

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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 AUTH. NAME      AUTHOR AFFILIATION  
 MORGAN, R.E.      Carolina Power & Light Co.  
 RECIP. NAME      RECIPIENT AFFILIATION

EFF-84A

O'REILLY, J.P.      Region 2, Office of Director

SUBJECT: ~~Supplemental info~~ to "Effluent & Waste Disposal Semiannual Rept for Jan-June 1984." W/840829 ltr.

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	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
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INTERNAL:	AEUD	1 1	IE FILE 01	1 1
	NRR/DE/EEB 08	1 1	NRR/DL/ORAB 09	1 1
	NRR/DSI/METB	2 2	NRR/DSI/RAB 10	1 1
	RGN2/DRSS/EPRPb	1 1	RM/DDAMI/MIB	1 1
EXTERNAL:	ACRS 11	1 1	LPDR 03	1 1
	NRC PDR 02	1 1	NTIS 05	1 1

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT  
1st SIX MONTHS REPORT 1984  
SUPPLEMENTAL INFORMATION

FACILITY: H. B. Robinson

LICENSE: DPR-23

1. REGULATORY LIMITS

- A. Fission and Activation Gases: 15,000 uCi/sec. based on Xe-133
- B. Iodines: 7.15E-03 uCi/sec. based on I-131.
- C. Particulates, half lives greater than 8 days: 7.15E-03 uCi/sec.
- D. Liquid Effluents: Tritium not to exceed annual daily average of 10.5 curies. All others not to exceed 10 CFR 20, Appendix B, Table 2, Column 2, except unidentified not to exceed annual daily limit average of 26 mCi/day.

2. MAXIMUM PERMISSIBLE CONCENTRATIONS

- A. Gaseous Effluent: The average annual release rates of gaseous wastes is limited to  $\sum \frac{Q_i}{MPC_i} < 5.0E04 \text{ m}^3/\text{sec.}$

$Q_i$  is the annual release rate (Ci/sec) of any radioisotope,  $i$ , and (MPC) <sub>$i$</sub> ; in units of uCi/cc as defined in Column 1, Table II of Appendix B, 10 CFR 20, except that for isotopes of Iodine and particulates with half-lives greater than 8 days, the values of (MPC) <sub>$i$</sub>  are reduced by a factor of 1/700.

- B. LIQUID EFFLUENTS: 1.00E-07 uCi/cc unidentified  
3.00E-03 uCi/cc Tritium

3. AVERAGE ENERGY OF FISSION & ACTIVATION GASES RELEASED

1st Quarter .152 MEV  
2nd Quarter NA MEV

4. MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY

- A. Fission and Activation Gases: measured and determined by continuous monitors, periodic grab samples, radionuclide gamma analysis, and scintillation counting.
- B. Iodines: measured and determined by continuous sample monitors and radionuclide gamma analysis.
- C. Particulates: measured and determined by continuous sample monitors, radionuclide gamma analysis, gross alpha and beta counting.
- D. Liquid Effluents: measured and determined by composite sample analysis, individual sample analysis, radionuclide gamma analysis, gross alpha and beta counting, and liquid scintillation counting.

25  
IEM  
1/1

5. BATCH RELEASES

A. Liquid

1. Number of Batch Releases: 1.18E02
2. Total Time Period for Batch Releases: 2.57E04 Min.
3. Maximum Time Period for a Batch Release: 1.14E03 Min.
4. Average Time Period for Batch Releases: 2.18E02 Min.
5. Minimum Time Period for a Batch Release: 2.00E00 Min.
6. Average Stream Flow during Periods of Release of Effluent into a Flowing Stream: 2.11E05 GPM

B. Gaseous

1. Number of Batch Releases: 6.40E01
2. Total Time Period for Batch Releases: 2.21E05 Min.
3. Maximum Time Period for a Batch Release: 1.01E04 Min.
4. Average Time Period for a Batch Release: 3.46E03 Min.
5. Minimum Time Period for a Batch Release: 7.30E01 Min.

6. ABNORMAL RELEASES

A. Liquid - 0

B. Gaseous - 0

7. H. B. Robinson shut down in January for Steam Generator Replacement and Refueling

TABLE 1A  
EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 1984  
GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	UNITS	1st QUARTER	2nd QUARTER	% ERROR	
<b>A. <u>FISSION AND ACTIVATION GASES</u></b>					
1.	Total Release	Ci	<u>4.90E01</u>	<u>0</u>	1.00E01
2.	Average Release Rate	uCi/sec	<u>6.23E00</u>	<u>0</u>	
3.	% of Tech. Spec. Limit	%	<u>4.26E-02</u>	<u>0</u>	
4.	Maximum Release Rate/Hour	uCi/sec	<u>9.93E02</u>	<u>0</u>	
<b>B. <u>IODINES</u></b>					
1.	Total Iodine-131	Ci	<u>2.22E-04</u>	<u>1.95E-06</u>	1.00E01
2.	Average Release Rate	uCi/sec	<u>2.82E-05</u>	<u>2.48E-07</u>	
3.	% of Tech. Spec. Limit	%	<u>3.95E-01</u>	<u>3.47E-03</u>	
4.	Total Iodine	Ci	<u>2.37E-04</u>	<u>1.95E-06</u>	
<b>C. <u>PARTICULATES</u></b>					
1.	Particulates T <sub>1/2</sub> 8 days	Ci	<u>4.75E-06</u>	<u>3.64E-06</u>	1.00E01
2.	Average Release Rate	uCi/sec	<u>6.04E-07</u>	<u>4.63E-07</u>	
3.	% of Tech. Spec. Limit	%	<u>2.77E-03</u>	<u>2.16E-03</u>	
4.	Gross Alpha Radioactivity	Ci	<u>0</u>	<u>0</u>	
5.	Total Gross Radioactivity	Ci	<u>4.75E-06</u>	<u>3.64E-06</u>	
<b>D. <u>TRITIUM</u></b>					
1.	Total Release	Ci	<u>4.74E-01</u>	<u>4.21E-01</u>	1.00E01
2.	Average Release Rate	uCi/sec	<u>6.02E-02</u>	<u>5.35E-02</u>	
3.	% of Tech. Spec. Limit	%	<u>6.02E-04</u>	<u>5.35E-04</u>	

TABLE 1B

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 1984

GASEOUS EFFLUENTS - ELEVATED RELEASES

No elevated releases made at H. B. Robinson.

TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 1984

GASEOUS EFFLUENTS<sup>1</sup> - GROUND LEVEL RELEASES

	UNITS	CONTINUOUS MODE		BATCH MODE	
		1st QUARTER	2nd QUARTER	1st QUARTER	2nd QUARTER
<b>1. FISSION GASES</b>					
Ar-41	Ci	0	0	0	0
Kr-85	Ci	6.91E-02	0	3.94E-02	0
Kr-85m	Ci	3.60E-02	0	4.73E-02	0
Kr-87	Ci	0	0	0	0
Kr-88	Ci	0	0	0	0
Xe-131m	Ci	2.40E-02	0	1.04E-02	0
Xe-133	Ci	4.71E01	0	5.27E01	0
Xe-133m	Ci	1.11E00	0	1.46E00	0
Xe-135	Ci	6.29E-01	0	8.27E-01	0
Xe-135m	Ci	0	0	0	0
Total for Period	Ci	4.90E01	0	5.51E01	0
<b>2. IODINES</b>					
I-131	Ci	2.22E-04	1.95E-06	2.04E-04	0
I-133	Ci	1.48E-05	0	1.60E-05	0
I-135	Ci	0	0	0	0
Total for Period	Ci	2.37E-04	1.95E-06	2.20E-04	0
<b>3. PARTICULATES</b>					
F-18	Ci	0	0	0	0
Na-24	Ci	0	0	0	0
K-40	Ci	0	0	0	0
Cr-51	Ci	0	0	0	0
Mn-54	Ci	0	0	1.64E-08	0
Co-58	Ci	8.83E-08	0	5.16E-06	0
Co-60	Ci	4.66E-06	3.64E-06	2.44E-05	1.09E-05
Y-88	Ci	0	0	0	0
Rb-88	Ci	0	0	0	0
Mo-99	Ci	0	0	2.32E-08	0
Tc-99m	Ci	0	0	0	0
I-131	Ci	0	0	4.14E-08	0
Cs-134	Ci	0	0	1.16E-07	0
Cs-136	Ci	0	0	0	0
Cs-137	Ci	0	0	1.05E-06	3.08E-06
Cs-138	Ci	0	0	0	0
Ba-139	Ci	0	0	0	0
Ce-139	Ci	0	0	0	0
Total for Period	Ci	4.75E-06	3.64E-06	3.08E-05	1.40E-05

<sup>1</sup> Continuous Accountability includes Batch Accountability.

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 1984  
LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	UNITS	1st QUARTER	2nd QUARTER	% ERROR	
<u>A. FISSION AND ACTIVATION PRODUCTS</u>					
1.	Total Releases	Ci	<u>3.34E-01</u>	<u>4.11E-03</u>	1.00E01
2.	Average Diluted Concentration	uCi/ml	<u>2.18E-09</u>	<u>7.25E-11</u>	
3.	% of Applicable Limit	%	<u>2.18E00</u>	<u>7.25E-02</u>	
<u>B. TRITIUM</u>					
1.	Total Release	Ci	<u>1.09E01</u>	<u>7.11E-02</u>	1.00E01
2.	Average Diluted Concentration	uCi/ml	<u>7.12E-08</u>	<u>1.26E-09</u>	
3.	% of Applicable Limit	%	<u>2.37E-03</u>	<u>4.19E-05</u>	
<u>C. DISSOLVED AND ENTRAINED GASES</u>					
1.	Total Release	Ci	<u>1.67E-02</u>	<u>0</u>	1.00E01
2.	Average Diluted Concentration	uCi/ml	<u>1.09E-10</u>	<u>0</u>	
3.	% of Applicable Limit	%	<u>3.63E-03</u>	<u>0</u>	
<u>D. GROSS ALPHA RADIOACTIVITY</u>					
1.	Total Release	Ci	<u>0</u>	<u>0</u>	1.00E01
<u>E. VOLUME OF WASTE RELEASED</u>					
		Liters	<u>1.24E07</u>	<u>4.92E05</u>	1.00E01
<u>F. VOLUME OF DILUTION WATER</u>					
		Liters	<u>1.53E11</u>	<u>5.66E10</u>	1.00E01
<u>G. MAXIMUM CONCENTRATION OF GROSS RADIOACTIVITY RELEASED</u>					
		uCi/ml	<u>2.58E-08</u>	<u>2.89E-08</u>	1.00E01

TABLE 2B

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 1984  
LIQUID EFFLUENTS

NUCLIDES	UNITS	CONTINUOUS MODE		BATCH MODE	
		1st QUARTER	2nd QUARTER	1st QUARTER	2nd QUARTER
F-18	Ci	0	0	0	0
Na-24	Ci	2.00E-01	0	1.13E-04	0
Cr-51	Ci	0	0	7.55E-04	0
Mn-54	Ci	0	0	1.28E-04	4.00E-05
Fe-59	Ci	0	0	0	0
Co-58	Ci	0	0	3.67E-03	6.34E-04
Co-60	Ci	0	0	1.66E-02	1.76E-03
Zn-65	Ci	0	0	0	0
Y-88	Ci	0	0	0	0
Sr-89	Ci	0	0	1.78E-04	1.27E-05
Sr-90	Ci	1.16E-04	0	2.94E-05	3.79E-06
Sr-92	Ci	0	0	6.53E-05	0
Zr-95	Ci	0	0	0	0
Nb-95	Ci	0	0	3.20E-04	9.28E-07
Nb-97	Ci	0	0	4.93E-05	0
Zr-97	Ci	0	0	1.36E-05	0
Tc-99m	Ci	0	0	1.93E-04	0
Mo-99	Ci	5.81E-04	0	1.70E-04	0
Cd-109	Ci	0	0	0	0
Ag-110m	Ci	0	0	1.54E-03	9.88E-05
Sn-113	Ci	0	0	0	0
Sb-124	Ci	0	0	3.58E-03	3.18E-05
Sb-125	Ci	0	0	0	0
I-131	Ci	4.51E-03	0	4.68E-03	0
I-132	Ci	0	0	0	0
Te-132	Ci	0	0	8.71E-07	0
I-133	Ci	8.78E-02	0	8.59E-04	0
Cs-134	Ci	1.64E-03	0	2.21E-03	6.20E-04
Cs-136	Ci	0	0	1.66E-04	0
Cs-137	Ci	1.58E-03	0	2.19E-03	9.04E-04
Ce-144	Ci	0	0	0	0
<b>Total</b>	<b>Ci</b>	<b>2.96E-01</b>	<b>0</b>	<b>3.75E-02</b>	<b>4.11E-03</b>
Ar-41	Ci	0	0	0	0
Kr-85	Ci	0	0	0	0
Kr-85m	Ci	0	0	0	0
Kr-87	Ci	0	0	0	0
Kr-88	Ci	0	0	0	0
Xe-131m	Ci	0	0	0	0
Xe-133	Ci	8.92E-04	0	9.40E-04	0
Xe-133m	Ci	0	0	0	0
Xe-135	Ci	2.69E-04	0	1.37E-02	0
Xe-135m	Ci	8.56E-04	0	0	0
<b>Total</b>	<b>Ci</b>	<b>2.02E-03</b>	<b>0</b>	<b>1.46E-02</b>	<b>0</b>



TABLE 3

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 1984  
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (NOT IRRADIATED FUEL)

<u>1. Type of Waste</u>	<u>Units</u>	<u>Totals</u>	<u>% Error</u>
(a) Spent resins, filter sludges evaporator bottoms, etc.	M <sup>3</sup> Ci	<u>1.03E02</u> <u>4.52E01</u>	1.00E01
(b) Dry compressible waste, contaminated equipment, etc.	M <sup>3</sup> Ci	<u>1.36E03</u> <u>1.00E01</u>	1.00E01
(c) Irradiated components, control rods, etc.	M <sup>3</sup> Ci	<u>0</u> <u>0</u>	0.00E00
(d) Other: Solidified Grit from decontamination of Steam Generators	M <sup>3</sup> Ci	<u>1.68E01</u> <u>3.01E01</u>	1.00E01

2. Estimate of Major Nuclide Composition (By Type of Waste)

	<u>%</u>	<u>Ci</u>
(a) H-3	<u>25</u>	<u>1.13E01</u>
Co-58	<u>8</u>	<u>3.62E00</u>
Co-60	<u>32</u>	<u>1.45E01</u>
Ni-63	<u>12</u>	<u>5.43E00</u>
Ag-110m	<u>3</u>	<u>1.36E00</u>
Sb-124	<u>4</u>	<u>1.81E00</u>
Others*	<u>16</u>	<u>7.23E00</u>
(b) Cr-51	<u>16</u>	<u>1.60E00</u>
Fe-55	<u>25</u>	<u>2.50E00</u>
Co-58	<u>19</u>	<u>1.90E00</u>
Co-60	<u>33</u>	<u>3.30E00</u>
Others**	<u>7</u>	<u>7.00E-01</u>

3. Solid Waste Disposition

Number of Shipments: 56  
Mode of Transportation: Sole Use Vehicle  
Destination: Barnwell, S.C.

IRRADIATED FUEL SHIPMENT (FOR STORAGE)

Number of Shipments: 0  
Mode of Transportation: NA  
Destination: NA  
Number of Bundles: 0

\*Others include: C-14, Cr-51, Mn-54, Fe-55, Co-57, Zn-65, Sr-90, Zr-95, Nb-95, Tc-99, Sn-113, Cs-134, Cs-137, Pu-238, U-234, Np-237, Pu-238, Am-241, Pu-241, Cm-242, Cm-244

\*\*Others include: H-3, C-14, Mn-54, Co-57, Ni-63, Nb-95, Zr-95, Ag-110m, Sb-124, Sb-125, Te-125m, Np-237, Pu-238, Pu-239, Pu-240, Am-241, Pu-241, Cm-242, Cm-244.

RADIOLOGICAL DOSE IMPACT ON MAN

The model used to calculate the dose commitment estimates presented in this report were taken from Regulatory Guide 1.109, "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance With 10 CFR Part 50, Appendix I," March, 1974. The dose commitments are based on Plant effluent data integrated over the six-month period from January 1, 1984 through June 30, 1984. Eight day depleted X/Q's were utilized for all airborne pathways and all usage factors were for the maximum exposed individual.

I-131 INHALATION DOSE FOR CRITICAL SECTOR AT SITE BOUNDARY  
MREM/YEAR

	INFANT	CHILD	TEEN	ADULT
BONE	1.08E-05	1.37E-05	1.01E-05	7.16E-06
LIVER	1.26E-05	1.37E-05	1.40E-05	1.02E-05
WHOLE BODY	5.57E-06	7.75E-06	7.50E-06	5.82E-06
THYROID	4.22E-03	4.61E-03	4.16E-03	3.39E-03
KIDNEY	1.47E-05	2.24E-05	2.39E-05	1.74E-05
LUNG	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GI-LLI	3.01E-07	8.07E-07	1.84E-06	1.78E-06

TOTAL INHALATION DOSE FOR CRITICAL SECTOR AT SITE BOUNDARY  
MREM/YEAR

	INFANT	CHILD	TEEN	ADULT
BONE	1.10E-05	1.40E-05	1.03E-05	7.32E-06
LIVER	7.47E-04	1.29E-03	1.46E-03	1.45E-03
WHOLE BODY	7.40E-04	1.28E-03	1.45E-03	1.44E-03
THYROID	5.02E-03	5.96E-03	5.66E-03	4.86E-03
KIDNEY	7.49E-04	1.30E-03	1.47E-03	1.45E-03
LUNG	7.82E-04	1.35E-03	1.54E-03	1.50E-03
GI-LLI	7.35E-04	1.28E-03	1.45E-03	1.44E-03

DOSE FROM SHORELINE SEDIMENT  
MREM/YEAR

	CHILD	TEEN	ADULT
WHOLE BODY	4.24E-08	2.03E-07	3.64E-08
SKIN	4.98E-08	2.38E-07	4.27E-08

DOSE FROM EATING FISH  
MREM/YEAR

	CHILD	TEEN	ADULT
BONE	5.21E-06	4.24E-06	4.05E-06
LIVER	6.34E-06	7.28E-06	7.10E-06
WHOLE BODY	1.23E-06	3.07E-06	5.34E-06
THYROID	1.55E-06	1.38E-06	1.43E-06
KIDNEY	2.05E-06	2.42E-06	2.38E-06
LUNG	7.56E-07	9.48E-07	8.10E-07
GI-LLI	2.62E-07	6.52E-07	9.01E-07

DOSE FROM EATING GREEN LEAFY VEG. FROM CRITICAL GARDEN  
MREM/YEAR

	CHILD	TEEN	ADULT
BONE	4.09E-05	2.25E-05	2.44E-05
LIVER	2.17E-04	1.80E-04	2.58E-04
WHOLE BODY	2.00E-04	1.65E-04	2.44E-04
THYROID	1.38E-02	9.33E-03	1.16E-02
KIDNEY	2.43E-04	2.02E-04	2.83E-04
LUNG	1.75E-04	1.48E-04	2.23E-04
GI-LLI	1.81E-04	1.57E-04	2.38E-04

DOSE FROM EATING PRODUCE FROM CRITICAL GARDEN  
MREM/YEAR

	CHILD	TEEN	ADULT
BONE	3.85E-06	1.59E-06	9.31E-07
LIVER	2.67E-03	1.69E-03	1.38E-03
WHOLE BODY	2.68E-03	1.69E-03	1.38E-03
THYROID	3.95E-03	2.33E-03	1.81E-03
KIDNEY	2.67E-03	1.69E-03	1.38E-03
LUNG	2.67E-03	1.69E-03	1.38E-03
GI-LLI	2.69E-03	1.72E-03	1.41E-03

I-131 DOSE FROM DRINKING MILK FROM CRITICAL COM  
MREM/YEAR

	INFANT	CHILD	TEEN	ADULT
BONE	1.97E-05	9.43E-06	3.89E-06	2.14E-06
LIVER	2.32E-05	9.48E-06	5.44E-06	3.06E-06
WHOLE BODY	1.02E-05	5.39E-06	2.92E-06	1.76E-06
THYROID	7.62E-03	3.13E-03	1.59E-03	1.00E-03
KIDNEY	2.71E-05	1.56E-05	9.37E-06	5.25E-06
LUNG	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GI-LLI	8.28E-07	8.44E-07	1.08E-06	8.08E-07

TOTAL DOSE FROM DRINKING MILK FROM CRITICAL COM  
MREM/YEAR

	INFANT	CHILD	TEEN	ADULT
BONE	1.97E-05	9.43E-06	3.89E-06	2.14E-06
LIVER	7.77E-05	4.54E-05	2.82E-05	2.05E-05
WHOLE BODY	6.48E-05	4.14E-05	2.57E-05	1.92E-05
THYROID	7.68E-03	3.17E-03	1.61E-03	1.02E-03
KIDNEY	8.15E-05	5.15E-05	3.21E-05	2.27E-05
LUNG	5.44E-05	3.59E-05	2.27E-05	1.74E-05
GI-LLI	5.54E-05	3.69E-05	2.40E-05	1.85E-05

I-131 INHALATION DOSE FOR CRITICAL SECTOR AT SITE BOUNDARY  
MREM/YEAR

	INFANT	CHILD	TEEN	ADULT
BONE	1.08E-05	1.37E-05	1.01E-05	7.16E-06
LIVER	1.26E-05	1.37E-05	1.40E-05	1.02E-05
WHOLE BODY	5.57E-06	7.75E-06	7.50E-06	5.82E-06
THYROID	4.22E-03	4.61E-03	4.16E-03	3.39E-03
KIDNEY	1.47E-05	2.24E-05	2.39E-05	1.74E-05
LUNG	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GI-LLI	3.01E-07	8.07E-07	1.84E-06	1.78E-06

TOTAL INHALATION DOSE FOR CRITICAL SECTOR AT SITE BOUNDARY  
MREM/YEAR

	INFANT	CHILD	TEEN	ADULT
BONE	1.10E-05	1.40E-05	1.03E-05	7.32E-06
LIVER	7.47E-04	1.29E-03	1.46E-03	1.45E-03
WHOLE BODY	7.40E-04	1.28E-03	1.45E-03	1.44E-03
THYROID	5.02E-03	5.96E-03	5.66E-03	4.86E-03
KIDNEY	7.49E-04	1.30E-03	1.47E-03	1.45E-03
LUNG	7.82E-04	1.35E-03	1.54E-03	1.50E-03
GI-LLI	7.35E-04	1.28E-03	1.45E-03	1.44E-03

SKIN DOSES FROM AIR SUBMERSION IN RADIONOBLE GASES  
MREM/YEAR

DOSE FOR CRITICAL SECTOR AT SITE BOUNDARY= 3.93E-02 MREM/6 MOS.

	RADIAL DISTANCE, MILES				
	0.5	1.5	2.5	3.5	4.5
S	2.65E-03	8.75E-04	4.13E-04	2.56E-04	1.77E-04
SSW	1.72E-03	5.90E-04	2.65E-04	1.57E-04	1.08E-04
SW	9.14E-04	3.15E-04	1.38E-04	8.46E-05	5.70E-05
WSW	7.18E-04	2.46E-04	1.08E-04	6.49E-05	4.42E-05
W	5.60E-04	1.97E-04	8.46E-05	4.92E-05	3.24E-05
WNW	8.85E-04	3.05E-04	1.38E-04	8.26E-05	5.60E-05
NW	9.73E-04	3.34E-04	1.47E-04	8.65E-05	5.90E-05
NNW	2.16E-03	7.47E-04	3.44E-04	2.06E-04	1.47E-04
N	3.54E-03	1.18E-03	5.51E-04	3.44E-04	2.36E-04
NNE	2.85E-03	9.73E-04	4.52E-04	2.85E-04	1.97E-04
NE	2.46E-03	8.46E-04	3.93E-04	2.46E-04	1.67E-04
ENE	1.97E-03	6.78E-04	3.15E-04	1.97E-04	1.38E-04
E	1.28E-03	4.33E-04	1.97E-04	1.18E-04	8.36E-05
ESE	1.18E-03	4.13E-04	1.87E-04	1.18E-04	1.67E-04
SE	2.46E-03	8.06E-04	3.83E-04	2.46E-04	1.67E-04
SSE	6.19E-03	1.97E-03	9.64E-04	6.10E-04	4.33E-04

	RADIAL DISTANCE, MILES				
	7.5	15.0	25.0	35.0	45.0
S	8.65E-05	3.15E-05	1.38E-05	8.26E-06	5.51E-06
SSW	5.11E-05	1.77E-05	7.47E-06	4.23E-06	2.75E-06
SW	2.65E-05	9.05E-06	3.83E-06	2.16E-06	1.38E-06
WSW	2.06E-05	6.69E-06	2.85E-06	1.57E-06	1.08E-06
W	1.47E-05	4.72E-06	1.97E-06	1.08E-06	6.88E-07
WNW	2.65E-05	8.95E-06	3.83E-06	2.16E-06	1.47E-06
NW	2.75E-05	9.14E-06	3.83E-06	2.16E-06	1.38E-06
NNW	6.98E-05	2.46E-05	1.08E-05	6.29E-06	4.13E-06
N	1.18E-04	4.23E-05	1.87E-05	1.08E-05	7.34E-06
NNE	9.54E-05	3.44E-05	1.57E-05	9.05E-06	6.00E-06
NE	8.26E-05	2.95E-05	1.28E-05	7.77E-06	5.11E-06
ENE	6.39E-05	2.26E-05	9.83E-06	5.80E-06	3.83E-06
E	4.03E-05	1.38E-05	6.10E-06	3.54E-06	2.26E-06
ESE	3.93E-05	1.38E-05	6.39E-06	3.74E-06	5.70E-06
SE	8.55E-05	3.15E-05	1.47E-05	8.55E-06	5.70E-06
SSE	2.16E-04	8.16E-05	3.83E-05	2.26E-05	1.47E-05

WHOLE BODY DOSES FROM AIR SUBMERSION IN RADIONOBLE GASES  
MREM/YEAR

DOSE FOR CRITICAL SECTOR AT SITE BOUNDARY= 1.36E-02 MREM/6 MOS.

	RADIAL DISTANCE, MILES				
	0.5	1.5	2.5	3.5	4.5
S	9.17E-04	3.02E-04	1.43E-04	8.83E-05	6.11E-05
SSW	5.94E-04	2.04E-04	9.17E-05	5.44E-05	3.74E-05
SW	3.16E-04	1.09E-04	4.76E-05	2.92E-05	1.97E-05
WSW	2.48E-04	8.49E-05	3.74E-05	2.24E-05	1.53E-05
W	1.94E-04	6.79E-05	2.92E-05	1.70E-05	1.12E-05
WNW	3.06E-04	1.05E-04	4.76E-05	2.85E-05	1.94E-05
NW	3.36E-04	1.15E-04	5.10E-05	2.99E-05	2.04E-05
NNW	7.47E-04	2.58E-04	1.19E-04	7.13E-05	5.10E-05
N	1.22E-03	4.08E-04	1.90E-04	1.19E-04	8.15E-05
NNE	9.85E-04	3.36E-04	1.56E-04	9.85E-05	6.79E-05
NE	8.49E-04	2.92E-04	1.36E-04	8.49E-05	5.77E-05
ENE	6.79E-04	2.34E-04	1.09E-04	6.79E-05	4.76E-05
E	4.42E-04	1.49E-04	6.79E-05	4.08E-05	2.89E-05
ESE	4.08E-04	1.43E-04	6.45E-05	4.08E-05	5.77E-05
SE	8.49E-04	2.79E-04	1.32E-04	8.49E-05	5.77E-05
SSE	2.14E-03	6.79E-04	3.33E-04	2.11E-04	1.49E-04

	RADIAL DISTANCE, MILES				
	7.5	15.0	25.0	35.0	45.0
S	2.99E-05	1.09E-05	4.76E-06	2.85E-06	1.90E-06
SSW	1.77E-05	6.11E-06	2.58E-06	1.46E-06	9.51E-07
SW	9.17E-06	3.13E-06	1.32E-06	7.47E-07	4.76E-07
WSW	7.13E-06	2.31E-06	9.85E-07	5.44E-07	3.74E-07
W	5.10E-06	1.63E-06	6.79E-07	3.74E-07	2.38E-07
WNW	9.17E-06	3.09E-06	1.32E-06	7.47E-07	5.10E-07
NW	9.51E-06	3.16E-06	1.32E-06	7.47E-07	4.76E-07
NNW	2.41E-05	8.49E-06	3.74E-06	2.17E-06	1.43E-06
N	4.08E-05	1.46E-05	6.45E-06	3.74E-06	2.53E-06
NNE	3.30E-05	1.19E-05	5.44E-06	3.13E-06	2.07E-06
NE	2.85E-05	1.02E-05	4.42E-06	2.68E-06	1.77E-06
ENE	2.21E-05	7.81E-06	3.40E-06	2.00E-06	1.32E-06
E	1.39E-05	4.76E-06	2.11E-06	1.22E-06	7.81E-07
ESE	1.36E-05	4.76E-06	2.21E-06	1.29E-06	1.97E-06
SE	2.96E-05	1.09E-05	5.10E-06	2.96E-06	1.97E-06
SSE	7.47E-05	2.82E-05	1.32E-05	7.81E-06	5.10E-06

POPULATION INTEGRATED WHOLE BODY DOSES  
PERSON-REM/YEAR

	RADIAL DISTANCE, MILES				
	0.5	1.5	2.5	3.5	4.5
S	1.47E-05	4.84E-06	1.07E-05	9.01E-06	8.13E-06
SSW	4.76E-05	2.04E-06	5.87E-05	3.48E-06	7.17E-06
SW	3.06E-05	2.21E-05	4.61E-06	2.69E-06	4.75E-06
MSW	3.87E-05	1.09E-05	1.61E-06	3.61E-06	2.12E-06
W	1.45E-05	2.24E-06	2.51E-06	1.73E-06	2.15E-06
WNW	7.95E-06	6.74E-06	1.24E-06	2.85E-07	1.45E-06
NW	1.68E-06	6.81E-06	4.33E-06	1.43E-06	1.98E-06
NNW	0.00E+00	1.29E-06	3.09E-06	7.13E-07	0.00E+00
N	0.00E+00	4.08E-06	8.18E-06	1.15E-05	2.09E-05
NNE	0.00E+00	3.26E-05	3.00E-05	1.74E-05	5.10E-06
NE	0.00E+00	3.45E-05	1.15E-05	7.81E-06	4.62E-06
ENE	1.77E-05	1.17E-06	2.97E-05	8.02E-06	5.09E-06
E	2.21E-06	0.00E+00	1.09E-06	2.01E-05	3.91E-05
ESE	1.35E-05	1.46E-05	2.13E-06	3.26E-06	8.24E-05
SE	4.25E-06	3.29E-05	2.48E-05	5.49E-05	8.24E-05
SSE	2.14E-05	1.77E-05	9.62E-05	1.23E-04	3.75E-05

7.5                      15.0                      25.0                      35.0                      45.0

RADIAL DISTANCE, MILES

S	5.37E-05	2.83E-05	2.43E-05	3.45E-05	1.78E-05
SSW	1.16E-05	3.53E-05	3.05E-05	1.29E-04	1.08E-05
SW	1.61E-05	6.30E-06	7.61E-06	1.33E-05	1.31E-05
MSW	1.25E-05	5.96E-06	1.94E-05	3.68E-06	1.52E-05
W	1.71E-06	4.22E-06	3.22E-06	1.76E-06	8.38E-07
WNW	2.38E-06	4.51E-06	7.74E-06	5.06E-06	1.26E-05
NW	7.42E-06	3.85E-06	6.71E-06	5.36E-06	5.94E-06
NNW	6.25E-06	7.67E-06	1.94E-05	1.10E-05	3.80E-05
N	2.11E-05	2.39E-05	3.70E-05	3.27E-05	1.45E-05
NNE	1.71E-05	1.71E-05	5.28E-05	3.10E-05	3.31E-05
NE	3.62E-05	2.85E-05	3.89E-05	2.94E-05	2.39E-05
ENE	2.80E-05	2.11E-05	4.95E-05	2.32E-05	2.28E-05
E	4.23E-05	1.24E-05	8.36E-06	9.79E-06	2.09E-05
ESE	1.80E-05	6.81E-05	7.74E-05	9.45E-06	2.06E-05
SE	7.03E-05	5.46E-05	1.66E-04	2.33E-05	2.06E-05
SSE	1.28E-04	1.76E-04	1.48E-04	7.93E-05	1.04E-04

TOTAL POPULATION INTEGRATED WHOLE BODY DOSE= 3.71E-03 PERSON-REM

POPULATION INTEGRATED INHALATION DOSE  
PERSON-REM/YEAR OR THYROID-REM/YEAR

	INFANT	CHILD	TEEN	ADULT
WHOLE BODY	3.84E-06	6.70E-05	6.07E-05	2.51E-04
THYROID	2.60E-05	3.11E-04	2.36E-04	8.49E-04





Carolina Power & Light Company

Company Correspondence

Raleigh, North Carolina  
July 24, 1984

Serial: ESS-84-306

MEMORANDUM

TO: Mr. R. E. Morgan  
FROM: R. B. Starkey, Jr.,  
SUBJECT: Meteorological Data - Semiannual Report

The attached information, described as follows, is provided for the July, 1984 Effluent and Waste Disposal Report:

1. Enclosures 1 and 2 - Summary report of meteorological data for each calendar quarter. The information may be reproduced and transmitted to the Nuclear Regulatory Commission as per Regulatory Guide 1.21, Section C.1 if this transmittal is required.
2. Enclosure 3 - Estimates of relative concentration (X/Q) and deposition (D/Q) for the six-month period January 1, 1984 through June 30, 1984. The values presented are to be used for the dose evaluation from continuous gaseous releases.
3. Enclosure 4 - Summary report of meteorological data used as input to the computer code for the X/Q and D/Q calculations.

Original Signed By  
R. B. STARKEY, JR.

RBS/kjr (7530TDD)  
Attachment

cc: Mr. A. Eaddy (w/attachment) ✓  
Mr. B. H. Webster (w/attachment)  
Mr. B. D. McFeaters (w/attachment)

ENCLOSURE 1

JOINT FREQUENCY OF WIND DIRECTION AND SPEED  
 FIRST QUARTER 1984  
H. B. ROBINSON STEAM-ELECTRIC PLANT

The attached tables present the number and frequency of wind direction occurrences by wind speed class as recorded at the on-site meteorological system during the period January 1 through March 31, 1984.

The frequencies are presented as a percent of total occurrences for each stability class as well as a summary for all classes of each sensor elevation. The first eight tables are for the upper sensor elevation (60 meter); the last eight tables are for the lower (10 meter) sensor elevation.

Pertinent information available from the tables is as follows:

1. Stability

Percent occurrence Pasquill Stability categories based on lower level (10m) wind distribution:

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>
0.5	1.8	3.6	33.0	32.6	11.5	17.0

2. Wind Speed

Average Speed (mph)  
 Percent Calm  
 Percent Less than 3.5 mph

<u>10 Meter</u>	<u>60 Meter</u>
5.3	9.9
0.9	0.0
36.0	4.0

3. Wind Direction

Prevailing Direction  
 Percent Occurrence

<u>10 Meter</u>	<u>60 Meter</u>
NNW	NNE
13.1	11.5

4. Data Recovery

Percent Good Hours

<u>10 Meter</u>	<u>60 Meter</u>
99.7	96.5

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR SUMMARY OVER ALL STAB

UPWNDSPD

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDSPD
N	/	12/ 0.57	54/ 2.56	109/ 5.17	39/ 1.85	8/ 0.38	/	222.0/10.53	9.70465
NNE	/	6/ 0.28	54/ 2.56	118/ 5.60	47/ 2.23	18/ 0.85	/	243.0/11.53	10.58732
NE	/	4/ 0.19	48/ 2.28	51/ 2.42	12/ 0.57	/	/	115.0/ 5.46	8.20768
ENE	/	5/ 0.24	46/ 2.18	19/ 0.90	4/ 0.19	3/ 0.14	/	77.0/ 3.65	7.45849
E	/	8/ 0.38	65/ 3.08	21/ 1.00	10/ 0.47	1/ 0.05	/	105.0/ 4.98	7.14706
ESE	/	10/ 0.47	45/ 2.13	37/ 1.76	10/ 0.47	/	/	102.0/ 4.84	7.65268
SE	/	10/ 0.47	35/ 1.66	53/ 2.51	20/ 0.95	6/ 0.28	/	124.0/ 5.88	9.34486
SSE	/	7/ 0.33	36/ 1.71	40/ 1.90	24/ 1.14	11/ 0.52	/	118.0/ 5.60	10.31928
S	/	1/ 0.05	27/ 1.28	54/ 2.56	21/ 1.00	2/ 0.09	1/ 0.05	106.0/ 5.03	9.91722
SSW	/	4/ 0.19	34/ 1.61	53/ 2.51	32/ 1.52	14/ 0.66	5/ 0.24	142.0/ 6.74	11.57507
SW	/	/	39/ 1.85	69/ 3.27	30/ 1.42	15/ 0.71	1/ 0.05	154.0/ 7.31	11.14323
WSW	/	3/ 0.14	42/ 1.99	73/ 3.46	34/ 1.61	6/ 0.28	/	158.0/ 7.50	10.26494
W	/	1/ 0.05	50/ 2.37	70/ 3.32	18/ 0.85	5/ 0.24	1/ 0.05	145.0/ 6.88	9.61147
WNW	/	5/ 0.24	28/ 1.33	44/ 2.09	19/ 0.90	7/ 0.33	1/ 0.05	104.0/ 4.93	10.22530
NW	/	4/ 0.19	11/ 0.52	43/ 2.04	30/ 1.42	2/ 0.09	/	90.0/ 4.27	10.99086
NNW	/	4/ 0.19	24/ 1.14	55/ 2.61	19/ 0.90	1/ 0.05	/	103.0/ 4.89	9.85363
TOTAL	/	84/ 3.98	638/30.27	909/43.12	369/17.50	99/ 4.70	9/ 0.43	2108/ 100	9.79449

NUMBER OF BAD RECORDS: 76

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNDSPO  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:30 MONDAY, JULY 23, 1984

3

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=A

UPWNDSPO

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDSPO
N	/	/	/	/	/	/	/	/	
NNE	/	/	/	/	/	/	/	/	
NE	/	/	/	/	/	/	/	/	
ENE	/	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	/	
ESE	/	/	/	3/ 0.14	/	/	/	3.0/ 0.14	10.58307
SE	/	/	1/ 0.05	1/ 0.05	/	/	/	2.0/ 0.09	7.81224
SSE	/	/	/	/	/	/	/	/	
S	/	/	/	/	/	/	/	/	
SSW	/	/	/	/	/	1/ 0.05	/	1.0/ 0.05	23.16156
SW	/	/	/	/	/	1/ 0.05	1/ 0.05	2.0/ 0.09	24.81238
WSW	/	/	/	/	1/ 0.05	/	/	1.0/ 0.05	13.52342
W	/	/	/	/	/	/	1/ 0.05	1.0/ 0.05	25.41269
WNW	/	/	/	/	/	/	/	/	
NW	/	/	/	/	1/ 0.05	/	/	1.0/ 0.05	16.85841
NNW	/	/	/	/	/	/	/	/	
TOTAL	/	/	1/ 0.05	4/ 0.19	2/ 0.09	2/ 0.09	2/ 0.09	11.0/ 0.52	15.99586

NUMBER OF BAD RECORDS: 0

Page 4 of 10

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWINDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

5  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=B

UPWINDSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWINDSPD
N	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	11.32232
NNE	/	/	/	/	1/ 0.05	/	/	1.0/ 0.05	14.49057
NE	/	/	/	/	/	/	/	/	/
ENE	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	10.12172
E	/	/	1/ 0.05	/	/	/	/	1.0/ 0.05	5.73620
ESE	/	/	2/ 0.09	2/ 0.09	/	/	/	4.0/ 0.19	8.33333
SE	/	/	1/ 0.05	/	/	/	/	1.0/ 0.05	6.67000
SSE	/	/	/	2/ 0.09	/	/	/	2.0/ 0.09	8.48757
S	/	/	/	2/ 0.09	1/ 0.05	/	/	3.0/ 0.14	10.22733
SSW	/	/	/	1/ 0.05	1/ 0.05	3/ 0.14	1/ 0.05	6.0/ 0.28	18.48145
SW	/	/	/	/	2/ 0.09	3/ 0.14	/	5.0/ 0.24	19.18624
WSW	/	/	/	2/ 0.09	/	/	/	2.0/ 0.09	10.58029
W	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	11.20560
WNW	/	/	/	2/ 0.09	2/ 0.09	/	1/ 0.05	5.0/ 0.24	14.65399
NW	/	/	/	/	3/ 0.14	/	/	3.0/ 0.14	14.45722
NNW	/	/	/	2/ 0.09	1/ 0.05	/	/	3.0/ 0.14	12.73414
TOTAL	/	/	4/ 0.19	16/ 0.76	11/ 0.52	6/ 0.28	2/ 0.09	39.0/ 1.85	13.41952

NUMBER OF BAD RECORDS: 0

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ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDOI#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNDS  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=C

UPWNDS

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDS
N	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	9.10455
NNE	/	/	/	4/ 0.19	5/ 0.24	/	/	9.0/ 0.43	13.20660
NE	/	/	/	/	/	/	/	/	/
ENE	/	/	2/ 0.09	1/ 0.05	/	/	/	3.0/ 0.14	8.46534
E	/	/	/	/	3/ 0.14	/	/	3.0/ 0.14	12.58407
ESE	/	/	5/ 0.24	3/ 0.14	2/ 0.09	/	/	10.0/ 0.47	7.68384
SE	/	/	2/ 0.09	2/ 0.09	/	/	/	4.0/ 0.19	7.54544
SSE	/	/	1/ 0.05	1/ 0.05	1/ 0.05	/	/	3.0/ 0.14	10.97215
S	/	/	/	5/ 0.24	/	/	/	5.0/ 0.24	9.42137
SSW	/	/	/	1/ 0.05	1/ 0.05	/	/	2.0/ 0.09	13.06486
SW	/	/	/	3/ 0.14	2/ 0.09	3/ 0.14	/	8.0/ 0.38	16.91678
WSW	/	/	/	/	1/ 0.05	/	/	1.0/ 0.05	15.42437
W	/	/	/	6/ 0.28	1/ 0.05	/	/	7.0/ 0.33	10.10981
WNW	/	/	/	2/ 0.09	4/ 0.19	1/ 0.05	/	7.0/ 0.33	14.11658
NW	/	/	/	3/ 0.14	3/ 0.14	/	/	6.0/ 0.28	12.87866
NNW	/	/	/	3/ 0.14	1/ 0.05	/	/	4.0/ 0.19	11.32232
TOTAL	/	/	10/ 0.47	35/ 1.66	24/ 1.14	4/ 0.19	/	73.0/ 3.46	11.60534

NUMBER OF BAD RECORDS: 5

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ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWINDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=D

UPWINDSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWINDSPD
N	/	2/ 0.09	19/ 0.90	37/ 1.76	24/ 1.14	7/ 0.33	/	89.0/ 4.22	11.26936
NNE	/	2/ 0.09	19/ 0.90	55/ 2.61	33/ 1.57	17/ 0.81	/	126.0/ 5.98	12.17010
NE	/	4/ 0.19	13/ 0.62	17/ 0.81	3/ 0.14	/	/	37.0/ 1.76	7.98312
ENE	/	/	19/ 0.90	9/ 0.43	3/ 0.14	1/ 0.05	/	32.0/ 1.52	7.92792
E	/	3/ 0.14	27/ 1.28	8/ 0.38	5/ 0.24	/	/	43.0/ 2.04	7.02095
ESE	/	5/ 0.24	10/ 0.47	4/ 0.19	3/ 0.14	/	/	22.0/ 1.04	7.09294
SE	/	5/ 0.24	11/ 0.52	13/ 0.62	3/ 0.14	1/ 0.05	/	33.0/ 1.57	8.05807
SSE	/	4/ 0.19	12/ 0.57	4/ 0.19	4/ 0.19	3/ 0.14	/	27.0/ 1.28	8.83404
S	/	/	10/ 0.47	8/ 0.38	9/ 0.43	1/ 0.05	1/ 0.05	29.0/ 1.38	10.73640
SSW	/	/	9/ 0.43	10/ 0.47	9/ 0.43	3/ 0.14	2/ 0.09	33.0/ 1.57	12.91571
SW	/	/	6/ 0.28	14/ 0.66	11/ 0.52	4/ 0.19	/	35.0/ 1.66	12.52149
WSW	/	/	6/ 0.28	15/ 0.71	11/ 0.52	3/ 0.14	/	35.0/ 1.66	12.10462
W	/	/	15/ 0.71	21/ 1.00	5/ 0.24	4/ 0.19	/	45.0/ 2.13	10.18842
WNW	/	/	12/ 0.57	17/ 0.81	7/ 0.33	3/ 0.14	/	39.0/ 1.85	10.35304
NW	/	1/ 0.05	4/ 0.19	16/ 0.76	11/ 0.52	/	/	32.0/ 1.52	10.97006
NNW	/	1/ 0.05	8/ 0.38	17/ 0.81	11/ 0.52	1/ 0.05	/	38.0/ 1.80	10.60135
TOTAL	/	27/ 1.28	200/ 9.49	265/ 12.57	152/ 7.21	48/ 2.28	3/ 0.14	695.0/ 32.97	10.45106

NUMBER OF BAD RECORDS: 24

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

11  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=E

UPWNSPD

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNSPD
N	/	7/ 0.33	14/ 0.66	29/ 1.38	12/ 0.57	1/ 0.05	/	63.0/ 2.99	8.84013
NNE	/	2/ 0.09	10/ 0.47	28/ 1.33	8/ 0.38	1/ 0.05	/	49.0/ 2.32	9.58642
NE	/	/	13/ 0.62	16/ 0.76	6/ 0.28	/	/	35.0/ 1.66	9.05643
ENE	/	2/ 0.09	16/ 0.76	5/ 0.24	/	2/ 0.09	/	25.0/ 1.19	7.43771
E	/	2/ 0.09	26/ 1.23	11/ 0.52	2/ 0.09	1/ 0.05	/	42.0/ 1.99	7.48985
ESE	/	3/ 0.14	19/ 0.90	24/ 1.14	5/ 0.24	/	/	51.0/ 2.42	8.17663
SE	/	4/ 0.19	11/ 0.52	23/ 1.09	13/ 0.62	5/ 0.24	/	56.0/ 2.66	10.64996
SSE	/	2/ 0.09	11/ 0.52	20/ 0.95	17/ 0.81	8/ 0.38	/	58.0/ 2.75	12.04452
S	/	/	11/ 0.52	12/ 0.57	8/ 0.38	1/ 0.05	/	32.0/ 1.52	10.16966
SSW	/	/	7/ 0.33	10/ 0.47	18/ 0.85	7/ 0.33	2/ 0.09	44.0/ 2.09	13.94181
SW	/	/	10/ 0.47	17/ 0.81	3/ 0.14	4/ 0.19	/	34.0/ 1.61	10.56606
WSW	/	1/ 0.05	12/ 0.57	20/ 0.95	10/ 0.47	3/ 0.14	/	46.0/ 2.18	10.61182
W	/	1/ 0.05	10/ 0.47	35/ 1.66	12/ 0.57	1/ 0.05	/	59.0/ 2.80	10.51203
WNW	/	/	2/ 0.09	13/ 0.62	5/ 0.24	3/ 0.14	/	23.0/ 1.09	12.07125
NW	/	2/ 0.09	4/ 0.19	9/ 0.43	10/ 0.47	2/ 0.09	/	27.0/ 1.28	11.32294
NNW	/	2/ 0.09	6/ 0.28	12/ 0.57	5/ 0.24	/	/	25.0/ 1.19	9.49208
TOTAL	/	28/ 1.33	182/ 8.63	284/ 13.47	134/ 6.36	39/ 1.85	2/ 0.09	669.0/ 31.74	10.13942

NUMBER OF BAD RECORDS: 40



ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1/25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

13  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=F

UPWNSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNSPD
N	/	1/ 0.05	11/ 0.52	28/ 1.33	2/ 0.09	/	/	42.0/ 1.99	9.02951
NNE	/	/	9/ 0.43	16/ 0.76	/	/	/	25.0/ 1.19	7.86260
NE	/	/	6/ 0.28	6/ 0.28	3/ 0.14	/	/	15.0/ 0.71	8.74103
ENE	/	1/ 0.05	3/ 0.14	1/ 0.05	1/ 0.05	/	/	6.0/ 0.28	6.78117
E	/	1/ 0.05	5/ 0.24	2/ 0.09	/	/	/	8.0/ 0.38	6.34067
ESE	/	/	6/ 0.28	1/ 0.05	/	/	/	7.0/ 0.33	6.57471
SE	/	/	2/ 0.09	8/ 0.38	4/ 0.19	/	/	14.0/ 0.66	10.33612
SSE	/	/	3/ 0.14	7/ 0.33	2/ 0.09	/	/	12.0/ 0.57	9.62425
S	/	/	1/ 0.05	5/ 0.24	3/ 0.14	/	/	9.0/ 0.43	10.05317
SSW	/	1/ 0.05	4/ 0.19	2/ 0.09	1/ 0.05	/	/	8.0/ 0.38	7.03476
SW	/	/	4/ 0.19	13/ 0.62	5/ 0.24	/	/	22.0/ 1.04	9.90950
WSW	/	/	7/ 0.33	14/ 0.66	9/ 0.43	/	/	30.0/ 1.42	10.32405
W	/	/	9/ 0.43	5/ 0.24	/	/	/	14.0/ 0.66	7.19645
WNW	/	2/ 0.09	7/ 0.33	5/ 0.24	1/ 0.05	/	/	15.0/ 0.71	7.64604
NW	/	1/ 0.05	2/ 0.09	5/ 0.24	2/ 0.09	/	/	10.0/ 0.47	9.83992
NNW	/	1/ 0.05	3/ 0.14	10/ 0.47	/	/	/	14.0/ 0.66	8.39467
TOTAL	/	8/ 0.38	82/ 3.89	128/ 6.07	33/ 1.57	/	/	251.0/11.91	8.80639

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNDSPO  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=G

UPWNDSPO

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDSPO
N	/	2/ 0.09	10/ 0.47	13/ 0.62	1/ 0.05	/	/	26.0/ 1.23	7.49477
NNE	/	2/ 0.09	16/ 0.76	15/ 0.71	/	/	/	33.0/ 1.57	7.26171
NE	/	/	16/ 0.76	12/ 0.57	/	/	/	28.0/ 1.33	7.15774
ENE	/	2/ 0.09	6/ 0.28	2/ 0.09	/	/	/	10.0/ 0.47	5.84625
E	/	2/ 0.09	6/ 0.28	/	/	/	/	8.0/ 0.38	4.96915
ESE	/	2/ 0.09	3/ 0.14	/	/	/	/	5.0/ 0.24	3.91529
SE	/	1/ 0.05	7/ 0.33	6/ 0.28	/	/	/	14.0/ 0.66	7.09045
SSE	/	1/ 0.05	9/ 0.43	6/ 0.28	/	/	/	16.0/ 0.76	7.19943
S	/	1/ 0.05	5/ 0.24	22/ 1.04	/	/	/	28.0/ 1.33	8.79189
SSW	/	3/ 0.14	14/ 0.66	29/ 1.38	2/ 0.09	/	/	48.0/ 2.28	8.07383
SW	/	/	19/ 0.90	22/ 1.04	7/ 0.33	/	/	48.0/ 2.28	8.74291
WSW	/	2/ 0.09	17/ 0.81	22/ 1.04	2/ 0.09	/	/	43.0/ 2.04	8.14477
W	/	/	16/ 0.76	2/ 0.09	/	/	/	18.0/ 0.85	5.93537
WNW	/	3/ 0.14	7/ 0.33	5/ 0.24	/	/	/	15.0/ 0.71	6.34984
NW	/	/	1/ 0.05	10/ 0.47	/	/	/	11.0/ 0.52	8.77408
NNW	/	/	7/ 0.33	11/ 0.52	1/ 0.05	/	/	19.0/ 0.90	9.14492
TOTAL	/	21/ 1.00	159/ 7.54	177/ 8.40	13/ 0.62	/	/	370.0/ 17.55	7.68411

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR SUMMARY OVER ALL STAB

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	1.9/ 0.09	74/ 3.40	105/ 4.82	35/ 1.61	1/ 0.05	/	/	216.9/ 9.96	4.97815
NNE	1.1/ 0.05	41/ 1.88	108/ 4.96	74/ 3.40	11/ 0.51	/	/	235.1/10.80	6.64028
NE	0.6/ 0.03	24/ 1.10	55/ 2.53	9/ 0.41	1/ 0.05	/	/	89.6/ 4.12	4.90386
ENE	0.6/ 0.03	22/ 1.01	39/ 1.79	6/ 0.28	3/ 0.14	/	/	70.6/ 3.24	4.87259
E	0.6/ 0.03	23/ 1.06	35/ 1.61	4/ 0.18	/	/	/	62.6/ 2.88	4.25305
ESE	0.8/ 0.04	29/ 1.33	35/ 1.61	8/ 0.37	/	/	/	72.8/ 3.34	4.35015
SE	0.8/ 0.04	31/ 1.42	54/ 2.48	13/ 0.60	3/ 0.14	/	/	101.8/ 4.68	5.29422
SSE	1.2/ 0.06	44/ 2.02	65/ 2.99	23/ 1.06	9/ 0.41	/	/	142.2/ 6.53	5.72437
S	1.5/ 0.07	59/ 2.71	53/ 2.43	36/ 1.65	7/ 0.32	/	/	156.5/ 7.19	5.58155
SSW	1.3/ 0.06	49/ 2.25	39/ 1.79	31/ 1.42	11/ 0.51	2/ 0.09	/	133.3/ 6.12	6.11398
SW	0.9/ 0.04	36/ 1.65	44/ 2.02	28/ 1.29	20/ 0.82	/	/	128.9/ 5.92	6.75007
WSW	0.9/ 0.04	36/ 1.65	47/ 2.16	39/ 1.78	12/ 0.55	/	/	134.9/ 6.20	6.60584
W	1.0/ 0.05	38/ 1.75	53/ 2.43	15/ 0.69	/	/	/	107.0/ 4.92	4.83302
WNW	0.7/ 0.03	26/ 1.19	43/ 1.98	33/ 1.52	3/ 0.14	/	/	105.7/ 4.86	6.04827
NW	1.7/ 0.08	66/ 3.03	43/ 1.98	22/ 1.01	2/ 0.09	/	/	134.7/ 6.19	4.53814
NNW	4.3/ 0.20	166/ 7.63	97/ 4.46	17/ 0.78	/	/	/	284.3/13.06	3.53296
TOTAL	20.0/ 0.92	764/35.09	915/42.03	393/18.05	83/ 3.81	2/ 0.09	/	2177/ 100	5.32018

NUMBER OF BAD RECORDS: 7

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT.

15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=A

LOWNSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNSPD
N	/	/	/	/	/	/	/	/	
NNE	/	/	/	/	/	/	/	/	
NE	/	/	/	/	/	/	/	/	
ENE	/	/	/	/	/	/	/	/	
E	/	/	/	/	/	/	/	/	
ESE	/	/	2/ 0.09	/	/	/	/	2.0/ 0.09	7.36201
SE	/	/	3/ 0.14	/	/	/	/	3.0/ 0.14	6.61442
SSE	/	/	/	/	/	/	/	/	
S	/	/	/	/	/	/	/	/	
SSW	/	/	/	/	1/ 0.05	/	/	1.0/ 0.05	16.49156
SW	/	/	/	/	/	/	/	/	
WSW	/	/	/	/	2/ 0.09	/	/	2.0/ 0.09	16.12472
W	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	9.78822
WNW	/	/	/	/	1/ 0.05	/	/	1.0/ 0.05	14.52392
NW	/	/	/	/	/	/	/	/	
NNW	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	10.57195
TOTAL	/	/	5/ 0.23	2/ 0.09	4/ 0.18	/	/	11.0/ 0.51	10.74476

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:28 MONDAY, JULY 23, 1984

5

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=B

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	/	/	/	3/ 0.14	/	/	/	3.0/ 0.14	9.21572
NNE	/	/	/	2/ 0.09	/	/	/	2.0/ 0.09	9.13790
NE	/	/	/	/	/	/	/	/	/
ENE	/	/	1/ 0.05	/	/	/	/	1.0/ 0.05	7.27030
E	/	/	/	/	/	/	/	/	/
ESE	/	/	1/ 0.05	1/ 0.05	/	/	/	2.0/ 0.09	6.81174
SE	/	/	4/ 0.18	/	/	/	/	4.0/ 0.18	5.50275
SSE	/	/	/	/	/	/	/	/	/
S	/	/	4/ 0.18	2/ 0.09	/	/	/	6.0/ 0.28	7.58990
SSW	/	/	/	2/ 0.09	1/ 0.05	/	/	3.0/ 0.14	12.92312
SW	/	/	/	/	4/ 0.18	/	/	4.0/ 0.18	14.55727
WSW	/	/	/	3/ 0.14	2/ 0.09	/	/	5.0/ 0.23	11.54243
W	/	/	/	/	/	/	/	/	/
WNW	/	/	/	2/ 0.09	1/ 0.05	/	/	3.0/ 0.14	10.71647
NW	/	/	1/ 0.05	4/ 0.18	/	/	/	5.0/ 0.23	8.58095
NNW	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	10.73870
TOTAL	/	/	11/ 0.51	20/ 0.92	8/ 0.37	/	/	39.0/ 1.79	9.61207

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=C

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	/	/	1/ 0.05	2/ 0.09	/	/	/	3.0/ 0.14	7.68717
NNE	/	/	2/ 0.09	6/ 0.28	/	/	/	8.0/ 0.37	8.66475
NE	/	/	/	2/ 0.09	/	/	/	2.0/ 0.09	10.38852
ENE	/	/	2/ 0.09	1/ 0.05	/	/	/	3.0/ 0.14	6.15863
E	/	/	/	2/ 0.09	/	/	/	2.0/ 0.09	8.32916
ESE	/	/	4/ 0.18	3/ 0.14	/	/	/	7.0/ 0.32	7.11070
SE	/	/	7/ 0.32	/	/	/	/	7.0/ 0.32	4.70950
SSE	/	/	2/ 0.09	1/ 0.05	/	/	/	3.0/ 0.14	8.40420
S	/	/	3/ 0.14	3/ 0.14	/	/	/	6.0/ 0.28	7.32866
SSW	/	/	/	2/ 0.09	/	/	/	2.0/ 0.09	10.36351
SW	/	/	1/ 0.05	4/ 0.18	3/ 0.14	/	/	8.0/ 0.37	11.78714
WSW	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	11.30565
W	/	/	2/ 0.09	3/ 0.14	/	/	/	5.0/ 0.23	7.68717
WNW	/	/	1/ 0.05	10/ 0.46	/	/	/	11.0/ 0.51	9.10000
NW	/	/	3/ 0.14	4/ 0.18	1/ 0.05	/	/	8.0/ 0.37	8.77939
NNW	/	/	/	2/ 0.09	/	/	/	2.0/ 0.09	10.18009
TOTAL	/	/	28/ 1.29	46/ 2.11	4/ 0.18	/	/	78.0/ 3.58	8.40612

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY.  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT.

15:28 MONDAY, JULY 23, 1984

9

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=D

LOWNDSPD

LOWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	0.3/ 0.01	3/ 0.14	53/ 2.43	27/ 1.24	1/ 0.05	/	/	84.3/ 3.87	7.09515
NNE	0.4/ 0.02	5/ 0.23	63/ 2.89	58/ 2.66	11/ 0.51	/	/	137.4/ 6.31	7.93385
NE	0.4/ 0.02	5/ 0.23	34/ 1.56	6/ 0.28	1/ 0.05	/	/	46.4/ 2.13	5.84918
ENE	0.4/ 0.02	5/ 0.23	32/ 1.47	5/ 0.23	/	/	/	42.4/ 1.95	5.14801
E	0.7/ 0.03	8/ 0.37	22/ 1.01	2/ 0.09	/	/	/	32.7/ 1.50	4.51511
ESE	0.5/ 0.02	6/ 0.28	14/ 0.64	3/ 0.14	/	/	/	23.5/ 1.08	4.74261
SE	1.1/ 0.05	12/ 0.55	20/ 0.92	5/ 0.23	1/ 0.05	/	/	39.1/ 1.80	5.15430
SSE	0.4/ 0.02	4/ 0.18	18/ 0.83	9/ 0.41	1/ 0.05	/	/	32.4/ 1.49	6.31282
S	/	/	16/ 0.73	15/ 0.69	7/ 0.32	/	/	38.0/ 1.75	9.05877
SSW	/	/	9/ 0.41	13/ 0.60	2/ 0.09	2/ 0.09	/	26.0/ 1.19	9.49192
SW	0.1/ 0.00	1/ 0.05	13/ 0.60	21/ 0.96	11/ 0.51	/	/	46.1/ 2.12	9.55647
WSW	/	/	12/ 0.55	17/ 0.78	4/ 0.18	/	/	33.0/ 1.52	8.88474
W	0.3/ 0.01	3/ 0.14	22/ 1.01	7/ 0.32	/	/	/	32.3/ 1.48	6.40167
WNW	0.2/ 0.01	2/ 0.09	20/ 0.92	17/ 0.78	1/ 0.05	/	/	40.2/ 1.85	7.49669
NW	0.3/ 0.01	3/ 0.14	24/ 1.10	10/ 0.46	1/ 0.05	/	/	38.3/ 1.76	6.69133
NNW	/	/	18/ 0.83	9/ 0.41	/	/	/	27.0/ 1.24	6.70891
TOTAL	5.0/ 0.23	57/ 2.62	390/ 17.91	224/ 10.29	41/ 1.88	2/ 0.09	/	719.0/ 33.03	7.11183

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

11  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=E

LOWNSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNSPD
N	/	19/ 0.87	32/ 1.47	3/ 0.14	/	/	/	54.0/ 2.48	4.63349
NNE	/	20/ 0.92	39/ 1.79	8/ 0.37	/	/	/	67.0/ 3.08	5.01196
NE	/	13/ 0.60	17/ 0.78	1/ 0.05	/	/	/	31.0/ 1.42	3.89657
ENE	/	14/ 0.64	3/ 0.14	/	3/ 0.14	/	/	20.0/ 0.92	4.56978
E	/	15/ 0.69	13/ 0.60	/	/	/	/	28.0/ 1.29	3.64468
ESE	/	19/ 0.87	13/ 0.60	1/ 0.05	/	/	/	33.0/ 1.52	3.57906
SE	/	14/ 0.64	18/ 0.83	8/ 0.37	2/ 0.09	/	/	42.0/ 1.93	5.81918
SSE	/	16/ 0.73	36/ 1.65	13/ 0.60	8/ 0.37	/	/	73.0/ 3.35	6.79289
S	/	13/ 0.60	24/ 1.10	16/ 0.73	/	/	/	53.0/ 2.43	6.01338
SSW	/	9/ 0.41	24/ 1.10	14/ 0.64	7/ 0.32	/	/	54.0/ 2.48	7.30705
SW	/	8/ 0.37	16/ 0.73	3/ 0.14	2/ 0.09	/	/	29.0/ 1.33	5.50275
WSW	/	9/ 0.41	27/ 1.24	17/ 0.78	4/ 0.18	/	/	57.0/ 2.62	6.93504
W	/	19/ 0.87	28/ 1.29	4/ 0.18	/	/	/	51.0/ 2.34	4.48623
WNW	/	7/ 0.32	21/ 0.96	4/ 0.18	/	/	/	32.0/ 1.47	4.83835
NW	/	8/ 0.37	13/ 0.60	4/ 0.18	/	/	/	25.0/ 1.15	4.96048
NNW	/	14/ 0.64	42/ 1.93	4/ 0.18	/	/	/	60.0/ 2.76	4.77683
TOTAL	/	217/ 9.97	366/ 16.81	100/ 4.59	26/ 1.19	/	/	709.0/ 32.57	5.38936

NUMBER OF BAD RECORDS: 0



ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

13  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=F

LOWNDSPD

LOWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	0.1/ 0.00	20/ 0.92	7/ 0.32	/	/	/	/	27.1/ 1.24	2.90459
NNE	0.1/ 0.00	9/ 0.41	2/ 0.09	/	/	/	/	11.1/ 0.51	2.70330
NE	0.0/ 0.00	2/ 0.09	3/ 0.14	/	/	/	/	5.0/ 0.23	3.48507
ENE	0.0/ 0.00	1/ 0.05	1/ 0.05	/	/	/	/	2.0/ 0.09	2.67634
E	/	/	/	/	/	/	/	/	/
ESE	0.0/ 0.00	1/ 0.05	1/ 0.05	/	/	/	/	2.0/ 0.09	3.07654
SE	0.0/ 0.00	3/ 0.14	2/ 0.09	/	/	/	/	5.0/ 0.23	3.15824
SSE	0.0/ 0.00	8/ 0.37	8/ 0.37	/	/	/	/	16.0/ 0.73	3.47568
S	0.1/ 0.00	10/ 0.46	5/ 0.23	/	/	/	/	15.1/ 0.69	3.02966
SSW	0.1/ 0.00	12/ 0.55	5/ 0.23	/	/	/	/	17.1/ 0.79	2.61778
SW	0.1/ 0.00	14/ 0.64	9/ 0.41	/	/	/	/	23.1/ 1.06	3.06177
WSW	0.1/ 0.00	16/ 0.73	8/ 0.37	1/ 0.05	/	/	/	25.1/ 1.15	3.15014
W	0.0/ 0.00	7/ 0.32	1/ 0.05	/	/	/	/	8.0/ 0.37	2.50959
WNW	0.1/ 0.00	9/ 0.41	1/ 0.05	/	/	/	/	10.1/ 0.46	2.40796
NW	0.1/ 0.00	21/ 0.96	2/ 0.09	/	/	/	/	23.1/ 1.06	2.50233
NNW	0.2/ 0.01	43/ 1.98	18/ 0.83	/	/	/	/	61.2/ 2.81	3.03937
TOTAL	1.0/ 0.05	176/ 8.08	73/ 3.35	1/ 0.05	/	/	/	251.0/11.53	2.93853

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=1ST QTR STAB=G

LOWNSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNSPD
N	1.4/ 0.06	32/ 1.47	12/ 0.55	/	/	/	/	45.4/ 2.09	2.21879
NNE	0.3/ 0.01	7/ 0.32	2/ 0.09	/	/	/	/	9.3/ 0.43	1.81362
NE	0.2/ 0.01	4/ 0.18	1/ 0.05	/	/	/	/	5.2/ 0.24	1.69955
ENE	0.1/ 0.00	2/ 0.09	/	/	/	/	/	2.1/ 0.10	1.34392
E	/	/	/	/	/	/	/	/	/
ESE	0.1/ 0.00	3/ 0.14	/	/	/	/	/	3.1/ 0.14	0.82433
SE	0.1/ 0.00	2/ 0.09	/	/	/	/	/	2.1/ 0.10	1.37568
SSE	0.7/ 0.03	16/ 0.73	1/ 0.05	/	/	/	/	17.7/ 0.81	1.81304
S	1.6/ 0.07	36/ 1.65	1/ 0.05	/	/	/	/	38.6/ 1.77	1.92582
SSW	1.2/ 0.06	28/ 1.29	1/ 0.05	/	/	/	/	30.2/ 1.39	1.70227
SW	0.6/ 0.03	13/ 0.60	5/ 0.23	/	/	/	/	18.6/ 0.85	2.47434
WSW	0.5/ 0.02	11/ 0.51	/	/	/	/	/	11.5/ 0.53	1.84765
W	0.4/ 0.02	9/ 0.41	/	/	/	/	/	9.4/ 0.43	1.34286
WNW	0.4/ 0.02	8/ 0.37	/	/	/	/	/	8.4/ 0.39	1.36774
NW	1.5/ 0.07	34/ 1.56	/	/	/	/	/	35.5/ 1.63	1.65046
NNW	4.9/ 0.23	109/ 5.01	19/ 0.87	/	/	/	/	132.9/ 6.10	2.31736
TOTAL	14.0/ 0.64	314/ 14.42	42/ 1.93	/	/	/	/	370.0/ 17.00	2.02835

NUMBER OF BAD RECORDS: 0

ENCLOSURE 2

JOINT FREQUENCY OF WIND DIRECTION AND SPEED  
 SECOND QUARTER 1984  
H. B. ROBINSON STEAM ELECTRIC PLANT

The attached tables present the number and frequency of wind direction occurrences by wind speed class as recorded at the on-site meteorological system during the period April 1 through June 30, 1984.

The frequencies are presented as a percent of total occurrences for each stability class as well as a summary for all classes of each sensor elevation. The first eight tables are for the upper sensor elevation (60 meter); the last eight tables are for the lower (10 meter) sensor elevation.

Pertinent information available from the tables is as follows:

1. Stability Percent occurrence Pasquill Stability categories based on lower level (10m) wind distribution:

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>
2.4	3.9	5.0	33.1	35.6	10.7	9.4

2. Wind Speed
- |                           | <u>10 Meter</u> | <u>60 Meter</u> |
|---------------------------|-----------------|-----------------|
| Average Speed (mph)       | 7.9             | 9.6             |
| Percent Calm              | 0.3             | 0.0             |
| Percent Less than 3.5 mph | 27.7            | 4.2             |

3. Wind Direction
- |                      | <u>10 Meter</u> | <u>60 Meter</u> |
|----------------------|-----------------|-----------------|
| Prevailing Direction | S               | S               |
| Percent Occurrence   | 14.9            | 14.4            |

4. Data Recovery
- |                    | <u>10 Meter</u> | <u>60 Meter</u> |
|--------------------|-----------------|-----------------|
| Percent Good Hours | 94.1            | 94.1            |

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNDSPO  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

17  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR SUMMARY OVER ALL STAB

UPWNDSPO

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDSPO
N	/	5/ 0.24	38/ 1.85	60/ 2.92	45/ 2.19	17/ 0.83	/	165.0/ 8.03	11.32727
NNE	/	4/ 0.19	35/ 1.70	30/ 1.46	7/ 0.34	1/ 0.05	/	77.0/ 3.75	8.14086
NE	/	6/ 0.29	38/ 1.85	32/ 1.56	5/ 0.24	1/ 0.05	/	82.0/ 3.99	7.46308
ENE	/	8/ 0.39	29/ 1.41	28/ 1.36	1/ 0.05	/	/	66.0/ 3.21	6.98405
E	/	5/ 0.24	23/ 1.12	14/ 0.68	2/ 0.10	/	/	44.0/ 2.14	6.63362
ESE	/	9/ 0.44	40/ 1.95	23/ 1.12	3/ 0.15	/	/	75.0/ 3.65	6.52111
SE	/	5/ 0.24	40/ 1.95	56/ 2.72	4/ 0.19	/	/	105.0/ 5.11	7.74355
SSE	/	11/ 0.54	35/ 1.70	110/ 5.35	26/ 1.26	4/ 0.19	2/ 0.10	188.0/ 9.14	9.65083
S	/	5/ 0.24	55/ 2.68	181/ 8.80	51/ 2.48	3/ 0.15	1/ 0.05	296.0/14.40	9.97937
SSW	/	6/ 0.29	45/ 2.19	124/ 6.03	53/ 2.58	8/ 0.39	2/ 0.10	238.0/11.58	10.61931
SW	/	5/ 0.24	50/ 2.43	136/ 6.61	64/ 3.11	15/ 0.73	1/ 0.05	271.0/13.18	10.94877
WSW	/	5/ 0.24	59/ 2.87	81/ 3.94	16/ 0.78	6/ 0.29	1/ 0.05	168.0/ 8.17	9.13863
W	/	2/ 0.10	26/ 1.26	26/ 1.26	13/ 0.63	1/ 0.05	/	68.0/ 3.31	9.17836
WNW	/	3/ 0.15	19/ 0.92	14/ 0.68	5/ 0.24	1/ 0.05	/	42.0/ 2.04	8.12946
NW	/	2/ 0.10	22/ 1.07	22/ 1.07	8/ 0.39	1/ 0.05	/	55.0/ 2.68	8.68403
NNW	/	5/ 0.24	18/ 0.88	55/ 2.68	34/ 1.65	4/ 0.19	/	116.0/ 5.64	11.01800
TOTAL	/	86/ 4.18	572/27.82	992/48.25	337/16.39	62/ 3.02	7/ 0.34	2056/ 100	9.57302

NUMBER OF BAD RECORDS: 128

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

19  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=A

UPWNSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNSPD
N	/	/	/	2/ 0.10	4/ 0.19	/	/	6.0/ 0.29	14.26824
NNE	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	10.45522
NE	/	/	/	/	/	/	/	/	/
ENE	/	/	/	/	/	/	/	/	/
E	/	/	1/ 0.05	/	/	/	/	1.0/ 0.05	4.90245
ESE	/	/	/	/	/	/	/	/	/
SE	/	/	/	2/ 0.10	/	/	/	2.0/ 0.10	8.40420
SSE	/	/	/	/	2/ 0.10	/	/	2.0/ 0.10	13.71519
S	/	/	/	5/ 0.24	3/ 0.15	/	/	8.0/ 0.39	11.73294
SSW	/	/	/	5/ 0.24	3/ 0.15	1/ 0.05	/	9.0/ 0.44	12.76378
SW	/	/	/	4/ 0.19	8/ 0.39	1/ 0.05	/	13.0/ 0.63	14.25840
WSW	/	/	/	/	1/ 0.05	/	/	1.0/ 0.05	13.40670
W	/	/	/	/	2/ 0.10	/	/	2.0/ 0.10	14.25712
WNW	/	/	/	/	/	/	/	/	/
NW	/	/	/	/	/	/	/	/	/
NNW	/	/	/	1/ 0.05	3/ 0.15	/	/	4.0/ 0.19	13.54427
TOTAL	/	/	1/ 0.05	20/ 0.97	26/ 1.26	2/ 0.10	/	49.0/ 2.38	12.96736

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

21  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=B

UPWNDSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDSPD
N	/	/	/	1/ 0.05	2/ 0.10	/	/	3.0/ 0.15	12.47290
NNE	/	/	/	/	1/ 0.05	/	/	1.0/ 0.05	14.69067
NE	/	/	/	2/ 0.10	/	/	/	2.0/ 0.10	9.20460
ENE	/	/	/	2/ 0.10	/	/	/	2.0/ 0.10	10.60530
E	/	/	/	/	/	/	/	/	/
ESE	/	/	1/ 0.05	1/ 0.05	/	/	/	2.0/ 0.10	6.18642
SE	/	/	3/ 0.15	5/ 0.24	/	/	/	8.0/ 0.39	7.54752
SSE	/	/	4/ 0.19	6/ 0.29	2/ 0.10	/	/	12.0/ 0.58	9.35745
S	/	/	1/ 0.05	7/ 0.34	1/ 0.05	/	/	9.0/ 0.44	10.06058
SSW	/	/	/	7/ 0.34	4/ 0.19	1/ 0.05	/	12.0/ 0.58	12.64660
SW	/	/	/	8/ 0.39	6/ 0.29	1/ 0.05	/	15.0/ 0.73	12.59740
WSW	/	/	/	2/ 0.10	2/ 0.10	/	/	4.0/ 0.19	11.98099
W	/	/	/	4/ 0.05	2/ 0.10	/	/	3.0/ 0.15	11.66694
WNW	/	/	/	/	1/ 0.05	/	/	1.0/ 0.05	13.13990
NW	/	/	/	/	/	/	/	/	/
NNW	/	/	/	/	5/ 0.24	1/ 0.05	/	6.0/ 0.29	17.10298
TOTAL	/	/	9/ 0.44	42/ 2.04	26/ 1.26	3/ 0.15	/	80.0/ 3.89	11.33400

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

23  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=C

UPWNSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNSPD
N	/	/	1/ 0.05	3/ 0.15	3/ 0.15	/	/	7.0/ 0.34	12.91597
NNE	/	/	1/ 0.05	1/ 0.05	/	/	/	2.0/ 0.10	8.74604
NE	/	/	/	1/ 0.05	2/ 0.10	/	/	3.0/ 0.15	12.76749
ENE	/	/	2/ 0.10	2/ 0.10	/	/	/	4.0/ 0.19	8.48757
E	/	/	2/ 0.10	/	/	/	/	2.0/ 0.10	5.39436
ESE	/	/	/	/	/	/	/	/	/
SE	/	/	2/ 0.10	4/ 0.19	/	/	/	6.0/ 0.29	7.77889
SSE	/	/	3/ 0.15	7/ 0.34	2/ 0.10	/	/	12.0/ 0.58	9.22544
S	/	/	5/ 0.24	11/ 0.54	1/ 0.05	/	/	17.0/ 0.83	9.32819
SSW	/	/	1/ 0.05	8/ 0.39	6/ 0.29	/	/	15.0/ 0.73	12.26057
SW	/	/	1/ 0.05	6/ 0.29	2/ 0.10	3/ 0.15	/	12.0/ 0.58	13.32332
WSW	/	/	1/ 0.05	6/ 0.29	1/ 0.05	1/ 0.05	/	9.0/ 0.44	11.02958
W	/	/	/	2/ 0.10	3/ 0.15	1/ 0.05	/	6.0/ 0.29	14.81573
WNW	/	/	/	2/ 0.10	1/ 0.05	1/ 0.05	/	4.0/ 0.19	13.41920
NW	/	/	/	/	/	/	/	/	/
NNW	/	/	/	2/ 0.10	2/ 0.10	/	/	4.0/ 0.19	13.59846
TOTAL	/	/	19/ 0.92	55/ 2.68	23/ 1.12	6/ 0.29	/	103.0/ 5.01	11.13517

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDOI#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

25  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=D

UPWNDSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDSPD
N	/	1/ 0.05	10/ 0.49	19/ 0.92	29/ 1.41	15/ 0.73	/	74.0/ 3.60	13.49615
NNE	/	/	15/ 0.73	14/ 0.68	6/ 0.29	/	/	35.0/ 1.70	9.11789
NE	/	1/ 0.05	17/ 0.83	16/ 0.78	1/ 0.05	1/ 0.05	/	36.0/ 1.75	7.88218
ENE	/	4/ 0.19	16/ 0.78	7/ 0.34	1/ 0.05	/	/	28.0/ 1.36	6.29838
E	/	3/ 0.15	8/ 0.39	4/ 0.19	1/ 0.05	/	/	16.0/ 0.78	6.68980
ESE	/	3/ 0.15	14/ 0.68	8/ 0.39	1/ 0.05	/	/	26.0/ 1.26	6.02117
SE	/	2/ 0.10	16/ 0.78	14/ 0.68	2/ 0.10	/	/	34.0/ 1.65	7.44490
SSE	/	4/ 0.19	9/ 0.44	26/ 1.26	12/ 0.58	/	/	51.0/ 2.48	9.45309
S	/	/	13/ 0.63	33/ 1.61	25/ 1.22	1/ 0.05	/	72.0/ 3.50	11.19564
SSW	/	1/ 0.05	22/ 1.07	31/ 1.51	12/ 0.58	2/ 0.10	2/ 0.10	70.0/ 3.40	9.98999
SW	/	2/ 0.10	23/ 1.12	28/ 1.36	15/ 0.73	6/ 0.29	/	74.0/ 3.60	10.31078
WSW	/	/	30/ 1.46	24/ 1.17	5/ 0.24	3/ 0.15	/	62.0/ 3.02	8.86446
W	/	/	10/ 0.49	16/ 0.78	4/ 0.19	/	/	30.0/ 1.46	9.49419
WNW	/	/	8/ 0.39	4/ 0.19	3/ 0.15	/	/	15.0/ 0.73	8.79217
NW	/	/	2/ 0.10	11/ 0.54	2/ 0.10	1/ 0.05	/	16.0/ 0.78	10.22594
NNW	/	/	12/ 0.58	18/ 0.88	11/ 0.54	/	/	41.0/ 1.99	10.41089
TOTAL	/	21/ 1.02	225/10.94	273/13.28	130/ 6.32	29/ 1.41	2/ 0.10	680.0/33.07	9.70871

NUMBER OF BAD RECORDS: 0



ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

27  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=E

UPWNSPD

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNSPD
N	/	2/ 0.10	13/ 0.63	18/ 0.88	7/ 0.34	2/ 0.10	/	42.0/ 2.04	9.66634
NNE	/	3/ 0.15	9/ 0.44	12/ 0.58	/	1/ 0.05	/	25.0/ 1.22	7.51175
NE	/	4/ 0.19	17/ 0.83	12/ 0.58	2/ 0.10	/	/	35.0/ 1.70	6.77386
ENE	/	2/ 0.10	6/ 0.29	15/ 0.73	/	/	/	23.0/ 1.12	7.98515
E	/	2/ 0.10	9/ 0.44	7/ 0.34	1/ 0.05	/	/	19.0/ 0.92	6.75776
ESE	/	3/ 0.15	13/ 0.63	13/ 0.63	2/ 0.10	/	/	31.0/ 1.51	7.81197
SE	/	3/ 0.15	13/ 0.63	23/ 1.12	2/ 0.10	/	/	41.0/ 1.99	7.95601
SSE	/	4/ 0.19	8/ 0.39	48/ 2.33	7/ 0.34	3/ 0.15	2/ 0.10	72.0/ 3.50	10.55064
S	/	2/ 0.10	22/ 1.07	101/ 4.91	21/ 1.02	2/ 0.10	1/ 0.05	149.0/ 7.25	9.94154
SSW	/	/	10/ 0.49	52/ 2.53	23/ 1.12	4/ 0.19	/	89.0/ 4.33	11.40176
SW	/	2/ 0.10	14/ 0.68	51/ 2.48	15/ 0.73	3/ 0.15	1/ 0.05	86.0/ 4.18	10.54868
WSW	/	/	14/ 0.68	28/ 1.36	3/ 0.15	2/ 0.10	1/ 0.05	48.0/ 2.33	9.70867
W	/	1/ 0.05	10/ 0.49	4/ 0.19	2/ 0.10	/	/	17.0/ 0.83	7.46059
WNW	/	1/ 0.05	2/ 0.10	2/ 0.10	/	/	/	5.0/ 0.24	6.51325
NW	/	/	11/ 0.54	2/ 0.10	5/ 0.24	/	/	18.0/ 0.88	9.04804
NNW	/	2/ 0.10	4/ 0.19	14/ 0.68	9/ 0.44	3/ 0.15	/	32.0/ 1.56	11.58912
TOTAL	/	31/ 1.51	175/ 8.51	402/ 19.55	99/ 4.82	20/ 0.97	5/ 0.24	732.0/ 35.60	9.60833

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

29  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=F

UPWNSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNSPD
N	/	1/ 0.05	8/ 0.39	6/ 0.29	/	/	/	15.0/ 0.73	7.62159
NNE	/	1/ 0.05	4/ 0.19	1/ 0.05	/	/	/	6.0/ 0.29	5.99466
NE	/	1/ 0.05	1/ 0.05	1/ 0.05	/	/	/	3.0/ 0.15	6.49769
ENE	/	/	3/ 0.15	2/ 0.10	/	/	/	5.0/ 0.24	6.89678
E	/	/	1/ 0.05	3/ 0.15	/	/	/	4.0/ 0.19	7.32866
ESE	/	1/ 0.05	4/ 0.19	/	/	/	/	5.0/ 0.24	4.80240
SE	/	/	/	5/ 0.24	/	/	/	5.0/ 0.24	9.66816
SSE	/	1/ 0.05	7/ 0.34	16/ 0.78	1/ 0.05	1/ 0.05	/	26.0/ 1.26	8.67549
S	/	1/ 0.05	10/ 0.49	16/ 0.78	/	/	/	27.0/ 1.31	8.12381
SSW	/	2/ 0.10	8/ 0.39	11/ 0.54	2/ 0.10	/	/	23.0/ 1.12	8.05620
SW	/	1/ 0.05	7/ 0.34	22/ 1.07	13/ 0.63	1/ 0.05	/	44.0/ 2.14	10.95055
WSW	/	3/ 0.15	5/ 0.24	12/ 0.58	3/ 0.15	/	/	23.0/ 1.12	8.73480
W	/	1/ 0.05	3/ 0.15	2/ 0.10	/	/	/	6.0/ 0.29	6.17809
WNW	/	/	6/ 0.29	1/ 0.05	/	/	/	7.0/ 0.34	7.22027
NW	/	/	2/ 0.10	4/ 0.19	1/ 0.05	/	/	7.0/ 0.34	8.60430
NNW	/	1/ 0.05	/	9/ 0.44	3/ 0.15	/	/	13.0/ 0.63	9.98063
TOTAL	/	14/ 0.68	69/ 3.36	111/ 5.40	23/ 1.12	2/ 0.10	/	219.0/10.65	8.65958

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

31  
 15:30 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=G

UPWNSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNSPD
N	/	1/ 0.05	6/ 0.29	11/ 0.54	/	/	/	18.0/ 0.88	7.58527
NNE	/	/	6/ 0.29	1/ 0.05	/	/	/	7.0/ 0.34	5.90295
NE	/	/	3/ 0.15	/	/	/	/	3.0/ 0.15	4.97471
ENE	/	2/ 0.10	2/ 0.10	/	/	/	/	4.0/ 0.19	2.82224
E	/	/	2/ 0.10	/	/	/	/	2.0/ 0.10	5.71952
ESE	/	2/ 0.10	8/ 0.39	1/ 0.05	/	/	/	11.0/ 0.54	4.90700
SE	/	/	6/ 0.29	3/ 0.15	/	/	/	9.0/ 0.44	6.83860
SSE	/	2/ 0.10	4/ 0.19	7/ 0.34	/	/	/	13.0/ 0.63	7.43192
S	/	2/ 0.10	4/ 0.19	8/ 0.39	/	/	/	14.0/ 0.68	7.44181
SSW	/	3/ 0.15	4/ 0.19	10/ 0.49	3/ 0.15	/	/	20.0/ 0.97	8.87527
SW	/	/	5/ 0.24	17/ 0.83	5/ 0.24	/	/	27.0/ 1.31	10.40396
WSW	/	2/ 0.10	9/ 0.44	9/ 0.44	1/ 0.05	/	/	21.0/ 1.02	7.53234
W	/	/	3/ 0.15	1/ 0.05	/	/	/	4.0/ 0.19	5.74871
WNW	/	2/ 0.10	3/ 0.15	5/ 0.24	/	/	/	10.0/ 0.49	5.96298
NW	/	2/ 0.10	7/ 0.34	5/ 0.24	/	/	/	14.0/ 0.68	6.49372
NNW	/	2/ 0.10	2/ 0.10	11/ 0.54	1/ 0.05	/	/	16.0/ 0.78	8.71581
TOTAL	/	20/ 0.97	74/ 3.60	89/ 4.33	10/ 0.49	/	/	193.0/ 9.39	7.57209

NUMBER OF BAD RECORDS: 0

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ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

17  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR SUMMARY OVER ALL STAB

LOWNDSPD

LOWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N.	0.3/ 0.01	23/ 1.12	60/ 2.92	46/ 2.24	/	/	/	129.3/ 6.29	6.36942
NNE	0.3/ 0.01	25/ 1.22	42/ 2.04	41/ 1.99	3/ 0.15	/	/	111.3/ 5.41	6.43163
NE	0.2/ 0.01	15/ 0.73	44/ 2.14	8/ 0.39	/	/	/	67.2/ 3.27	5.01288
ENE	0.1/ 0.00	9/ 0.44	48/ 2.33	8/ 0.39	/	/	/	65.1/ 3.17	5.29094
E	0.0/ 0.00	4/ 0.19	33/ 1.61	3/ 0.15	/	/	/	40.0/ 1.95	5.11339
ESE	0.3/ 0.01	21/ 1.02	31/ 1.51	/	/	/	/	52.3/ 2.54	3.79460
SE	0.2/ 0.01	17/ 0.83	45/ 2.19	5/ 0.24	/	/	/	67.2/ 3.27	4.88773
SSE	0.5/ 0.02	41/ 1.99	117/ 5.69	24/ 1.17	1/ 0.05	/	/	183.5/ 8.93	5.40442
S	0.9/ 0.04	76/ 3.70	147/ 7.15	78/ 3.79	5/ 0.24	/	/	306.9/ 14.93	5.80555
SSW	0.8/ 0.04	67/ 3.26	114/ 5.54	65/ 3.16	9/ 0.44	/	/	255.8/ 12.44	5.89439
SW	0.7/ 0.03	55/ 2.68	132/ 6.42	62/ 3.02	7/ 0.34	/	/	256.7/ 12.49	5.85171
WSW	0.6/ 0.03	47/ 2.29	85/ 4.13	25/ 1.22	6/ 0.29	/	/	163.6/ 7.96	5.39165
W	0.3/ 0.01	24/ 1.17	32/ 1.56	15/ 0.73	/	/	/	71.3/ 3.47	5.19137
WNW	0.3/ 0.01	25/ 1.22	18/ 0.88	16/ 0.78	1/ 0.05	/	/	60.3/ 2.93	4.93060
NW	0.5/ 0.02	41/ 1.99	19/ 0.92	2/ 0.10	1/ 0.05	/	/	63.5/ 3.09	3.34130
NNW	0.9/ 0.04	73/ 3.55	71/ 3.45	16/ 0.78	1/ 0.05	/	/	161.9/ 7.87	4.35623
TOTAL	7.0/ 0.34	563/ 27.38	1038/ 50.49	414/ 20.14	34/ 1.65	/	/	2056/ 100	5.44868

NUMBER OF BAD RECORDS: 128

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT.

19  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=A

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	/	/	/	8/ 0.39	/	/	/	8.0/ 0.39	9.67775
NNE	/	/	/	3/ 0.15	/	/	/	3.0/ 0.15	8.50981
NE	/	/	/	/	/	/	/	/	/
ENE	/	/	/	/	/	/	/	/	/
E	/	/	/	/	/	/	/	/	/
ESE	/	/	1/ 0.05	/	/	/	/	1.0/ 0.05	4.45222
SE	/	/	/	/	/	/	/	/	/
SSE	/	/	2/ 0.10	1/ 0.05	/	/	/	3.0/ 0.15	8.02067
S	/	/	1/ 0.05	5/ 0.24	1/ 0.05	/	/	7.0/ 0.34	9.95021
SSW	/	/	1/ 0.05	7/ 0.34	1/ 0.05	/	/	9.0/ 0.44	9.48993
SW	/	/	/	11/ 0.54	3/ 0.15	/	/	14.0/ 0.68	10.55170
WSW	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	8.80440
W	/	/	/	3/ 0.15	/	/	/	3.0/ 0.15	9.67150
WNW	/	/	/	/	/	/	/	/	/
NW	/	/	/	/	/	/	/	/	/
NNW	/	/	/	/	/	/	/	/	/
TOTAL	/	/	5/ 0.24	39/ 1.90	5/ 0.24	/	/	49.0/ 2.38	9.63407

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

21  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=B

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	/	/	/	7/ 0.34	/	/	/	7.0/ 0.34	10.18842
NNE	/	/	/	2/ 0.10	/	/	/	2.0/ 0.10	9.84659
NE	/	/	1/ 0.05	/	/	/	/	1.0/ 0.05	5.95297
ENE	/	/	1/ 0.05	2/ 0.10	/	/	/	3.0/ 0.15	7.55933
E	/	/	/	/	/	/	/	/	/
ESE	/	/	/	/	/	/	/	/	/
SE	/	/	9/ 0.44	/	/	/	/	9.0/ 0.44	5.91036
SSE	/	/	6/ 0.29	3/ 0.15	/	/	/	9.0/ 0.44	7.69829
S	/	/	7/ 0.34	4/ 0.19	/	/	/	11.0/ 0.54	7.62502
SSW	/	/	1/ 0.05	8/ 0.39	1/ 0.05	/	/	10.0/ 0.49	9.51642
SW	/	/	4/ 0.19	11/ 0.54	/	/	/	15.0/ 0.73	9.12345
WSW	/	/	1/ 0.05	5/ 0.24	1/ 0.05	/	/	7.0/ 0.34	9.58098
W	/	/	1/ 0.05	2/ 0.10	/	/	/	3.0/ 0.15	8.36529
WNW	/	/	/	2/ 0.10	/	/	/	2.0/ 0.10	9.18792
NW	/	/	/	/	/	/	/	/	/
NNW	/	/	/	1/ 0.05	/	/	/	1.0/ 0.05	10.67200
TOTAL	/	/	31/ 1.51	47/ 2.29	2/ 0.10	/	/	80.0/ 3.89	8.49028

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

23  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=C

LOWNDSPD

LOWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	/	/	2/ 0.10	8/ 0.39	/	/	/	10.0/ 0.49	9.09121
NNE	/	/	1/ 0.05	/	/	/	/	1.0/ 0.05	4.96915
NE	/	/	/	2/ 0.10	/	/	/	2.0/ 0.10	8.73770
ENE	/	/	2/ 0.10	3/ 0.15	/	/	/	5.0/ 0.24	7.29698
E	/	/	2/ 0.10	/	/	/	/	2.0/ 0.10	4.56895
ESE	/	/	1/ 0.05	/	/	/	/	1.0/ 0.05	5.00250
SE	/	/	2/ 0.10	/	/	/	/	2.0/ 0.10	5.71952
SSE	/	/	10/ 0.49	1/ 0.05	/	/	/	11.0/ 0.54	6.73215
S	/	/	5/ 0.24	13/ 0.63	/	/	/	18.0/ 0.88	8.05217
SSW	/	/	7/ 0.34	4/ 0.19	2/ 0.10	/	/	13.0/ 0.63	8.36444
SW	/	/	3/ 0.15	9/ 0.44	/	/	/	12.0/ 0.58	8.60708
WSW	/	/	6/ 0.29	2/ 0.10	3/ 0.15	/	/	11.0/ 0.54	9.15003
W	/	/	2/ 0.10	3/ 0.15	/	/	/	5.0/ 0.24	7.98399
WNW	/	/	2/ 0.10	3/ 0.15	1/ 0.05	/	/	6.0/ 0.29	9.54088
NW	/	/	1/ 0.05	1/ 0.05	1/ 0.05	/	/	3.0/ 0.15	9.03785
NNW	/	/	1/ 0.05	/	/	/	/	1.0/ 0.05	6.30315
TOTAL	/	/	47/ 2.29	49/ 2.38	7/ 0.34	/	/	103.0/ 5.01	8.13270

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

25-  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=D

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	/	2/ 0.10	32/ 1.56	21/ 1.02	/	/	/	55.0/ 2.68	7.17267
NNE	/	4/ 0.19	27/ 1.31	33/ 1.61	2/ 0.10	/	/	66.0/ 3.21	7.59420
NE	/	1/ 0.05	26/ 1.26	6/ 0.29	/	/	/	33.0/ 1.61	5.84753
ENE	/	1/ 0.05	24/ 1.17	3/ 0.15	/	/	/	28.0/ 1.36	5.38146
E	/	3/ 0.15	21/ 1.02	1/ 0.05	/	/	/	25.0/ 1.22	4.74771
ESE	/	5/ 0.24	14/ 0.68	/	/	/	/	19.0/ 0.92	4.21351
SE	/	8/ 0.39	24/ 1.17	4/ 0.19	/	/	/	36.0/ 1.75	4.97702
SSE	/	2/ 0.10	31/ 1.51	14/ 0.68	/	/	/	47.0/ 2.29	6.76260
S	/	4/ 0.19	32/ 1.56	38/ 1.85	/	/	/	74.0/ 3.60	7.55039
SSW	/	1/ 0.05	30/ 1.46	28/ 1.36	5/ 0.24	/	/	64.0/ 3.11	7.86461
SW	/	3/ 0.15	47/ 2.29	24/ 1.17	4/ 0.19	/	/	78.0/ 3.79	7.29210
WSW	/	3/ 0.15	41/ 1.99	14/ 0.68	2/ 0.10	/	/	60.0/ 2.92	6.47629
W	/	3/ 0.15	22/ 1.07	7/ 0.34	/	/	/	32.0/ 1.56	6.08394
WNW	/	2/ 0.10	11/ 0.54	10/ 0.49	/	/	/	23.0/ 1.12	6.62940
NW	/	/	9/ 0.44	/	/	/	/	9.0/ 0.44	5.49349
NNW	/	3/ 0.15	20/ 0.97	7/ 0.34	1/ 0.05	/	/	31.0/ 1.51	6.71106
TOTAL	/	45/ 2.19	411/19.99	210/10.21	14/ 0.68	/	/	680.0/33.07	6.70471

NUMBER OF BAD RECORDS: 0



ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

27  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=E

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	/	5/ 0.24	23/ 1.12	2/ 0.10	/	/	/	30.0/ 1.46	4.85409
NNE	/	12/ 0.58	14/ 0.68	3/ 0.15	1/ 0.05	/	/	30.0/ 1.46	4.91134
NE	/	12/ 0.58	17/ 0.83	/	/	/	/	29.0/ 1.41	3.99395
ENE	/	6/ 0.29	21/ 1.02	/	/	/	/	27.0/ 1.31	4.78387
E	/	1/ 0.05	10/ 0.49	2/ 0.10	/	/	/	13.0/ 0.63	5.90038
ESE	/	10/ 0.49	15/ 0.73	/	/	/	/	25.0/ 1.22	3.92930
SE	/	6/ 0.29	10/ 0.49	1/ 0.05	/	/	/	17.0/ 0.83	4.75630
SSE	/	22/ 1.07	62/ 3.02	5/ 0.24	/	/	/	89.0/ 4.33	4.80352
S	/	24/ 1.17	96/ 4.67	18/ 0.88	4/ 0.19	/	/	142.0/ 6.91	5.58929
SSW	/	27/ 1.31	71/ 3.45	18/ 0.88	/	/	/	116.0/ 5.64	5.26686
SW	/	16/ 0.78	54/ 2.63	7/ 0.34	/	/	/	77.0/ 3.75	4.81344
WSW	/	22/ 1.07	27/ 1.31	3/ 0.15	/	/	/	52.0/ 2.53	4.24731
W	/	14/ 0.68	5/ 0.24	/	/	/	/	19.0/ 0.92	3.05503
WNW	/	7/ 0.34	3/ 0.15	1/ 0.05	/	/	/	11.0/ 0.54	3.45021
NW	/	8/ 0.39	6/ 0.29	1/ 0.05	/	/	/	15.0/ 0.73	4.01867
NNW	/	6/ 0.29	26/ 1.26	8/ 0.39	/	/	/	40.0/ 1.95	5.59446
TOTAL	/	198/ 9.63	460/22.37	69/ 3.36	5/ 0.24	/	/	732.0/35.60	4.91455

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

29  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=F

LOWNDSPD

LOWNDEG	CALM	75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	0.1/ 0.00	4/ 0.19	3/ 0.15	/	/	/	/	7.1/ 0.35	3.34556
NNE	0.1/ 0.00	7/ 0.34	/	/	/	/	/	7.1/ 0.35	1.99454
NE	0.0/ 0.00	2/ 0.10	/	/	/	/	/	2.0/ 0.10	2.20944
ENE	0.0/ 0.00	2/ 0.10	/	/	/	/	/	2.0/ 0.10	2.65966
E	/	/	/	/	/	/	/	/	/
ESE	0.1/ 0.00	4/ 0.19	/	/	/	/	/	4.1/ 0.20	2.03455
SE	/	/	/	/	/	/	/	/	/
SSE	0.1/ 0.00	10/ 0.49	5/ 0.24	/	1/ 0.05	/	/	16.1/ 0.78	3.73245
S	0.4/ 0.02	27/ 1.31	6/ 0.29	/	/	/	/	33.4/ 1.62	2.66849
SSW	0.4/ 0.02	27/ 1.31	1/ 0.05	/	/	/	/	28.4/ 1.38	2.18418
SW	0.2/ 0.01	19/ 0.92	21/ 1.02	/	/	/	/	40.2/ 1.96	3.21429
WSW	0.2/ 0.01	16/ 0.78	9/ 0.44	/	/	/	/	25.2/ 1.23	3.12259
W	0.1/ 0.00	4/ 0.19	2/ 0.10	/	/	/	/	6.1/ 0.30	2.90445
WNW	0.1/ 0.00	5/ 0.24	2/ 0.10	/	/	/	/	7.1/ 0.35	2.31688
NW	0.1/ 0.00	9/ 0.44	2/ 0.10	/	/	/	/	11.1/ 0.54	2.55608
NNW	0.2/ 0.01	17/ 0.83	12/ 0.58	/	/	/	/	29.2/ 1.42	3.39667
TOTAL	2.0/ 0.10	153/ 7.44	63/ 3.06	/	1/ 0.05	/	/	219.0/10.65	2.90809

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

31  
 15:28 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=2ND QTR STAB=G

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	0.4/ 0.02	12/ 0.58	/	/	/	/	/	12.4/ 0.60	1.60698
NNE	0.1/ 0.00	2/ 0.10	/	/	/	/	/	2.1/ 0.10	1.21687
NE	/	/	/	/	/	/	/	/	/
ENE	/	/	/	/	/	/	/	/	/
E	/	/	/	/	/	/	/	/	/
ESE	0.1/ 0.00	2/ 0.10	/	/	/	/	/	2.1/ 0.10	1.05806
SE	0.1/ 0.00	3/ 0.15	/	/	/	/	/	3.1/ 0.15	1.16321
SSE	0.2/ 0.01	7/ 0.34	1/ 0.05	/	/	/	/	8.2/ 0.40	2.24095
S	0.6/ 0.03	21/ 1.02	/	/	/	/	/	21.6/ 1.05	1.89330
SSW	0.4/ 0.02	12/ 0.58	3/ 0.15	/	/	/	/	15.4/ 0.75	2.69831
SW	0.5/ 0.02	17/ 0.83	3/ 0.15	/	/	/	/	20.5/ 1.00	2.20068
WSW	0.2/ 0.01	6/ 0.29	1/ 0.05	/	/	/	/	7.2/ 0.35	2.33680
W	0.1/ 0.00	3/ 0.15	/	/	/	/	/	3.1/ 0.15	1.75490
WNW	0.3/ 0.01	11/ 0.54	/	/	/	/	/	11.3/ 0.55	1.28788
NW	0.7/ 0.03	24/ 1.17	1/ 0.05	/	/	/	/	25.7/ 1.25	1.82159
NNW	1.4/ 0.07	47/ 2.29	12/ 0.58	/	/	/	/	60.4/ 2.94	2.60173
TOTAL	5.0/ 0.24	167/ 8.12	21/ 1.02	/	/	/	/	193.0/ 9.39	2.15040

NUMBER OF BAD RECORDS: 0

ENCLOSURE 3

DIFFUSION ANALYSIS  
GROUND LEVEL RELEASE  
JULY 1 - DECEMBER 31, 1983  
H. B. ROBINSON STEAM ELECTRIC PLANT

Description of Attachment

The attached tables provide estimates of relative ground-level concentration (X/Q) and deposition (D/Q) for the period July 1 through December 31, 1983 for a ground-level release.

A description of the tables is as follows:

- Table 1 - Undecayed, undepleted X/Q for standard distances.
- Table 2 - 2.26-day decay undepleted X/Q for standard distances.
- Table 3 - 8.0-day decay, depleted X/Q for standard distances.
- Table 4 - Deposition estimates for standard distances.
- Table 5 - X/Q and D/Q estimates for site boundary locations and special points of interest.

Method of Calculation

The ground-level release calculations represent sector averaged concentrations at the given distances from the center of the reactor buildings. The computer code used (XOQDOQ) was received from the U. S. Nuclear Regulatory Commission (NRC), Hydrology Meteorology Branch. <sup>(1)</sup>

Input variables included:

1. Wake correction factor from RG 1.111.
2. Building height for wake correction = 59.0 meters.
3. Joint wind frequency from the ten-meter level on-site meteorological tower.
4. Sigma Z limited to 1000 meters.
5. Calm winds included with joint frequency are distributed according to the occurrence in the lowest non-calm speed class.

The adjustment factors to account for the straight-line flow model limitations (RG 1.111, Section C.1.c) were not applied. The code was modified to incorporate the revised curves for estimating plume depletion and ground deposition (XOQDOQ - ERRATA, November 8, 1976).

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(1) Program for the Meteorological Evaluation of Routine Effluent Release at Nuclear Power Stations, J. F. Sagendorf and J. T. Goll, August 29, 1976.

Relative Concentration Estimates

The site boundary distances used for the calculations are as prepared for the June 4, 1976, Appendix I submittal to the NRC. Special point distances were obtained from the December 1978 site survey.

The maximum undepleted, undecayed X/Q value at the site boundary is 4.3E-05 in the SSE sector. Site boundary maximums for previous six-month periods are as follows:

JUL - DEC 1982	4.4E-05	SSE SECTOR
JAN - JUN 1983	4.9E-05	SSE SECTOR
JUL - DEC 1983	3.1E-05	SSE SECTOR



1	11	70.	73.	69.	69.	73.	78.	73.	71.	70.	76.	72.	84.	74.	76.	69.	69.
2	10	1207.	1207.	805.	966.	966.	1207.	1207.	1207.	1207.	2012.	1625.	1448.	1207.	966.	483.	483.
3	11	72.	76.	70.	71.	74.	81.	82.	75.	79.	82.	73.	87.	86.	78.	69.	69.
4	10	2012.	2012.	1207.	1207.	1207.	1448.	2012.	2012.	2012.	2253.	2012.	2012.	1448.	1207.	1207.	1207.
5	11	74.	81.	72.	73.	75.	84.	91.	79.	74.	83.	74.	104.	89.	80.	69.	69.
6	10	2816.	2816.	2012.	2012.	2012.	2012.	2816.	2816.	2816.	2655.	2816.	2816.	2012.	2012.	2012.	2012.
7	11	76.	87.	77.	77.	80.	88.	92.	83.	77.	86.	76.	114.	98.	88.	69.	69.
8	10	3621.	3347.	2816.	2816.	2816.	2816.	3621.	3042.	3122.	2816.	3621.	3541.	2816.	2816.	2816.	2816.
9	11	79.	90.	81.	82.	85.	89.	102.	84.	78.	87.	78.	115.	109.	91.	69.	69.
10	10	4426.	3621.	3621.	3621.	3621.	3621.	4426.	3621.	3621.	3621.	4426.	3621.	3621.	3621.	3621.	3621.
11	11	81.	92.	86.	87.	88.	90.	111.	87.	79.	92.	81.	122.	120.	91.	69.	69.
12	10	5230.	4426.	4426.	4426.	4426.	4426.	5230.	4426.	4426.	4426.	5230.	4426.	4426.	4426.	4426.	4426.
13	11	83.	95.	91.	91.	88.	90.	121.	91.	82.	99.	83.	122.	120.	91.	69.	69.
14	10	6035.	5230.	5230.	5230.	5230.	5230.	6035.	5230.	5230.	5230.	6035.	5230.	5230.	5230.	5230.	5230.
15	11	85.	95.	95.	91.	88.	91.	127.	96.	84.	109.	85.	122.	120.	91.	69.	69.
16	10	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.
17	11	87.	95.	95.	91.	88.	122.	133.	96.	91.	118.	101.	122.	120.	91.	69.	69.
18	12	16	2	14	16	16											

SITE BOUNDARY

19	13																
20	14	1 0.28	2 0.29	3 0.36	4 0.36	5 0.50	6 0.55	7 1.23	8 1.89								
21	9 1.94	10 1.26	11 1.01	12 0.86	13 0.61	14 0.50	15 0.29	16 0.26									
22	13	MILK COW															
23	14	11 1.30	13 4.20														
24	13	MEAT ANIMAL															
25	14	1 2.32	2 2.08	3 2.27	4 2.69	5 3.97	6 4.07	7 1.60	8 2.84								
26	9 2.93	10 1.65	11 1.16	12 2.41	13 3.12	14 1.99											
27	13	RESIDENT															
28	14	1 0.30	2 0.30	3 0.40	4 0.40	5 0.60	6 0.70	7 1.30	8 2.90								
29	9 2.90	10 1.30	11 1.20	12 0.90	13 0.80	14 0.60	15 0.30	16 0.30									
30	13	GARDEN															
31	14	1 0.40	2 0.50	3 0.50	4 0.60	5 0.60	6 0.90	7 1.30	8 3.00								
32	9 2.90	10 1.40	11 1.30	12 2.20	13 2.80	14 0.60	15 0.30	16 0.30									
33	15	EXIT ONE GROUND LEVEL RELEASE JAN-JUN 84															
34	16	0.0	0.0	0.0	59.000	1370.0	11.0	0.0									
35	17	A	0	0	0												
36	15	EXIT TWO MIXED-MODE RELEASE JAN-JUN 84															
37	16	20.100	1.400	60.700	59.000	1370.0	11.0	0.0									
38	17	B	0	0	0												
39																	
40																	
41																	
42																	
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60																	

1 XQOQOQ - ROBINSON GROUND AND MIXED MODE RELEASES JAN-JUN 84

3 THE JOINT FREQUENCY DISTRIBUTION, I=WIND SPEED CLASS, J= STABILITY CLASS

4 DIRECTION =	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
5 I= 1,J= 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 I= 2,J= 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7 I= 3,J= 1	0.0	0.0	0.0	0.0	0.0	0.07	0.07	0.05	0.02	0.02	0.0	0.0	0.0	0.0	0.0	0.0
8 I= 4,J= 1	0.19	0.07	0.0	0.0	0.0	0.0	0.0	0.02	0.12	0.17	0.26	0.02	0.09	0.0	0.0	0.02
9 I= 5,J= 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.05	0.07	0.05	0.0	0.02	0.0	0.0
10 I= 6,J= 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 I= 7,J= 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12 I= 1,J= 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13 I= 2,J= 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14 I= 3,J= 2	0.0	0.0	0.02	0.05	0.0	0.02	0.31	0.14	0.26	0.02	0.09	0.02	0.02	0.0	0.02	0.0
15 I= 4,J= 2	0.24	0.09	0.0	0.05	0.0	0.02	0.0	0.07	0.14	0.24	0.26	0.19	0.05	0.09	0.09	0.05
16 I= 5,J= 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.09	0.07	0.0	0.02	0.0	0.0
17 I= 6,J= 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18 I= 7,J= 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19 I= 1,J= 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20 I= 2,J= 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21 I= 3,J= 3	0.07	0.07	0.0	0.09	0.05	0.12	0.21	0.28	0.19	0.17	0.09	0.14	0.09	0.07	0.09	0.02
22 I= 4,J= 3	0.24	0.14	0.09	0.09	0.05	0.07	0.0	0.05	0.38	0.14	0.31	0.07	0.14	0.31	0.12	0.05
23 I= 5,J= 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.07	0.07	0.0	0.02	0.05	0.0
24 I= 6,J= 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25 I= 7,J= 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26 I= 1,J= 4	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.00	0.0	0.00	0.00	0.01	0.00	0.00	0.00
27 I= 2,J= 4	0.12	0.21	0.14	0.14	0.26	0.26	0.47	0.14	0.09	0.02	0.09	0.07	0.14	0.09	0.07	0.07
28 I= 3,J= 4	2.01	2.13	1.42	1.32	1.02	0.66	1.04	1.16	1.13	0.92	1.42	1.25	1.04	0.73	0.78	0.90
29 I= 4,J= 4	1.13	2.15	0.28	0.19	0.07	0.07	0.21	0.54	1.25	0.97	1.05	0.73	0.33	0.64	0.24	0.38
30 I= 5,J= 4	0.02	0.31	0.02	0.0	0.0	0.0	0.02	0.02	0.17	0.17	0.35	0.14	0.0	0.02	0.02	0.02
31 I= 6,J= 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.0	0.0	0.0	0.0	0.0	0.0
32 I= 7,J= 4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33 I= 1,J= 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
34 I= 2,J= 5	0.57	0.76	0.59	0.47	0.38	0.69	0.47	0.90	0.87	0.85	0.57	0.73	0.78	0.33	0.38	0.47
35 I= 3,J= 5	1.30	1.25	0.80	0.57	0.54	0.66	0.66	2.32	2.83	2.24	1.65	1.28	0.78	0.57	0.45	1.61
36 I= 4,J= 5	0.12	0.26	0.02	0.0	0.05	0.02	0.21	0.43	0.80	0.76	0.24	0.47	0.09	0.12	0.12	0.28
37 I= 5,J= 5	0.0	0.02	0.0	0.07	0.0	0.0	0.05	0.19	0.09	0.17	0.05	0.09	0.0	0.0	0.0	0.0
38 I= 6,J= 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39 I= 7,J= 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40 I= 1,J= 6	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.01
41 I= 2,J= 6	0.57	0.38	0.09	0.07	0.0	0.12	0.07	0.43	0.87	0.92	0.78	0.76	0.26	0.33	0.71	1.42
42 I= 3,J= 6	0.24	0.05	0.07	0.02	0.0	0.02	0.05	0.31	0.26	0.14	0.71	0.40	0.07	0.07	0.09	0.71
43 I= 4,J= 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.0	0.0	0.0	0.0	0.0
44 I= 5,J= 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45 I= 6,J= 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
46 I= 7,J= 6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47 I= 1,J= 7	0.04	0.01	0.00	0.00	0.0	0.00	0.00	0.02	0.05	0.04	0.03	0.02	0.01	0.02	0.05	0.15
48 I= 2,J= 7	1.04	0.21	0.09	0.05	0.0	0.12	0.12	0.54	1.35	0.94	0.71	0.40	0.28	0.45	1.37	3.69
49 I= 3,J= 7	0.28	0.05	0.02	0.0	0.0	0.0	0.05	0.02	0.09	0.19	0.02	0.0	0.0	0.02	0.73	
50 I= 4,J= 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
51 I= 5,J= 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
52 I= 6,J= 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
53 I= 7,J= 7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

54 TOTAL 8.18 8.17 3.70 3.20 2.42 2.95 4.00 7.69 10.96 9.19 9.11 7.04 4.20 3.92 4.69 10.58

55 TOTAL HOURS CONSIDERED ARE 4233

57 WIND MEASURED AT 11.0 METERS.

58 THE MAXIMUM WIND SPEED (METERS/SEC) IN EACH CLASS IS: 0.335 1.565 3.353 5.588 8.270 11.176 11.623

59 THE CONVERSION FACTOR APPLIED TO THE WIND SPEED CLASSES IS 0.447



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DISTANCES AND TERRAIN HEIGHTS IN METERS AS FUNCTIONS OF DIRECTION FROM THE SITE:																
DIRECTION =	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
DISTANCE	402.	402.	402.	402.	402.	402.	402.	402.	402.	402.	402.	402.	402.	402.	402.	402.
ELEVATION	69.	71.	68.	68.	71.	73.	73.	70.	69.	71.	69.	73.	74.	72.	69.	69.
DISTANCE	451.	805.	579.	579.	805.	885.	418.	418.	418.	207.	207.	207.	418.	805.	418.	418.
ELEVATION	70.	73.	69.	69.	73.	78.	73.	71.	70.	76.	72.	84.	74.	76.	69.	69.
DISTANCE	1207.	1207.	805.	966.	966.	1207.	1207.	1207.	1207.	2012.	1625.	1448.	1207.	966.	483.	483.
ELEVATION	72.	76.	70.	71.	74.	81.	82.	75.	79.	82.	73.	87.	86.	78.	69.	69.
DISTANCE	2012.	2012.	1207.	1207.	1207.	1448.	2012.	2012.	2012.	2253.	2012.	2012.	1448.	1207.	1207.	1207.
ELEVATION	74.	81.	72.	73.	75.	84.	91.	79.	74.	83.	74.	104.	89.	80.	69.	69.
DISTANCE	2816.	2816.	2012.	2012.	2012.	2012.	2816.	2816.	2816.	2655.	2816.	2816.	2012.	2012.	2012.	2012.
ELEVATION	76.	87.	77.	77.	80.	88.	92.	83.	77.	86.	76.	114.	98.	88.	69.	69.
DISTANCE	3621.	3347.	2816.	2816.	2816.	2816.	3621.	3042.	3122.	2816.	3621.	3541.	2816.	2816.	2816.	2816.
ELEVATION	79.	90.	81.	82.	85.	89.	102.	84.	78.	87.	78.	115.	109.	91.	69.	69.
DISTANCE	4426.	3621.	3621.	3621.	3621.	3621.	4426.	3621.	3621.	3621.	4426.	3621.	3621.	3621.	3621.	3621.
ELEVATION	81.	92.	86.	87.	88.	90.	111.	87.	79.	92.	81.	122.	120.	91.	69.	69.
DISTANCE	5230.	4426.	4426.	4426.	4426.	4426.	5230.	4426.	4426.	4426.	5230.	4426.	4426.	4426.	4426.	4426.
ELEVATION	83.	95.	91.	91.	88.	90.	121.	91.	82.	99.	83.	122.	120.	91.	69.	69.
DISTANCE	6035.	5230.	5230.	5230.	5230.	5230.	6035.	5230.	5230.	5230.	6035.	5230.	5230.	5230.	5230.	5230.
ELEVATION	85.	95.	95.	91.	88.	91.	127.	96.	84.	109.	85.	122.	120.	91.	69.	69.
DISTANCE	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.	7644.
ELEVATION	87.	95.	95.	91.	88.	122.	133.	96.	91.	118.	101.	122.	120.	91.	69.	69.



1	E	1.449E-06	5.222E-07	2.521E-07	1.589E-07	1.129E-07	5.785E-08	2.309E-08	1.173E-08	7.579E-09	5.488E-09
2	ESE	1.395E-06	4.903E-07	2.400E-07	1.538E-07	1.106E-07	5.784E-08	2.382E-08	1.240E-08	8.132E-09	5.952E-09
3	SE	2.811E-06	9.669E-07	4.841E-07	3.173E-07	2.318E-07	1.244E-07	5.307E-08	2.832E-08	1.884E-08	1.393E-08
4	SSE	7.044E-06	2.404E-06	1.212E-06	8.010E-07	5.882E-07	3.184E-07	1.373E-07	7.384E-08	4.934E-08	3.658E-08
5	VENT AND BUILDING PARAMETERS:										
6	RELEASE HEIGHT (METERS)	0.0	REP. WIND HEIGHT (METERS)				11.0				
7	DIAMETER (METERS)	0.0	BUILDING HEIGHT (METERS)				59.0				
8	EXIT VELOCITY (METERS)	0.0	BLDG. MIN. CRS. SEC. AREA (SQ. METERS)				1370.0				
9			HEAT EMISSION RATE (CAL/SEC)				0.0				
10											
11	AT THE RELEASE HEIGHT:					AT THE MEASURED WIND HEIGHT ( 11.0 METERS):					
12	VENT RELEASE MODE	WIND SPEED (METERS/SEC)			VENT RELEASE MODE	WIND SPEED (METERS/SEC)			WIND SPEED (METERS/SEC)		
13									UNSTABLE/NEUTRAL CONDITIONS		
14									LESS THAN 0.0		
15	ELEVATED	LESS THAN	0.0		ELEVATED	LESS THAN	0.0		LESS THAN 0.0		
16	MIXED	BETWEEN	0.0	AND 0.0	MIXED	BETWEEN	0.0	AND 0.0	BETWEEN 0.0 AND 0.0		
17	GROUND LEVEL	ABOVE	0.0		GROUND LEVEL	ABOVE	0.0		ABOVE 0.0		
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1 EXIT ONE GROUND LEVEL RELEASE JAN-JUN 84  
 2 2.260 DAY DECAY, UNDEPLETED

4 ANNUAL AVERAGE CHI/Q (SEC/METER CUBED)	5 DISTANCE IN MILES										
6 SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
7 S	1.828E-05	5.566E-06	2.827E-06	1.820E-06	9.991E-07	6.754E-07	5.031E-07	3.954E-07	3.224E-07	2.702E-07	2.312E-07
8 SSW	1.070E-05	3.479E-06	1.874E-06	1.229E-06	6.802E-07	4.508E-07	3.284E-07	2.535E-07	2.037E-07	1.686E-07	1.427E-07
9 SW	5.597E-06	1.831E-06	1.004E-06	6.592E-07	3.644E-07	2.409E-07	1.751E-07	1.349E-07	1.082E-07	8.940E-08	7.555E-08
10 WSW	4.308E-06	1.432E-06	7.907E-07	5.189E-07	2.859E-07	1.878E-07	1.357E-07	1.041E-07	8.314E-08	6.846E-08	5.768E-08
11 W	3.166E-06	1.093E-06	6.182E-07	4.066E-07	2.232E-07	1.453E-07	1.041E-07	7.925E-08	6.292E-08	5.152E-08	4.319E-08
12 WNW	5.528E-06	1.779E-06	9.719E-07	6.377E-07	3.528E-07	2.337E-07	1.702E-07	1.314E-07	1.055E-07	8.729E-08	7.385E-08
13 NW	5.956E-06	1.965E-06	1.068E-06	6.956E-07	3.803E-07	2.496E-07	1.805E-07	1.385E-07	1.107E-07	9.123E-08	7.690E-08
14 NNW	1.442E-05	4.457E-06	2.353E-06	1.537E-06	8.536E-07	5.728E-07	4.226E-07	3.295E-07	2.671E-07	2.226E-07	1.896E-07
15 N	2.428E-05	7.337E-06	3.758E-06	2.432E-06	1.344E-06	9.090E-07	6.767E-07	5.316E-07	4.334E-07	3.630E-07	3.105E-07
16 NNE	1.975E-05	5.970E-06	3.070E-06	1.998E-06	1.111E-06	7.521E-07	5.593E-07	4.390E-07	3.576E-07	2.994E-07	2.559E-07
17 NE	1.719E-05	5.239E-06	2.681E-06	1.747E-06	9.725E-07	6.569E-07	4.875E-07	3.820E-07	3.108E-07	2.599E-07	2.220E-07
18 ENE	1.319E-05	4.061E-06	2.115E-06	1.391E-06	7.806E-07	5.255E-07	3.881E-07	3.029E-07	2.456E-07	2.048E-07	1.745E-07
19 E	8.297E-06	2.603E-06	1.384E-06	9.049E-07	5.014E-07	3.351E-07	2.462E-07	1.913E-07	1.546E-07	1.286E-07	1.093E-07
20 ESE	8.408E-06	2.573E-06	1.315E-06	8.497E-07	4.680E-07	3.154E-07	2.341E-07	1.835E-07	1.493E-07	1.248E-07	1.066E-07
21 SE	1.796E-05	5.305E-06	2.614E-06	1.670E-06	9.157E-07	6.259E-07	4.714E-07	3.736E-07	3.068E-07	2.586E-07	2.223E-07
22 SSE	4.583E-05	1.339E-05	6.533E-06	4.153E-06	2.271E-06	1.560E-06	1.181E-06	9.403E-07	7.748E-07	6.549E-07	5.644E-07

25 ANNUAL AVERAGE CHI/Q (SEC/METER CUBED)	26 DISTANCE IN MILES										
27 BEARING	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
28 S	2.010E-07	1.173E-07	7.981E-08	4.610E-08	3.103E-08	2.270E-08	1.751E-08	1.401E-08	1.151E-08	9.655E-09	8.231E-09
29 SSW	1.229E-07	6.914E-08	4.593E-08	2.571E-08	1.696E-08	1.224E-08	9.337E-09	7.406E-09	6.044E-09	5.040E-09	4.276E-09
30 SW	6.499E-08	3.641E-08	2.411E-08	1.344E-08	8.837E-09	6.359E-09	4.842E-09	3.835E-09	3.125E-09	2.603E-09	2.206E-09
31 WSW	4.949E-08	2.746E-08	1.806E-08	9.978E-09	6.526E-09	4.677E-09	3.550E-09	2.804E-09	2.280E-09	1.896E-09	1.604E-09
32 W	3.689E-08	2.009E-08	1.304E-08	7.071E-09	4.564E-09	3.238E-09	2.439E-09	1.914E-09	1.548E-09	1.281E-09	1.080E-09
33 WNW	6.359E-08	3.574E-08	2.372E-08	1.325E-08	8.723E-09	6.279E-09	4.781E-09	3.785E-09	3.082E-09	2.565E-09	2.171E-09
34 NW	6.603E-08	3.674E-08	2.421E-08	1.341E-08	8.781E-09	6.298E-09	4.785E-09	3.781E-09	3.076E-09	2.559E-09	2.166E-09
35 NNW	1.642E-07	9.439E-08	6.361E-08	3.630E-08	2.426E-08	1.766E-08	1.357E-08	1.083E-08	8.880E-09	7.436E-09	6.331E-09
36 N	2.699E-07	1.573E-07	1.069E-07	6.167E-08	4.145E-08	3.029E-08	2.333E-08	1.865E-08	1.531E-08	1.283E-08	1.092E-08
37 NNE	2.224E-07	1.293E-07	8.779E-08	5.054E-08	3.394E-08	2.478E-08	1.908E-08	1.524E-08	1.251E-08	1.048E-08	8.925E-09
38 NE	1.928E-07	1.119E-07	7.586E-08	4.365E-08	2.933E-08	2.144E-08	1.653E-08	1.322E-08	1.087E-08	9.117E-09	7.775E-09
39 ENE	1.512E-07	8.695E-08	5.862E-08	3.345E-08	2.234E-08	1.626E-08	1.249E-08	9.956E-09	8.158E-09	6.827E-09	5.808E-09
40 E	9.445E-08	5.387E-08	3.610E-08	2.043E-08	1.357E-08	9.824E-09	7.514E-09	5.970E-09	4.876E-09	4.068E-09	3.451E-09
41 ESE	9.256E-08	5.366E-08	3.635E-08	2.086E-08	1.398E-08	1.019E-08	7.829E-09	6.243E-09	5.115E-09	4.279E-09	3.638E-09
42 SE	1.941E-07	1.148E-07	7.876E-08	4.590E-08	3.102E-08	2.274E-08	1.755E-08	1.403E-08	1.152E-08	9.654E-09	8.219E-09
43 SSE	4.939E-07	2.945E-07	2.031E-07	1.192E-07	8.099E-08	5.961E-08	4.617E-08	3.705E-08	3.051E-08	2.563E-08	2.188E-08

45 CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT	46 SEGMENT BOUNDARIES IN MILES									
47 DIRECTION FROM SITE	5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
49 S	2.988E-08	1.038E-08	8.080E-07	3.234E-07	2.316E-07	1.192E-07	4.689E-08	2.284E-08	1.406E-08	9.677E-09
50 SSW	1.944E-06	7.002E-07	3.311E-07	2.046E-07	1.430E-07	7.076E-08	2.632E-08	1.234E-08	7.439E-09	5.055E-09
51 SW	1.035E-06	3.750E-07	1.765E-07	1.087E-07	7.575E-08	3.730E-08	1.377E-08	6.413E-09	3.852E-09	2.611E-09
52 WSW	8.124E-07	2.941E-07	1.369E-07	8.352E-08	5.784E-08	2.818E-08	1.024E-08	4.719E-09	2.818E-09	1.902E-09
53 W	6.295E-07	2.293E-07	1.052E-07	6.324E-08	4.333E-08	2.069E-08	7.284E-09	3.272E-09	1.925E-09	1.286E-09
54 WNW	1.003E-06	3.632E-07	1.716E-07	1.060E-07	7.403E-08	3.658E-08	1.356E-08	6.332E-09	3.802E-09	2.572E-09
55 NW	1.102E-06	3.923E-07	1.821E-07	1.112E-07	7.712E-08	3.768E-08	1.375E-08	6.355E-09	3.799E-09	2.566E-09
56 NNW	2.458E-06	8.807E-07	4.254E-07	2.680E-07	1.899E-07	9.622E-08	3.702E-08	1.778E-08	1.087E-08	7.454E-09
57 N	3.964E-06	1.392E-06	6.806E-07	4.346E-07	3.110E-07	1.600E-07	6.274E-08	3.048E-08	1.871E-08	1.286E-08
58 NNE	3.238E-06	1.149E-06	5.626E-07	3.587E-07	2.564E-07	1.315E-07	5.144E-08	2.494E-08	1.530E-08	1.051E-08
59 NE	2.834E-06	1.004E-06	4.905E-07	3.118E-07	2.224E-07	1.138E-07	4.444E-08	2.158E-08	1.327E-08	9.138E-09
60 ENE	2.226E-06	8.029E-07	3.907E-07	2.464E-07	1.748E-07	8.863E-08	3.410E-08	1.637E-08	9.894E-09	6.844E-09

1	E	1.442E-06	5.172E-07	2.479E-07	1.552E-07	1.095E-07	5.499E-08	2.086E-08	9.898E-09	5.994E-09	4.079E-09
2	ESE	1.388E-06	4.850E-07	2.355E-07	1.497E-07	1.068E-07	5.461E-08	2.124E-08	1.025E-08	6.266E-09	4.289E-09
3	SE	2.792E-06	9.545E-07	4.735E-07	3.075E-07	2.226E-07	1.164E-07	4.659E-08	2.287E-08	1.408E-08	9.676E-09
4	SSE	6.899E-06	2.373E-06	1.186E-06	7.764E-07	5.651E-07	2.982E-07	1.209E-07	5.894E-08	3.716E-08	2.569E-08

6 VENT AND BUILDING PARAMETERS:

7	RELEASE HEIGHT (METERS)	0.0	REP. WIND HEIGHT (METERS)	11.0
8	DIAMETER (METERS)	0.0	BUILDING HEIGHT (METERS)	59.0
9	EXIT VELOCITY (METERS)	0.0	BLDG. MIN. CRS. SEC. AREA (SQ. METERS)	1370.0
			HEAT EMISSION RATE (CAL/SEC)	0.0

12 AT THE RELEASE HEIGHT:				12 AT THE MEASURED WIND HEIGHT ( 11.0 METERS):			
13 VENT RELEASE MODE	WIND SPEED (METERS/SEC)			13 VENT RELEASE MODE	WIND SPEED (METERS/SEC)		
14	ELEVATED	LESS THAN	0.0	14	ELEVATED	STABLE CONDITIONS	UNSTABLE/NEUTRAL CONDITIONS
15	MIXED	BETWEEN	0.0 AND 0.0	15	MIXED	LESS THAN 0.0	LESS THAN 0.0
16	GROUND LEVEL	ABOVE	0.0	16	GROUND LEVEL	BETWEEN 0.0 AND 0.0	BETWEEN 0.0 AND 0.0
17				17		ABOVE 0.0	ABOVE 0.0

1 EXIT ONE GROUND LEVEL RELEASE JAN-JUN 84  
2 8.000 DAY DECAY, DEPLETED  
3

4 ANNUAL AVERAGE CHI/Q (SEC/METER CUBED)

DISTANCE IN MILES

SECTOR	0.250	0.500	0.750	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500
S	1.732E-05	5.097E-06	2.529E-06	1.601E-06	8.550E-07	5.651E-07	4.128E-07	3.190E-07	2.563E-07	2.118E-07	1.790E-07
SSW	1.014E-05	3.183E-06	1.675E-06	1.080E-06	5.810E-07	3.761E-07	2.686E-07	2.038E-07	1.612E-07	1.315E-07	1.098E-07
SW	5.303E-06	1.675E-06	8.974E-07	5.793E-07	3.113E-07	2.010E-07	1.432E-07	1.084E-07	8.562E-08	6.973E-08	5.816E-08
WSW	4.081E-06	1.310E-06	7.066E-07	4.560E-07	2.442E-07	1.567E-07	1.110E-07	8.360E-08	6.575E-08	5.337E-08	4.437E-08
W	2.999E-06	9.997E-07	5.525E-07	3.573E-07	1.906E-07	1.213E-07	8.515E-08	6.368E-08	4.976E-08	4.016E-08	3.323E-08
WNW	5.238E-06	1.628E-06	8.691E-07	5.608E-07	3.017E-07	1.953E-07	1.395E-07	1.058E-07	8.368E-08	6.826E-08	5.701E-08
NW	5.644E-06	1.799E-06	9.553E-07	6.118E-07	3.253E-07	2.086E-07	1.479E-07	1.116E-07	8.785E-08	7.137E-08	5.940E-08
NNW	1.366E-05	4.080E-06	2.104E-06	1.352E-06	7.298E-07	4.786E-07	3.462E-07	2.654E-07	2.118E-07	1.740E-07	1.463E-07
N	2.302E-05	6.719E-06	3.362E-06	2.140E-06	1.150E-06	7.605E-07	5.554E-07	4.290E-07	3.445E-07	2.847E-07	2.405E-07
NNE	1.871E-05	5.466E-06	2.747E-06	1.758E-06	9.509E-07	6.290E-07	4.588E-07	3.540E-07	2.841E-07	2.346E-07	1.980E-07
NE	1.629E-05	4.796E-06	2.397E-06	1.536E-06	8.317E-07	5.490E-07	3.996E-07	3.078E-07	2.466E-07	2.034E-07	1.715E-07
ENE	1.249E-05	3.717E-06	1.891E-06	1.223E-06	6.674E-07	4.391E-07	3.180E-07	2.439E-07	1.948E-07	1.601E-07	1.347E-07
E	7.862E-06	2.383E-06	1.238E-06	7.959E-07	4.289E-07	2.801E-07	2.018E-07	1.542E-07	1.227E-07	1.006E-07	8.445E-08
ESE	7.969E-06	2.357E-06	1.177E-06	7.478E-07	4.006E-07	2.640E-07	1.922E-07	1.481E-07	1.187E-07	9.796E-08	8.264E-08
SE	1.703E-05	4.861E-06	2.341E-06	1.471E-06	7.851E-07	5.249E-07	3.880E-07	3.025E-07	2.449E-07	2.037E-07	1.730E-07
SSE	4.344E-05	1.227E-05	5.850E-06	3.659E-06	1.947E-06	1.308E-06	9.722E-07	7.613E-07	6.182E-07	5.157E-07	4.391E-07

25 ANNUAL AVERAGE CHI/Q (SEC/METER CUBED)

DISTANCE IN MILES

BEARING	5.000	7.500	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	50.000
S	1.539E-07	8.605E-08	5.655E-08	3.102E-08	2.010E-08	1.426E-08	1.073E-08	8.397E-09	6.769E-09	5.580E-09	4.683E-09
SSW	9.344E-08	5.025E-08	3.214E-08	1.700E-08	1.074E-08	7.487E-09	5.549E-09	4.292E-09	3.425E-09	2.800E-09	2.332E-09
SW	4.943E-08	2.646E-08	1.687E-08	8.879E-09	5.592E-09	3.886E-09	2.874E-09	2.219E-09	1.768E-09	1.443E-09	1.200E-09
WSW	3.761E-08	1.993E-08	1.261E-08	6.575E-09	4.116E-09	2.846E-09	2.097E-09	1.614E-09	1.282E-09	1.044E-09	8.670E-10
W	2.803E-08	1.457E-08	9.095E-09	4.644E-09	2.863E-09	1.956E-09	1.427E-09	1.089E-09	8.594E-10	6.954E-10	5.741E-10
WNW	4.851E-08	2.609E-08	1.669E-08	8.823E-09	5.577E-09	3.885E-09	2.879E-09	2.226E-09	1.776E-09	1.451E-09	1.208E-09
NW	5.040E-08	2.683E-08	1.704E-08	8.930E-09	5.610E-09	3.891E-09	2.874E-09	2.216E-09	1.764E-09	1.438E-09	1.196E-09
NNW	1.253E-07	6.891E-08	4.478E-08	2.420E-08	1.552E-08	1.094E-08	8.178E-09	6.372E-09	5.116E-09	4.204E-09	3.518E-09
N	2.067E-07	1.155E-07	7.581E-08	4.153E-08	2.688E-08	1.906E-08	1.432E-08	1.120E-08	9.024E-09	7.435E-09	6.235E-09
NNE	1.701E-07	9.477E-08	6.212E-08	3.394E-08	2.193E-08	1.553E-08	1.166E-08	9.112E-09	7.335E-09	6.039E-09	5.063E-09
NE	1.472E-07	8.177E-08	5.349E-08	2.916E-08	1.882E-08	1.332E-08	9.995E-09	7.810E-09	6.287E-09	5.177E-09	4.341E-09
ENE	1.153E-07	6.347E-08	4.126E-08	2.229E-08	1.430E-08	1.007E-08	7.528E-09	5.863E-09	4.707E-09	3.866E-09	3.235E-09
E	7.215E-08	3.941E-08	2.549E-08	1.368E-08	8.732E-09	6.129E-09	4.568E-09	3.549E-09	2.843E-09	2.331E-09	1.947E-09
ESE	7.094E-08	3.945E-08	2.582E-08	1.409E-08	9.098E-09	6.440E-09	4.832E-09	3.775E-09	3.037E-09	2.500E-09	2.095E-09
SE	1.494E-07	8.494E-08	5.640E-08	3.135E-08	2.048E-08	1.462E-08	1.104E-08	8.665E-09	7.001E-09	5.782E-09	4.859E-09
SSE	3.801E-07	2.177E-07	1.453E-07	8.128E-08	5.332E-08	3.817E-08	2.890E-08	2.274E-08	1.841E-08	1.523E-08	1.282E-08

45 CHI/Q (SEC/METER CUBED) FOR EACH SEGMENT

SEGMENT BOUNDARIES IN MILES

DIRECTION FROM SITE	5-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50
S	2.687E-08	8.919E-07	4.159E-07	2.873E-07	1.794E-07	8.802E-08	3.184E-08	1.441E-08	8.443E-09	5.600E-09
SSW	1.746E-06	6.008E-07	2.714E-07	1.621E-07	1.102E-07	5.180E-08	1.758E-08	7.580E-09	4.321E-09	2.812E-09
SW	9.289E-07	3.219E-07	1.447E-07	8.608E-08	5.836E-08	2.730E-08	9.193E-09	3.936E-09	2.434E-09	1.449E-09
WSW	7.294E-07	2.523E-07	1.122E-07	6.613E-08	4.453E-08	2.061E-08	6.824E-09	2.885E-09	1.626E-09	1.049E-09
W	5.651E-07	1.968E-07	8.619E-08	5.008E-08	3.336E-08	1.513E-08	4.842E-09	1.986E-09	1.098E-09	6.991E-10
WNW	9.008E-07	3.120E-07	1.409E-07	8.413E-08	5.720E-08	2.689E-08	9.128E-09	3.934E-09	2.241E-09	1.457E-09
NW	9.901E-07	3.371E-07	1.496E-07	8.835E-08	5.961E-08	2.772E-08	9.257E-09	3.943E-09	2.232E-09	1.445E-09
NNW	2.209E-06	7.564E-07	3.492E-07	2.127E-07	1.467E-07	7.070E-08	2.492E-08	1.106E-08	6.410E-09	4.220E-09
N	3.565E-06	1.197E-06	5.595E-07	3.458E-07	2.410E-07	1.181E-07	4.264E-08	1.925E-08	1.126E-08	7.461E-09
NNE	2.911E-06	9.872E-07	4.623E-07	2.852E-07	1.985E-07	9.699E-08	3.486E-08	1.569E-08	9.162E-09	6.061E-09
NE	2.548E-06	8.626E-07	4.027E-07	2.476E-07	1.719E-07	8.373E-08	2.997E-08	1.346E-08	7.854E-09	5.196E-09
ENE	2.000E-06	6.894E-07	3.206E-07	1.956E-07	1.350E-07	6.512E-08	2.295E-08	1.018E-08	5.898E-09	3.881E-09

1	E	1.296E-06	4.443E-07	2.037E-07	1.233E-07	8.469E-08	4.050E-08	1.410E-08	6.199E-09	3.571E-09	2.340E-09
2	ESE	1.248E-06	4.171E-07	1.937E-07	1.192E-07	8.284E-08	4.039E-08	1.448E-08	6.506E-09	3.796E-09	2.509E-09
3	SE	2.514E-06	8.219E-07	3.903E-07	2.456E-07	1.734E-07	8.658E-08	3.209E-08	1.475E-08	8.708E-09	5.801E-09
4	SSE	6.302E-06	2.043E-06	9.774E-07	6.201E-07	4.399E-07	2.216E-07	8.308E-08	3.850E-08	2.285E-08	1.528E-08

6 VENT AND BUILDING PARAMETERS:

7	RELEASE HEIGHT (METERS)	0.0	REP. WIND HEIGHT (METERS)	11.0
8	DIAMETER (METERS)	0.0	BUILDING HEIGHT (METERS)	59.0
9	EXIT VELOCITY (METERS)	0.0	BLDG. MIN. CRS. SEC. AREA (SQ. METERS)	1370.0
10			HEAT EMISSION RATE (CAL/SEC)	0.0

12 AT THE RELEASE HEIGHT:

13	VENT RELEASE MODE	WIND SPEED (METERS/SEC)
14		
15	ELEVATED	LESS THAN 0.0
16	MIXED	BETWEEN 0.0 AND 0.0
17	GROUND LEVEL	ABOVE 0.0

12 AT THE MEASURED WIND HEIGHT ( 11.0 METERS):

13	VENT RELEASE MODE	WIND SPEED (METERS/SEC)	WIND SPEED (METERS/SEC)
14		STABLE CONDITIONS	UNSTABLE/NEUTRAL CONDITIONS
15	ELEVATED	LESS THAN 0.0	LESS THAN 0.0
16	MIXED	BETWEEN 0.0 AND 0.0	BETWEEN 0.0 AND 0.0
17	GROUND LEVEL	ABOVE 0.0	ABOVE 0.0

1 EXIT ONE GROUND LEVEL RELEASE JAN-JUN 84												
2 ***** RELATIVE DEPOSITION PER UNIT AREA (M** <sup>-2</sup> ) AT FIXED POINTS BY DOWNWIND SECTORS *****												
3 DIRECTION												
4 FROM SITE												
	0.25	0.50	0.75	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	
5 S	4.734E-08	1.601E-08	8.220E-09	5.047E-09	2.516E-09	1.526E-09	1.032E-09	7.477E-10	5.685E-10	4.479E-10	3.626E-10	
6 SSW	4.731E-08	1.600E-08	8.215E-09	5.044E-09	2.515E-09	1.525E-09	1.031E-09	7.473E-10	5.682E-10	4.476E-10	3.624E-10	
7 SW	2.141E-08	7.239E-09	3.717E-09	2.282E-09	1.138E-09	6.901E-10	4.666E-10	3.381E-10	2.571E-10	2.025E-10	1.640E-10	
8 WSW	1.852E-08	6.263E-09	3.216E-09	1.975E-09	9.844E-10	5.970E-10	4.037E-10	2.925E-10	2.224E-10	1.752E-10	1.419E-10	
9 W	1.402E-08	4.741E-09	2.434E-09	1.495E-09	7.452E-10	4.520E-10	3.056E-10	2.214E-10	1.684E-10	1.327E-10	1.074E-10	
10 WNW	1.706E-08	5.768E-09	2.962E-09	1.819E-09	9.066E-10	5.499E-10	3.718E-10	2.694E-10	2.048E-10	1.614E-10	1.306E-10	
11 NW	2.314E-08	7.826E-09	4.018E-09	2.467E-09	1.230E-09	7.461E-10	5.044E-10	3.655E-10	2.779E-10	2.190E-10	1.773E-10	
12 NNW	4.451E-08	1.505E-08	7.728E-09	4.745E-09	2.366E-09	1.435E-09	9.701E-10	7.030E-10	5.345E-10	4.211E-10	3.409E-10	
13 N	6.344E-08	2.145E-08	1.101E-08	6.764E-09	3.372E-09	2.045E-09	1.383E-09	1.002E-09	7.619E-10	6.002E-10	4.859E-10	
14 NNE	5.321E-08	1.799E-08	9.238E-09	5.673E-09	2.828E-09	1.715E-09	1.160E-09	8.404E-10	6.390E-10	5.034E-10	4.075E-10	
15 NE	5.276E-08	1.784E-08	9.160E-09	5.625E-09	2.804E-09	1.701E-09	1.150E-09	8.332E-10	6.336E-10	4.992E-10	4.041E-10	
16 ENE	4.078E-08	1.379E-08	7.080E-09	4.347E-09	2.167E-09	1.314E-09	8.887E-10	6.440E-10	4.897E-10	3.858E-10	3.123E-10	
17 E	2.433E-08	8.229E-09	4.225E-09	2.594E-09	1.293E-09	7.844E-10	5.304E-10	3.843E-10	2.922E-10	2.302E-10	1.864E-10	
18 ESE	2.272E-08	7.683E-09	3.945E-09	2.422E-09	1.208E-09	7.324E-10	4.952E-10	3.588E-10	2.728E-10	2.150E-10	1.740E-10	
19 SE	2.718E-08	9.191E-09	4.719E-09	2.898E-09	1.445E-09	8.762E-10	5.924E-10	4.293E-10	3.264E-10	2.571E-10	2.082E-10	
20 SSE	6.125E-08	2.071E-08	1.063E-08	6.530E-09	3.256E-09	1.975E-09	1.335E-09	9.674E-10	7.356E-10	5.795E-10	4.692E-10	
21												
22 DIRECTION												
23 FROM SITE												
	5.00	7.50	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	
24 S	2.999E-10	1.470E-10	9.223E-11	4.662E-11	2.821E-11	1.892E-11	1.356E-11	1.018E-11	7.914E-12	6.322E-12	5.160E-12	
25 SSW	2.998E-10	1.469E-10	9.217E-11	4.659E-11	2.820E-11	1.891E-11	1.355E-11	1.017E-11	7.909E-12	6.318E-12	5.157E-12	
26 SW	1.356E-10	6.647E-11	4.170E-11	2.108E-11	1.276E-11	8.554E-12	6.129E-12	4.603E-12	3.579E-12	2.859E-12	2.333E-12	
27 WSW	1.173E-10	5.750E-11	3.608E-11	1.824E-11	1.104E-11	7.401E-12	5.303E-12	3.982E-12	3.096E-12	2.473E-12	2.019E-12	
28 W	8.883E-11	4.353E-11	2.731E-11	1.381E-11	8.356E-12	5.602E-12	4.014E-12	3.014E-12	2.344E-12	1.872E-12	1.528E-12	
29 WNW	1.081E-10	5.296E-11	3.323E-11	1.680E-11	1.017E-11	6.816E-12	4.884E-12	3.667E-12	2.851E-12	2.278E-12	1.859E-12	
30 NW	1.466E-10	7.186E-11	4.509E-11	2.279E-11	1.379E-11	9.248E-12	6.627E-12	4.976E-12	3.869E-12	3.091E-12	2.523E-12	
31 NNW	2.820E-10	1.382E-10	8.671E-11	4.383E-11	2.653E-11	1.779E-11	1.274E-11	9.570E-12	7.441E-12	5.944E-12	4.851E-12	
32 N	4.019E-10	1.970E-10	1.236E-10	6.247E-11	3.781E-11	2.535E-11	1.816E-11	1.364E-11	1.061E-11	8.472E-12	6.915E-12	
33 NNE	3.371E-10	1.652E-10	1.037E-10	5.239E-11	3.171E-11	2.126E-11	1.524E-11	1.144E-11	8.895E-12	7.105E-12	5.800E-12	
34 NE	3.343E-10	1.638E-10	1.028E-10	5.195E-11	3.144E-11	2.108E-11	1.511E-11	1.134E-11	8.819E-12	7.045E-12	5.750E-12	
35 ENE	2.583E-10	1.266E-10	7.944E-11	4.015E-11	2.430E-11	1.629E-11	1.168E-11	8.767E-12	6.816E-12	5.445E-12	4.444E-12	
36 E	1.542E-10	7.555E-11	4.741E-11	2.396E-11	1.450E-11	9.724E-12	6.968E-12	5.232E-12	4.068E-12	3.249E-12	2.652E-12	
37 ESE	1.439E-10	7.054E-11	4.426E-11	2.237E-11	1.354E-11	9.079E-12	6.505E-12	4.885E-12	3.798E-12	3.034E-12	2.476E-12	
38 SE	1.722E-10	8.439E-11	5.295E-11	2.676E-11	1.620E-11	1.086E-11	7.782E-12	5.844E-12	4.544E-12	3.629E-12	2.962E-12	
39 SSE	3.881E-10	1.902E-10	1.193E-10	6.031E-11	3.651E-11	2.448E-11	1.754E-11	1.317E-11	1.024E-11	8.179E-12	6.676E-12	
40												
41 ***** RELATIVE DEPOSITION PER UNIT AREA (M** <sup>-2</sup> ) BY DOWNWIND SECTORS *****												
42 SEGMENT BOUNDARIES IN MILES												
43 DIRECTION	1-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50		
44 FROM SITE												
45 S	8.541E-09	2.639E-09	1.080E-09	6.738E-10	3.847E-10	1.866E-10	4.857E-11	1.828E-11	1.022E-11	6.365E-12		
46 SSW	8.536E-09	2.637E-09	1.048E-09	6.734E-10	3.848E-10	1.866E-10	4.855E-11	1.824E-11	1.027E-11	6.360E-12		
47 SW	3.862E-09	1.193E-09	4.748E-10	2.594E-10	1.648E-10	7.083E-11	9.196E-11	8.708E-12	4.648E-12	9.877E-13		
48 WSW	3.341E-09	1.032E-09	4.108E-10	2.245E-10	1.427E-10	6.128E-11	1.800E-11	7.582E-12	4.022E-12	2.489E-13		
49 W	2.529E-09	7.814E-10	3.110E-10	1.699E-10	1.080E-10	4.639E-11	1.439E-11	5.702E-12	3.048E-12	1.885E-12		
50 WNW	9.077E-09	9.507E-10	3.783E-10	2.067E-10	1.314E-10	5.644E-11	1.750E-11	6.936E-12	3.704E-12	2.293E-12		
51 NW	4.175E-09	1.290E-09	5.133E-10	2.805E-10	1.783E-10	7.658E-11	2.375E-11	9.412E-12	5.026E-12	3.111E-12		
52 NNW	8.030E-09	2.481E-09	9.872E-10	5.394E-10	3.429E-10	1.473E-10	4.567E-11	1.810E-11	9.666E-12	5.983E-12		
53 N	1.144E-08	3.536E-09	1.407E-09	7.689E-10	4.887E-10	2.099E-10	6.509E-11	2.580E-11	1.378E-11	8.527E-12		
54 NNE	9.599E-09	2.966E-09	1.180E-09	6.449E-10	4.099E-10	1.761E-10	5.459E-11	2.164E-11	1.155E-11	7.152E-12		
55 NE	9.518E-09	2.941E-09	1.170E-09	6.394E-10	4.064E-10	1.746E-10	5.413E-11	2.145E-11	1.146E-11	7.091E-12		
56 ENE	7.356E-09	2.273E-09	9.044E-10	4.942E-10	3.114E-10	1.349E-10	4.184E-11	1.658E-11	8.855E-12	5.401E-12		
57 E	4.390E-09	1.356E-09	5.397E-10	2.949E-10	1.874E-10	8.052E-11	2.497E-11	9.896E-12	5.284E-12	3.271E-12		
58 ESE	4.099E-09	1.266E-09	5.039E-10	2.754E-10	1.750E-10	7.517E-11	2.331E-11	9.239E-12	4.934E-12	3.054E-12		
59 SE	4.903E-09	1.515E-09	6.028E-10	3.294E-10	2.094E-10	8.993E-11	2.789E-11	1.105E-11	5.902E-12	3.653E-12		
60 SSE	1.105E-08	3.414E-09	1.359E-09	7.424E-10	4.718E-10	2.027E-10	6.285E-11	2.491E-11	1.330E-11	8.233E-12		



1	VENT AND BUILDING PARAMETERS:					
2	RELEASE HEIGHT (METERS)	0.0	REP. WIND HEIGHT (METERS)	11.0		
3	DIAMETER (METERS)	0.0	BUILDING HEIGHT (METERS)	59.0		
4	EXIT VELOCITY (METERS)	0.0	BLDG. MIN. CRS. SEC. AREA (SQ. METERS)	1370.0		
5			HEAT EMISSION RATE (CAL/SEC)	0.0		
6	AT THE RELEASE HEIGHT:			AT THE MEASURED WIND HEIGHT ( 11.0 METERS):		
7	VENT RELEASE MODE	WIND SPEED (METERS/SEC)		VENT RELEASE MODE	WIND SPEED (METERS/SEC)	
8					STABLE CONDITIONS	UNSTABLE/NEUTRAL CONDITIONS
9	ELEVATED	LESS THAN	0.0	ELEVATED	LESS THAN	0.0
10	MIXED	BETWEEN	0.0 AND 0.0	MIXED	BETWEEN	0.0 AND 0.0
11	GROUND LEVEL	ABOVE	0.0	GROUND LEVEL	ABOVE	0.0
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1 EXIT ONE GROUND LEVEL RELEASE JAN-JUN 84  
 2 SPECIFIC POINTS OF INTEREST

RELEASE ID	TYPE OF LOCATION	DIRECTION	DISTANCE		X/Q			D/Q	
			(MILES)	(METERS)	(SEC/CUB.METER)	(SEC/CUB.METER)	(SEC/CUB.METER)	(PER SQ.METER)	
NO DECAY 2.260 DAY DECAY									
					UNDEPLETED	UNDEPLETED	DEPLETED		
A	SITE BOUNDARY	S	0.28	451.	1.5E-05	1.5E-05	1.4E-05	4.0E-08	
A	SITE BOUNDARY	SSW	0.29	467.	8.3E-06	8.3E-06	7.8E-06	3.8E-08	
A	SITE BOUNDARY	SW	0.36	579.	3.1E-06	3.0E-06	2.8E-06	1.2E-08	
A	SITE BOUNDARY	WSW	0.36	579.	2.4E-06	2.4E-06	2.2E-06	1.1E-08	
A	SITE BOUNDARY	W	0.50	805.	1.1E-06	1.1E-06	1.0E-06	4.7E-09	
A	SITE BOUNDARY	WNW	0.55	885.	1.6E-06	1.5E-06	1.4E-06	4.9E-09	
A	SITE BOUNDARY	NW	1.23	1979.	5.2E-07	5.1E-07	4.4E-07	1.7E-09	
A	SITE BOUNDARY	NNW	1.89	3042.	6.3E-07	6.2E-07	5.2E-07	1.6E-09	
A	SITE BOUNDARY	N	1.94	3122.	9.6E-07	9.5E-07	7.9E-07	2.2E-09	
A	SITE BOUNDARY	NNE	1.26	2028.	1.4E-06	1.4E-06	1.2E-06	3.8E-09	
A	SITE BOUNDARY	NE	1.01	1625.	1.7E-06	1.7E-06	1.5E-06	5.5E-09	
A	SITE BOUNDARY	ENE	0.86	1384.	1.7E-06	1.7E-06	1.8E-06	5.6E-09	
A	SITE BOUNDARY	E	0.61	982.	1.9E-06	1.9E-06	1.7E-06	5.9E-09	
A	SITE BOUNDARY	ESE	0.50	805.	2.6E-06	2.6E-06	2.4E-06	7.7E-09	
A	SITE BOUNDARY	SE	0.29	467.	1.4E-05	1.4E-05	1.3E-05	2.2E-08	
A	SITE BOUNDARY	SSE	0.26	418.	4.3E-05	4.3E-05	4.0E-05	5.8E-08	
A	MILK COW	NE	1.30	2092.	1.2E-06	1.2E-06	1.0E-06	3.6E-09	
A	MILK COW	E	4.20	6759.	1.2E-07	1.2E-07	9.4E-08	2.1E-10	
A	MEAT ANIMAL	S	2.32	3734.	5.6E-07	5.6E-07	4.6E-07	1.2E-09	
A	MEAT ANIMAL	SSW	2.08	3347.	4.3E-07	4.3E-07	3.5E-07	1.4E-09	
A	MEAT ANIMAL	SW	2.27	3653.	2.0E-07	2.0E-07	1.7E-07	5.5E-10	
A	MEAT ANIMAL	WSW	2.69	4329.	1.2E-07	1.2E-07	9.9E-08	3.5E-10	
A	MEAT ANIMAL	W	3.97	6389.	5.3E-08	5.2E-08	4.1E-08	1.3E-10	
A	MEAT ANIMAL	WNW	4.07	6550.	8.7E-08	8.5E-08	6.6E-08	1.6E-10	
A	MEAT ANIMAL	NW	1.60	2575.	3.5E-07	3.5E-07	2.9E-07	1.1E-09	
A	MEAT ANIMAL	NNW	2.84	4571.	3.6E-07	3.6E-07	2.9E-07	7.7E-10	
A	MEAT ANIMAL	N	2.93	4715.	5.6E-07	5.5E-07	4.4E-07	1.0E-09	
A	MEAT ANIMAL	NNE	1.65	2655.	9.8E-07	9.7E-07	8.2E-07	2.4E-09	
A	MEAT ANIMAL	NE	1.16	1867.	1.4E-06	1.4E-06	1.2E-06	4.4E-09	
A	MEAT ANIMAL	ENE	2.41	3879.	4.1E-07	4.1E-07	3.4E-07	9.5E-10	
A	MEAT ANIMAL	E	3.12	5021.	1.9E-07	1.8E-07	1.5E-07	3.6E-10	
A	MEAT ANIMAL	ESE	1.99	3203.	3.2E-07	3.2E-07	2.7E-07	7.4E-10	
A	RESIDENT	S	0.30	483.	1.3E-05	1.3E-05	1.2E-05	3.6E-08	
A	RESIDENT	SSW	0.30	483.	7.9E-06	7.8E-06	7.4E-06	3.6E-08	
A	RESIDENT	SW	0.40	644.	2.6E-06	2.6E-06	2.4E-06	1.0E-08	
A	RESIDENT	WSW	0.40	644.	2.0E-06	2.0E-06	1.9E-06	9.0E-09	
A	RESIDENT	W	0.60	966.	8.5E-07	8.5E-07	7.7E-07	3.5E-09	
A	RESIDENT	WNW	0.70	1127.	1.1E-06	1.1E-06	9.7E-07	3.3E-09	
A	RESIDENT	NW	1.30	2092.	4.7E-07	4.7E-07	4.1E-07	1.6E-09	
A	RESIDENT	NNW	2.90	4667.	3.5E-07	3.5E-07	2.8E-07	7.5E-10	
A	RESIDENT	N	2.90	4667.	5.7E-07	5.6E-07	4.5E-07	1.1E-09	
A	RESIDENT	NNE	1.30	2092.	1.4E-06	1.4E-06	1.2E-06	3.6E-09	
A	RESIDENT	NE	1.20	1931.	1.4E-06	1.3E-06	1.2E-06	4.1E-09	
A	RESIDENT	ENE	0.90	1448.	1.6E-06	1.6E-06	1.4E-06	5.2E-09	
A	RESIDENT	E	0.80	1287.	1.3E-06	1.3E-06	1.1E-06	3.8E-09	
A	RESIDENT	ESE	0.60	966.	1.9E-06	1.9E-06	1.7E-06	5.7E-09	
A	RESIDENT	SE	0.30	483.	1.3E-05	1.3E-05	1.2E-05	2.1E-08	
A	RESIDENT	SSE	0.30	483.	3.3E-05	3.3E-05	3.0E-05	4.6E-08	
A	GARDEN	S	0.40	644.	8.1E-06	8.1E-06	7.5E-06	2.3E-08	
A	GARDEN	SSW	0.50	805.	3.5E-06	3.5E-06	3.2E-06	1.6E-08	
A	GARDEN	SW	0.50	805.	1.8E-06	1.8E-06	1.7E-06	7.2E-09	
A	GARDEN	WSW	0.60	966.	1.1E-06	1.1E-06	9.9E-07	4.6E-09	
A	GARDEN	W	0.60	966.	8.5E-07	8.5E-07	7.7E-07	3.5E-09	

1	A	GARDEN	WNW	0.80	1448.	7.5E-07	7.4E-07	6.6E-07	2.2E-09
2	A	GARDEN	NW	1.30	2092.	4.7E-07	4.7E-07	4.1E-07	1.6E-09
3	A	GARDEN	NNW	3.00	4828.	3.4E-07	3.3E-07	2.7E-07	7.0E-10
4	A	GARDEN	N	2.90	4667.	5.7E-07	5.6E-07	4.5E-07	1.1E-09
5	A	GARDEN	NNE	1.40	2253.	1.2E-06	1.2E-06	1.1E-06	3.2E-09
6	A	GARDEN	NE	1.30	2092.	1.2E-06	1.2E-06	1.0E-06	3.6E-09
7	A	GARDEN	ENE	2.20	3541.	4.7E-07	4.6E-07	3.8E-07	1.1E-09
8	A	GARDEN	E	2.80	4506.	2.1E-07	2.1E-07	1.7E-07	4.3E-10
9	A	GARDEN	ESE	0.60	966.	1.9E-06	1.9E-06	1.7E-06	5.7E-09
10	A	GARDEN	SE	0.30	483.	1.3E-05	1.3E-05	1.2E-05	2.1E-08
11	A	GARDEN	SSE	0.30	483.	3.3E-05	3.3E-05	3.1E-05	4.6E-08
12									
13	VENT AND BUILDING PARAMETERS:								
14	RELEASE HEIGHT (METERS)	0.0	REP. WIND HEIGHT (METERS)	11.0					
15	DIAMETER (METERS)	0.0	BUILDING HEIGHT (METERS)	59.0					
16	EXIT VELOCITY (METERS)	0.0	BLDG. MIN. CRS. SEC. AREA (SQ. METERS)	1370.0					
17				HEAT EMISSION RATE (CAL/SEC)	0.0				
18									
19	AT THE RELEASE HEIGHT:				AT THE MEASURED WIND HEIGHT ( 11.0 METERS):				
20	VENT RELEASE MODE	WIND SPEED (METERS/SEC)		VENT RELEASE MODE	WIND SPEED (METERS/SEC)		WIND SPEED (METERS/SEC)		
21	ELEVATED	LESS THAN	0.0	ELEVATED	STABLE CONDITIONS		UNSTABLE/NEUTRAL CONDITIONS		
22	MIXED	BETWEEN	0.0 AND 0.0	MIXED	LESS THAN	0.0	LESS THAN 0.0		
23	GROUND LEVEL	ABOVE	0.0	GROUND LEVEL	BETWEEN	0.0 AND 0.0	BETWEEN 0.0 AND 0.0		
24					ABOVE	0.0	ABOVE 0.0		
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ENCLOSURE 4

METEOROLOGICAL DATA FOR  
DIFFUSION ANALYSIS  
JANUARY 1 - JUNE 30, 1984  
H. B. ROBINSON STEAM ELECTRIC PLANT

The attached tables present the number and frequency of wind direction occurrences by wind speed class as recorded at the on-site meteorological system during the period January 1 through June 30, 1984.

The frequencies are presented as a percent of total occurrences for each stability class as well as a summary for all classes of each sensor elevation. The first eight tables are for the upper sensor elevation (60 meter); the last eight tables are for the lower (10 meter) sensor elevation.

Pertinent information available from the tables is as follows:

- 1. Stability Percent occurrence Pasquill Stability categories based on lower level (10m) wind distribution.

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>
1.4	2.8	4.3	33.1	34.0	11.1	13.3

- 2. Wind Speed

	<u>10 Meter</u>	<u>60 Meter</u>
Average Speed (mph)	5.4	9.7
Percent Calm	0.6	0.0
Percent Less than 3.5 mph	32.0	4.1

- 3. Wind Direction

	<u>10 Meter</u>	<u>60 Meter</u>
Prevailing Direction	S	SW
Percent Occurrence	11.0	10.2

- 4. Data Recovery

	<u>10 Meter</u>	<u>60 Meter</u>
Percent Good Hours	96.9	95.3

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNDSPO  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:35 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN SUMMARY OVER ALL STAB

UPWNDSPO

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDSPO
N	/	17/ 0.41	92/ 2.21	169/ 4.06	84/ 2.02	25/ 0.60	/	387.0/ 9.29	10.39647
NNE	/	10/ 0.24	89/ 2.14	148/ 3.55	54/ 1.30	19/ 0.46	/	320.0/ 7.68	9.99864
NE	/	10/ 0.24	86/ 2.07	83/ 1.99	17/ 0.41	1/ 0.02	/	197.0/ 4.73	7.89774
ENE	/	13/ 0.31	75/ 1.80	47/ 1.13	5/ 0.12	3/ 0.07	/	143.0/ 3.43	7.23951
E	/	13/ 0.31	88/ 2.11	35/ 0.84	12/ 0.29	1/ 0.02	/	149.0/ 3.58	6.99544
ESE	/	19/ 0.46	85/ 2.04	60/ 1.44	13/ 0.31	/	/	177.0/ 4.25	7.17320
SE	/	15/ 0.36	75/ 1.80	109/ 2.62	24/ 0.58	6/ 0.14	/	229.0/ 5.50	8.61063
SSE	/	18/ 0.43	71/ 1.71	150/ 3.60	50/ 1.20	15/ 0.36	2/ 0.05	306.0/ 7.35	9.90860
S	/	6/ 0.14	82/ 1.97	235/ 5.64	72/ 1.73	5/ 0.12	2/ 0.05	402.0/ 9.65	9.96298
SSW	/	10/ 0.24	79/ 1.90	177/ 4.25	85/ 2.04	22/ 0.53	7/ 0.17	380.0/ 9.13	10.97646
SW	/	5/ 0.12	89/ 2.14	205/ 4.92	94/ 2.26	30/ 0.72	2/ 0.05	425.0/10.21	11.01923
WSW	/	8/ 0.19	101/ 2.43	154/ 3.70	50/ 1.20	12/ 0.29	1/ 0.02	326.0/ 7.83	9.68451
W	/	3/ 0.07	76/ 1.83	96/ 2.31	31/ 0.74	6/ 0.14	1/ 0.02	213.0/ 5.12	9.47320
WNW	/	8/ 0.19	47/ 1.13	58/ 1.39	24/ 0.58	8/ 0.19	1/ 0.02	146.0/ 3.51	9.62239
NW	/	6/ 0.14	33/ 0.79	65/ 1.56	38/ 0.91	3/ 0.07	/	145.0/ 3.48	10.11586
NNW	/	9/ 0.22	42/ 1.01	110/ 2.64	53/ 1.27	5/ 0.12	/	219.0/ 5.26	10.47038
TOTAL	/	170/ 4.08	1210/29.06	1901/45.65	706/16.95	161/ 3.87	16/ 0.38	4164/ 100	9.68514

NUMBER OF BAD RECORDS: 204

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

3  
 15:35 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=A

UPWNSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNSPD
N	/	/	/	2/ 0.05	4/ 0.10	/	/	6.0/ 0.14	14.26824
NNE	/	/	/	1/ 0.02	/	/	/	1.0/ 0.02	10.45522
NE	/	/	/	/	/	/	/	/	
ENE	/	/	/	/	/	/	/	/	
E	/	/	1/ 0.02	/	/	/	/	1.0/ 0.02	4.90245
ESE	/	/	/	3/ 0.07	/	/	/	3.0/ 0.07	10.58307
SE	/	/	1/ 0.02	3/ 0.07	/	/	/	4.0/ 0.10	8.10822
SSE	/	/	/	/	2/ 0.05	/	/	2.0/ 0.05	13.71519
S	/	/	/	5/ 0.12	3/ 0.07	/	/	8.0/ 0.19	11.73294
SSW	/	/	/	5/ 0.12	3/ 0.07	2/ 0.05	/	10.0/ 0.24	13.80356
SW	/	/	/	4/ 0.10	8/ 0.19	2/ 0.05	1/ 0.02	15.0/ 0.36	15.66560
WSW	/	/	/	/	2/ 0.05	/	/	2.0/ 0.05	13.46506
W	/	/	/	/	2/ 0.05	/	1/ 0.02	3.0/ 0.07	17.97565
WNW	/	/	/	/	/	/	/	/	
NW	/	/	/	/	1/ 0.02	/	/	1.0/ 0.02	16.85841
NNW	/	/	/	1/ 0.02	3/ 0.07	/	/	4.0/ 0.10	13.54427
TOTAL	/	/	2/ 0.05	24/ 0.58	28/ 0.67	4/ 0.10	2/ 0.05	60.0/ 1.44	13.52259

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWINDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:35 MONDAY, JULY 23, 1984

5

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=B

UPWINDSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWINDSPD
N	/	/	/	2/ 0.05	2/ 0.05	/	/	4.0/ 0.10	12.18526
NNE	/	/	/	/	2/ 0.05	/	/	2.0/ 0.05	14.59062
NE	/	/	/	2/ 0.05	/	/	/	2.0/ 0.05	9.20460
ENE	/	/	/	3/ 0.07	/	/	/	3.0/ 0.07	10.44411
E	/	/	1/ 0.02	/	/	/	/	1.0/ 0.02	5.73620
ESE	/	/	3/ 0.07	3/ 0.07	/	/	/	6.0/ 0.14	7.61770
SE	/	/	4/ 0.10	5/ 0.12	/	/	/	9.0/ 0.22	7.45002
SSE	/	/	4/ 0.10	8/ 0.19	2/ 0.05	/	/	14.0/ 0.34	9.23319
S	/	/	1/ 0.02	9/ 0.22	2/ 0.05	/	/	12.0/ 0.29	10.10227
SSW	/	/	/	8/ 0.19	5/ 0.12	4/ 0.10	1/ 0.02	18.0/ 0.43	14.59155
SW	/	/	/	8/ 0.19	8/ 0.19	4/ 0.10	/	20.0/ 0.48	14.24461
WSW	/	/	/	4/ 0.10	2/ 0.05	/	/	6.0/ 0.14	11.51409
W	/	/	/	2/ 0.05	2/ 0.05	/	/	4.0/ 0.10	11.55161
WNW	/	/	/	2/ 0.05	3/ 0.07	/	1/ 0.02	6.0/ 0.14	14.40164
NW	/	/	/	/	3/ 0.07	/	/	3.0/ 0.07	14.45722
NNW	/	/	/	2/ 0.05	6/ 0.14	1/ 0.02	/	9.0/ 0.22	15.64670
TOTAL	/	/	13/ 0.31	58/ 1.39	37/ 0.89	9/ 0.22	2/ 0.05	119.0/ 2.86	12.01749

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNDS PD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:35 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=C

UPWNDS PD

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDS PD
N	/	/	1/ 0.02	4/ 0.10	3/ 0.07	/	/	8.0/ 0.19	12.43954
NNE	/	/	1/ 0.02	5/ 0.12	5/ 0.12	/	/	11.0/ 0.26	12.39559
NE	/	/	/	1/ 0.02	2/ 0.05	/	/	3.0/ 0.07	12.76749
ENE	/	/	4/ 0.10	3/ 0.07	/	/	/	7.0/ 0.17	8.47805
E	/	/	2/ 0.05	/	3/ 0.07	/	/	5.0/ 0.12	9.70818
ESE	/	/	5/ 0.12	3/ 0.07	2/ 0.05	/	/	10.0/ 0.24	7.68384
SE	/	/	4/ 0.10	6/ 0.14	/	/	/	10.0/ 0.24	7.68551
SSE	/	/	4/ 0.10	8/ 0.19	3/ 0.07	/	/	15.0/ 0.36	9.57478
S	/	/	5/ 0.12	16/ 0.38	1/ 0.02	/	/	22.0/ 0.53	9.34937
SSW	/	/	1/ 0.02	9/ 0.22	7/ 0.17	/	/	17.0/ 0.41	12.35519
SW	/	/	1/ 0.02	9/ 0.22	4/ 0.10	6/ 0.14	/	20.0/ 0.48	14.76070
WSW	/	/	1/ 0.02	6/ 0.14	2/ 0.05	1/ 0.02	/	10.0/ 0.24	11.46906
W	/	/	/	8/ 0.19	4/ 0.10	1/ 0.02	/	13.0/ 0.31	12.28178
WNW	/	/	/	4/ 0.10	5/ 0.12	2/ 0.05	/	11.0/ 0.26	13.86299
NW	/	/	/	3/ 0.07	3/ 0.07	/	/	6.0/ 0.14	12.87866
NNW	/	/	/	5/ 0.12	3/ 0.07	/	/	8.0/ 0.19	12.46039
TOTAL	/	/	29/ 0.70	90/ 2.16	47/ 1.13	10/ 0.24	/	176.0/ 4.23	11.33019

NUMBER OF BAD RECORDS: 5



ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNDS PD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:35 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=D

UPWNDS PD

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDS PD
N	/	3/ 0.07	29/ 0.70	56/ 1.34	53/ 1.27	22/ 0.53	/	163.0/ 3.91	12.28030
NNE	/	2/ 0.05	34/ 0.82	69/ 1.66	39/ 0.94	17/ 0.41	/	161.0/ 3.87	11.50658
NE	/	5/ 0.12	30/ 0.72	33/ 0.79	4/ 0.10	1/ 0.02	/	73.0/ 1.75	7.93334
ENE	/	4/ 0.10	35/ 0.84	16/ 0.38	4/ 0.10	1/ 0.02	/	60.0/ 1.44	7.16747
E	/	6/ 0.14	35/ 0.84	12/ 0.29	6/ 0.14	/	/	59.0/ 1.42	6.93115
ESE	/	8/ 0.19	24/ 0.58	12/ 0.29	4/ 0.10	/	/	48.0/ 1.15	6.51240
SE	/	7/ 0.17	27/ 0.65	27/ 0.65	5/ 0.12	1/ 0.02	/	67.0/ 1.61	7.74691
SSE	/	8/ 0.19	21/ 0.50	30/ 0.72	16/ 0.38	3/ 0.07	/	78.0/ 1.87	9.23880
S	/	/	23/ 0.55	41/ 0.98	34/ 0.82	2/ 0.05	1/ 0.02	101.0/ 2.43	11.06378
SSW	/	1/ 0.02	31/ 0.74	41/ 0.98	21/ 0.50	5/ 0.12	4/ 0.10	103.0/ 2.47	10.92736
SW	/	2/ 0.05	29/ 0.70	42/ 1.01	26/ 0.62	10/ 0.24	/	109.0/ 2.62	11.02064
WSW	/	/	36/ 0.86	39/ 0.94	16/ 0.38	6/ 0.14	/	97.0/ 2.33	10.03359
W	/	/	25/ 0.60	37/ 0.89	9/ 0.22	4/ 0.10	/	75.0/ 1.80	9.91073
WNW	/	/	20/ 0.48	21/ 0.50	10/ 0.24	3/ 0.07	/	54.0/ 1.30	9.91946
NW	/	1/ 0.02	6/ 0.14	27/ 0.65	13/ 0.31	1/ 0.02	/	48.0/ 1.15	10.72202
NNW	/	1/ 0.02	20/ 0.48	35/ 0.84	22/ 0.53	1/ 0.02	/	79.0/ 1.90	10.50250
TOTAL	/	48/ 1.15	425/ 10.21	538/ 12.92	282/ 6.77	77/ 1.85	5/ 0.12	1375/ 33.02	10.08393

NUMBER OF BAD RECORDS: 24

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWINDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

11  
 15:35 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=E

UPWINDSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>> 25	TOTAL	AVERAGE UPWINDSPD
N	/	9/ 0.22	27/ 0.65	47/ 1.13	19/ 0.46	3/ 0.07	/	105.0/ 2.52	9.17061
NNE	/	5/ 0.12	19/ 0.46	40/ 0.96	8/ 0.19	2/ 0.05	/	74.0/ 1.78	8.88552
NE	/	4/ 0.10	30/ 0.72	28/ 0.67	8/ 0.19	/	/	70.0/ 1.68	7.91514
ENE	/	4/ 0.10	22/ 0.53	20/ 0.48	/	2/ 0.05	/	48.0/ 1.15	7.70003
E	/	4/ 0.10	35/ 0.84	18/ 0.43	3/ 0.07	1/ 0.02	/	61.0/ 1.46	7.26182
ESE	/	6/ 0.14	32/ 0.77	37/ 0.89	7/ 0.17	/	/	82.0/ 1.97	8.03877
SE	/	7/ 0.17	24/ 0.58	46/ 1.10	15/ 0.36	5/ 0.12	/	97.0/ 2.33	9.51128
SSE	/	6/ 0.14	19/ 0.46	68/ 1.63	24/ 0.58	11/ 0.26	2/ 0.05	130.0/ 3.12	11.21714
S	/	2/ 0.05	33/ 0.79	113/ 2.71	29/ 0.70	3/ 0.07	1/ 0.02	181.0/ 4.35	9.98187
SSW	/	/	17/ 0.41	62/ 1.49	41/ 0.98	11/ 0.26	2/ 0.05	133.0/ 3.19	12.24208
SW	/	2/ 0.05	24/ 0.58	68/ 1.63	18/ 0.43	7/ 0.17	1/ 0.02	120.0/ 2.88	10.55361
WSW	/	1/ 0.02	26/ 0.62	48/ 1.15	13/ 0.31	5/ 0.12	1/ 0.02	94.0/ 2.26	10.15064
W	/	2/ 0.05	20/ 0.48	39/ 0.94	14/ 0.34	1/ 0.02	/	76.0/ 1.83	9.82947
WNW	/	1/ 0.02	4/ 0.10	15/ 0.36	5/ 0.12	3/ 0.07	/	28.0/ 0.67	11.07875
NW	/	2/ 0.05	15/ 0.36	11/ 0.26	15/ 0.36	2/ 0.05	/	45.0/ 1.08	10.41298
NNW	/	4/ 0.10	10/ 0.24	26/ 0.62	14/ 0.34	3/ 0.07	/	57.0/ 1.37	10.66936
TOTAL	/	59/ 1.42	357/ 8.57	686/ 16.47	233/ 5.60	59/ 1.42	7/ 0.17	1401/ 33.65	9.86193

NUMBER OF BAD RECORDS: 40

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDEG AND UPWNDSPO  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

13  
 15:35 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=F

UPWNDSPO

UPWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE UPWNDSPO
N	/	2/ 0.05	19/ 0.46	34/ 0.82	2/ 0.05	/	/	57.0/ 1.37	8.65900
NNE	/	1/ 0.02	13/ 0.31	17/ 0.41	/	/	/	31.0/ 0.74	7.50106
NE	/	1/ 0.02	7/ 0.17	7/ 0.17	3/ 0.07	/	/	18.0/ 0.43	8.36714
ENE	/	1/ 0.02	6/ 0.14	3/ 0.07	1/ 0.02	/	/	11.0/ 0.26	6.83372
E	/	1/ 0.02	6/ 0.14	5/ 0.12	/	/	/	12.0/ 0.29	6.67000
ESE	/	1/ 0.02	10/ 0.24	1/ 0.02	/	/	/	12.0/ 0.29	5.83625
SE	/	/	2/ 0.05	13/ 0.31	4/ 0.10	/	/	19.0/ 0.46	10.16034
SSE	/	1/ 0.02	10/ 0.24	23/ 0.55	3/ 0.07	1/ 0.02	/	38.0/ 0.91	8.97510
S	/	1/ 0.02	11/ 0.26	21/ 0.50	3/ 0.07	/	/	36.0/ 0.86	8.60615
SSW	/	3/ 0.07	12/ 0.29	13/ 0.31	3/ 0.07	/	/	31.0/ 0.74	7.79260
SW	/	1/ 0.02	11/ 0.26	35/ 0.84	18/ 0.43	1/ 0.02	/	66.0/ 1.59	10.60353
WSW	/	3/ 0.07	12/ 0.29	26/ 0.62	12/ 0.29	/	/	53.0/ 1.27	9.63437
W	/	1/ 0.02	12/ 0.29	7/ 0.17	/	/	/	20.0/ 0.48	6.89094
WNW	/	2/ 0.05	13/ 0.31	6/ 0.14	1/ 0.02	/	/	22.0/ 0.53	7.51057
NW	/	1/ 0.02	4/ 0.10	9/ 0.22	3/ 0.07	/	/	17.0/ 0.41	9.33113
NNW	/	2/ 0.05	3/ 0.07	19/ 0.46	3/ 0.07	/	/	27.0/ 0.65	9.15828
TOTAL	/	22/ 0.53	151/ 3.63	239/ 5.74	56/ 1.34	2/ 0.05	/	470.0/11.29	8.73798

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR UPWNDDEG AND UPWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15  
 15:35 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=G

UPWNSPD

UPWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5+25	>= 25	TOTAL	AVERAGE UPWNSPD
N	/	3/ 0.07	16/ 0.38	24/ 0.58	1/ 0.02	/	/	44.0/ 1.06	7.53179
NNE	/	2/ 0.05	22/ 0.53	16/ 0.38	/	/	/	40.0/ 0.96	7.02393
NE	/	/	19/ 0.46	12/ 0.29	/	/	/	31.0/ 0.74	6.94648
ENE	/	4/ 0.10	8/ 0.19	2/ 0.05	/	/	/	14.0/ 0.34	4.98225
E	/	2/ 0.05	8/ 0.19	/	/	/	/	10.0/ 0.24	5.11922
ESE	/	4/ 0.10	11/ 0.26	1/ 0.02	/	/	/	16.0/ 0.38	4.59709
SE	/	1/ 0.02	13/ 0.31	9/ 0.22	/	/	/	23.0/ 0.55	6.99190
SSE	/	3/ 0.07	13/ 0.31	13/ 0.31	/	/	/	29.0/ 0.70	7.30365
S	/	3/ 0.07	9/ 0.22	30/ 0.72	/	/	/	42.0/ 1.01	8.34187
SSW	/	6/ 0.14	18/ 0.43	39/ 0.94	5/ 0.12	/	/	68.0/ 1.63	8.30954
SW	/	/	24/ 0.58	39/ 0.94	12/ 0.29	/	/	75.0/ 1.80	9.34089
WSW	/	4/ 0.10	26/ 0.62	31/ 0.74	3/ 0.07	/	/	64.0/ 1.54	7.94381
W	/	/	19/ 0.46	3/ 0.07	/	/	/	22.0/ 0.53	5.90143
WNW	/	5/ 0.12	10/ 0.24	10/ 0.24	/	/	/	25.0/ 0.60	6.19510
NW	/	2/ 0.05	8/ 0.19	15/ 0.36	/	/	/	25.0/ 0.60	7.49708
NNW	/	2/ 0.05	9/ 0.22	22/ 0.53	2/ 0.05	/	/	35.0/ 0.84	8.94876
TOTAL	/	41/ 0.98	233/ 5.60	266/ 6.39	23/ 0.55	/	/	563.0/13.52	7.64571

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:33 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN SUMMARY OVER ALL STAB

LOWNDSPD

LOWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	2.0/ 0.05	97/ 2.29	165/ 3.90	81/ 1.91	1/ 0.02	/	/	346.0/ 8.17	5.50040
NNE	1.3/ 0.03	66/ 1.56	150/ 3.54	115/ 2.72	14/ 0.33	/	/	346.3/ 8.18	6.57470
NE	0.8/ 0.02	39/ 0.92	99/ 2.34	17/ 0.40	1/ 0.02	/	/	156.8/ 3.70	4.95106
ENE	0.6/ 0.01	31/ 0.73	87/ 2.06	14/ 0.33	3/ 0.07	/	/	135.6/ 3.20	5.07620
E	0.5/ 0.01	27/ 0.64	68/ 1.61	7/ 0.17	/	/	/	102.5/ 2.42	4.59184
ESE	1.0/ 0.02	50/ 1.18	66/ 1.56	8/ 0.19	/	/	/	125.0/ 2.95	4.12119
SE	1.0/ 0.02	48/ 1.13	99/ 2.34	18/ 0.43	3/ 0.07	/	/	169.0/ 3.99	5.13303
SSE	1.7/ 0.04	85/ 2.01	182/ 4.30	47/ 1.11	10/ 0.24	/	/	325.7/ 7.69	5.54411
S	2.7/ 0.06	135/ 3.19	200/ 4.72	114/ 2.69	12/ 0.28	/	/	463.7/ 10.95	5.72716
SSW	2.4/ 0.06	116/ 2.74	153/ 3.61	96/ 2.27	20/ 0.47	2/ 0.05	/	389.4/ 9.20	5.96724
SW	1.9/ 0.04	91/ 2.15	176/ 4.16	90/ 2.13	27/ 0.64	/	/	385.9/ 9.12	6.14840
WSW	1.7/ 0.04	83/ 1.96	132/ 3.12	64/ 1.51	18/ 0.43	/	/	298.7/ 7.06	5.93740
W	1.3/ 0.03	62/ 1.46	85/ 2.01	30/ 0.71	/	/	/	178.3/ 4.21	4.97632
WNW	1.0/ 0.02	51/ 1.20	61/ 1.44	49/ 1.16	4/ 0.09	/	/	166.0/ 3.92	5.64227
NW	2.2/ 0.05	107/ 2.53	62/ 1.46	24/ 0.57	3/ 0.07	/	/	198.2/ 4.68	4.15469
NNW	4.9/ 0.12	239/ 5.65	168/ 3.97	33/ 0.78	1/ 0.02	/	/	445.9/ 10.53	3.83686
TOTAL	27.0/ 0.64	1327/ 31.35	1953/ 46.14	807/ 19.06	117/ 2.76	2/ 0.05	/	4233/ 100	5.38326

NUMBER OF BAD RECORDS: 135

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:33 MONDAY, JULY 23, 1984 3

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=A

LOWNDSPD

LOWNDDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	/	/	/	8/ 0.19	/	/	/	8.0/ 0.19	9.67775
NNE	/	/	/	3/ 0.07	/	/	/	3.0/ 0.07	8.50981
NE	/	/	/	/	/	/	/	/	/
ENE	/	/	/	/	/	/	/	/	/
E	/	/	/	/	/	/	/	/	/
ESE	/	/	3/ 0.07	/	/	/	/	3.0/ 0.07	6.39208
SE	/	/	3/ 0.07	/	/	/	/	3.0/ 0.07	6.61442
SSE	/	/	2/ 0.05	1/ 0.02	/	/	/	3.0/ 0.07	8.02067
S	/	/	1/ 0.02	5/ 0.12	1/ 0.02	/	/	7.0/ 0.17	9.95021
SSW	/	/	1/ 0.02	7/ 0.17	2/ 0.05	/	/	10.0/ 0.24	10.19009
SW	/	/	/	11/ 0.26	3/ 0.07	/	/	14.0/ 0.33	10.55170
WSW	/	/	/	1/ 0.02	2/ 0.05	/	/	3.0/ 0.07	13.68461
W	/	/	/	4/ 0.09	/	/	/	4.0/ 0.09	9.70068
WNW	/	/	/	/	1/ 0.02	/	/	1.0/ 0.02	14.52392
NW	/	/	/	/	/	/	/	/	/
NNW	/	/	/	1/ 0.02	/	/	/	1.0/ 0.02	10.57195
TOTAL	/	/	10/ 0.24	41/ 0.97	9/ 0.21	/	/	60.0/ 1.42	9.83769

NUMBER OF BAD RECORDS: 0

FORM 0113 (01/83)

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:33 MONDAY, JULY 23, 1984

5

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=B

LOWNSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNSPD
N	/	/	/	10/ 0.24	/	/	/	10.0/ 0.24	9.89661
NNE	/	/	/	4/ 0.09	/	/	/	4.0/ 0.09	9.49224
NE	/	/	1/ 0.02	/	/	/	/	1.0/ 0.02	5.95297
ENE	/	/	2/ 0.05	2/ 0.05	/	/	/	4.0/ 0.09	7.48707
E	/	/	/	/	/	/	/	/	/
ESE	/	/	1/ 0.02	1/ 0.02	/	/	/	2.0/ 0.05	6.81174
SE	/	/	13/ 0.31	/	/	/	/	13.0/ 0.31	5.78494
SSE	/	/	6/ 0.14	3/ 0.07	/	/	/	9.0/ 0.21	7.69829
S	/	/	11/ 0.26	6/ 0.14	/	/	/	17.0/ 0.40	7.61263
SSW	/	/	1/ 0.02	10/ 0.24	2/ 0.05	/	/	13.0/ 0.31	10.30258
SW	/	/	4/ 0.09	11/ 0.26	4/ 0.09	/	/	19.0/ 0.45	10.26741
WSW	/	/	1/ 0.02	8/ 0.19	3/ 0.07	/	/	12.0/ 0.28	10.39825
W	/	/	1/ 0.02	2/ 0.05	/	/	/	3.0/ 0.07	8.36529
WNW	/	/	/	4/ 0.09	1/ 0.02	/	/	5.0/ 0.12	10.10505
NW	/	/	1/ 0.02	4/ 0.09	/	/	/	5.0/ 0.12	8.58095
NNW	/	/	/	2/ 0.05	/	/	/	2.0/ 0.05	10.70535
TOTAL	/	/	42/ 0.99	67/ 1.58	10/ 0.24	/	/	119.0/ 2.81	8.85793

NUMBER OF BAD RECORDS: 0

APPROVED: [Signature] DATE: [Date]  
 SUPERVISOR: [Name] DATE: [Date]  
 PROJECT: [Name] STAB: [Stab]

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IM001#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

7  
 15:33 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=C

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	/	/	3/ 0.07	10/ 0.24	/	/	/	13.0/ 0.31	8.76720
NNE	/	/	3/ 0.07	6/ 0.14	/	/	/	9.0/ 0.21	8.25412
NE	/	/	/	4/ 0.09	/	/	/	4.0/ 0.09	9.56311
ENE	/	/	4/ 0.09	4/ 0.09	/	/	/	8.0/ 0.19	6.87010
E	/	/	2/ 0.05	2/ 0.05	/	/	/	4.0/ 0.09	6.44906
ESE	/	/	5/ 0.12	3/ 0.07	/	/	/	8.0/ 0.19	6.84717
SE	/	/	9/ 0.21	/	/	/	/	9.0/ 0.21	4.93395
SSE	/	/	12/ 0.28	2/ 0.05	/	/	/	14.0/ 0.33	7.09045
S	/	/	8/ 0.19	16/ 0.38	/	/	/	24.0/ 0.57	7.87129
SSW	/	/	7/ 0.17	6/ 0.14	2/ 0.05	/	/	15.0/ 0.35	8.63098
SW	/	/	4/ 0.09	13/ 0.31	3/ 0.07	/	/	20.0/ 0.47	9.87910
WSW	/	/	6/ 0.14	3/ 0.07	3/ 0.07	/	/	12.0/ 0.28	9.32966
W	/	/	4/ 0.09	6/ 0.14	/	/	/	10.0/ 0.24	7.83558
WNW	/	/	3/ 0.07	13/ 0.31	1/ 0.02	/	/	17.0/ 0.40	9.25561
NW	/	/	4/ 0.09	5/ 0.12	2/ 0.05	/	/	11.0/ 0.26	8.84988
NNW	/	/	1/ 0.02	2/ 0.05	/	/	/	3.0/ 0.07	8.88777
TOTAL	/	/	75/ 1.77	95/ 2.24	11/ 0.26	/	/	181.0/ 4.28	8.25053

NUMBER OF BAD RECORDS: 0



ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15:33 MONDAY, JULY 23, 1984

9

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=D

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	0.2/ 0.00	5/ 0.12	85/ 2.01	48/ 1.13	1/ 0.02	/	/	139.2/ 3.29	7.12980
NNE	0.4/ 0.01	9/ 0.21	90/ 2.13	91/ 2.15	13/ 0.31	/	/	203.4/ 4.81	7.82364
NE	0.3/ 0.01	6/ 0.14	60/ 1.42	12/ 0.28	1/ 0.02	/	/	79.3/ 1.87	5.85398
ENE	0.3/ 0.01	6/ 0.14	56/ 1.32	8/ 0.19	/	/	/	70.3/ 1.66	5.24671
E	0.5/ 0.01	11/ 0.26	43/ 1.02	3/ 0.07	/	/	/	57.5/ 1.36	4.62803
ESE	0.5/ 0.01	11/ 0.26	28/ 0.66	3/ 0.07	/	/	/	42.5/ 1.00	4.50607
SE	1.0/ 0.02	20/ 0.47	44/ 1.04	9/ 0.21	1/ 0.02	/	/	75.0/ 1.77	5.07408
SSE	0.3/ 0.01	6/ 0.14	49/ 1.16	23/ 0.54	1/ 0.02	/	/	79.3/ 1.87	6.58546
S	0.2/ 0.00	4/ 0.09	48/ 1.13	53/ 1.25	7/ 0.17	/	/	112.2/ 2.65	8.05047
SSW	0.0/ 0.00	1/ 0.02	39/ 0.92	41/ 0.97	7/ 0.17	2/ 0.05	/	90.0/ 2.13	8.33472
SW	0.2/ 0.00	4/ 0.09	60/ 1.42	45/ 1.06	15/ 0.35	/	/	124.2/ 2.93	8.12792
WSW	0.1/ 0.00	3/ 0.07	53/ 1.25	31/ 0.73	6/ 0.14	/	/	93.1/ 2.20	7.32464
W	0.3/ 0.01	6/ 0.14	44/ 1.04	14/ 0.33	/	/	/	64.3/ 1.52	6.24355
WNW	0.2/ 0.00	4/ 0.09	31/ 0.73	27/ 0.64	1/ 0.02	/	/	63.2/ 1.49	7.18106
NW	0.1/ 0.00	3/ 0.07	33/ 0.78	10/ 0.24	1/ 0.02	/	/	47.1/ 1.11	6.48448
NNW	0.1/ 0.00	3/ 0.07	38/ 0.90	16/ 0.38	1/ 0.02	/	/	58.1/ 1.37	6.70109
TOTAL	5.0/ 0.12	102/ 2.41	801/18.92	434/10.25	55/ 1.30	2/ 0.05	/	1399/33.05	6.91359

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

11  
 15:33 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=E

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	/	24/ 0.57	55/ 1.30	5/ 0.12	/	/	/	84.0/ 1.98	4.71227
NNE	/	32/ 0.76	53/ 1.25	11/ 0.26	1/ 0.02	/	/	97.0/ 2.29	4.98084
NE	/	25/ 0.59	34/ 0.80	1/ 0.02	/	/	/	60.0/ 1.42	3.94364
ENE	/	20/ 0.47	24/ 0.57	/	3/ 0.07	/	/	47.0/ 1.11	4.69277
E	/	16/ 0.38	23/ 0.54	2/ 0.05	/	/	/	41.0/ 0.97	4.35990
ESE	/	29/ 0.69	28/ 0.66	1/ 0.02	/	/	/	58.0/ 1.37	3.73002
SE	/	20/ 0.47	28/ 0.66	9/ 0.21	2/ 0.05	/	/	59.0/ 1.39	5.51292
SSE	/	38/ 0.90	98/ 2.32	18/ 0.43	8/ 0.19	/	/	162.0/ 3.83	5.69997
S	/	37/ 0.87	120/ 2.83	34/ 0.80	4/ 0.09	/	/	195.0/ 4.61	5.70456
SSW	/	36/ 0.85	95/ 2.24	32/ 0.76	7/ 0.17	/	/	170.0/ 4.02	5.91492
SW	/	24/ 0.57	70/ 1.65	10/ 0.24	2/ 0.05	/	/	106.0/ 2.50	5.00203
WSW	/	31/ 0.73	54/ 1.28	20/ 0.47	4/ 0.09	/	/	109.0/ 2.58	5.65282
W	/	33/ 0.78	33/ 0.78	4/ 0.09	/	/	/	70.0/ 1.65	4.09776
WNW	/	14/ 0.33	24/ 0.57	5/ 0.12	/	/	/	43.0/ 1.02	4.48325
NW	/	16/ 0.38	19/ 0.45	5/ 0.12	/	/	/	40.0/ 0.94	4.60730
NNW	/	20/ 0.47	68/ 1.61	12/ 0.28	/	/	/	100.0/ 2.36	5.10388
TOTAL	/	415/ 9.80	826/ 19.51	169/ 3.99	31/ 0.73	/	/	1441/ 34.04	5.14817

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

13  
 15:33 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=F

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	0.2/ 0.00	24/ 0.57	10/ 0.24	/	/	/	/	34.2/ 0.81	2.99613
NNE	0.1/ 0.00	16/ 0.38	2/ 0.05	/	/	/	/	18.1/ 0.43	2.43814
NE	0.0/ 0.00	4/ 0.09	3/ 0.07	/	/	/	/	7.0/ 0.17	3.12061
ENE	0.0/ 0.00	3/ 0.07	1/ 0.02	/	/	/	/	4.0/ 0.09	2.66800
E	/	/	/	/	/	/	/	/	/
ESE	0.0/ 0.00	5/ 0.12	1/ 0.02	/	/	/	/	6.0/ 0.14	2.40954
SE	0.0/ 0.00	3/ 0.07	2/ 0.05	/	/	/	/	5.0/ 0.12	3.15824
SSE	0.2/ 0.00	18/ 0.43	13/ 0.31	/	1/ 0.02	/	/	32.2/ 0.76	3.59677
S	0.3/ 0.01	37/ 0.87	11/ 0.26	/	/	/	/	48.3/ 1.14	2.78935
SSW	0.4/ 0.01	39/ 0.92	6/ 0.14	/	/	/	/	45.4/ 1.07	2.35066
SW	0.3/ 0.01	33/ 0.78	30/ 0.71	/	/	/	/	63.3/ 1.50	3.15863
WSW	0.3/ 0.01	32/ 0.76	17/ 0.40	1/ 0.02	/	/	/	50.3/ 1.19	3.13783
W	0.1/ 0.00	11/ 0.26	3/ 0.07	/	/	/	/	14.1/ 0.33	2.68041
WNW	0.1/ 0.00	14/ 0.33	3/ 0.07	/	/	/	/	17.1/ 0.40	2.37984
NW	0.3/ 0.01	30/ 0.71	4/ 0.09	/	/	/	/	34.3/ 0.81	2.51462
NNW	0.5/ 0.01	60/ 1.42	30/ 0.71	/	/	/	/	90.5/ 2.14	3.18213
TOTAL	3.0/ 0.07	329/ 7.77	136/ 3.21	1/ 0.02	1/ 0.02	/	/	470.0/ 11.19	2.92427

NUMBER OF BAD RECORDS: 0

ENVIRONMENTAL MONITORING SYSTEM - CAROLINA POWER & LIGHT COMPANY  
 PROGRAM IMDO1#25 (MDFREQ) - FEB 1983  
 JOINT OCCURRENCE FREQUENCIES FOR LOWNDEG AND LOWNDSPD  
 RANGES INCLUDE LOWER END POINT, EXCLUDE UPPER END POINT

15  
 15:33 MONDAY, JULY 23, 1984

SITE=ROBN YEAR=84 PERIOD=JAN-JUN STAB=G

LOWNDSPD

LOWNDEG	CALM	.75-3.5	3.5-7.5	7.5-12.5	12.5-18.5	18.5-25	>= 25	TOTAL	AVERAGE LOWNDSPD
N	1.7/ 0.04	44/ 1.04	12/ 0.28	/	/	/	/	57.7/ 1.36	2.09246
NNE	0.4/ 0.01	9/ 0.21	2/ 0.05	/	/	/	/	11.4/ 0.27	1.70698
NE	0.2/ 0.00	4/ 0.09	1/ 0.02	/	/	/	/	5.2/ 0.12	1.69955
ENE	0.1/ 0.00	2/ 0.05	/	/	/	/	/	2.1/ 0.05	1.34392
E	/	/	/	/	/	/	/	/	/
ESE	0.2/ 0.00	5/ 0.12	/	/	/	/	/	5.2/ 0.12	0.91872
SE	0.2/ 0.00	5/ 0.12	/	/	/	/	/	5.2/ 0.12	1.24901
SSE	0.9/ 0.02	23/ 0.54	2/ 0.05	/	/	/	/	25.9/ 0.61	1.94851
S	2.3/ 0.05	57/ 1.35	1/ 0.02	/	/	/	/	60.3/ 1.42	1.91595
SSW	1.6/ 0.04	40/ 0.94	4/ 0.09	/	/	/	/	45.6/ 1.08	2.03865
SW	1.2/ 0.03	30/ 0.71	8/ 0.19	/	/	/	/	39.2/ 0.93	2.32683
WSW	0.7/ 0.02	17/ 0.40	1/ 0.02	/	/	/	/	18.7/ 0.44	2.04602
W	0.5/ 0.01	12/ 0.28	/	/	/	/	/	12.5/ 0.30	1.44505
WNW	0.8/ 0.02	19/ 0.45	/	/	/	/	/	19.8/ 0.47	1.31715
NW	2.3/ 0.05	58/ 1.37	1/ 0.02	/	/	/	/	61.3/ 1.45	1.72991
NNW	6.2/ 0.15	156/ 3.69	31/ 0.73	/	/	/	/	193.2/ 4.56	2.40707
TOTAL	19.0/ 0.45	481/ 11.36	63/ 1.49	/	/	/	/	563.0/ 13.30	2.07246

NUMBER OF BAD RECORDS: 0

H. B. ROBINSON STEAM ELECTRIC PLANT  
POST OFFICE BOX 790  
HARTSVILLE, SOUTH CAROLINA 29550

AUG 29 1984

Robinson File No: 12510E

Serial: RSEP/84-521

*50-261/D*

Mr. James P. O'Reilly  
Regional Administrator  
U.S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, Suite 3100  
Atlanta, Georgia 30323

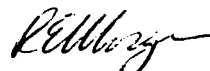
SUBJECT: Effluent and Waste Disposal Semi-Annual Report

Dear Mr. O'Reilly:

The Effluent and Waste Disposal Semi-Annual Report for January through June, 1984, is enclosed as required by 10CFR50.36a (a) (2).

Please contact me if you need additional information.

Very truly yours,



R. E. Morgan  
General Manager  
H. B. Robinson SEG Plant

ALT/sr

Enclosure

cc: R. C. DeYoung (25)  
J. L. Harness (1)  
R. A. Hartfield (2)  
B. H. Webster (4)

34 SEP 4 P12:31

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extra