1	0	0	0	41
E	0	0	0	1	1	4	13	3	0	0	0	0	0	21
ESE	0	0	0	1	2	8	9	1	0	0	0	0	0	19
SE	0	1	0	1	1	7	18	7	0	0	0	0	0	34
SSE	0	0	0	1	2	10	21	11	1	0	1	0	0	46
S	0	1	0	0	1	7	18	14	3	2	1	0	0	45
SSW	0	0	0	0	2	5	17	32	21	9	5	1	0	91
SW	0	0	0	0	1	1	12	29	19	17	14	2	0	94
WSW	0	0	0	0	1	2	7	19	15	6	9	2	0	60
W	0	0	0	1	0	2	5	4	9	2	1	0	0	22
WNW	0	0	1	0	2	1	7	9	9	8	8	3	1	48
NW	0	0	0	1	1	2	6	7	8	8	8	1	2	43
NNW	0	0	0	0	0	2	4	6	1	3	0	0	0	16
CALM	0													0
TOTAL	0	1	1	4	14	67	180	188	100	59	47	8	2	672

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-205
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
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STABILITY CLASS B HRS

	Wind Speed (m/sec)													
DIR	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<=10.00	<=12.00	TOTAL
N	0	0	0	1	1	3	4	8	8	2	0	0	0	27
NNE	0	0	0	0	0	5	10	8	5	4	1	0	0	33
NE	0	0	0	1	2	8	10	15	4	2	0	0	0	41
ENE	0	0	0	1	4	3	12	17	2	1	1	0	0	39
E	0	0	0	1	0	4	12	3	1	0	0	0	0	22
ESE	0	0	0	0	1	4	9	1	0	0	0	0	0	14
SE	0	0	1	1	1	6	11	1	0	0	0	0	0	19
SSE	0	0	0	1	2	7	17	1	0	0	1	0	0	29
S	0	0	0	1	2	6	24	6	1	1	0	0	0	40
SSW	0	0	0	0	0	2	20	20	13	6	3	1	0	66
SW	0	0	0	0	0	3	17	17	19	13	9	1	1	79
WSW	0	0	0	0	0	4	14	20	8	6	5	1	0	58
W	0	0	0	0	1	1	10	7	6	4	1	0	0	30
WNW	0	0	0	0	1	3	9	7	4	5	4	4	0	37
NW	0	0	0	0	1	5	16	8	5	5	4	2	1	46
NNW	0	0	1	1	1	0	4	4	4	2	0	1	0	16
CALM	0													0
TOTAL	0	0	1	6	14	62	200	142	82	51	28	9	1	596

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-205
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
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STABILITY CLASS C HRS

	Wind Speed (m/sec)													
DIR	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<=10.00	<=12.00	TOTAL
N	0	0	1	2	2	5	8	5	3	1	1	0	0	25
NNE	0	0	0	0	2	3	12	11	8	2	0	0	0	37
NE	0	0	0	1	3	8	24	12	5	2	0	0	0	55
ENE	0	0	0	1	2	7	17	11	3	0	1	0	0	41
E	0	0	0	0	1	11	11	2	1	0	0	0	0	26
ESE	0	0	0	0	2	6	6	1	0	0	0	0	0	15
SE	0	0	0	2	4	15	18	0	0	0	0	0	0	39
SSE	0	0	0	2	4	16	25	3	0	1	0	0	0	52
S	0	0	1	1	1	7	28	5	2	2	0	0	0	45
SSW	0	0	0	0	1	5	23	17	11	5	5	1	0	69
SW	0	0	1	1	1	4	21	14	11	6	15	4	0	78
WSW	0	0	0	1	3	6	25	12	7	4	2	2	1	61
W	0	0	1	1	2	4	12	6	2	1	1	0	0	30
WNW	0	0	0	2	1	7	9	6	3	2	3	2	0	33
NW	0	0	0	0	1	7	13	5	5	4	7	3	1	44
NNW	0	0	0	1	0	3	8	4	1	3	0	1	0	20
CALM	0													0
TOTAL	0	0	2	12	27	113	263	113	60	30	34	12	1	669

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-205
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
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STABILITY CLASS D HRS

	Wind Speed (m/sec)													
DIR	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<=10.00	<=12.00	TOTAL
N	0	0	7	9	17	31	59	20	20	8	3	0	0	173
NNE	0	1	6	9	15	44	79	41	21	6	1	0	0	221
NE	0	1	5	7	13	32	74	33	14	6	1	0	0	186
ENE	0	1	7	13	16	30	55	24	5	3	0	0	0	154
E	0	2	10	9	16	20	24	6	2	0	0	0	0	88
ESE	0	1	8	7	15	26	18	4	0	1	0	0	0	79
SE	0	2	3	10	25	41	37	5	5	1	0	0	0	127
SSE	1	1	4	8	18	43	48	6	5	2	3	2	0	140
S	1	1	4	4	19	43	59	25	11	3	4	1	0	173
SSW	0	0	5	3	8	25	74	48	34	15	2	2	0	215
SW	0	1	4	5	9	19	43	37	32	28	14	1	0	192
WSW	0	0	3	7	5	15	29	23	16	8	7	3	0	114
W	0	1	4	5	4	13	22	12	6	4	1	0	0	71
WNW	0	2	4	5	8	12	21	11	12	9	7	4	0	95
NW	0	1	7	9	14	30	32	16	19	14	15	7	0	164
NNW	0	2	8	10	17	21	30	22	14	10	4	2	1	141
CALM	3													3
TOTAL	4	12	89	121	217	445	704	334	215	115	60	19	1	2335

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-205
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
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STABILITY CLASS E HRS

	Wind Speed (m/sec)													
DIR	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<=10.00	<=12.00	TOTAL
N	0	4	18	16	18	24	22	9	2	2	1	0	0	115
NNE	1	5	13	12	18	20	25	15	1	0	0	0	0	110
NE	1	4	17	14	19	19	21	9	2	0	0	0	0	105
ENE	1	7	13	9	14	16	19	2	1	0	0	0	0	80
E	0	6	21	19	16	17	9	1	0	0	0	0	0	88
ESE	0	4	17	22	16	15	7	1	0	0	0	0	0	81
SE	0	2	16	19	23	25	12	2	1	0	0	0	0	98
SSE	1	1	10	19	23	36	21	6	3	1	1	0	0	122
S	0	2	6	12	20	43	69	20	1	0	1	0	0	174
SSW	0	2	4	11	10	15	55	29	14	5	0	0	0	145
SW	0	2	4	5	5	16	27	27	23	7	2	0	0	117
WSW	0	1	4	6	5	14	17	14	7	2	0	0	0	69
W	0	2	6	2	5	11	19	10	2	0	0	0	0	57
WNW	0	0	8	12	14	23	30	12	6	3	0	0	0	109
NW	1	3	15	30	33	39	36	20	4	0	1	0	0	181
NNW	1	4	15	16	24	29	28	17	5	1	1	0	0	139
CALM	6													6
TOTAL	9	47	186	225	262	360	418	193	69	21	5	0	0	1795

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-205
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
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STABILITY CLASS F HRS

	Wind Speed (m/sec)													
DIR	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<=10.00	<=12.00	TOTAL
N	2	8	16	10	6	6	4	0	0	0	0	0	0	50
NNE	1	9	15	7	9	5	2	0	0	0	0	0	0	48
NE	1	10	15	7	6	7	1	1	0	0	0	0	0	46
ENE	1	9	18	10	4	1	1	0	0	0	0	0	0	44
E	0	10	29	12	4	2	0	0	0	0	0	0	0	57
ESE	1	9	22	20	6	3	1	0	0	0	0	0	0	60
SE	0	4	16	15	18	10	3	1	0	0	0	0	0	67
SSE	0	3	8	16	14	12	6	0	1	0	0	0	0	59
S	1	1	6	5	9	11	16	3	0	0	0	0	0	52
SSW	0	0	5	3	5	4	11	3	0	1	0	0	0	31
SW	0	1	2	3	5	5	2	0	0	0	0	0	0	17
WSW	0	2	5	5	1	4	4	1	0	0	0	0	0	20
W	0	2	6	3	6	6	5	1	1	0	0	0	0	30
WNW	0	4	16	12	15	25	18	2	1	0	0	0	0	92
NW	1	8	23	25	43	53	34	2	0	0	1	0	0	189
NNW	0	9	24	16	16	11	10	2	0	0	0	0	0	89
CALM	17													17
TOTAL	23	88	223	170	164	166	117	14	3	1	1	0	0	968

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-205
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
10-M MEASUREMENT LEVEL
Page 7 of 7

STABILITY CLASS G HRS

	Wind Speed (m/sec)												
DIR	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<=10.00	<=12.00	TOTAL
N	4	25	34	14	4	2	1	0	0	0	0	0	0	83
NNE	4	29	19	7	3	3	1	0	0	0	0	0	0	65
NE	2	23	21	4	4	1	1	0	0	0	0	0	0	55
ENE	4	21	30	6	2	1	0	0	0	0	0	0	0	63
E	3	21	42	12	11	2	1	0	0	0	0	0	0	92
ESE	3	23	38	21	9	2	0	0	0	0	0	0	0	96
SE	1	21	37	17	11	6	2	0	0	0	0	0	0	94
SSE	1	9	12	9	7	4	2	0	0	0	0	0	0	44
S	0	8	3	2	1	1	2	0	0	0	0	0	0	17
SSW	1	1	2	1	2	2	1	0	0	0	0	0	0	8
SW	0	2	3	2	2	1	0	0	0	0	0	0	0	8
WSW	0	3	5	2	1	0	0	0	0	0	0	0	0	10
W	1	4	9	6	3	4	3	0	0	0	0	0	0	29
WNW	4	13	19	20	24	42	31	1	0	0	0	0	0	153
NW	4	25	56	86	128	214	118	0	0	0	0	0	0	631
NNW	3	32	59	47	30	10	3	1	0	0	0	0	0	184
CALM	94													94
TOTAL	125	260	387	256	241	292	162	2	0	0	0	0	0	1726

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-206
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
(ALL STABILITY CLASSES COMBINED)
10-M MEASUREMENT LEVEL

	Wind Speed (m/sec)														
Dir	<=0.50	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	<12.00	Total	Mean Speed
N	5	37	74	51	47	73	103	46	39	15	5	0	0	495	2.1
NNE	5	44	52	36	46	84	136	85	38	14	3	0	0	542	2.2
NE	3	37	57	33	46	82	149	86	27	9	1	0	0	530	2.2
ENE	6	37	68	41	43	62	117	69	15	4	1	0	0	462	2.0
E	3	39	101	55	48	59	71	15	3	0	0	0	0	394	1.5
ESE	4	37	85	71	49	62	49	6	0	1	0	0	0	364	1.4
SE	1	28	72	64	82	110	101	15	5	1	0	0	0	479	1.6
SSE	2	13	35	55	70	129	140	28	10	4	5	2	0	492	2.0
S	1	12	20	25	53	118	215	71	17	7	5	1	0	544	2.3
SSW	1	3	15	17	28	57	201	150	93	41	15	5	0	624	3.2
SW	0	5	12	16	22	48	122	123	105	70	54	8	1	585	3.7
WSW	0	5	16	20	15	43	96	89	53	25	23	7	1	393	3.3
W	1	8	25	18	19	40	77	41	25	10	4	0	0	268	2.5
WNW	4	18	47	51	64	113	125	48	34	27	21	12	1	567	2.5
NW	5	37	101	151	219	350	254	58	41	31	35	12	3	1296	2.1
NNW	3	47	107	90	88	76	86	56	25	19	4	3	1	604	1.9
Calm	120													120	
Total	42	408	888	794	940	1506	2044	986	528	276	175	48	5	8760	2.2

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-207
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
Page 1 of 7

Stability Class A HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	0	0	1	1	7	9	5	5	4	3	2	0	37
NNE	0	0	0	0	0	3	10	8	9	2	3	2	0	37
NE	0	0	0	0	2	6	15	25	14	0	2	1	0	66
ENE	0	0	0	1	1	4	22	17	10	3	1	0	0	59
E	0	0	0	3	1	8	16	3	1	0	0	0	0	32
ESE	0	0	0	1	2	8	12	2	0	0	0	0	0	25
SE	0	0	0	1	2	12	18	2	1	1	0	0	0	37
SSE	0	0	0	1	5	10	19	13	11	2	0	1	1	64
S	0	0	0	2	1	4	18	17	12	1	4	1	1	61
SSW	0	0	0	0	1	3	18	22	25	24	19	4	1	118
SW	0	0	0	0	3	2	12	16	21	14	30	8	2	109
WSW	0	0	0	0	0	1	6	9	13	14	10	3	0	56
W	0	0	1	0	2	3	5	6	4	9	0	2	0	32
WNW	0	0	0	1	1	1	6	8	6	9	12	6	3	53
NW	0	0	1	0	0	1	11	5	5	2	10	9	1	45
NNW	0	0	0	0	1	3	7	1	4	4	9	0	0	29
Calm	0													0
Total	0	0	2	11	23	77	206	160	142	90	104	39	9	863

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-207
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class B HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	1	0	0	0	7	5	8	13	5	5	0	0	44
NNE	0	0	0	0	1	4	4	15	6	4	4	1	0	39
NE	0	0	0	1	5	10	9	11	6	2	2	0	0	46
ENE	0	0	0	1	2	1	14	5	6	0	0	0	0	29
E	0	0	0	0	1	2	10	2	1	0	0	0	0	16
ESE	0	0	0	1	1	3	6	4	0	0	0	0	0	15
SE	0	0	0	0	1	3	11	2	0	0	0	0	0	17
SSE	0	0	0	3	3	7	14	3	1	1	0	0	0	32
S	0	0	1	0	3	2	12	11	1	3	0	0	0	33
SSW	0	0	0	1	0	5	7	15	21	8	6	2	1	67
SW	0	0	0	0	0	4	12	15	19	11	18	4	3	87
WSW	0	0	0	0	0	1	5	13	8	10	10	5	0	52
W	0	0	0	0	0	4	5	5	5	3	6	1	0	29
WNW	0	0	0	0	0	3	8	6	5	4	6	6	3	41
NW	0	0	0	0	0	2	17	11	2	3	8	3	1	47
NNW	0	0	0	0	0	2	2	5	3	2	2	0	0	16
Calm	0													0
Total	0	1	1	7	17	60	142	132	98	56	68	22	8	613

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-207
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class C HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	0	1	1	2	3	5	13	1	6	2	1	0	35
NNE	0	0	0	1	2	3	5	11	4	4	6	1	0	37
NE	0	0	0	1	2	11	16	15	7	2	4	0	0	58
ENE	0	0	0	1	0	2	11	7	3	2	1	0	0	27
E	0	0	0	1	0	7	3	1	2	0	0	0	0	14
ESE	0	0	0	0	2	3	9	0	0	1	0	0	0	15
SE	0	0	1	1	2	9	12	2	0	0	0	0	0	27
SSE	0	0	0	1	2	8	16	6	6	1	1	0	1	42
S	0	0	1	1	0	4	20	8	3	1	2	0	0	40
SSW	0	0	0	0	0	2	13	17	8	14	7	2	1	65
SW	0	0	2	0	0	3	12	17	8	8	13	10	8	82
WSW	0	0	0	0	1	3	10	15	10	5	7	5	2	58
W	0	0	0	1	2	0	9	5	3	1	2	1	0	24
WNW	0	0	0	1	0	1	6	5	7	3	5	3	1	32
NW	0	0	0	0	1	4	14	7	4	2	6	2	0	40
NNW	0	0	1	0	0	3	9	5	2	1	6	1	3	31
Calm	0													0
Total	0	0	6	10	16	67	171	135	69	51	63	26	16	630

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-207
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class D HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	0	3	2	5	14	37	36	19	20	15	4	0	156
NNE	0	0	1	4	5	15	30	43	58	34	28	5	0	225
NE	0	0	0	1	3	16	43	59	41	24	14	2	1	206
ENE	0	1	2	5	2	13	24	25	21	8	5	0	0	107
E	0	0	0	7	8	6	24	14	8	2	1	0	0	71
ESE	0	1	2	4	2	10	17	11	3	1	0	0	0	51
SE	0	0	3	5	6	19	25	15	2	1	4	0	0	81
SSE	0	0	6	2	10	18	30	32	20	10	11	2	4	146
S	0	0	7	3	10	24	62	27	19	12	12	4	1	182
SSW	0	1	1	4	3	17	47	48	34	28	27	4	0	216
SW	0	0	1	4	8	7	35	31	30	33	45	14	0	210
WSW	0	0	2	1	3	5	15	24	21	19	10	12	4	117
W	0	0	1	4	4	7	14	8	8	4	7	0	0	57
WNW	0	1	1	5	8	13	11	10	9	11	10	5	2	87
NW	0	0	4	5	10	12	26	13	10	14	21	6	6	128
NNW	0	0	3	2	7	12	28	19	13	12	14	5	1	117
Calm	1													1
Total	1	4	37	58	95	210	472	418	319	235	226	64	19	2157

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-207
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class E HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	0	2	1	6	11	33	25	15	5	5	1	1	106
NNE	0	1	0	3	4	12	47	33	8	16	4	0	0	129
NE	0	0	3	3	6	12	29	29	16	7	2	0	0	108
ENE	0	0	4	3	3	13	25	17	7	3	1	0	0	77
E	0	0	3	4	1	9	23	18	6	2	0	0	0	67
ESE	0	1	3	3	0	9	22	9	2	0	0	0	0	49
SE	0	0	2	3	5	11	30	18	5	1	0	0	0	76
SSE	0	2	4	2	6	13	27	21	19	6	2	1	0	104
S	0	0	1	1	8	18	36	29	41	28	10	0	0	173
SSW	0	0	6	4	6	12	26	31	26	24	30	0	0	166
SW	0	1	1	2	8	9	17	18	34	30	46	9	0	176
WSW	0	2	3	6	1	13	22	18	20	26	26	1	0	139
W	0	0	4	3	2	8	13	16	8	8	7	0	0	70
WNW	0	0	2	3	6	4	8	15	26	18	9	2	0	94
NW	0	1	5	5	6	5	24	19	25	20	15	1	0	127
NNW	1	0	2	7	5	10	29	25	20	23	4	0	1	128
Calm	1													1
Total	2	8	45	53	74	170	414	344	280	219	162	15	2	1789

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-207
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class F HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	1	2	2	4	4	23	19	6	3	1	0	0	66
NNE	1	0	3	3	8	11	31	22	12	1	0	1	0	94
NE	0	0	3	5	2	9	20	19	8	0	0	0	0	67
ENE	0	2	0	1	2	3	11	4	5	0	0	0	0	28
E	0	2	1	5	2	3	7	7	5	1	0	0	0	33
ESE	0	1	3	2	2	6	13	3	0	0	0	0	0	30
SE	0	0	1	0	2	9	10	4	2	0	0	0	0	28
SSE	0	1	2	2	5	8	24	12	9	4	0	0	0	68
S	1	2	1	0	3	12	34	28	25	5	7	0	0	119
SSW	0	0	0	5	7	8	29	23	9	10	6	0	1	99
SW	0	1	3	3	6	9	24	16	8	6	3	0	0	80
WSW	0	1	1	2	1	5	19	11	7	3	0	0	0	50
W	0	0	0	3	2	7	11	13	4	0	1	0	0	41
WNW	0	1	2	5	3	6	12	8	10	3	2	0	0	52
NW	0	1	2	0	4	4	21	14	25	8	1	0	0	81
NNW	0	0	3	1	2	6	20	15	7	6	1	0	0	61
Calm	4													4
Total	6	13	27	39	55	111	311	220	143	50	22	1	1	1001

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-207
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class G HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	1	1	6	8	9	20	51	25	8	0	0	0	0	130
NNE	0	2	6	5	15	25	67	47	4	1	0	0	0	172
NE	1	1	4	12	11	33	53	28	11	0	0	0	0	155
ENE	2	1	5	6	10	13	36	14	2	0	1	0	0	91
E	0	1	5	8	3	10	10	8	0	0	0	0	0	45
ESE	0	0	3	2	10	5	15	4	1	0	0	0	0	40
SE	0	2	6	4	10	15	19	10	4	0	0	0	0	71
SSE	0	5	1	4	7	17	44	26	11	4	0	0	0	120
S	0	1	3	7	13	23	68	72	27	3	1	0	0	218
SSW	1	1	3	6	6	19	47	57	17	13	1	0	0	172
SW	1	1	2	2	13	12	40	17	14	3	0	0	0	106
WSW	0	0	0	4	4	10	21	11	3	2	0	0	0	55
W	0	0	5	5	7	13	16	11	6	0	0	0	0	64
WNW	1	0	4	2	9	4	14	11	7	0	1	0	0	53
NW	0	1	3	4	4	14	29	17	8	4	0	0	0	85
NNW	0	1	4	5	16	19	41	24	11	0	0	0	0	122
Calm	7													7
Total	14	18	60	85	148	254	574	384	135	30	4	0	0	1707

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-208
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
FIRST YEAR OF LEE NUCLEAR STATION DATA
(ALL STABILITY CLASSES COMBINED)
60-M MEASUREMENT LEVEL

	Wind Speed (m/sec)														
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total	Ave Speed
N	1	3	14	15	27	67	164	132	68	43	31	8	1	575	3.3
NNE	1	3	10	16	35	74	195	180	102	62	45	10	0	734	3.4
NE	1	1	10	23	31	98	186	187	104	35	24	3	1	706	3.1
ENE	2	4	11	18	20	49	144	90	54	16	9	0	0	418	2.9
E	0	3	9	28	16	45	94	53	23	5	1	0	0	278	2.5
ESE	0	3	11	13	19	44	95	33	6	2	0	0	0	227	2.3
SE	0	2	13	14	28	79	126	53	14	3	4	0	0	337	2.4
SSE	0	8	13	15	38	82	175	114	78	28	14	4	6	576	3.0
S	1	3	14	14	38	88	251	193	129	53	36	5	2	828	3.3
SSW	1	2	10	20	23	67	189	215	141	122	97	12	4	902	3.9
SW	1	3	9	11	38	46	153	131	135	106	156	45	13	849	4.5
WSW	0	3	6	13	10	38	99	102	83	80	64	26	6	529	4.2
W	0	0	11	16	19	42	74	65	38	25	23	4	0	318	3.3
WNW	1	2	9	17	27	32	66	64	71	48	45	22	9	413	4.1
NW	0	3	15	14	25	42	143	87	80	53	61	21	8	553	3.9
NNW	1	1	13	15	31	55	137	95	60	48	36	6	5	505	3.4
Calm	13													13	
Total	10	44	179	264	428	949	2290	1793	1185	732	648	167	55	8760	3.5

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.

TABLE 2CC-209
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class A HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	0	0	1	1	4	5	3	4	3	4	1	0	23
NNE	0	0	0	0	0	2	6	8	5	2	3	1	0	24
NE	0	0	0	0	1	3	9	16	12	1	2	1	0	43
ENE	0	0	0	1	1	3	11	14	11	3	1	0	0	43
E	0	0	0	2	1	4	9	4	1	0	0	0	0	20
ESE	0	0	0	1	1	4	8	3	1	0	0	0	0	17
SE	0	0	0	1	1	7	14	6	4	1	0	0	0	32
SSE	0	0	0	1	3	7	14	13	7	1	0	1	1	45
S	0	0	1	1	1	2	14	14	10	1	2	1	1	45
SSW	0	0	0	0	1	2	13	20	23	20	11	4	1	93
SW	0	0	0	0	2	1	6	16	21	16	25	8	2	95
WSW	0	0	0	0	0	1	4	8	11	13	7	9	2	52
W	0	0	1	0	1	2	3	4	6	8	2	1	0	26
WNW	0	0	1	1	1	1	5	8	7	7	12	5	3	46
NW	0	0	1	1	0	1	6	6	5	4	9	7	3	40
NNW	0	0	0	0	1	2	4	2	4	3	6	0	0	19
Calm	0													0
Total	0	0	2	6	12	41	127	142	127	79	81	36	11	665

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-209
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class B HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	1	0	0	0	4	5	5	10	5	5	0	0	32
NNE	0	0	0	0	1	2	5	10	5	5	6	1	0	34
NE	0	0	0	1	3	6	7	14	9	3	4	0	0	44
ENE	0	0	0	1	1	1	9	9	12	1	1	1	0	34
E	0	0	0	0	1	1	9	5	2	1	0	0	0	18
ESE	0	0	0	1	1	2	10	3	1	0	0	0	0	17
SE	0	0	0	0	1	3	12	5	0	0	0	0	0	20
SSE	0	0	0	2	2	4	18	6	1	1	0	0	0	32
S	0	0	1	0	2	1	15	11	4	2	0	0	0	34
SSW	0	0	0	1	0	3	14	18	18	9	6	2	1	70
SW	0	0	0	0	0	2	10	16	16	13	19	6	3	84
WSW	0	0	0	0	0	1	7	13	11	9	8	4	1	52
W	0	0	0	0	0	2	6	7	5	5	5	1	0	29
WNW	0	0	0	0	1	2	10	7	3	3	6	4	4	37
NW	0	0	0	0	0	2	12	15	5	4	6	3	3	48
NNW	0	0	0	0	0	1	2	5	3	2	1	0	0	14
Calm	0													0
Total	0	1	1	4	10	35	147	147	102	60	64	19	11	600

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-209
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class C HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	0	1	1	1	4	5	9	2	4	1	1	0	27
NNE	0	0	0	1	1	2	7	8	7	8	4	1	0	36
NE	0	0	0	1	1	8	17	16	10	3	6	1	0	62
ENE	0	0	0	1	0	4	15	11	8	3	1	1	0	41
E	0	0	0	1	0	6	9	4	2	1	0	0	0	21
ESE	0	0	0	0	2	5	6	1	0	1	0	0	0	13
SE	0	0	1	2	2	11	17	3	0	0	0	0	0	34
SSE	0	0	0	1	2	12	25	7	3	1	1	0	1	51
S	0	0	1	1	1	4	23	10	4	1	2	0	0	45
SSW	0	0	0	0	1	2	18	17	10	11	9	2	1	70
SW	0	0	1	0	0	4	19	17	8	8	12	11	5	84
WSW	0	0	0	0	2	3	19	12	8	5	6	4	3	60
W	0	0	0	1	2	2	10	6	4	1	2	1	0	27
WNW	0	0	0	1	0	3	9	4	5	2	3	2	1	28
NW	0	0	0	0	1	5	12	8	3	3	6	5	3	44
NNW	0	0	1	0	1	4	8	3	3	1	5	1	2	27
Calm	0													0
Total	0	0	3	7	15	75	219	132	74	51	55	27	14	670

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-209
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class D HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	1	4	5	6	14	38	33	15	16	15	5	0	151
NNE	0	0	1	4	5	19	47	62	50	26	22	3	0	238
NE	0	0	2	4	7	16	51	66	47	20	15	2	1	230
ENE	0	1	2	6	5	12	33	40	26	10	5	1	0	139
E	0	0	0	7	10	15	29	16	6	3	1	0	0	87
ESE	0	1	2	5	5	15	20	14	3	2	0	0	0	65
SE	0	0	4	4	10	19	36	16	8	3	4	1	0	103
SSE	0	1	6	5	16	26	33	31	15	8	6	3	2	150
S	0	0	5	6	13	20	50	29	21	11	11	4	1	170
SSW	0	1	4	3	5	17	42	47	34	33	23	2	2	211
SW	0	0	1	3	7	9	35	28	30	34	46	15	1	209
WSW	0	0	2	1	6	8	21	27	16	17	17	7	4	123
W	0	1	1	5	6	10	18	12	9	5	7	0	0	72
WNW	0	2	1	6	9	13	16	9	6	10	13	6	4	92
NW	1	1	4	5	9	16	27	13	12	15	25	16	8	150
NNW	0	0	4	7	6	12	21	16	12	18	17	6	2	119
Calm	1													1
Total	1	5	38	73	122	240	517	459	309	228	225	68	23	2309

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-209
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class E HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	1	2	2	6	13	30	19	13	7	5	1	1	99
NNE	0	1	2	3	8	11	42	29	18	24	7	0	0	143
NE	0	0	2	3	5	14	33	34	21	12	5	0	0	128
ENE	0	0	4	2	2	11	25	26	15	6	2	0	0	91
E	0	0	2	6	4	9	19	17	9	2	0	0	0	66
ESE	0	1	2	2	2	9	23	10	6	0	0	0	0	52
SE	0	2	3	4	3	11	27	19	7	2	1	0	0	77
SSE	1	1	3	3	6	12	24	22	20	8	3	1	0	102
S	0	0	1	2	7	13	40	38	34	26	8	2	0	171
SSW	0	0	5	3	5	12	27	31	38	34	25	0	0	179
SW	0	1	3	2	7	9	19	19	31	33	38	6	0	166
WSW	0	1	2	4	2	10	17	15	15	19	18	1	0	103
W	0	1	3	2	4	7	14	16	8	8	4	0	0	65
WNW	0	1	3	2	4	3	8	11	20	16	9	2	0	78
NW	0	1	4	5	6	10	20	15	23	19	13	1	0	116
NNW	1	0	2	5	6	11	26	21	18	18	6	0	1	113
Calm	1													1
Total	2	8	38	47	75	162	393	341	294	232	143	13	1	1749

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-209
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class F HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	0	1	2	2	3	8	21	15	6	4	2	0	0	61
NNE	1	0	3	3	6	8	31	24	13	4	1	1	0	94
NE	0	0	2	4	3	9	16	22	16	3	0	0	0	74
ENE	1	1	0	1	2	3	9	8	10	2	0	0	0	37
E	0	2	2	3	1	3	8	9	4	1	0	0	0	31
ESE	0	1	2	2	2	7	14	3	1	0	0	0	0	28
SE	0	0	2	1	3	6	15	8	3	1	1	0	0	38
SSE	0	2	2	3	3	6	19	17	6	4	1	0	0	61
S	1	1	1	1	4	11	33	25	18	5	6	0	0	104
SSW	0	0	1	4	6	9	30	24	17	11	9	0	1	110
SW	0	1	2	2	3	10	20	16	12	6	2	0	0	74
WSW	0	1	1	2	1	3	15	8	5	2	1	0	0	38
W	0	1	2	3	4	6	10	10	4	2	3	0	0	43
WNW	0	1	2	4	4	5	10	6	9	3	1	0	0	43
NW	0	1	2	1	4	4	17	15	18	6	1	1	0	67
NNW	0	1	2	1	4	7	20	15	8	10	1	0	0	68
Calm	3													3
Total	5	9	26	34	50	104	286	223	148	61	26	1	1	973

NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-209
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
60-M MEASUREMENT LEVEL
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Stability Class G HRS

	Wind Speed (m/sec)													
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total
N	1	2	7	6	7	21	54	35	12	1	0	0	0	144
NNE	0	3	6	8	10	23	67	48	16	2	0	0	0	182
NE	1	1	5	9	9	29	55	40	16	0	0	0	0	164
ENE	2	1	4	7	8	10	34	13	4	2	1	0	0	84
E	0	1	4	7	5	11	11	8	0	0	0	0	0	45
ESE	0	0	2	2	8	8	24	6	1	0	0	0	0	48
SE	0	1	5	3	9	17	29	12	4	1	0	0	0	80
SSE	0	3	1	4	7	15	44	27	8	2	0	0	0	110
S	0	2	3	8	9	21	63	55	20	3	1	0	0	182
SSW	1	1	5	8	9	19	47	49	18	12	2	0	0	168
SW	1	2	4	5	10	17	51	27	17	5	0	0	0	137
WSW	0	0	1	4	8	9	32	17	6	1	0	0	0	78
W	0	0	6	8	6	12	19	11	6	0	0	0	0	67
WNW	1	0	5	4	7	9	15	13	8	1	1	0	0	61
NW	0	1	2	5	3	14	33	19	11	5	1	0	0	91
NNW	0	2	5	6	15	20	47	35	14	1	1	0	0	146
Calm	5													5
Total	10	16	61	91	126	255	625	414	157	34	5	0	0	1793

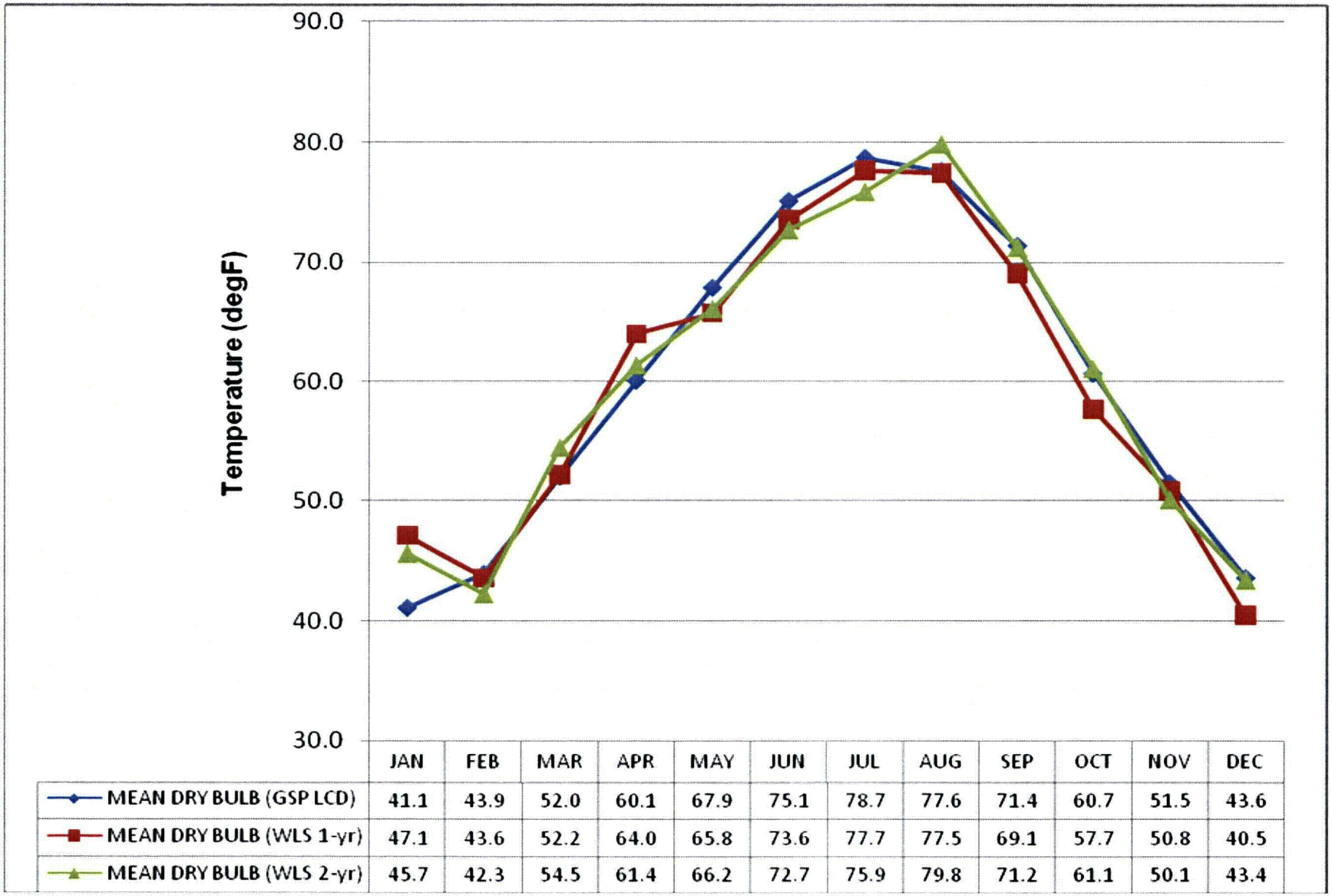
NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2007.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

TABLE 2CC-210
LEE NUCLEAR STATION JOINT FREQUENCY DISTRIBUTION
TWO YEARS OF LEE NUCLEAR STATION DATA
(ALL STABILITY CLASSES COMBINED)
60-M MEASUREMENT LEVEL

	Wind Speed (m/sec)														
Dir	<=0.45	<=0.75	<=1.00	<=1.25	<=1.5	<=2.00	<=3.00	<=4.00	<=5.00	<=6.00	<=8.00	<10.00	>10.00	Total	Ave Speed
N	1	4	14	15	23	67	158	119	61	38	31	8	1	538	3.3
NNE	1	3	12	17	30	66	204	188	113	71	42	5	0	751	3.4
NE	1	1	10	20	28	85	187	208	130	40	31	3	1	745	3.3
ENE	3	2	9	17	19	42	136	121	84	25	10	2	0	470	3.1
E	0	2	8	25	21	48	93	62	23	6	1	0	0	287	2.5
ESE	0	2	7	10	19	49	104	38	11	2	0	0	0	241	2.4
SE	0	3	13	14	27	73	150	68	24	6	5	1	0	383	2.5
SSE	1	6	11	18	36	82	177	123	59	24	10	4	3	552	2.9
S	1	3	11	18	36	73	236	182	111	47	29	6	2	751	3.2
SSW	1	1	13	18	25	62	190	205	157	130	85	10	4	901	3.9
SW	1	3	10	11	28	51	161	138	135	116	141	45	10	849	4.4
WSW	0	2	5	11	18	33	114	100	72	65	56	25	9	507	4.1
W	0	2	11	18	23	39	79	65	40	28	20	3	0	328	3.2
WNW	1	3	10	16	24	34	72	56	57	41	44	17	12	386	4.0
NW	1	3	12	15	22	50	126	89	75	55	60	32	17	557	4.1
NNW	1	3	13	19	31	57	127	97	61	51	35	6	4	504	3.4
Calm	9													9	
Total	8	38	169	262	410	912	2314	1858	1211	745	599	165	61	8760	3.5

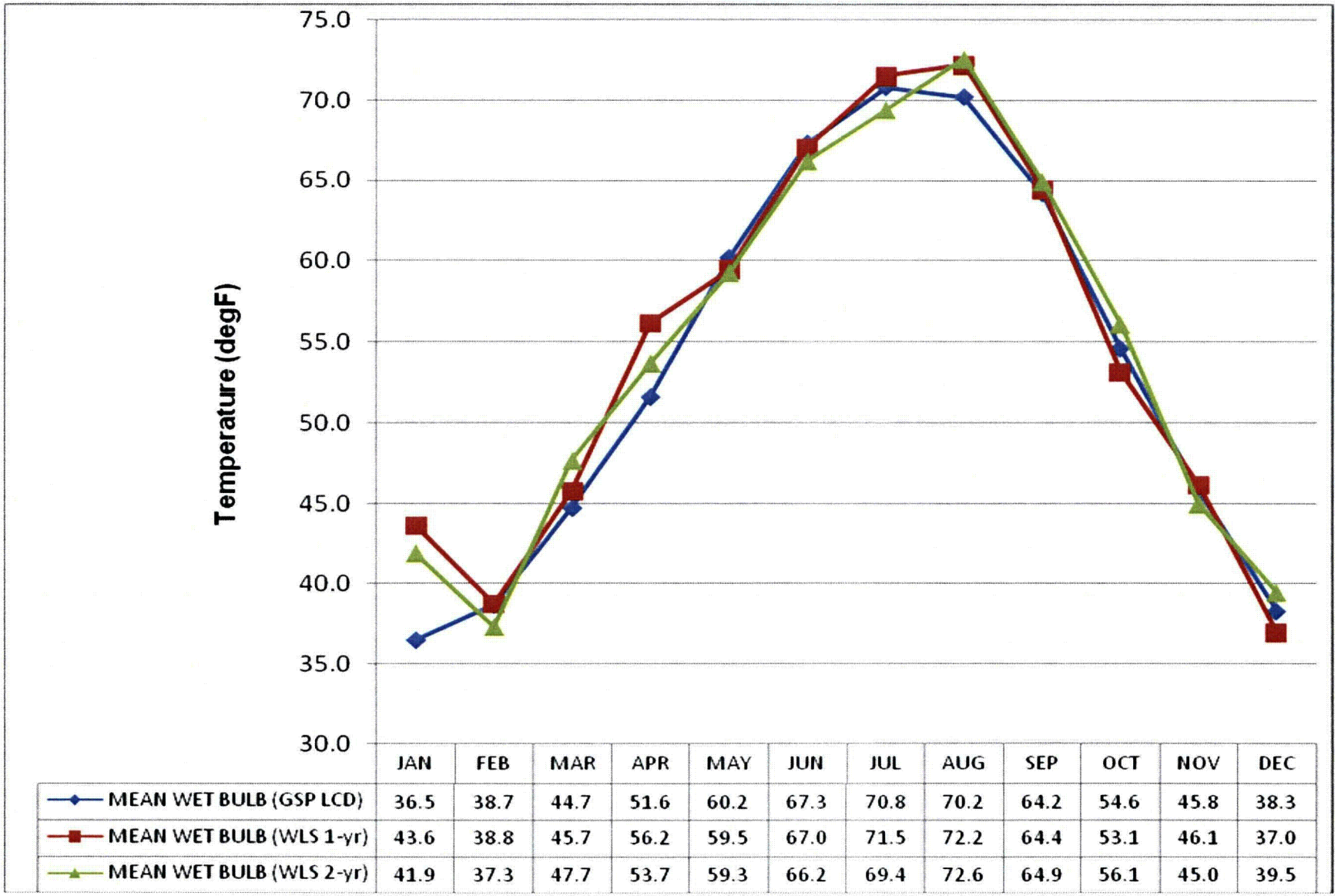
NOTES:
1. Data from Lee Nuclear Station Site Meteorological Tower, 12/1/2005 – 11/30/2006.
2. Calms are wind speeds less than or equal to 0.45 m/sec.
3. Double precision values reported in sum.
4. The joint frequency distribution based on the two-year data set is annualized to total 8760 hrs.

FIGURE 2CC-201
DRY BULB TEMPERATURE COMPARISON



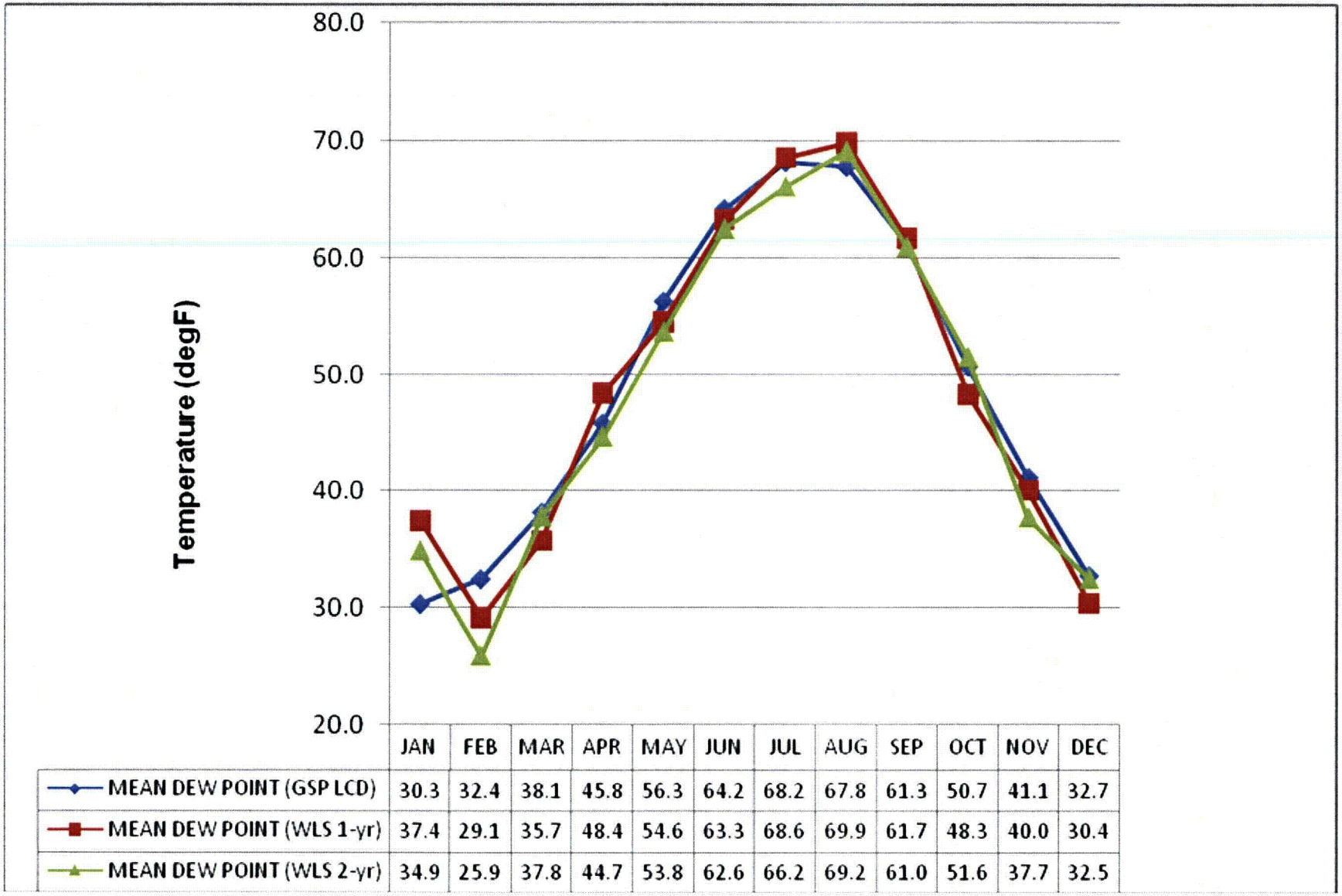
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MEAN DRY BULB (GSP LCD)	41.1	43.9	52.0	60.1	67.9	75.1	78.7	77.6	71.4	60.7	51.5	43.6
MEAN DRY BULB (WLS 1-yr)	47.1	43.6	52.2	64.0	65.8	73.6	77.7	77.5	69.1	57.7	50.8	40.5
MEAN DRY BULB (WLS 2-yr)	45.7	42.3	54.5	61.4	66.2	72.7	75.9	79.8	71.2	61.1	50.1	43.4

FIGURE 2CC-202
WET BULB TEMPERATURE COMPARISON



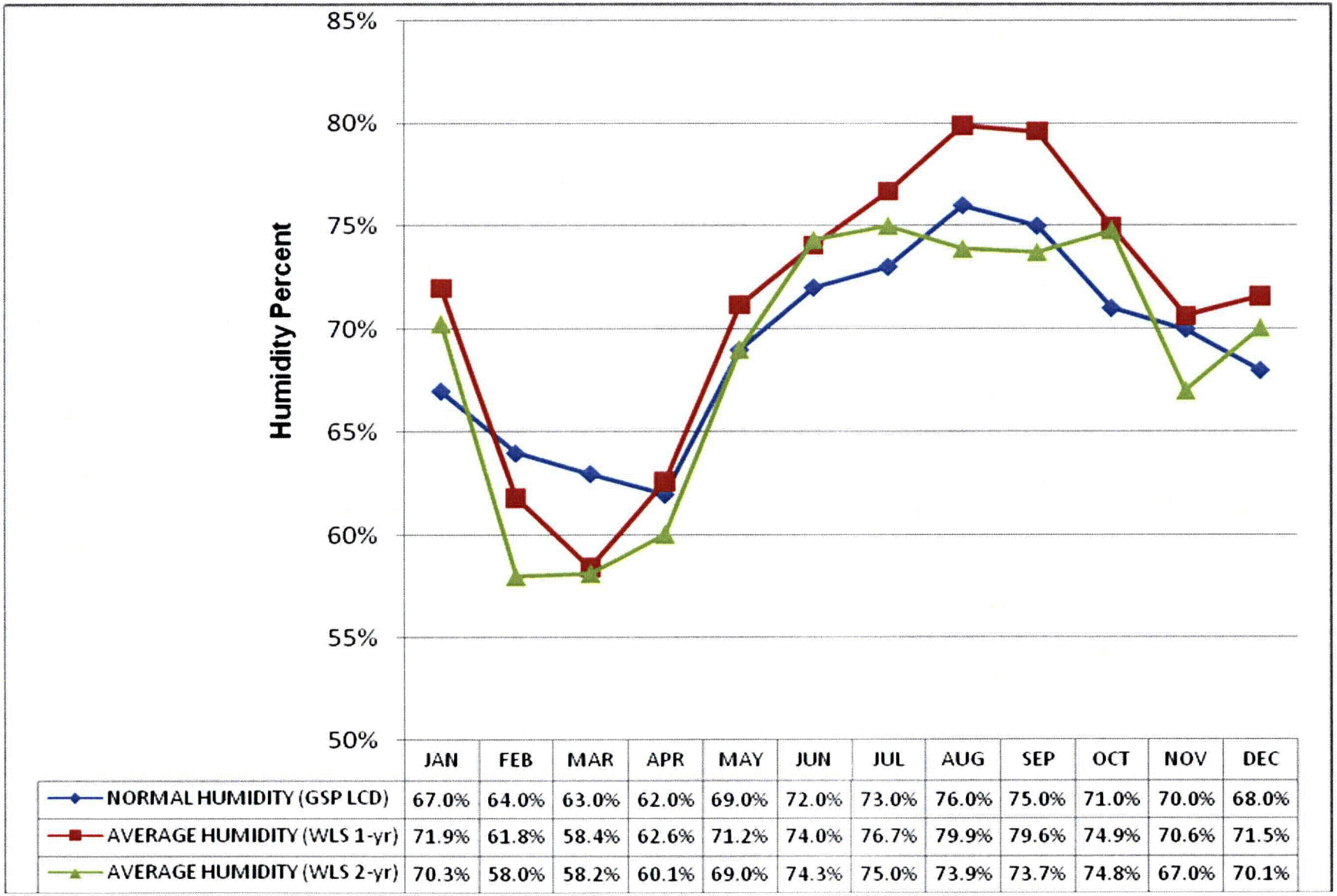
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MEAN WET BULB (GSP LCD)	36.5	38.7	44.7	51.6	60.2	67.3	70.8	70.2	64.2	54.6	45.8	38.3
MEAN WET BULB (WLS 1-yr)	43.6	38.8	45.7	56.2	59.5	67.0	71.5	72.2	64.4	53.1	46.1	37.0
MEAN WET BULB (WLS 2-yr)	41.9	37.3	47.7	53.7	59.3	66.2	69.4	72.6	64.9	56.1	45.0	39.5

FIGURE 2CC-203
DEW POINT TEMPERATURE COMPARISON



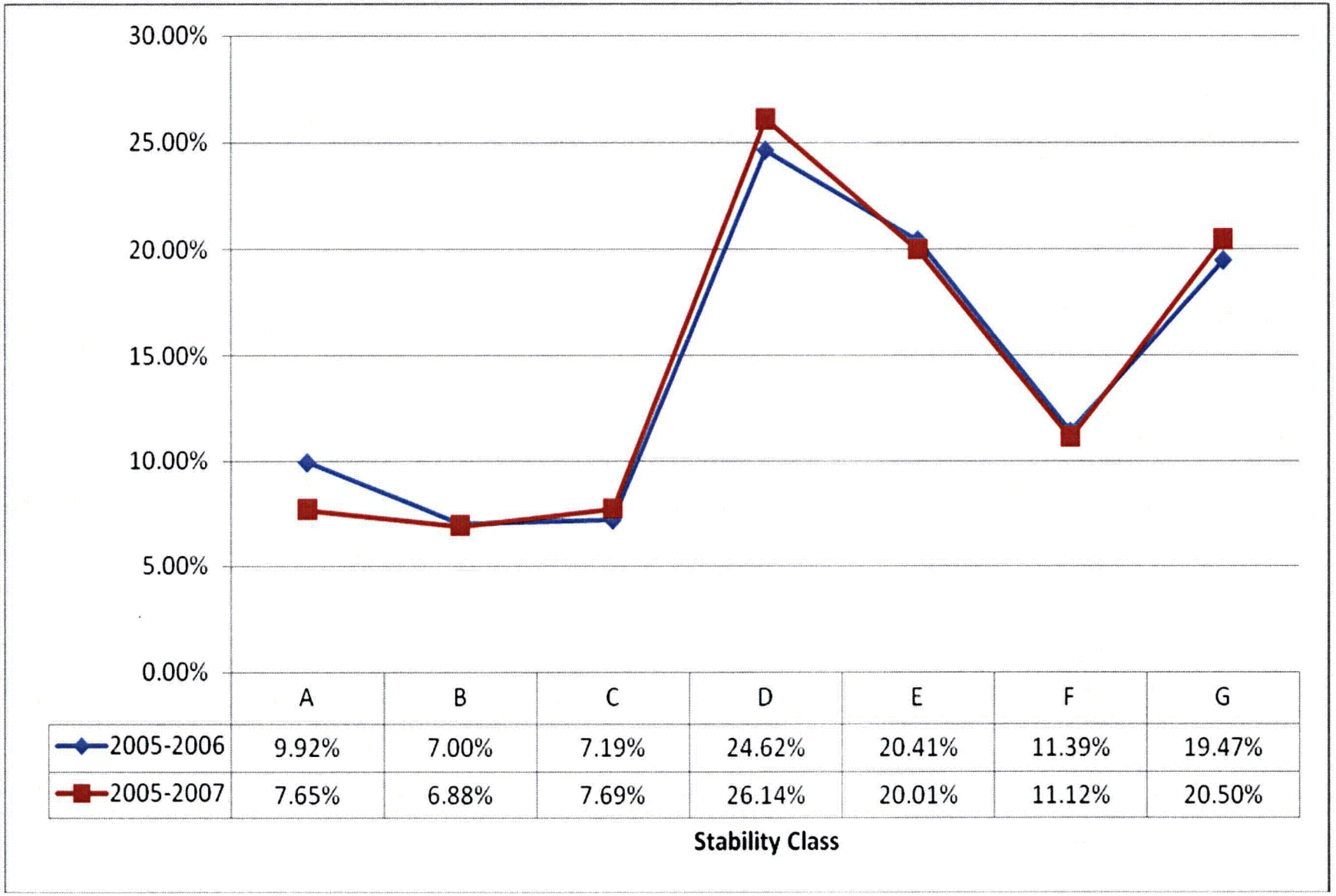
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
MEAN DEW POINT (GSP LCD)	30.3	32.4	38.1	45.8	56.3	64.2	68.2	67.8	61.3	50.7	41.1	32.7
MEAN DEW POINT (WLS 1-yr)	37.4	29.1	35.7	48.4	54.6	63.3	68.6	69.9	61.7	48.3	40.0	30.4
MEAN DEW POINT (WLS 2-yr)	34.9	25.9	37.8	44.7	53.8	62.6	66.2	69.2	61.0	51.6	37.7	32.5

FIGURE 2CC-204
RELATIVE HUMIDITY COMPARISON



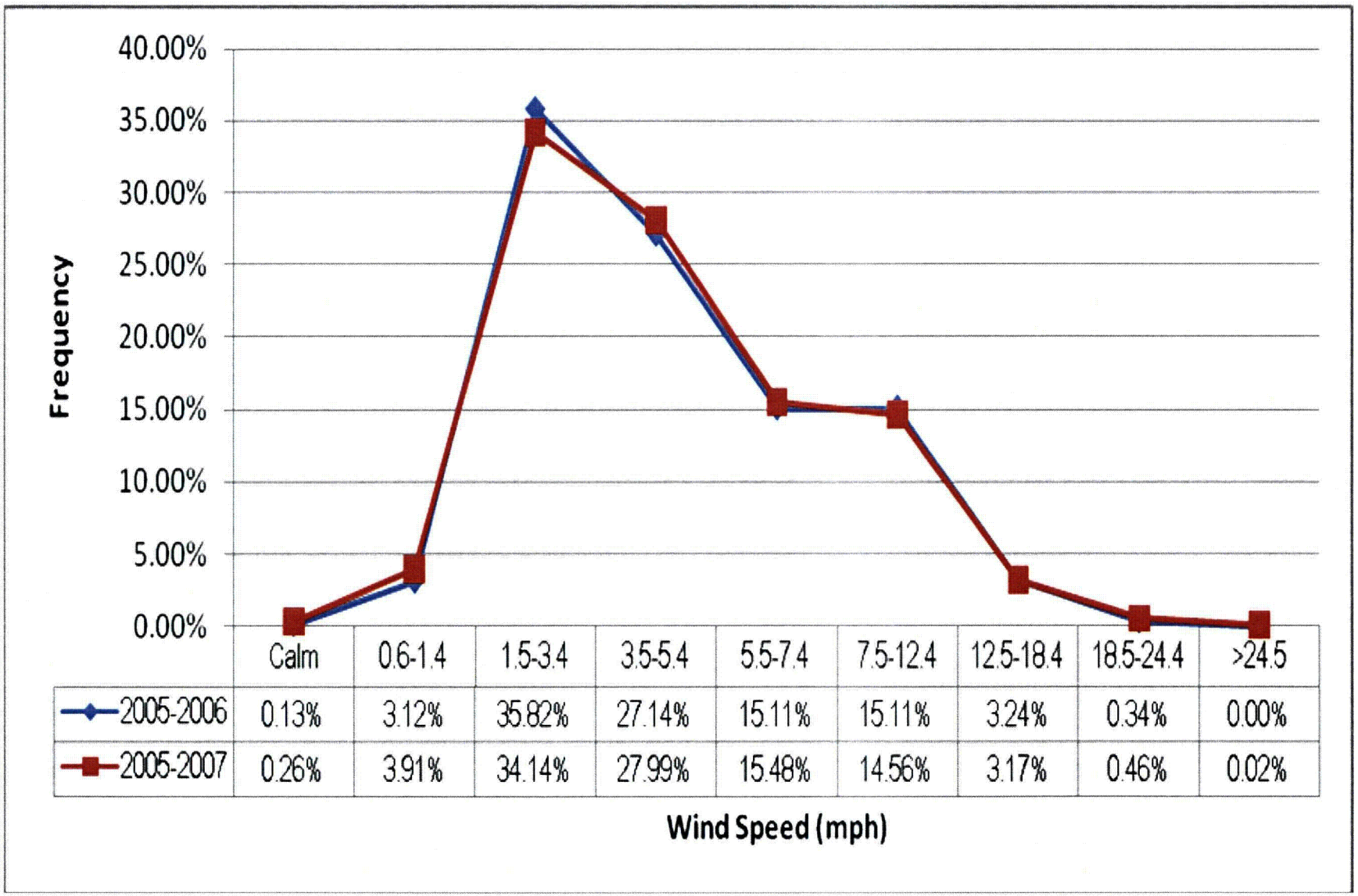
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
NORMAL HUMIDITY (GSP LCD)	67.0%	64.0%	63.0%	62.0%	69.0%	72.0%	73.0%	76.0%	75.0%	71.0%	70.0%	68.0%
AVERAGE HUMIDITY (WLS 1-yr)	71.9%	61.8%	58.4%	62.6%	71.2%	74.0%	76.7%	79.9%	79.6%	74.9%	70.6%	71.5%
AVERAGE HUMIDITY (WLS 2-yr)	70.3%	58.0%	58.2%	60.1%	69.0%	74.3%	75.0%	73.9%	73.7%	74.8%	67.0%	70.1%

FIGURE 2CC-205
LEE NUCLEAR STATION STABILITY CLASS COMPARISON



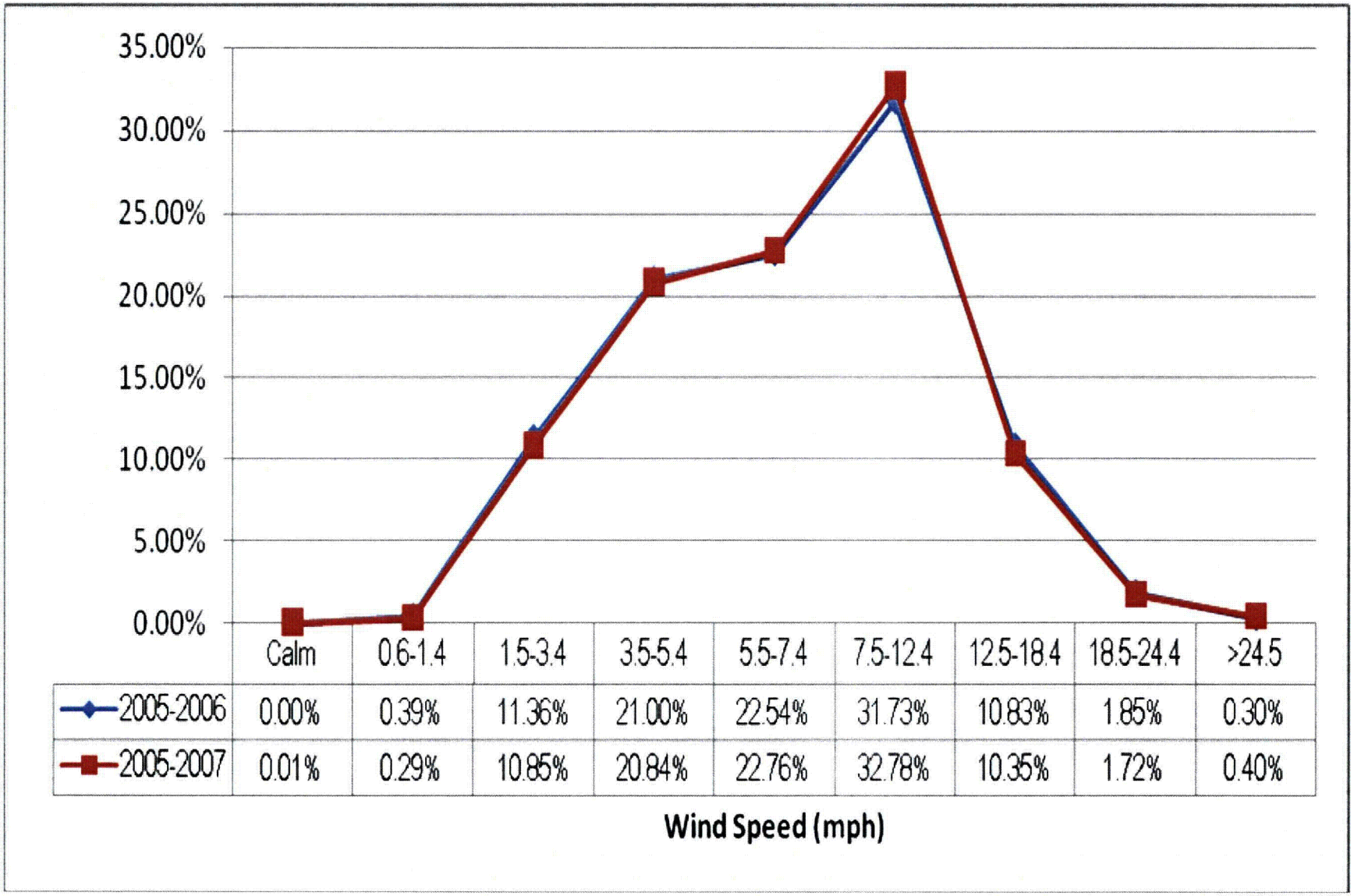
	A	B	C	D	E	F	G
2005-2006	9.92%	7.00%	7.19%	24.62%	20.41%	11.39%	19.47%
2005-2007	7.65%	6.88%	7.69%	26.14%	20.01%	11.12%	20.50%

FIGURE 2CC-206
WIND SPEED FREQUENCY
(10 M LEVEL)



	Calm	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>24.5
2005-2006	0.13%	3.12%	35.82%	27.14%	15.11%	15.11%	3.24%	0.34%	0.00%
2005-2007	0.26%	3.91%	34.14%	27.99%	15.48%	14.56%	3.17%	0.46%	0.02%

FIGURE 2CC-207
WIND SPEED FREQUENCY
(60 M LEVEL)



	Calm	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>24.5
2005-2006	0.00%	0.39%	11.36%	21.00%	22.54%	31.73%	10.83%	1.85%	0.30%
2005-2007	0.01%	0.29%	10.85%	20.84%	22.76%	32.78%	10.35%	1.72%	0.40%

FIGURE 2CC-208
WIND DIRECTION FREQUENCY
(10 M LEVEL)

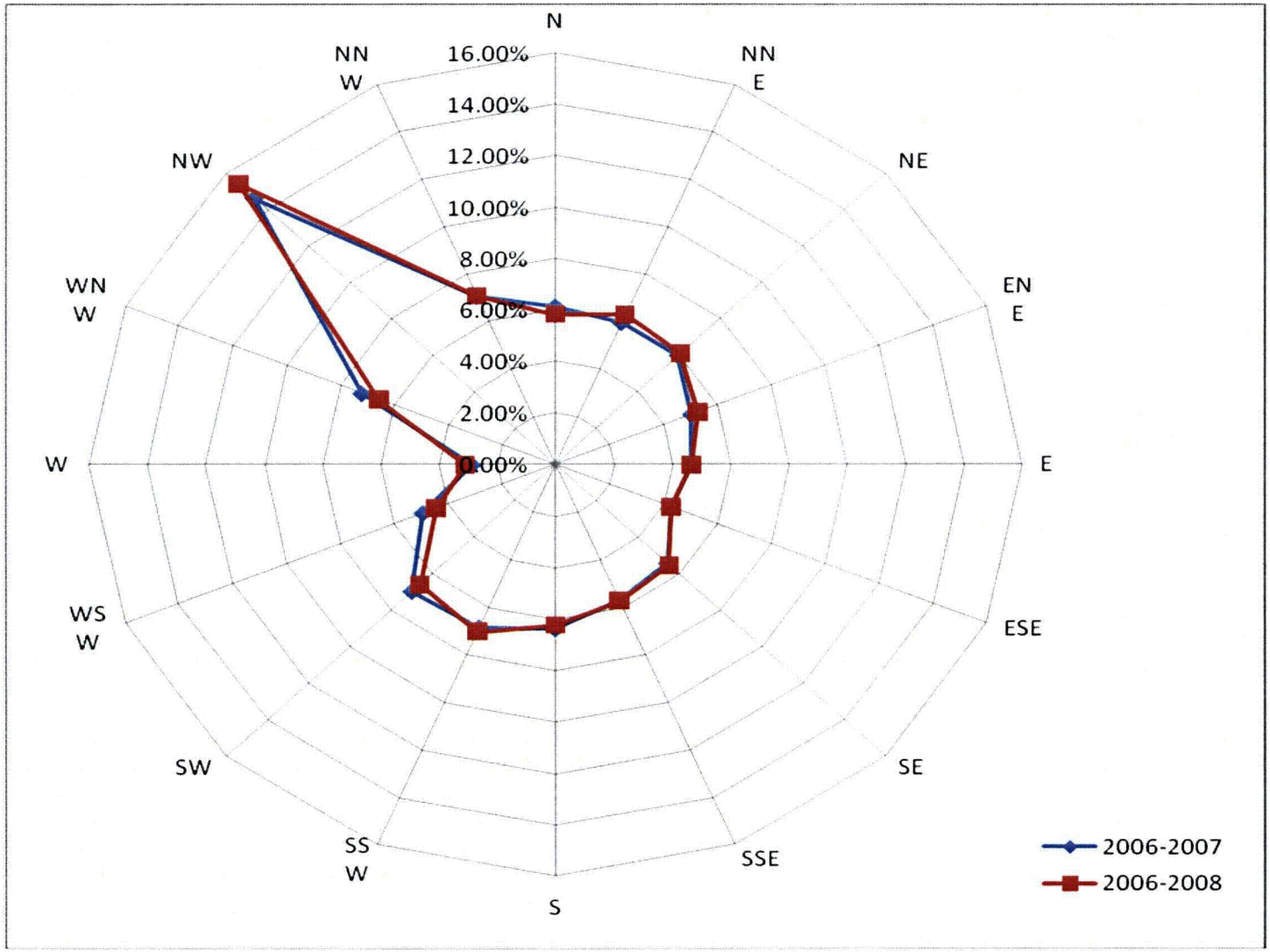
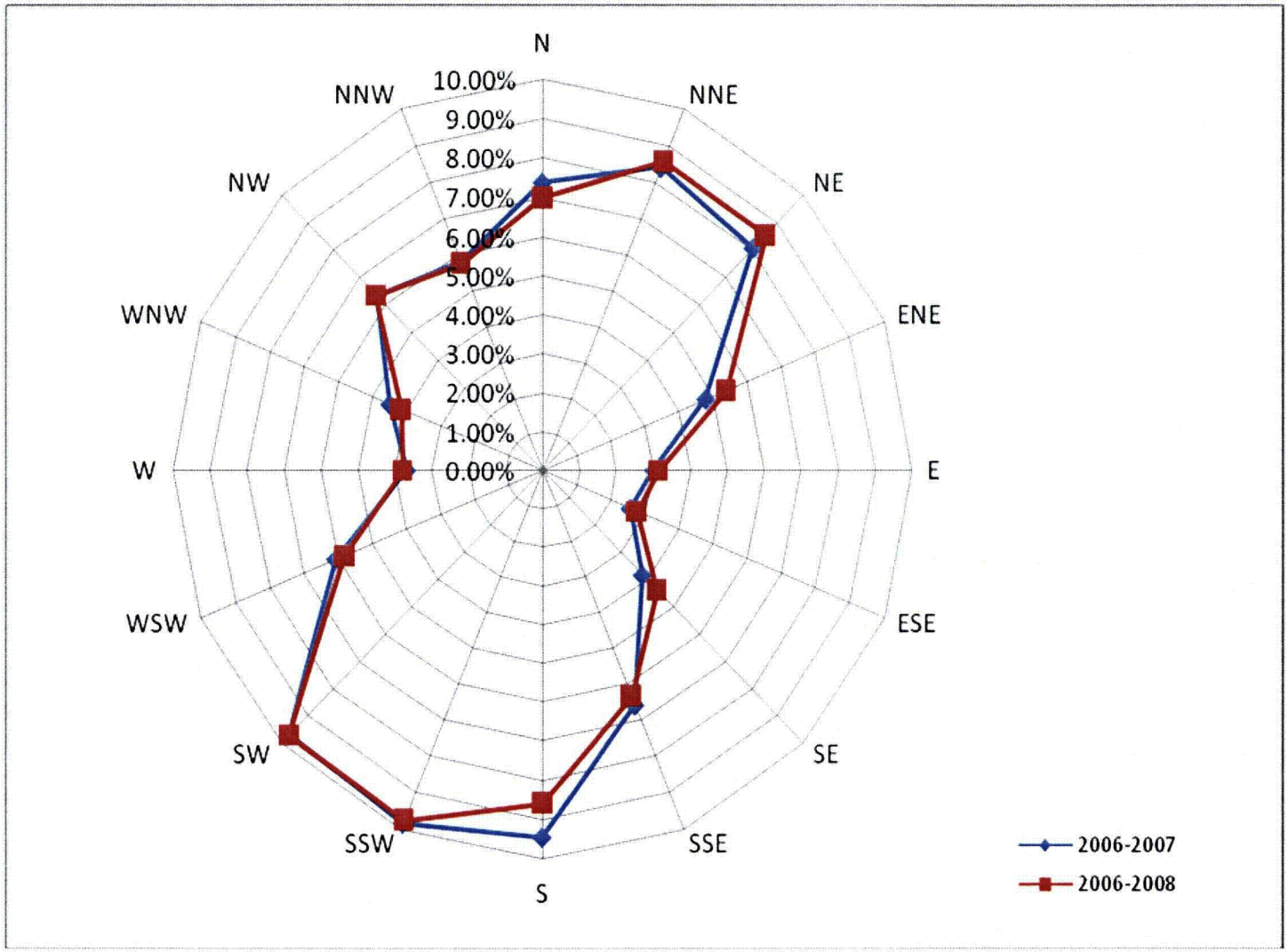


FIGURE 2CC-209
WIND DIRECTION FREQUENCY
(60 M LEVEL)



Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 035

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.02-002

NRC RAI:

FSAR Section 2.3.2 states that "the net regional air movement can be deduced from the monthly wind joint frequency distributions for the Greenville/Spartanburg International Airport." The staff disagrees with this statement based on a comparison of annual wind speed and direction distributions from other NWS stations. The following figure in Attachment 1 shows the annual wind direction distribution for the proposed Lee site and the two closest first-order NWS stations, Greenville and Charlotte. Nearby non-first-order NWS stations (Rock Hill, Rutherfordton, and Gastonia) also have different annual wind distributions compared to Greenville. Please provide additional justification for this statement or remove it.

Duke Energy Response:

Net regional air movement statement will be removed from text.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

FSAR Subsection 2.3.2

Attachments:

1) Mark-up of FSAR Subsection 2.3.2

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 02.03.02-002

Mark-up of FSAR Subsection 2.3.2

COLA Part 2, FSAR, Chapter 2, Subsection 2.3.2, third paragraph, will be revised as follows:

The general direction of airflow across the region is from the northerly sectors during much of the year, although the prevailing direction may be from one of the southerly sectors during some months. The ~~net regional air movement can be deduced from the~~ monthly wind joint frequency distributions for the Greenville/Spartanburg International Airport are shown in Tables 2.3-209 through Table 2.3-221.

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 035

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.02-003

NRC RAI:

NUREG-0800, Section 2.3.1, states that at least 30 years of meteorological data from nearby representative locations should be used to determine dry and wet bulb temperatures. Please justify only using nine years (1997 - 2005) of meteorological data to determine the worst 1-, 5-, and 30-day dry bulb and wet bulb temperatures.

Duke Energy Response:

NUREG-0800, Standard Review Plan, Section 2.3.1 recommends the use of 30 years of data for design of the Ultimate Heat Sink (UHS.) For a passive plant, a site-specific UHS evaluation is not necessary. As a result, there is no need to use 30 years of data in determining the worst 1-, 5-, and 30-day dry bulb and wet bulb temperatures. Because this data is not needed for a passive plant, FSAR Table 2.3-247, Table 2.3-248, Table 2.3-249, Table 2.3-250, Table 2.3-251, and Table 2.3-252 showing the worst 1-day, 5-day and 30-day temperatures will be deleted. Thirty years of data will be used in the calculation of design basis 0% exceedance temperatures, as further discussed in the response to RAI 02.03.02-004 in this letter.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

1. Revise FSAR Subsection 2.3.2.2
2. The following FSAR Tables will be deleted:
   - FSAR Table 2.3-247
   - FSAR Table 2.3-248
   - FSAR Table 2.3-249
   - FSAR Table 2.3-250
   - FSAR Table 2.3-251
   - FSAR Table 2.3-252

Attachments:

1) Mark-up of FSAR Subsection 2.3.2.2

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 02.03.02-003

Mark-up of FSAR Subsection 2.3.2.2

COLA Part 2, FSAR, Chapter 2, Subsection 2.3.2.2, fourth paragraph, will be revised as follows:

The maximum temperature at the Lee Nuclear Station site during the 2005-2006 data collection period was 96°F and the minimum was 20°F which is within the bounds of the historic record for Ninety-Nine Islands, South Carolina (see Figure 2.3-238). The temperature range at the Lee Nuclear Station site is consistent with the temperature ranges for Ninety-Nine Islands and the Greenville/Spartanburg areas. The controlling meteorological parameters required for the analysis of cooling tower performance are the wet bulb temperature and the coincident dry bulb temperature. ~~Table 2.3-247, Table 2.3-248, and Table 2.3-249 present data on the worst 1-day (worst 1-day is defined as the calendar day with the highest average wet bulb temperature), worst five day, and worst 30-day period for Greenville/Spartanburg, South Carolina. Tables 2.3-250 through 2.3-252 provide the same information based on Lee Nuclear Station site data.~~ Table 2.3-293 provides the site characteristic temperatures for the Lee Nuclear site based on the ASHRAE handbook. These values are compared to the AP1000 design parameters in Table 2.0-201.

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 035

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.02-004

NRC RAI:

FSAR Table 2.0-201 lists maximum and minimum safety dry bulb and wet bulb temperature site characteristics as 0.4% exceedance values rather than 0% exceedance values. Pursuant to 10 CFR 52.79(a)(iii), the maximum and minimum safety temperature site characteristics should be based on the higher of either historic or 100-year return period values. Please revise FSAR Table 2.0-201 accordingly and revise FSAR Section 2.3.2 to justify the chosen values.

Duke Energy Response:

The maximum safety and minimum safety wet bulb and dry bulb temperature site characteristics were reported in FSAR Table 2.0-201 as the 0.4% exceedance ASHRAE values given in FSAR Table 2.3-293. To be completely consistent with the definition of the values provided in the AP1000 DCD, Tier 2 Table 2-1, the 0% exceedance values using the Westinghouse definition were selected for the Lee site as discussed below. Additionally, 100-year return period site characteristic values, and the inherent uncertainties associated with their calculation, have been provided.

0% exceedance dry bulb and wet bulb temperature

For the Lee site, the 0% exceedance dry bulb temperature was determined in accordance with the definition provided by the Westinghouse AP1000 DCD, Tier 2 Table 2-1. The maximum coincident dry bulb/wet bulb temperature limit is based on the maximum dry bulb temperature that has existed for two hours or more combined with the maximum wet bulb temperature that exists in that population of dry bulb temperatures. Consequently, the term "coincident wet bulb temperature" is not defined in the same way as the standard NCDC "Engineering Weather Data" and ASHRAE "Climatic Design Information" references (e.g., the mean coincident wet-bulb temperature).

The DCD specifies that "[t]he Combined License applicant must provide information to demonstrate that the site parameters are within the limits specified for the standard design." Consistent with the Westinghouse methodology described above, the highest dry bulb temperature that persists for at least two hours has been determined to be 103°F from a 31-year (1977-2007) sequential hourly meteorological data set for the NWS station at Greer Greenville/Spartanburg Airport, South Carolina. The highest of the coincident wet bulb temperatures has been determined to be 78°F. This dry bulb/wet bulb pair will be reported in revised FSAR Table 2.0-201, FSAR Table 2.3-293, and FSAR Subsection 2.3.2.2.

Similar to the approach described above for determining the maximum safety dry bulb temperature, the highest wet bulb temperature that persists for at least two hours has been determined to be 81°F from the 31-year sequential hourly meteorological data set for the Greer

Greenville/Spartanburg Airport NWS station. This maximum safety wet bulb temperature (non-coincident) will be reported in revised FSAR Table 2.0-201, FSAR Table 2.3-293, and FSAR Subsection 2.3.2.3.2.

The minimum safety dry bulb temperature persisting for at least two hours was also determined, using the approach discussed above, to be -1°F. This minimum safety dry bulb temperature will be reported in revised FSAR Table 2.0-201, FSAR Table 2.3-293, and FSAR Subsection 2.3.2.3.2.

1% exceedance dry bulb and wet bulb temperature

The maximum normal limits represent the maximum normal range of operation for power generation systems. The maximum coincident normal temperature limit is based on a 1% exceedance dry bulb temperature that persists for two hours or more in historical meteorological data. The complementary coincident wet bulb temperature is not selected based on a median or a maximum value from the 1% exceedance coincident data set. Since a slightly lower dry bulb temperature with its complimentary coincident wet bulb temperature may be more limiting, the 1% exceedance wet bulb value, disregarding any hourly persistence limitation, was assumed to be the coincident wet bulb temperature. This methodology specified by Westinghouse is considered a conservative approach to the selection of the maximum normal coincident condition. Based on the 31-year sequential hourly meteorological data set for the Greer Greenville/Spartanburg Airport NWS station, the 1% exceedance dry bulb temperature is 92°F and the assumed coincident 1% exceedance wet bulb temperature is 76°F.

The maximum normal non-coincident wet bulb temperature limit is the 1% exceedance wet bulb temperature that has existed at the site for two hours or more based on historical meteorological data. From the 31-year sequential hourly meteorological data set for the Greer Greenville/Spartanburg Airport NWS station, the maximum normal non-coincident wet bulb temperature was determined to be 76°F.

100-year return period dry bulb and wet bulb temperature

Because reliable, sequential hourly meteorological data sets do not exist for durations of 100 years, the maximum 100-year return period dry bulb temperature value must be extrapolated. The maximum 100-year return period dry bulb temperature was calculated using the 31-year sequential hourly meteorological data set for the Greer Greenville/Spartanburg Airport NWS station, and was based on methodology provided in ASHRAE Fundamental Handbook Chapter 27 – Climatic Design Information. See Equations 1 and 2 below:

$$Tn = M + IFs \qquad \text{Equation 1}$$

where:

Tn = n-year return period value of extreme dry bulb temperature to be estimated, years
M = mean of the annual extreme maximum or minimum dry bulb temperatures, °F
s = standard deviation of the annual extreme maximum or minimum dry bulb temperatures, °F
I = 1, if maximum dry bulb temperatures are being considered
I = -1 if minimum dry bulb temperatures are being considered

$$F = -\frac{\sqrt{6}}{\pi}\left\{0.5772 + \ln\left[\ln\left(\frac{n}{n-1}\right)\right]\right\} \qquad \text{Equation 2}$$

The resultant maximum 100-year return period dry bulb temperature was 108°F.

Since the maximum 100-year return period dry bulb temperature value was extrapolated, there are no occurrences of maximum dry bulb temperatures to pair with concurrent wet bulb temperature values to determine a coincident wet bulb temperature. In order to calculate a 100-year return period coincident wet bulb temperature, the 31-year sequential hourly meteorological data set for the Greer Greenville/Spartanburg Airport NWS station was used to develop a dry bulb to coincident wet bulb correlation curve. The entire range of measured dry bulb temperatures (-3°F to 106°F) was used to develop this correlation, whereby the maximum measured coincident wet bulb temperature was conservatively correlated with each dry bulb temperature, in 1°F dry bulb temperature increments. The resultant 100-year return period coincident wet bulb temperature was 71°F.

Similar to the approach described above for determining the maximum 100-year return period dry bulb temperature, the maximum 100-year return period wet bulb temperature (non-coincident) was calculated to be 87°F using the 31-year sequential hourly meteorological data set for the Greer Greenville/Spartanburg Airport NWS station. Likewise, the minimum 100-year return period dry bulb temperature was calculated to be -5°F.

As stated previously, reliable, sequential hourly meteorological data sets do not exist for durations of 100 years. As a result, maximum 100-year return period dry bulb and non-coincident wet bulb temperature values are extrapolated and, therefore, would necessarily be higher than any recorded values in the available 31-year data set. In contrast, the 100-year return period coincident wet bulb temperature of 71°F, calculated conservatively using the maximum observed coincident wet bulb temperatures at each 1°F dry bulb temperature increment, is below the calculated 0% exceedance coincident wet bulb temperature value of 78°F. Since the 100-year return period methodology relies upon extrapolated values, which do not produce a completely conservative set of values, the site characteristic maximum safety and minimum safety wet bulb and dry bulb temperature site characteristics are determined using the 0% exceedance methodology in accordance with the definition provided by the Westinghouse AP1000 DCD, Tier 2, Table 2-1.

References:

1) National Climatic Data Center, Engineering Weather Data, 2000 Interactive Edition.

2) ASHRAE Fundamentals Handbook 2001, Chapter 27 - Climatic Design Information.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

FSAR Table 2.0-201

FSAR Table 2.3-293

FSAR Subsection 2.3.2.2

FSAR Subsection 2.3.7

Attachments:

1) Revised FSAR Table 2.0-201
2) Revised FSAR Table 2.3-293
3) Mark-up of FSAR Subsection 2.3.2.2
4) Mark-up of FSAR Subsection 2.3.7

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 02.03.02-004

Revised FSAR Table 2.0-201

COLA Part 2, FSAR, Chapter 2, Table 2.0-201 will be revised as follows:

TABLE 2.0-201 (Sheet 1 of 6)
COMPARISON OF AP1000 DCD SITE PARAMETERS AND LEE NUCLEAR STATION UNITS 1 & 2 SITE CHARACTERISTICS

	AP 1000 DCD Site Parameters	WLS Site Characteristic	WLS FSAR Reference	WLS Within Site Parameter
Air Temperature				
Maximum Safety[a]	115°F dry bulb / 80°F coincident wet bulb	~~93~~103°F dry bulb/ ~~74~~78°F coincident wet bulb (0.~~4~~% exceedance)	Table 2.3-293	Yes
	85.5°F wet bulb (noncoincident)	~~77~~81°F (0.~~4~~% exceedance)	Table 2.3-293	Yes
Minimum Safety[a]	-40°F	~~19~~-1°F (0.~~4~~% exceedance)	Table 2.3-293	Yes
Maximum Normal[b]	100°F dry bulb / 80.1°F coincident wet bulb	~~91~~92°F dry bulb / ~~74~~76°F coincident wet bulb (1% exceedance)	Table 2.3-293	Yes
	80.1°F wet bulb (noncoincident)[c]	76°F wet bulb (1% exceedance)	Table 2.3-293	Yes
Minimum Normal[b]	-10°F	~~23~~24°F (1% exceedance)	Table 2.3-293	Yes

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 2 to RAI 02.03.02-004

Revised FSAR Table 2.3-293

COLA Part 2, FSAR, Chapter 2, Table 2.3-293 will be revised as follows:

TABLE 2.3-293
LEE NUCLEAR STATION DESIGN TEMPERATURES

	Frequency of Occurrence				
	0 %	100-year	0.4 %[1]	1 %	2 %[1]
Cooling dry-bulb temperature, °F	103	108	93	~~91~~92	88
Coincident wet-bulb temperature, °F	78	71	74	~~74~~76	73
Evaporation wet-bulb, °F	81	87	77	76	75
Coincident dry-bulb, °F	N/A	N/A	88	~~87~~N/A	85

	Dry Bulb Temperature °F	
	Maximum	Minimum
~~99%~~1 percent exceedance	~~91~~92	~~23~~24
~~99.6%~~0.4 percent exceedance[1]	93	19
0 percent exceedance	103	-1
100-year return	108	-5

Notes:

1. Data from ASHRAE Fundamentals Handbook 2001, for Greer/Greenville, South Carolina.
2. The above design temperatures are in good general agreement with the historic data from Ninety-Nine Islands shown on Figure 2.3-238.

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 3 to RAI 02.03.02-004

Mark-up of FSAR Subsection 2.3.2.2

COLA Part 2, FSAR, Chapter 2, Subsection 2.3.2.2, third paragraph, will be revised as follows:

The maximum temperature at the Lee Nuclear Station site during the 2005-2006 data collection period was 96°F and the minimum was 20°F which is within the bounds of the historic record for Ninety-Nine Islands, South Carolina (see Figure 2.3-238). The temperature range at the Lee Nuclear Station site is consistent with the temperature ranges for Ninety-Nine Islands and the Greenville/Spartanburg areas. The controlling meteorological parameters required for the analysis of cooling tower performance are the wet bulb temperature and the coincident dry bulb temperature. Table 2.3-247, Table 2.3-248, and Table 2.3-249 present data on the worst 1-day (worst 1-day is defined as the calendar day with the highest average wet bulb temperature), worst five day, and worst 30-day period for Greenville/Spartanburg, South Carolina. Tables 2.3-250 through 2.3-252 provide the same information based on Lee Nuclear Station site data. ~~Table 2.3-293 provides the site characteristic temperatures for the Lee Nuclear site based on the ASHRAE handbook.~~ The maximum safety dry bulb temperature is determined as the highest dry bulb temperature that persists for at least two hours using a 31-year (1977-2007) data set of sequential hourly meteorological data from the NWS station at Greer Greenville/Spartanburg Airport, South Carolina. The maximum coincident wet bulb temperature is the highest wet bulb temperature that exists in that population of dry bulb temperatures. The maximum safety dry bulb temperature is 103°F, and the coincident wet bulb temperature is 78°F (Table 2.3-293). The maximum wet bulb temperature (noncoincident) that persists for at least two hours has been determined to be 81°F from the 31-year data set. The minimum dry bulb temperature (100% exceedance), as indicated in Table 2.3-293, determined from the same data set is -1°F. These values are compared to the AP1000 design parameters in Table 2.0-201.

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 4 to RAI 02.03.02-004

Mark-up of FSAR Subsection 2.3.7

COLA Part 2, FSAR, Chapter 2, Subsection 2.3.7, will be revised to add a new reference as follows:

2.3.7 REFERENCES

235. ASHRAE Fundamentals Handbook 2001, Chapter 27 – Climatic Design Information.

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 035

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.02-005

NRC RAI:

Please clarify why the wet bulb temperature site characteristics, as presented in FSAR Table 2.0-201, and based on data from Greenville/Spartanburg, are representative of expected site conditions given that FSAR Section 2.3.2 stated that because of the site's proximity to the Broad River, site humidity (i.e., moisture) data is more appropriate for site estimates than the Greenville/Spartanburg data.

Duke Energy Response:

Site data has been recorded for a relatively short time period. No long term wet-bulb or humidity measurements are recorded at a location near the site and in close proximity to a body of water. As the variability in humidity measurements due to a body of water diminishes dramatically within a short distance of the shoreline, it is expected that any increase in humidity at the site location would be minimal. Additionally, significant variability exists within a single year data set when compared to a 30-year data set (i.e., Greenville/Spartanburg data). As a result, the Greenville-Spartanburg data set has been utilized in order to minimize variability and more accurately represent long term averages. Because the FSAR statement was intended to be limited to the area directly adjacent to the Broad River, this FSAR statement will be revised to clarify the applicability of the Greenville/Spartanburg data.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

FSAR Subsection 2.3.2

Attachments:

1) Mark-up of FSAR Subsection 2.3.2

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 02.03.02-005

Mark-up of FSAR Subsection 2.3.2

COLA Part 2, FSAR, Chapter 2, Subsection 2.3.2, first paragraph, will be revised as follows:

2.3.2 LOCAL METEOROLOGY

This section discusses the local meteorological conditions at the Lee Nuclear Station site. Local site meteorological conditions reflect the synoptic-scale atmospheric processes and are consistent with the regional meteorology. There are two exceptions caused by local effects from the Broad River. First, there is higher humidity directly adjacent to the river~~, so the site humidity data is more appropriate for site estimates than the Greenville/Spartanburg data~~. Second, there is a possibility of channeling of low-level winds along the river valley. Channeling of flow from the NW is indicated in the site's wind rose in Figure 2.3-203. This figure shows that the predominant wind direction is from the Northwest, which aligns with the river valley.

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 035

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.02-006

NRC RAI:

FSAR Section 2.3.2.3.1 stated that for Greenville/Spartanburg, (1) the maximum mean monthly precipitation is in July (5.3 inches), (2) the minimum monthly mean (3.2 inches) occurs in May, August, and October, and (3) the maximum monthly precipitation in Greenville/Spartanburg is 11.4 inches. FSAR Table 2.3-256 provides the monthly frequency distribution of rainfall rates at the Greenville/Spartanburg. The staff was unable to verify the accuracy of these statements when comparing them against data available in the 2006 NCDC Local Climatological Data (LCD) summary for Greenville/Spartanburg. Please confirm the accuracy and validity of these statements.

Duke Energy Response:

The values currently provided are based on 9-years of unedited NCDC Greenville/Spartanburg data. Values provided in the edited NCDC LCD publications generally span a larger data set, and as such have been retrieved and used in revising the applicable FSAR text and table.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

FSAR Subsection 2.3.2.3.1

FSAR Subsection 2.3.7

FSAR Table 2.3-256

Attachments:

1) Mark-up of FSAR Subsection 2.3.2.3.1
2) Mark-up of FSAR Subsection 2.3.7
3) Revised FSAR Table 2.3-256

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 02.03.02-006

Mark-up of FSAR Subsection 2.3.2.3.1

COLA Part 2, FSAR, Chapter 2, Subsection 2.3.2.3.1, second paragraph, will be revised as follows:

2.3.2.3.1 Precipitation

For Greenville/Spartanburg, the maximum normal mean monthly precipitation is in ~~July (5.3 inches), and the minimum monthly mean (3.2 inches) occurs in May, August, and October. The~~ March (5.31 inches) based on 30 years of data from the NCDC (Reference 236), and the minimum monthly mean (3.54 inches) occurs in April. Based on 45 years of data from the NCDC (Reference 236), the maximum monthly precipitation in Greenville/Spartanburg is ~~11.4~~17.37 inches, which occurred in August 1995 from tropical storm Jerry (Table 2.3-256). Table 2.3-256 provides the monthly frequency distribution of rainfall rates at the Greenville/Spartanburg meteorological station.

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 02.03.02-006

Mark-up of FSAR Subsection 2.3.7

COLA Part 2, FSAR, Chapter 2, Subsection 2.37, will be revised to add a new reference as follows:

2.3.7 REFERENCES

236. National Climatic Data Center (NCDC) Local Climatic Data Annual Summary with Comparative Data, Greenville–Spartanburg (Greer), South Carolina (Station ID GSP), 2007.

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 3 to RAI 02.03.02-006

Revised FSAR Table 2.3-256

WLS COL 2.3-1

TABLE 2.3-256
PRECIPITATION DATA (INCHES OF RAIN)
GREENVILLE/SPARTANBURG, SOUTH CAROLINA

GSP Precipitation	Period of Record	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Normal (in)	30	4.41	4.24	5.31	3.54	4.59	3.92	4.65	4.08	3.97	3.88	3.79	3.86	50.24
Maximum Monthly (in)	45	7.19	7.43	11.37	11.30	8.89	10.12	13.57	17.37	11.65	10.24	7.85	8.45	17.37
Year of Occurrence		1993	1971	1980	1964	1972	1994	1984	1995	1975	1964	1992	1983	AUG 1995
Minimum Monthly (in)	45	0.29	0.53	1.13	0.69	1.09	0.17	0.75	0.79	0.16	0.00	0.89	0.37	0.00
Year of Occurrence		1981	1978	1985	1976	1965	1993	1993	1999	2005	2000	2007	1965	OCT 2000
Maximum In 24 Hours (in)	45	3.30	3.57	4.45	3.76	3.79	4.80	4.68	12.32	6.21	4.93	2.83	3.54	12.32
Year of Occurrence		1982	1984	1963	1963	1996	1980	2005	1995	1973	1990	1964	2004	AUG 1995
Normal No. Days With:														
Precipitation >= 0.01	30	11.3	9.3	11.0	8.7	10.6	10.2	11.8	10.2	9.1	7.1	9.4	10.3	119.0
Precipitation >= 1.00	30	1.1	1.1	1.7	1.0	1.4	1.0	1.4	1.0	1.2	1.0	1.2	1.1	14.2

NOTES:

1. National Climatic Data Center (NCDC) Local Climatic Data (LCD), data for Greenville–Spartanburg (Greer), South Carolina (Station ID GSP), 2007. (Reference 236).

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 035

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.02-007

NRC RAI:

FSAR Section 2.3.2.3.3 states that Greenville/Spartanburg has averaged approximately 38 hours/year of fog from 1997 through 2005. The staff was unable to confirm the values provided in FSAR Table 2.3-263. Please provide further clarification on where these data were obtained and how the annual estimate was calculated.

Duke Energy Response:

The values that are currently provided in the FSAR are based on the hourly occurrence of the "fog" descriptor as a weather type in 9-years (1997-2005) of unedited data from NCDC Greenville/Spartanburg (GSP). Values provided in the edited NCDC LCD publications for GSP (Reference 1) resulted in an average of 29 hours/year of heavy fog (visibility < 1/4 mile) based on data from 1964-2007. Since the results from the unedited NCDC GSP data are more conservative these values will be retained.

References:

1. National Climatic Data Center (NCDC) Local Climatic Data (LCD), data for Greenville-Spartanburg (Greer), South Carolina (Station ID GSP) and Charlotte, North Carolina (Station ID CLT), 2007.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

None

Attachments:

None

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 035

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.02-008

NRC RAI:

Please verify that the mean afternoon mixing heights presented in FSAR Table 2.3-277 are correct. The staff was unable to reproduce the values presented in the table. Differences were as much as 91%.

Duke Energy Response:

Monthly mixing height values were averaged directly from the referenced EPA Support Center for Regulatory Atmospheric Modeling (SCRAM) morning and afternoon mixing height data (1984-1987 and 1990-1991). The EPA SCRAM data and the averages obtained from this data were reviewed and found to be correct.

References:

1. EPA SCRAM Website: http://www.epa.gov/scram001/mixingheightdata.htm

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

None

Attachments:

None

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 035

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.02-009

NRC RAI:

Please provide a copy of the SACTI input files (e.g., PREP.USR, MULT.USR, TABLES.USR, and PAGE.USR) so the staff may conduct a confirmatory analysis. Also, please justify how using NWS data from Charlotte, North Carolina is representative of site conditions given that monthly and annual average wind distributions differ due to site-specific topographical features.

Duke Energy Response:

The SACTI input/output files were sent to NRC in a letter dated August 18, 2008 on a CD-ROM. (Reference Letter No. WLG2008.08-02, ADAMS Accession Number ML082340082).

The SACTI model requires hourly surface meteorological data in a format provided by the U.S. National Climatic Data Center (NCDC) in Asheville, NC or in Nuclear Regulatory Commission (NRC) format for on-site data. The William States Lee III Nuclear Station on-site meteorological database is preferred for this analysis, but less than one year of data was available at the time of the analysis. Therefore, data from the National Weather Service (NWS) station at Charlotte, NC was selected for the analysis. A 5-year database (i.e., 2001 – 2005) containing the parameters needed by the SACTI model was used. Seasonal mixing height values for Greensboro, NC (the nearest upper air observation location to the site) were also used in the SACTI model.

The weather station at the Charlotte-Douglas Airport (CLT) is located approximately 35 miles northeast of the site. The ground elevation of the CLT airport is approximately 740 feet above mean sea level (msl). The weather station at the Greenville-Spartanburg Airport (Greer, GSP) is located approximately 40 miles southwest of the site. The ground elevation of the GSP airport is approximately 940 feet msl. The plant elevation is approximately 600 feet msl with the circular mechanical draft cooling towers being located at a grade elevation of approximately 610 feet msl and the top of the towers at 701 feet msl. The onsite meteorological tower (i.e., Tower 2) is located at a base elevation of approximately 611 feet msl with instrumentation levels of 644 feet msl and 808 feet msl. Because the CLT weather station is in reasonable proximity to the site and is located at fairly similar elevations above sea level, the data from CLT are judged to be spatially representative of the site.

Table 1 gives a comparison of the meteorological data for the CLT and GSP weather stations (2001-2005) and the Lee Nuclear Station site data (1/2006 – 12/2007). The data comparison shows that the annual average wind speeds are very similar among the locations, with Charlotte and Lee Nuclear Station annual average wind speeds very similar and slightly lower than Greer.

The annual average humidity data (i.e., relative humidity and dew point) compared in Table 1, as well as Figure 2 and Figure 3, indicates that the Lee Nuclear Station site has higher humidity

than the other two locations and that Charlotte humidity is closer than Greer to Lee Nuclear Station humidity for the period. The dry bulb temperatures are compared between the CLT, Lee Nuclear Station, and GSP in Table 1 and Figure 4. The annual average temperature values are very similar among all three sites, with Charlotte being almost equal to the Lee Nuclear Station annual average temperature.

The stability class frequencies for the CLT weather station, the GSP weather station, and Lee Nuclear Station site are compared in Table 1 and Figure 1. Stability class is determined at the NWS sites by the STAR method, which uses wind speed, cloud cover, and ceiling height data in the calculation. The two NWS sites (i.e., Charlotte and Greer) have similar frequency distributions with fewer occurrences of the extreme unstable and stable classes (i.e., A and G stability class) for Greenville and more occurrences of neutral stability (i.e., D stability class). The Lee Nuclear Station stability classes, based on the vertical temperature difference (Delta-T) method, exhibit much more frequently occurring G stability class and stable classes (i.e., E, F, and G) in general with approximately 54 percent occurrence of the stable classes versus 44 percent for Charlotte and 39 percent for Greer. Therefore, the Lee Nuclear Station onsite stability class distribution would tend to produce lower plume rises. The differences between stability class frequencies between the NWS sites and the Lee Nuclear Station site is attributable to the location of the Lee Nuclear Station site in a shallow river valley, as well as the different methods used to determine the stability classes.

Figure 5 shows the wind rose for each of the three sites, providing a comparison between the wind speed and wind direction frequencies. The wind roses indicate that the Lee Nuclear Station site has a much higher frequency of NW winds due to the local terrain than the other two locations, although there is a secondary maximum in the Charlotte data from the NW direction. Thus, in this respect, it is closer to the prevailing wind direction at Lee Nuclear Station. The Greer data shows strong prevailing southwest and northeast winds. The Charlotte data is turned more from the S – SSW. Also note that at higher wind speeds, the similarity of the Lee Nuclear Station winds to the SW - S and NE - N regional wind pattern improves.

Based on the above comparisons, it is concluded that use of the five-year meteorological dataset from the Charlotte (2001-2005) NWS weather station is reasonably representative of the conditions expected at the Lee Nuclear Station site. The CLT data is similar to Lee Nuclear Station in wind speeds, the occurrence of NW winds, and humidity. The 5-year CLT data also exhibits a lower frequency of extremely unstable conditions than Lee Nuclear Station. The frequency of stable conditions is similar at the CLT and GSP sites, while Lee Nuclear Station has fewer class F and more class G. But stability class methodology differs between the NWS sites and Lee Nuclear Station.

Sensitivity studies were performed to address the differences in data for the three data sets. The SACTI visible plume results for the CLT, GSP, and Lee Nuclear Station onsite meteorological data are summarized in Tables 2, 3, and 4, respectively. Table 5 provides a comparison of the frequency of occurrence of visible plume dimensions for the three meteorological databases. These tables provide a range of frequency of occurrence of visible plume dimensions (i.e., length, width, and height) in meters from the towers for each season of the year and for the annual period.

Plume Length and Height

On an annual average basis, 40 percent of the plumes reach 400 meters downwind for all three meteorological databases. Twenty percent of the plumes reach a length of 4,600 meters using the CLT database, 5,400 meters using the GSP database and 800 meters using the Lee Nuclear Station data. This is the only case in which the plume length based on GSP data exceeds the length using the CLT data. On an annual average basis, 40 percent of the plumes reach a maximum of 170 meters in height for the CLT database (160 meters for GSP and 100 meters for Lee Nuclear Station). The visible plumes predicted with the Lee Nuclear Station database are noticeably lower in height compared to the NWS databases. This could be due to higher wind speeds calculated by SACTI at plume height, which cause the plumes to bend over further, or a result of the greater frequency of G stability class in the Lee Nuclear Station meteorological dataset. Comparison of the plume length and height shows that CLT gives a reasonably conservative estimate of the plume extent offsite.

The largest visible plumes shown in Tables 2, 3, and 4 reach a distance of 9,900 meters downwind of the towers and a height of approximately 1,400 meters, and occur approximately 1 percent of the time. The longer plumes occur a little less frequently with the Lee Nuclear Station database compared to the NWS databases, with the approximately 8,000-meter visible plumes occurring less than 20 percent of the time. It should be noted that the longest plumes occur during conditions of high ambient relative humidity that are conducive to natural fog formation and poor visibility conditions. Under these conditions, the atmosphere is either already at or near saturation. Therefore, the largest plumes may not be discernable from the ambient fogging conditions and present less of an aesthetic impact.

The SACTI results for three different meteorological databases (i.e., CLT, GSP, and Lee Nuclear Station) indicate that the majority (i.e., >50 percent) of the visible plumes extend less than 1,000 meters downwind and 200 meters in height. It also shows that the longest and largest visible plumes occur in the winter with smaller plumes occurring in the spring and fall seasons due to the cold air in winter causing condensation of the moist plumes more readily than in the warmer seasons (i.e., cold air has a much smaller capacity of holding water vapor). The summer visible plumes are noticeably smaller since warmer ambient air results in less condensation of the moist plumes, due to its ability to maintain higher water vapor concentrations.

Plume Shadowing

Consistent with the visible plume frequency results, the most plume shadowing occurs in the winter season with lesser amounts in the spring and fall and the least amounts in the summer. Plume shadowing effects reach 1,000 meters downwind less than 2 percent of the time with the farthest impact reaching approximately 4,600 meters in the winter for approximately 0.5 percent of the time (i.e., CLT meteorological database). The farthest extent of the winter plume shadowing effects is smaller for the GSP and Lee Nuclear Station meteorological databases with distances of 2,600 meters and 2,400 meters, respectively.

On an annual average basis, plume shadowing effects reach 1,000 meters downwind 1 percent of the time with the effects reaching 3,200 meters 0.5 percent of the time using the CLT meteorological database. The annual average shadowing effects are less extensive for the GSP and Lee Nuclear Station meteorological databases with 1 percent distances of 600 meters and 800 meters and 0.5 percent distances of 1,200 meters and 1,400 meters, respectively.

Ground-level Fogging/Icing

The SACTI output for the CLT and GSP data shows that there are virtually no occurrences of ground level fogging. Plume fogging occurred almost entirely in the Spring with the CLT meteorological data, with periods of fogging ranging from 0.5 to 2 hours in the south sector and a maximum of 2 hours at 500 meters. Other sectors impacted were SSW (200 meters) and SW (300-700 meters) with 0.1 hour to 1.0 hour of fogging. Using GSP meteorological data, fogging occurred only in the Spring and Winter with 1.0 to 2.0 hours in the Spring in the SW downwind sector over a range of 300-700 meters and 0.5 to 1.0 hour in the Winter in two downwind sectors (i.e., NNE and ENE).

The SACTI results for the Lee Nuclear Station data indicate that the maximum number of hours of ground level fogging is 362 hours over the 2-year 2006-2007 meteorological database (i.e., 2 percent of the time) for all directions occurring at a downwind distance of 400 meters. However, many of those fogging occurrences are within the property boundary (i.e., onsite) leaving a maximum of 82 hours per 2-year period (i.e., 0.5 percent of the time) at a downwind distance of 500 meters.

The SACTI output for the CLT, GSP and Lee Nuclear Station meteorological data indicate no occurrences of ground level icing.

Conclusion

Based on the above comparisons, it is concluded that use of the five-year meteorological dataset from the Charlotte (2001-2005) NWS weather station is reasonably representative of the conditions expected at the Lee Nuclear Station site. The comparison of the meteorological variables between CLT and Lee Nuclear Station datasets, as well as the resulting SACTI outputs, support the use of a 5-year dataset from CLT as input to the SACTI modeling for the Lee Nuclear Station site.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

None

Attachments:

1) Supporting Tables and Figures

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 02.03.02-009

Supporting Tables and Figures

TABLE 1
Meteorological Data Comparison

Parameter	Lee Onsite Data	Charlotte Data	Greer Data
Annual Average Wind Speed (m/s)	2.45	2.67	2.97
Annual Average Temperature (°C)	15.6	15.5	15.9
Annual Average Dew Point (°C)	9.6	8.4	7.8
Annual Average RH (%)	70.9	65.7	62.4
Stability Class Frequency			
A	4.90%	3.60%	1.00%
B	5.90%	9.80%	8.00%
C	7.50%	11.60%	15.80%
D	28.00%	30.90%	36.20%
E	21.50%	18.00%	18.60%
F	11.40%	18.10%	16.10%
G	20.70%	8.00%	4.30%

TABLE 2
Visible Plume Frequency of Occurrence by Season Using
2001-2005 Charlotte Meteorological Data (All Wind Directions)

	Percent Frequency of Occurrence					
	100%	**80%**	**60%**	**40%**	**20%**	**1%**
Winter:						
length (m)	100	200	400	900	5,100	9,900
height (m)	40	120	160	370	1,400	1,400
radius (m)	25	45	60	85	520	1,400
Spring:						
length (m)	100	200	250	300	4,800	9,900
height (m)	40	110	120	160	1,400	1,400
radius (m)	25	35	45	60	470	650
Summer:						
length (m)	100	150	200	250	600	9,800
height (m)	40	110	120	130	330	1,400
radius (m)	25	35	40	45	75	650
Fall:						
length (m)	100	200	250	400	4,700	9,900
height (m)	40	110	125	160	1,400	1,400
radius (m)	25	35	45	60	435	1,400
Annual:						
length (m)	100	200	250	400	4,600	9,900
height (m)	40	110	120	170	1,400	1,400
radius (m)	25	35	40	65	435	1,400

TABLE 3
Visible Plume Frequency of Occurrence by Season Using
2001-2005 Greenville-Spartanburg Meteorological Data (All Wind Directions)

	Percent Frequency of Occurrence					
	100%	**80%**	**60%**	**40%**	**20%**	**1%**
Winter:						
length (m)	<100	250	400	700	9,700	9,900
height (m)	<10	80	160	290	1,400	1,700
radius (m)	<5	35	60	80	560	710
Spring:						
length (m)	100	200	250	300	5,300	9,800
height (m)	30	75	85	120	1,400	1,700
radius (m)	20	30	35	55	390	710
Summer:						
length (m)	100	200	250	300	600	9,800
height (m)	40	75	85	90	240	1,600
radius (m)	25	27	30	35	75	710
Fall:						
length (m)	100	200	250	400	5,400	9,800
height (m)	40	80	85	160	1,400	1,600
radius (m)	25	30	35	60	475	710
Annual:						
length (m)	100	200	250	400	5,400	9,800
height (m)	40	80	85	160	1,400	1,600
radius (m)	25	30	35	60	475	710

TABLE 4
Visible Plume Frequency of Occurrence by Season Using
2006-2007 Lee Onsite Meteorological Data (All Wind Directions)

	Percent Frequency of Occurrence					
	100%	**80%**	**60%**	**40%**	**20%**	**1%**
Winter:						
length (m)	100	300	400	500	8,000	9,900
height (m)	10	80	100	120	960	1,400
radius (m)	5	35	50	60	330	640
Spring:						
length (m)	100	200	250	300	450	9,900
height (m)	10	40	70	90	120	1,400
radius (m)	5	25	30	45	60	640
Summer:						
length (m)	100	150	250	300	500	9,900
height (m)	10	40	70	90	120	1,400
radius (m)	5	20	30	35	60	640
Fall:						
length (m)	100	200	300	400	700	9,900
height (m)	10	50	80	100	190	1,400
radius (m)	5	25	35	50	70	640
Annual:						
length (m)	100	200	300	400	800	9,900
height (m)	10	50	80	100	210	1,400
radius (m)	5	25	35	50	75	640

TABLE 5
Visible Plume Frequency of Occurrence by Season
Comparison of Meteorological Databases (All Wind Directions)

		Percent Frequency of Occurrence					
		100%	80%	60%	40%	20%	1%
Winter:							
length (m)	CLT	100	200	400	900	5,100	9,900
	GSP	<100	250	400	700	9,700	9,900
	LEE	100	300	400	500	8,000	9,900
height (m)	CLT	40	120	160	370	1,400	1,400
	GSP	<10	80	160	290	1,400	1,700
	LEE	10	80	100	120	960	1,400
radius (m)	CLT	25	45	60	85	520	1,400
	GSP	<5	35	60	80	560	710
	LEE	5	35	50	60	330	640
Spring:							
length (m)	CLT	100	200	250	300	4,800	9,900
	GSP	100	200	250	300	5,300	9,800
	LEE	100	200	250	300	450	9,900
height (m)	CLT	40	110	120	160	1,400	1,400
	GSP	30	75	85	120	1,400	1,700
	LEE	10	40	70	90	120	1,400
radius (m)	CLT	25	35	45	60	470	650
	GSP	20	30	35	55	390	710
	LEE	5	25	30	45	60	640
Summer:							
length (m)	CLT	100	150	200	250	600	9,800
	GSP	100	200	250	300	600	9,800
	LEE	100	150	250	300	500	9,900
height (m)	CLT	40	110	120	130	330	1,400
	GSP	40	75	85	90	240	1,600
	LEE	10	40	70	90	120	1,400
radius (m)	CLT	25	35	40	45	75	650
	GSP	25	27	30	35	75	710
	LEE	5	20	30	35	60	640
Fall:							
length (m)	CLT	100	200	250	400	4,700	9,900
	GSP	100	200	250	400	5,400	9,800
	LEE	100	200	300	400	700	9,900
height (m)	CLT	40	110	125	160	1,400	1,400
	GSP	40	80	85	160	1,400	1,600
	LEE	10	50	80	100	190	1,400
radius (m)	CLT	25	35	45	60	435	1,400
	GSP	25	30	35	60	475	710
	LEE	5	25	35	50	70	640
Annual:							
length (m)	CLT	100	200	250	400	4,600	9,900
	GSP	100	200	250	400	5,400	9,800
	LEE	100	200	300	400	800	9,900
height (m)	CLT	40	110	120	170	1,400	1,400
	GSP	40	80	85	160	1,400	1,600
	LEE	10	50	80	100	210	1,400
radius (m)	CLT	25	35	40	65	435	1,400
	GSP	25	30	35	60	475	710
	LEE	5	25	35	50	75	640

FIGURE 1
Stability Class Comparison

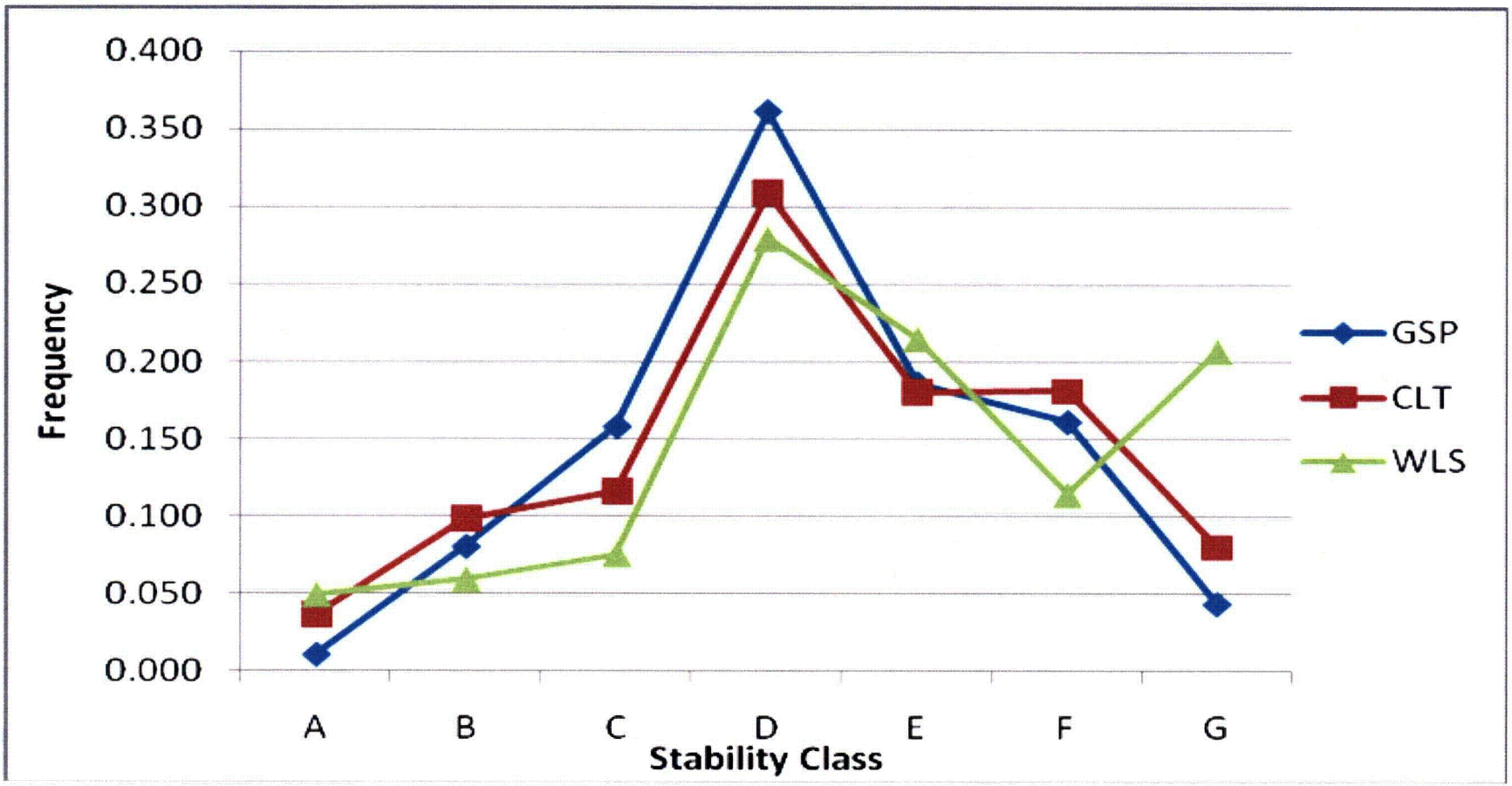


FIGURE 2
Relative Humidity Comparison

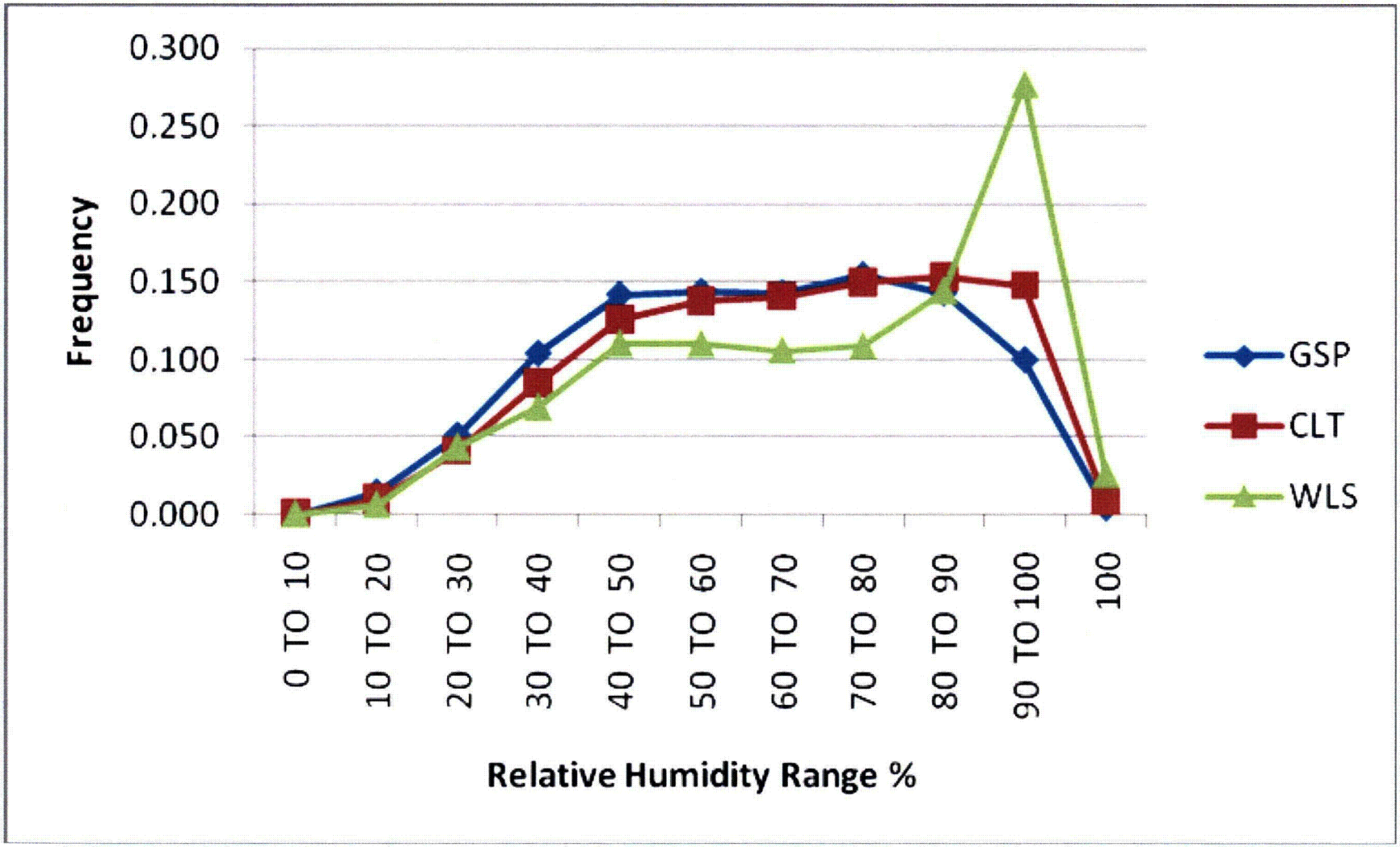


FIGURE 3
Dew Point Comparison

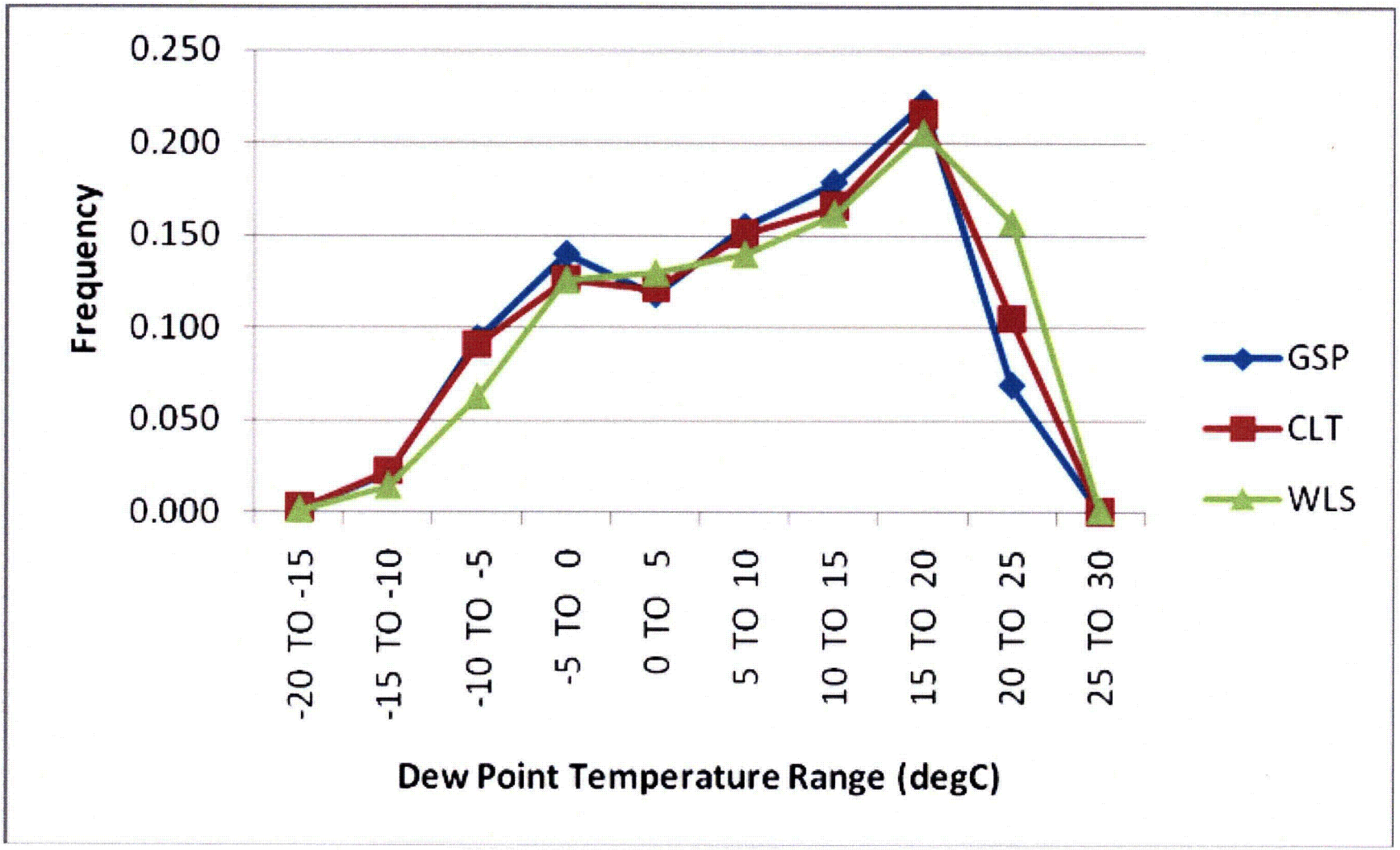


FIGURE 4
Dry Bulb Temperature Comparison

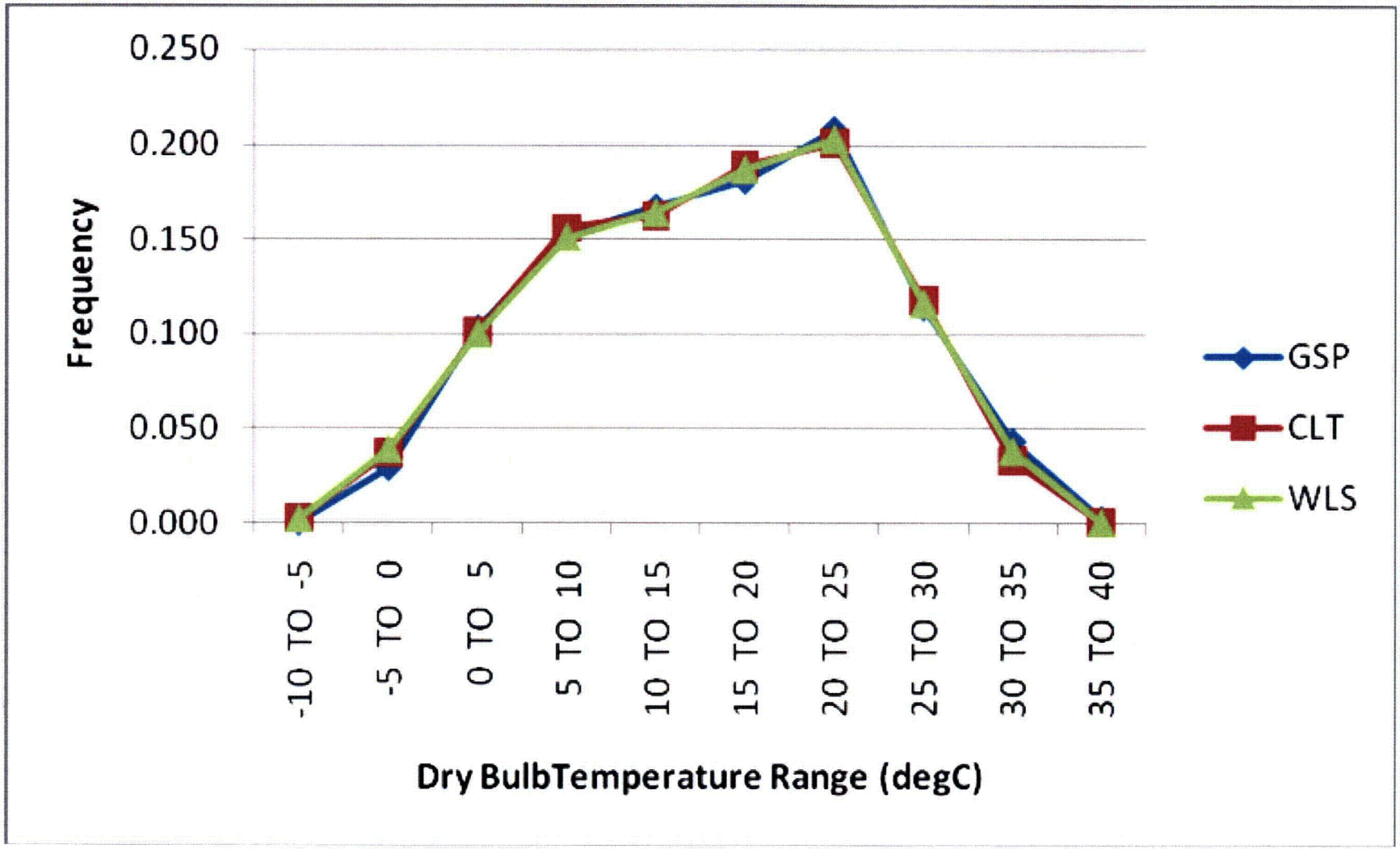


FIGURE 5
Wind Direction Frequency
Lee Nuclear Station Data
(Page 1 of 3)

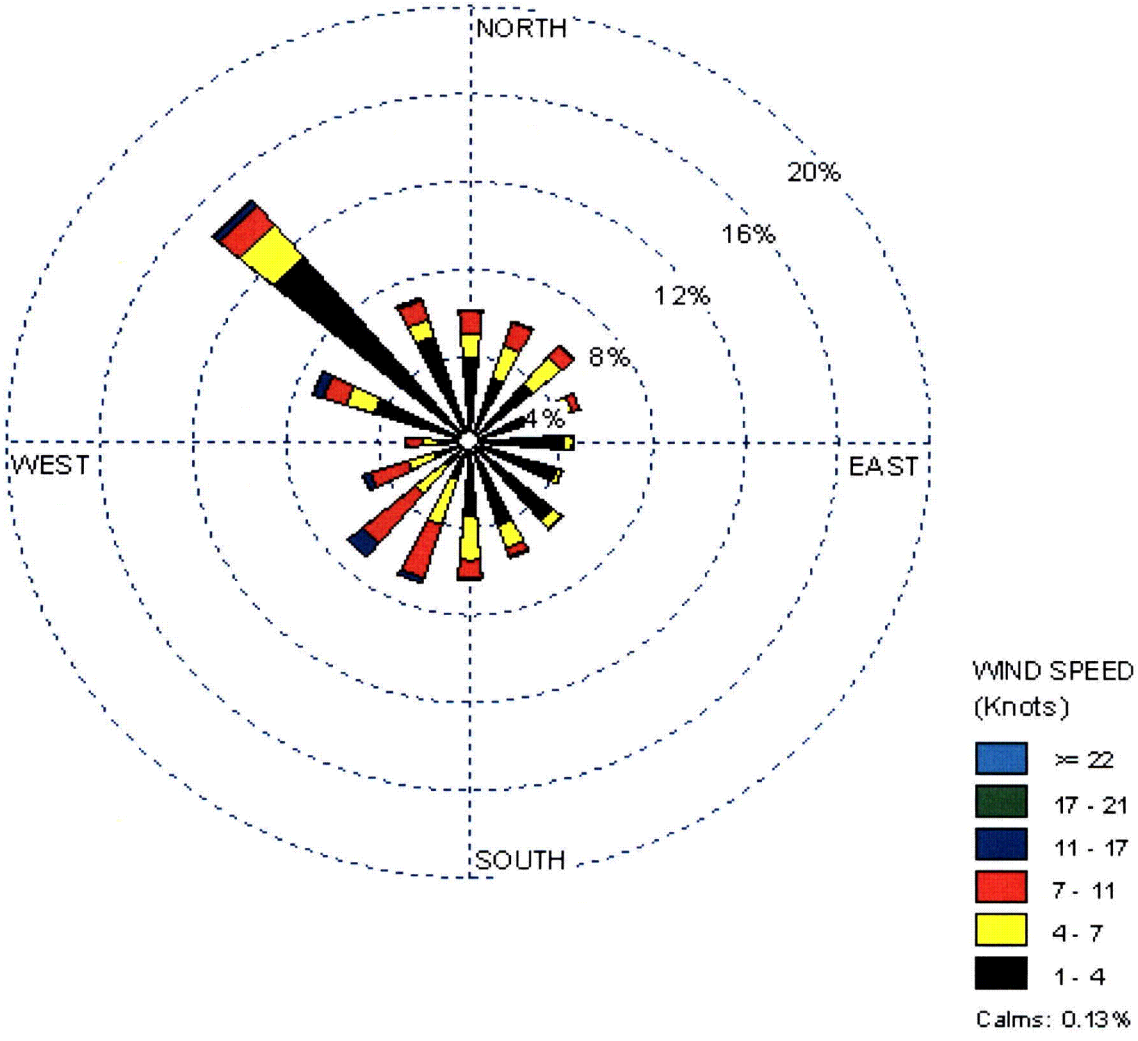


FIGURE 5
Wind Direction Frequency
CLT Data
(Page 2 of 3)

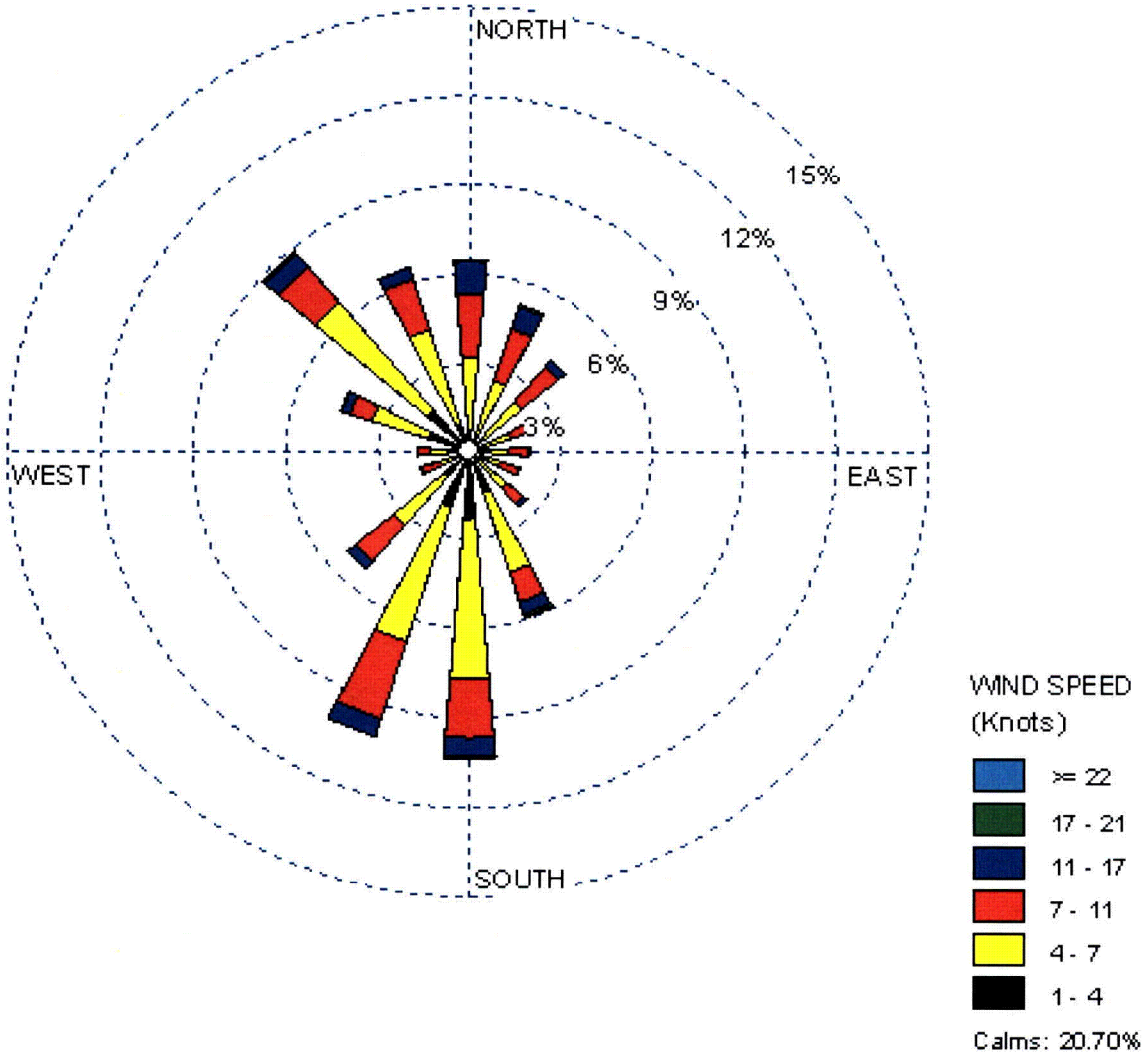


FIGURE 5
Wind Direction Frequency
GSP Data
(Page 3 of 3)