



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

November 7, 2011

10 CFR 100

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 2  
Docket No. 50-391

Subject: **Meteorology Data for Accident Dose Analysis**

Reference: TVA to NRC letter dated October 17, 2011, "Watts Bar Nuclear Plant (WBN) Unit 2 – Final Safety Analysis Report (FSAR) – Chapter 15.5 Fuel Handling Accident (FHA) Dose Analysis"

The referenced letter provided hourly meteorology data for the 20-year period of 1991 to 2010 on optical media. This data was used to develop the dispersion factors for the accident dose analysis presented in FSAR Section 15.5.

Draft FSAR Section 2.3 Tables developed from the 20-year meteorology data are enclosed herein. The tables are being provided in advance of the submittal of WBN Unit 2 FSAR Amendment 107 in response to a verbal request from the NRC staff.

There are no new commitments in this submittal.

If you have any questions, please contact Gordon Arent at (423) 365-2004.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 7<sup>th</sup> day of November 2011.

Respectfully,

David Stinson  
Watts Bar Unit 2 Vice President

1001  
NRR

U.S. Nuclear Regulatory Commission  
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Enclosure:

1. Draft FSAR Section 2.3 Tables

cc (Enclosure):

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# ENCLOSURE 1

## Draft FSAR Section 2.3 Tables

<b>Tables Provided</b>	
<b>2.3-61b</b>	Calculated 1-Hour Average Atmospheric Dispersion Factors (X/Q) at Minimum Distance (1100 Meters) Between Release Zone (100 m Radius) and Exclusion Area Boundary (1200 m Radius) for Watts Bar Nuclear Plant
<b>2.3-62b</b>	Calculated 1-Hour Average and Annual Average Atmospheric Dispersion Factors (X/Q) at Low Population Zone Distance (4828 Meters) for Watts Bar Nuclear Plant
<b>2.3-63b</b>	Values of 5th Percentile Overall Site 8-Hour, 16-Hour, 3-Day, and 26-Day Atmospheric Dispersion Factors (X/Q) at Low Population Zone Distance (4828 Meters) for Watts Bar Nuclear Plant
<b>2.3-64b</b>	0.5th Percentile Sector Values of 8-Hour, 16-Hour, 3-Day, And 26-Day Atmospheric Dispersion Factors (X/Q) at Low Population Zone Outer Boundary Distance (4828 Meters) for Watts Bar Nuclear Plant
<b>2.3-66b</b>	Atmospheric Dispersion Factors (X/Q), $\text{sec}/\text{m}^3$ , for Design Basis Accident Analyses Based on Onsite Meteorological Data for Watts Bar Nuclear Plant
<b>2.3-67b</b>	Dispersion Meteorology - Onsite 10-Meter Wind Data - 5th Percentile Values of Inverse Wind Speed (1/u) Distributions for Post-LOCA Control Bay Dose Calculations for Watts Bar Nuclear Plant
<b>2.3-76 - 82</b>	Joint Percentage Frequencies of Wind Direction and Wind Speed for Each Stability Class A through G (seven tables)
<b>2.3-83</b>	Joint Percentage Frequencies of Wind Speed by Stability Class Watts Bar Nuclear Plant

**Table 2.3-61b Calculated 1-Hour Average Atmospheric Dispersion Factors (X/Q) at Minimum Distance (1100 Meters) Between Release Zone (100 m Radius) and Exclusion Area Boundary (1200 m Radius) for Watts Bar Nuclear Plant**

Based on RG 1.145 and Meteorological Data for 1991 through 2010\*

Plume Sector Direction	0.5th Percentile X/Q Value (sec/m <sup>3</sup> )	5th Percentile X/Q Value (sec/m <sup>3</sup> )
N	3.681E-04	3.460E-05
NNE	4.601E-04	6.261E-05
NE	5.285E-04	6.777E-05
ENE	6.276E-04	1.005E-04
E	6.382E-04	1.386E-04
ESE	6.309E-04	8.259E-05
SE	6.103E-04	4.620E-05
SSE	4.509E-04	2.383E-05
S	3.044E-04	2.664E-05
SSW	2.463E-04	2.498E-05
SW	3.080E-04	9.021E-06
WSW	3.244E-04	**
W	2.437E-04	**
WNW	1.471E-04	**
NW	1.640E-04	**
NNW	2.278E-04	**
All Directions Combined	9.297E-04	<u>5.486E-04</u>

\* Meteorological facility located 0.8 km SSW of reactor site. Temperature instruments are 9.51 and 45.63 meters above ground. Wind speed and direction is measured at 9.72-meter level. Joint percent valid data in data base = 96.9.

\*\* Less than 5% of the hours had nonzero X/Q values.

**Table 2.3-62b Calculated 1-Hour Average and Annual Average Atmospheric Dispersion Factors (X/Q) at Low Population Zone Distance (4828 Meters) for Watts Bar Nuclear Plant**

Based on RG 1.145 and Meteorological Data for 1991 through 2010\*

Plume Sector Direction	0.5th Percentile X/Q Value (sec/m <sup>3</sup> )	5th Percentile X/Q Value (sec/m <sup>3</sup> )	Annual Average X/Q Value (sec/m <sup>3</sup> )
N	8.003E-05	4.982E-06	8.135E-07
NNE	1.175E-04	1.139E-05	1.640E-06
NE	1.428E-04	1.178E-05	2.220E-06
ENE	1.698E-04	1.824E-05	2.255E-06
E	1.784E-04	2.669E-05	2.541E-06
ESE	1.703E-04	1.464E-05	2.640E-06
SE	1.554E-04	7.360E-06	1.568E-06
SSE	1.159E-04	2.844E-06	9.011E-07
S	6.924E-05	3.330E-06	7.804E-07
SSW	5.744E-05	2.958E-06	6.690E-07
SW	6.975E-05	5.074E-07	7.880E-07
WSW	7.696E-05	**	6.594E-07
W	5.371E-05	**	2.940E-07
WNW	2.669E-05	**	2.754E-07
NW	3.036E-05	**	2.080E-07
NNW	4.656E-05	**	2.983E-07
All Directions Combined	2.798E-04	1.484E-04	--

\* Meteorological facility located 0.8 km SSW of reactor site. Temperature instruments are 9.51 and 45.63 meters above ground. Wind speed and direction is measured at 9.72-meter level. Joint percent valid data in data base = 96.9.

\*\* Less than 5% of the hours had nonzero X/Q values.

**Table 2.3-63b Values of 5th Percentile Overall Site 8-Hour, 16-Hour, 3-Day, and 26-Day Atmospheric Dispersion Factors (X/Q) at Low Population Zone Distance (4828 Meters) for Watts Bar Nuclear Plant**

Based on R.G. 1.145 Method of Logarithmic Interpolation between Overall 5th Percentile 1-hour X/Q Assumed to Apply for 2-hour Period and Maximum Sector Annual Average X/Q (underscored in Table 2.3-62b)\*

Averaging period	5th Percentile X/Q Value (sec/m <sup>3</sup> )
8-hour	7.623E-05
16-hour	5.464E-05
3-day	2.652E-05
26-day	9.395E-06

\* 1-hour and annual average X/Qs calculated from meteorological data for 1991 through 2010. Meteorological facility located 0.8 km SSW of reactor site. Temperature instruments are 9.51 and 45.63 meters above ground. Wind speed and direction is measured at 9.72-meter level. Joint percent valid data in data base = 96.9.

**Table 2.3-64b 0.5th Percentile Sector Values of 8-Hour, 16-Hour, 3-Day, And 26-Day Atmospheric Dispersion Factors (X/Q) at Low Population Zone Outer Boundary Distance (4828 Meters) For Watts Bar Nuclear Plant**

Based on R.G. 1.145 Method of Logarithmic Interpolation between 0.5th Percentile 1-hour X/Q for Each Sector and Annual Average X/Q for Same Sector.\*

Plume Sector Direction	Sector-Specific X/Q Value (sec/m <sup>3</sup> )			
	8-hour	16-hour	3-day	26-day
N	3.748E-05	2.565E-05	1.126E-05	3.453E-06
NNE	5.799E-05	4.074E-05	1.893E-05	6.302E-06
NE	7.173E-05	5.084E-05	2.409E-05	8.242E-06
ENE	8.312E-05	5.815E-05	2.679E-05	8.801E-06
E	8.835E-05	6.217E-05	2.900E-05	9.701E-06
ESE	8.549E-05	6.058E-05	2.869E-05	9.811E-06
SE	7.269E-05	4.971E-05	2.180E-05	6.672E-06
SSE	5.194E-05	3.476E-05	1.454E-05	4.163E-06
S	3.298E-05	2.276E-05	1.018E-05	3.207E-06
SSW	2.751E-05	1.904E-05	8.565E-06	2.721E-06
SW	3.324E-05	2.295E-05	1.027E-05	3.236E-06
WSW	3.503E-05	2.364E-05	1.006E-05	2.954E-06
W	2.270E-05	1.476E-05	5.800E-06	1.517E-06
WNW	1.253E-05	8.584E-06	3.779E-06	1.164E-06
NW	1.332E-05	8.821E-06	3.608E-06	9.999E-07
NNW	2.020E-05	1.331E-05	5.378E-06	1.464E-06

\* 1-hour and annual average X/Qs calculated from meteorological data for 1991 through 2010. Meteorological facility located 0.8 km SSW of reactor site. Temperature instruments are 9.51 and 45.63 meters above ground. Wind speed and direction is measured at 9.72-meter level. Joint percent valid data in data base = 96.9.

**Table 2.3-66b Atmospheric Dispersion Factors (X/Q), sec/m<sup>3</sup>, for Design Basis Accident Analyses Based on Onsite Meteorological Data for Watts Bar Nuclear Plant**

Regulatory Guide 1.145 Results (maximum sector 0.5th percentile 1-hour value for 0-2 hours at exclusion area boundary and at low population zone; and 8-hour, 16-hour, 3-day and 26-day values for 2-8, 8-24, 24-96, and 96-720 hours from logarithmic interpolation between 0.5th percentile maximum sector 1-hour value at 2 hours and corresponding sector annual average value at 8760 hours at low population zone) for 1991 through 2010 Data\*.

Period (hours)	Minimum Distance to Exclusion Boundary (1100 m**)	Low Population Zone (4828 m)
0-2	6.382E-04	1.784E-04
2-8		8.835E-05
8-24		6.217E-05
24-96		2.900E-05
96-720		9.811E-06

\* Hourly 10-m wind and 10-m and 46-m temperature data. Meteorological facility located 0.8 km SSW of reactor site. Calms assigned a wind speed of 0.6 mph.

\*\* Travel distance from 100-m radius release zone to 1200-m exclusion area boundary distance.



**Table 2.3-67b Dispersion Meteorology - Onsite 10-Meter Wind Data - 5th Percentile Values of Inverse Wind Speed (1/u) Distributions for Post-LOCA Control Bay Dose Calculations for Watts Bar Nuclear Plant**

January 1991 through December 2010 Wind Speed and Direction Data \*

Plume Sectors (degrees)	Averaging Periods				
	1-hour	8-hour	16-hour	3-day	26-day
89.75-157.25	2.034	1.223	0.957	0.692	0.547
132.25-199.75	1.177	0.680	0.565	0.413	0.304
154.75-222.25	0.828	0.565	0.494	0.361	0.250
192.25-259.75	0.895	0.609	0.532	0.382	0.265

\* Meteorological facility is located 0.8 km SSW of reactor site.  
Calms are assumed to be 0.6 mph.

**Table 2.3-76**  
**Joint Percentage Frequencies of Wind Direction and Wind Speed for Different Stability Classes**

STABILITY CLASS A (DELTA T<=-1.9 C/100 M)

WATTS BAR NUCLEAR PLANT

JAN 1, 1991 - DEC 31, 2010

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.001	0.014	0.065	0.118	0.136	0.006	0.000	0.000	0.340
NNE	0.000	0.000	0.016	0.097	0.152	0.219	0.007	0.000	0.000	0.490
NE	0.000	0.000	0.026	0.084	0.077	0.072	0.000	0.000	0.000	0.258
ENE	0.000	0.000	0.026	0.059	0.042	0.016	0.000	0.000	0.000	0.144
E	0.000	0.000	0.025	0.033	0.008	0.004	0.000	0.000	0.000	0.069
ESE	0.000	0.000	0.008	0.021	0.002	0.001	0.000	0.000	0.000	0.032
SE	0.000	0.001	0.016	0.016	0.006	0.004	0.000	0.000	0.000	0.042
SSE	0.000	0.000	0.029	0.041	0.012	0.010	0.001	0.000	0.000	0.093
S	0.000	0.001	0.041	0.117	0.129	0.099	0.015	0.000	0.000	0.402
SSW	0.000	0.001	0.037	0.300	0.537	0.562	0.022	0.000	0.000	1.459
SW	0.000	0.001	0.024	0.126	0.145	0.055	0.001	0.000	0.000	0.351
WSW	0.000	0.000	0.006	0.020	0.019	0.039	0.007	0.000	0.000	0.092
W	0.000	0.000	0.006	0.006	0.029	0.070	0.006	0.000	0.000	0.117
WNW	0.000	0.000	0.006	0.009	0.024	0.095	0.005	0.000	0.000	0.139
NW	0.000	0.000	0.004	0.009	0.028	0.087	0.011	0.000	0.000	0.138
NNW	0.000	0.000	0.009	0.027	0.059	0.124	0.011	0.000	0.000	0.230
SUBTOTAL	0.000	0.004	0.293	1.030	1.386	1.592	0.091	0.000	0.000	4.398

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	171942
TOTAL HOURS OF STABILITY CLASS A	7524
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS A	7473
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	169934
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: WATTS BAR NUCLEAR PLANT  
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS  
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

MEAN WIND SPEED = 6.89

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**Table 2.3-77**  
**Joint Percentage Frequencies of Wind Direction and Wind Speed for Different Stability Classes**

STABILITY CLASS B      (-1.9 < DELTA T <= -1.7 C/100 M)

WATTS BAR NUCLEAR PLANT

JAN 1, 1991 - DEC 31, 2010

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.023	0.105	0.098	0.108	0.003	0.000	0.000	0.337
NNE	0.000	0.000	0.030	0.172	0.172	0.219	0.006	0.000	0.000	0.600
NE	0.000	0.000	0.058	0.139	0.078	0.059	0.000	0.000	0.000	0.334
ENE	0.000	0.000	0.041	0.083	0.035	0.008	0.000	0.000	0.000	0.167
E	0.000	0.001	0.026	0.048	0.005	0.001	0.000	0.000	0.000	0.081
ESE	0.000	0.001	0.019	0.026	0.001	0.000	0.000	0.000	0.000	0.047
SE	0.000	0.000	0.026	0.028	0.004	0.002	0.000	0.000	0.000	0.061
SSE	0.000	0.000	0.038	0.038	0.009	0.004	0.000	0.000	0.000	0.089
S	0.000	0.000	0.055	0.142	0.081	0.045	0.010	0.001	0.000	0.334
SSW	0.000	0.001	0.058	0.342	0.270	0.198	0.014	0.000	0.000	0.883
SW	0.000	0.000	0.026	0.179	0.069	0.019	0.000	0.000	0.000	0.294
WSW	0.000	0.000	0.008	0.040	0.015	0.019	0.001	0.000	0.000	0.084
W	0.000	0.000	0.005	0.015	0.031	0.047	0.009	0.000	0.000	0.107
WNW	0.000	0.001	0.004	0.013	0.037	0.082	0.006	0.000	0.000	0.143
NW	0.000	0.000	0.005	0.021	0.034	0.078	0.009	0.000	0.000	0.147
NNW	0.000	0.000	0.008	0.041	0.055	0.080	0.004	0.000	0.000	0.188
SUBTOTAL	0.000	0.004	0.430	1.432	0.996	0.970	0.063	0.001	0.000	3.895

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	171942
TOTAL HOURS OF STABILITY CLASS B	6670
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS B	6619
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	169934
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: WATTS BAR NUCLEAR PLANT  
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS  
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

MEAN WIND SPEED = 6.08

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**Table 2.3-78**  
**Joint Percentage Frequencies of Wind Direction and Wind Speed for Different Stability Classes**

STABILITY CLASS C      (-1.7 < DELTA T <= -1.5 C/100 M)

WATTS BAR NUCLEAR PLANT

JAN 1, 1991 - DEC 31, 2010

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.000	0.000	0.058	0.163	0.134	0.149	0.004	0.000	0.000	0.508
NNE	0.000	0.001	0.108	0.255	0.214	0.233	0.013	0.000	0.000	0.824
NE	0.000	0.002	0.117	0.206	0.089	0.052	0.001	0.000	0.000	0.467
ENE	0.000	0.001	0.097	0.118	0.023	0.005	0.001	0.000	0.000	0.245
E	0.000	0.002	0.069	0.055	0.005	0.001	0.000	0.000	0.000	0.132
ESE	0.000	0.001	0.049	0.036	0.003	0.001	0.000	0.000	0.000	0.091
SE	0.000	0.002	0.062	0.045	0.004	0.001	0.000	0.000	0.000	0.114
SSE	0.000	0.002	0.074	0.071	0.009	0.003	0.001	0.000	0.000	0.159
S	0.000	0.001	0.116	0.252	0.085	0.047	0.006	0.001	0.000	0.508
SSW	0.000	0.001	0.152	0.464	0.255	0.171	0.012	0.000	0.000	1.056
SW	0.000	0.002	0.083	0.269	0.076	0.009	0.001	0.000	0.000	0.440
WSW	0.000	0.001	0.024	0.058	0.027	0.021	0.002	0.000	0.000	0.132
W	0.000	0.001	0.016	0.034	0.039	0.046	0.004	0.000	0.000	0.139
WNW	0.000	0.000	0.016	0.038	0.058	0.105	0.006	0.000	0.000	0.224
NW	0.000	0.000	0.021	0.042	0.052	0.095	0.009	0.000	0.000	0.219
NNW	0.000	0.000	0.034	0.070	0.072	0.101	0.006	0.000	0.000	0.282
SUBTOTAL	0.000	0.016	1.097	2.176	1.143	1.041	0.066	0.001	0.000	5.541

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	171942
TOTAL HOURS OF STABILITY CLASS C	9494
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS C	9416
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	169934
TOTAL HOURS CALM	0

METEOROLOGICAL FACILITY: WATTS BAR NUCLEAR PLANT  
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS  
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

MEAN WIND SPEED = 5.49

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**Table 2.3-79**  
**Joint Percentage Frequencies of Wind Direction and Wind Speed for Different Stability Classes**

STABILITY CLASS D      (-1.5 < DELTA T <= -0.5 C/100 M)

WATTS BAR NUCLEAR PLANT

JAN 1, 1991 - DEC 31, 2010

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.004	0.048	0.664	0.970	1.049	1.087	0.024	0.000	0.000	3.847
NNE	0.004	0.047	0.702	1.162	1.020	0.979	0.057	0.002	0.000	3.973
NE	0.005	0.050	0.798	0.976	0.415	0.170	0.004	0.000	0.000	2.418
ENE	0.005	0.089	0.834	0.447	0.101	0.036	0.002	0.000	0.000	1.515
E	0.003	0.102	0.517	0.144	0.023	0.005	0.000	0.000	0.000	0.794
ESE	0.002	0.081	0.317	0.062	0.008	0.004	0.000	0.000	0.000	0.474
SE	0.003	0.087	0.392	0.082	0.024	0.013	0.000	0.001	0.000	0.602
SSE	0.004	0.120	0.620	0.178	0.039	0.032	0.009	0.000	0.000	1.003
S	0.008	0.159	1.179	0.760	0.288	0.280	0.083	0.004	0.000	2.762
SSW	0.011	0.136	1.736	1.934	0.922	0.770	0.059	0.001	0.000	5.567
SW	0.007	0.163	1.138	0.853	0.204	0.094	0.004	0.000	0.000	2.462
WSW	0.004	0.114	0.593	0.310	0.124	0.099	0.001	0.000	0.000	1.244
W	0.003	0.119	0.421	0.313	0.231	0.252	0.008	0.000	0.000	1.347
WNW	0.003	0.084	0.373	0.438	0.521	0.478	0.018	0.000	0.000	1.915
NW	0.002	0.059	0.372	0.427	0.567	0.598	0.040	0.001	0.000	2.067
NNW	0.003	0.035	0.481	0.558	0.655	0.839	0.035	0.000	0.000	2.607
SUBTOTAL	0.071	1.495	11.138	9.614	6.191	5.735	0.345	0.008	0.000	34.598

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	171942
TOTAL HOURS OF STABILITY CLASS D	59374
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS D	58793
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	169934
TOTAL HOURS CALM	121

METEOROLOGICAL FACILITY: WATTS BAR NUCLEAR PLANT  
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS  
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

MEAN WIND SPEED = 4.86

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**Table 2.3-80**  
**Joint Percentage Frequencies of Wind Direction and Wind Speed for Different Stability Classes**

STABILITY CLASS E (-0.5 < DELTA T <= 1.5 C/100 M)

WATTS BAR NUCLEAR PLANT

JAN 1, 1991 - DEC 31, 2010

WIND DIRECTION	WIND SPEED (MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.020	0.131	0.474	0.609	0.324	0.058	0.002	0.000	0.000	1.618
NNE	0.018	0.122	0.423	0.304	0.161	0.047	0.003	0.000	0.000	1.078
NE	0.025	0.149	0.598	0.350	0.061	0.011	0.004	0.000	0.000	1.197
ENE	0.033	0.208	0.790	0.188	0.012	0.002	0.001	0.000	0.000	1.235
E	0.018	0.237	0.322	0.043	0.012	0.002	0.000	0.000	0.000	0.636
ESE	0.009	0.157	0.130	0.022	0.007	0.004	0.000	0.000	0.000	0.330
SE	0.011	0.183	0.151	0.045	0.023	0.012	0.001	0.000	0.000	0.425
SSE	0.020	0.300	0.294	0.085	0.046	0.038	0.006	0.000	0.000	0.789
S	0.048	0.469	0.983	0.402	0.197	0.183	0.031	0.001	0.000	2.314
SSW	0.082	0.561	1.928	1.181	0.575	0.395	0.026	0.000	0.000	4.749
SW	0.068	0.701	1.348	0.308	0.109	0.052	0.002	0.000	0.000	2.588
WSW	0.050	0.713	0.800	0.141	0.077	0.031	0.000	0.000	0.000	1.810
W	0.046	0.703	0.687	0.201	0.078	0.029	0.000	0.000	0.000	1.745
WNW	0.040	0.617	0.600	0.295	0.100	0.041	0.001	0.000	0.000	1.693
NW	0.032	0.410	0.565	0.295	0.125	0.059	0.002	0.001	0.000	1.489
NNW	0.022	0.211	0.467	0.425	0.290	0.094	0.005	0.000	0.000	1.513
SUBTOTAL	0.543	5.873	10.559	4.895	2.197	1.057	0.084	0.002	0.000	25.209

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	171942
TOTAL HOURS OF STABILITY CLASS E	43451
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS E	42839
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	169934
TOTAL HOURS CALM	923

METEOROLOGICAL FACILITY: WATTS BAR NUCLEAR PLANT  
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS  
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

MEAN WIND SPEED = 3.03

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**Table 2.3-81**  
**Joint Percentage Frequencies of Wind Direction and Wind Speed for Different Stability Classes**

STABILITY CLASS F ( 1.5< DELTA T<= 4.0 C/100 M)

WATTS BAR NUCLEAR PLANT

JAN 1, 1991 - DEC 31, 2010

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.026	0.227	0.173	0.017	0.000	0.001	0.000	0.000	0.000	0.444
NNE	0.022	0.181	0.165	0.010	0.002	0.001	0.000	0.000	0.000	0.381
NE	0.027	0.176	0.237	0.028	0.002	0.001	0.000	0.000	0.000	0.470
ENE	0.034	0.220	0.304	0.022	0.000	0.001	0.000	0.000	0.000	0.580
E	0.019	0.167	0.125	0.004	0.000	0.000	0.000	0.000	0.000	0.315
ESE	0.009	0.115	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.152
SE	0.009	0.107	0.035	0.004	0.001	0.002	0.000	0.000	0.000	0.157
SSE	0.014	0.152	0.058	0.009	0.002	0.001	0.001	0.000	0.000	0.236
S	0.033	0.272	0.238	0.033	0.003	0.001	0.000	0.000	0.000	0.580
SSW	0.066	0.424	0.594	0.150	0.009	0.004	0.000	0.000	0.000	1.247
SW	0.088	0.687	0.677	0.029	0.005	0.000	0.000	0.000	0.000	1.486
WSW	0.113	1.020	0.728	0.019	0.002	0.002	0.000	0.000	0.000	1.884
W	0.132	1.389	0.659	0.022	0.004	0.000	0.000	0.000	0.000	2.207
WNW	0.129	1.411	0.577	0.028	0.002	0.001	0.000	0.000	0.000	2.148
NW	0.110	1.159	0.546	0.034	0.004	0.000	0.000	0.000	0.000	1.852
NNW	0.046	0.436	0.272	0.038	0.004	0.001	0.000	0.000	0.000	0.796
SUBTOTAL	0.876	8.143	5.415	0.447	0.037	0.014	0.001	0.000	0.000	14.933

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	171942
TOTAL HOURS OF STABILITY CLASS F	25798
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS F	25377
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	169934
TOTAL HOURS CALM	1489

METEOROLOGICAL FACILITY: WATTS BAR NUCLEAR PLANT  
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS  
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

MEAN WIND SPEED = 1.47

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS

**Table 2.3-82**  
**Joint Percentage Frequencies of Wind Direction and Wind Speed for Different Stability Classes**

STABILITY CLASS G (DELTA T > 4.0 C/100 M)

WATTS BAR NUCLEAR PLANT

JAN 1, 1991 - DEC 31, 2010

WIND DIRECTION	WIND SPEED(MPH)									TOTAL
	CALM	0.6-1.4	1.5-3.4	3.5-5.4	5.5-7.4	7.5-12.4	12.5-18.4	18.5-24.4	>=24.5	
N	0.021	0.215	0.071	0.002	0.000	0.000	0.000	0.000	0.000	0.309
NNE	0.018	0.177	0.068	0.000	0.000	0.000	0.000	0.000	0.000	0.263
NE	0.024	0.231	0.099	0.002	0.000	0.000	0.000	0.000	0.000	0.357
ENE	0.028	0.235	0.151	0.001	0.001	0.000	0.000	0.000	0.000	0.415
E	0.017	0.172	0.057	0.001	0.000	0.000	0.000	0.000	0.000	0.246
ESE	0.010	0.117	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.148
SE	0.012	0.141	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.175
SSE	0.013	0.151	0.028	0.001	0.000	0.000	0.000	0.000	0.000	0.193
S	0.023	0.267	0.056	0.002	0.001	0.000	0.000	0.000	0.000	0.349
SSW	0.039	0.405	0.137	0.006	0.001	0.000	0.000	0.000	0.000	0.589
SW	0.069	0.664	0.282	0.003	0.000	0.000	0.000	0.000	0.000	1.018
WSW	0.118	1.112	0.525	0.005	0.000	0.000	0.000	0.000	0.000	1.760
W	0.134	1.359	0.489	0.002	0.000	0.000	0.000	0.000	0.000	1.984
WNW	0.108	1.123	0.364	0.005	0.000	0.000	0.000	0.000	0.000	1.600
NW	0.097	0.930	0.405	0.003	0.000	0.000	0.000	0.000	0.000	1.435
NNW	0.039	0.383	0.159	0.004	0.000	0.000	0.000	0.000	0.000	0.585
SUBTOTAL	0.769	7.682	2.936	0.038	0.002	0.000	0.000	0.000	0.000	11.426

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	171942
TOTAL HOURS OF STABILITY CLASS G	19631
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY CLASS G	19417
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	169934
TOTAL HOURS CALM	1306

METEOROLOGICAL FACILITY: WATTS BAR NUCLEAR PLANT  
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND 45.63 METERS  
 WIND SPEED AND DIRECTION MEASURED AT 9.72 METER LEVEL

MEAN WIND SPEED = 1.20

NOTE: TOTALS AND SUBTOTALS ARE OBTAINED FROM UNROUNDED NUMBERS



**Table 2.3-83**  
**JOINT PERCENTAGE FREQUENCIES OF WIND SPEED BY STABILITY CLASS**  
**WATTS BAR NUCLEAR PLANT**

JAN 1, 1991 - DEC 31, 2010

WIND SPEED  (MPH)	STABILITY CLASS						
	A	B	C	D	E	F	G
CALM	0.000	0.000	0.000	0.071	0.543	0.876	0.769
0.6- 1.4	0.004	0.004	0.016	1.495	5.873	8.143	7.682
1.5- 3.4	0.293	0.430	1.097	11.138	10.559	5.415	2.936
3.5- 5.4	1.030	1.432	2.176	9.614	4.895	0.447	0.038
5.5- 7.4	1.386	0.996	1.143	6.191	2.197	0.037	0.002
7.5-12.4	1.592	0.970	1.041	5.735	1.057	0.014	0.000
12.5-18.4	0.091	0.063	0.066	0.345	0.084	0.001	0.000
18.5-24.4	0.000	0.001	0.001	0.008	0.002	0.000	0.000
>=24.5	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TOTAL	4.398	3.895	5.541	34.598	25.209	14.933	11.426

TOTAL HOURS OF VALID STABILITY OBSERVATIONS	171942
TOTAL HOURS OF VALID WIND DIRECTION-WIND SPEED-STABILITY OBSERVATIONS	169934
TOTAL HOURS OF OBSERVATIONS	175320
JOINT RECOVERABILITY PERCENTAGE	96.9

METEOROLOGICAL FACILITY:  
 STABILITY BASED ON DELTA-T BETWEEN 9.51 AND  
 WIND SPEED AND DIRECTION MEASURED AT

WATTS BAR NUCLEAR PLANT  
 45.63 METERS  
 9.72 METER LEVEL