Attachment 5

Millstone Nuclear Power Station, Unit No. 3

Calculation WM(B)-01
Normalized X/Q at the Unit 3 Control Room For
Releases From the MSVB and ESFB

CALCULATION TITLE PAGE

Total Number of Pages: 56

Normalized X/Q at the Unit 3 Control Room For Releases From the Unit 3 MSVB and ESFB

TITLE

N/A	0	RBVS/SLCRS
CALCULATION #	**REVISION No.**	**SYSTEM NAME**
WM(B)-01	CB,MS,ES	N/A
VENDOR CALCULATION NUMBER	**Structure**	**System Number**

NUCLEAR INDICATOR:	Calc. Supports DCR/MMOD?	Calc. Supports Ind. Analysis?	N/A
☒CAT1 ☐RWQA ☐SBOQA ☐FPQA ☐ATWSQA ☐NON-QA	☒YES ☐ NO	☐YES ☒NO	**Component**
	↓	↓	
	M3-98-029	N/A	
	DCR/MMOD No.	**Reference**	

INCORPORATES:

CCN NO:	AGAINST REV.
N/A	N/A

Executive Summary

THIS IS FORMAL APPROVAL OF A QA APPROVED VENDOR CALCULATION. NO (NU) IR IS REQUIRED.

REC'D 6-8-98
ON HOLD
CDS 6/17/98
CDS QC 6/25/98
NRP ✓ TJ

Initial JW Date 6/13/00

Approvals (Print & Sign Name)		
Preparer::James L. Wheeler		Date: 5/27/98
Interdiscipline Reviewer:N/A	Discipline:	Date:
Interdiscipline Reviewer:N/A	Discipline:	Date:
Independent Reviewer:N/A		Date:
Supervisor: William Eakin		Date: 5/27/98
Installation Verification		
☒ Calculation accurately reflects plant configuration, OR		
☐ N/A does not affect plant configuration)		
Preparer/Designer Engineer:JAMES L. WHEELER		Date: 5/27/98

PassPort DATABASE INPUTs

CH #4

Calculation Number: N/A (prefix) N/A (sequence no.) N/A (suffix) Revision: N/A

Vendor Calculation Number/Other: WM(B)-01 Revision: 0

CCN # N/A QA ☒ Yes ☐ No Calc Voided: ☐ Yes ☒ No

Superseded By: N/A Supersedes Calc: N/A

Discipline (Up to 10) Z

Unit	Project Reference (EWA)	Component Id	Computer Code	Rev. No./ Level No.
3	N/A	N/A	EN-200	0/0

PMMS CODES*

Structure	System	Component	Reference Calculation	Rev No.
N/A	N/A	N/A	ENVR-W223	00

*The codes required must be alpha codes designed for structure, system and component.

Reference Drawing	Sheet	Rev. No.
25212-10002	~~A~~	11
25212-24114-~~00001~~	~~N~~ 01	13
25212-24118-~~00001~~	~~S~~ 01	11
25212-14045	~~B~~	15
25212-24215-~~00001~~	~~L~~ 01	14

Comments:

Table of Contents

Title page	1A
CTP Database	1B
Table of Contents	1C
Vendor Calculation Pages	1 thru 13
Appendix 1	20 pages
Appendix 2	20 pages
Total number of pages	56

5010.65

STONE & WEBSTER ENGINEERING CORPORATION
CALCULATION TITLE PAGE

CLIENT & PROJECT:	PAGE 1 of 13 Total Pages: 53 w/attachments pages
NORTHEAST UTILITIES - MILLSTONE UNIT 3	
CALCULATION TITLE: Normalized Concentrations (X/Qs) at Unit 3 Control Room Air Intake for Releases from the Unit 3 Main Steam Valve Bldg. & Engineered Safety Features Bldg.	QA CATEGORY (✓) ☑ I ☐ II

CALCULATION IDENTIFICATION NUMBER				OPTIONAL WORK PACKAGE NO.
JOB ORDER NO.	DISCIPLINE	CURRENT CALC NO	OPTIONAL TASK CODE	
03703.7002	WM(B)	01 Rev 0		

APPROVALS - SIGNATURE & DATE			REVISION NO. OR NEW CALCULATION NO.	SUPERSEDES CALCULATION NO. OR REVISON NO.	CONFIRMATION REQUIRED (✓)	
PREPARES(S) / DATE(S)	REVIEWER(S) / DATES(S)	INDEPENDENT REVIEWER(S) / DATE(S)			YES	NO
Stephen A. Vigeant Stephen A. Vigeant 5/21/98	Carl A. Mazzola Carl A. Mazzola 5/21/98	Carl A. Mazzola Carl A. Mazzola 5/21/98	0			✓

DISTRIBUTION

GROUP	NAME & LOCATION	COPY SENT (✓)	GROUP	NAME & LOCATION	COPY SENT (✓)
Record Mgmt. File (or Fire File if none)					
Lead Radiological Specialist	S. Ferguson Boston - 6	cc			
	Stephen A. Vigeant Boston - 3	cc			
~~Project Files~~	~~Charlie Gronan~~ ~~Boston - 7~~				
NU. RAD PROT	RJ Schmidt New Britain	cc			
NUNDS	MP3 Site	original			

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STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION SHEET

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO.	DISCIPLINE	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
037037002	WM(B)	01 Rw 0		2 OF [illegible]

CHANGE HISTORY PAGE

REVISION NO.	DESCRIPTION OF CHANGES	PAGES REVISED	PAGES ADDED	PAGES REPLACED
0	0	N/A	N/A	N/A

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OBJECTIVE

To calculate the normalized atmospheric dispersion values (X/Qs) at the Millstone Unit 3 control room air intake for gaseous radiological releases from the Unit 3 Main Steam Valve Building (MSVB) and from the Engineered Safety Features Building (ESFB). These X/Q values will apply to the 0-2 hour through 30-day period for the MSVB and ESFB ground level releases. The specific release-receptor combinations for which X/Q values are calculated are as follows:

1. Unit 3 MSVB to Unit 3 Control Room Air Intake
2. Unit 3 ESFB to Unit 3 Control Room Air Intake

METHODOLOGY

The control room X/Q values are calculated using the methodology described in Murphy and Campe (Ref. 1). The radiological releases are from vents which are essentially point sources. The difference in elevation between the MSVB release point and the control room air intake is less than 30 percent of the MSVB and the difference in elevation between the ESFB release point and the control room air intake is greater than 30 percent of the ESFB height (see Data Section, p. 6). Reference 1 recommends that the point source - point receptor technique for X/Q calculation be used when the elevation difference between the release and receptor is less than or equal to 30 percent of the building height. Otherwise, the diffuse source - point receptor technique for X/Q calculation is recommended.

Although the MSVB release point does not meet the 30 percent elevation difference criterion for use of the diffuse source - point receptor technique, the wind flow transporting the release to the control room air intake must first flow around the containment structure and the MSVB along with other structures between the MSVB and control room air intake. Therefore, it is reasonable to use the diffuse source - point receptor technique for X/Q calculation from Section V(B)(1)(b) of Murphy and Campe (Ref. 1) for both release points given the multiple flow disruptions caused by the aerodynamic obstacles on the MSVB release, effectively making it a diffuse source. The X/Q equation is as follows:

$$X/Q = [u(\pi\sigma_y\sigma_z + A/(K+2))]^{-1}$$

where:

X/Q is relative concentration (sec/m^3)
σ_y, σ_z are horizontal and vertical dispersion coefficients based on stability class and horizontal distance between the source and receptor (m)
u = wind speed at 10-meter (33-ft) elevation (m/sec)
A = projected building area (m^2)
k = $3/(s/d)^{1.4}$
s = source to receptor distance (m)
d = building width (m)

The above relationship is used to calculate the 0 - 2 hour X/Q value based on onsite meteorological data, selecting the condition that represents the 5 percentile dispersion condition at the site. In this case, 1974 to 1981 onsite meteorological data (Ref. 2) are used. This period of record (i.e., 8 years) is temporally representative of the meteorological conditions encountered at the site. From earlier control room X/Q calculations (Ref. 3), the 5 percentile site stability class is F stability.

The corresponding 5 percentile wind speed is determined from the onsite meteorological data considering only those wind directions resulting in receptor exposure (i.e., influencing wind directions). The number of wind direction sectors to be considered for each source-receptor relationship is determined using Figure 2 of Ref. 1 which is based on the ratio of the distance (s) between the source and receptor to the diameter (d) or width of the building from which the release emanates (i.e., s/d ratio). The dispersion coefficients (σ_y, σ_z) are determined from Ref. 4.

The intermediate averaging time X/Qs (8-24 hours, 1-4 days, and 4-30 days) are determined from the 0-2 hour X/Q value multiplying by occupancy, wind speed, and wind direction factors in accordance with Ref. 1. These factors are as follows:

Averaging Time	Occupancy Factor	Wind Speed Factor	Wind Direction Factor
0 - 2 Hours	1	1	1
8 - 24 Hours	1	5%/10% wind speed	0.75 + F/4
1 - 4 Days	0.6	5%/20% wind speed	0.50 + F/2
4 - 30 Days	0.4	5%/40% wind speed	F

F is the fraction of time the wind blows the activity toward the receptor for the wind azimuth range of influence.

The frequency of wind directions blowing in the appropriate range and at certain wind speeds is determined from the on-site meteorological data base (Ref. 2) using Stone & Webster computer program EN-200, "Distribution of Two Parameters" (Ref. 5).

ASSUMPTIONS

1. It is conservatively assumed that each plume centerline is transported directly over the Unit 3 control room intake and that the plume dispersion is not aerodynamically affected by the containment building which is adjacent to or very near the release points.

2. For purposes of determining the appropriate dispersion equation to use in the analysis, the elevation differences between the release points and the control room air intake are compared to the height of the buildings from which the releases occur (MSVB and ESFB). Although the release-receptor elevation difference of 30 percent of the building height criterion is not met, the MSVB release is assumed to be a diffuse source given the multiple flow disruptions encountered by the release due to the aerodynamic interference of buildings both upwind and downwind of the release point.

3. It is assumed that the Unit 3 control room air intake X/Q values are representative of the X/Q values for the center of the Unit 3 control room given that the distances and directions from the release to these receptors are very similar.

EQUATIONS

$$X/Q = [u(\pi\sigma_y\sigma_z + A/(K+2))]^{-1} \quad \text{(Ref. 1)}$$

where:

X/Q is relative concentration (sec/m^3) for point source - point receptor configurations
σ_y, σ_z are horizontal and vertical dispersion coefficients (m) (Ref. 4)
u = wind speed at 10-meter elevation (m/sec)
A = projected building area (m^2)
k = $3/(s/d)^{1.4}$
s = source to receptor distance (m)
d = building width (m)

Determination of Influencing Wind Directions (Ref. 1)

s = source to receptor distance (m)

d = release point diameter or width (m)

Calculate s/d ratio and use Figure 2 from Ref. 1 to determine the appropriate number of influencing wind directions.

Determination of Intermediate Period Factors (Ref. 1)

Averaging Time	Occupancy Factor	Wind Speed Factor	Wind Direction Factor
0 - 2 Hours	1	1	
8 - 24 Hours	1	5%/10% wind speed	0.75 ← F/4
1 - 4 Days	0.6	5%/20% wind speed	0.50 ← F/2
4 - 30 Days	0.4	5%/40% wind speed	F

F is the fraction of time the wind blows the activity toward the receptor, withim the influencing wind direction azimuthal range.

DATA

1. Unit 3 MSVB to Unit 3 Control Room Air Intake

Distance from nearest MSVB vent to Unit 3 control room air intake = 68.2 m (Ref. 6)
Wind direction from nearest MSVB vent to Unit 3 control room air intake = 120 deg (Ref. 6)
d = MSVB diagonal width = 74.0 ft or 22.56 m (Ref. 7)
MSVB vent elevation = 85.9 ft (Ref. 7)
Unit 3 control room air intake elevation = 94.6 ft (Ref. 9)
MSVB vent-control room air intake elevation difference = 85.9 ft - 94.6 ft = -8.7 ft
MSVB height (top elevation - grade elevation) = 83.9 ft - 24.0 ft = 59.9 ft (Ref. 6)
Percentage difference in elevations = 8.7 ft/ 59.9 ft = 14.5 percent
A = MSVB projected area = diagonal width x height = 74.0 ft x 59.9 ft = 4432.6 ft^2 or 411.8 m^2

2. Unit 3 ESFB to Unit 3 Control Room Air Intake

Distance from ESFB vent to Unit 3 control room center = 120.5 m (Ref. 6)
Wind direction from ESFB vent to Unit 3 control room center = 90 deg (Ref. 6)
d = ESFB diagonal width = 144.0 ft = 43.9 m (Ref. 6)
ESFB vent elevation = 39.5 ft (Ref. 8)
Unit 3 control room air intake elevation = 94.6 ft (Ref. 9)
ESFB vent-control room air intake elevation difference = 94.6 ft - 39.5 ft = 55.1 ft
ESFB height (top elevation - grade elevation) = 56.8 ft - 24.0 ft = 32.8 ft (Ref. 8)
Percentage difference in elevations = 55.1 ft/ 32.8 ft = 168 percent
A = ESFB projected area = diagonal width x height = 144.0 ft x 32.8 ft = 4723.2 ft^2 or 438.8 m^2

CALCULATION

1. Unit 3 MSVB to Unit 3 Control Room Air Intake

s = 68.2 m (Ref. 6)
direction = 120 deg (Ref. 6)
d = 22.56 m (Ref. 7)
s/d = 68.2 m/22.56 m = 3.02 or 3 sectors (3 x 22.5° = 68° or 120° - 34° = 86° to 120° + 34° = 154°
A = 411.8 m^2

$k = 3/(s/d)^{1.4} = 3/(3.02)^{1.4} = 0.64$

σ_y @ 68.2m for F stability class	= 3.27 m (Reference 4)
σ_z @ 68.2m for F stability class	= 1.65 m (Reference 4)
u(5%) = 2.2 mph (1.0 m/sec)	(Appendix 1, p. 12)
u(10%) = 3.1 mph (1.4 m/sec)	(Appendix 1, p. 13)
u(20%) = 4.5 mph (2.0 m/sec)	(Appendix 1, p. 14)
u(40%) = 6.7 mph (3.0 m/sec)	(Appendix 1, p. 16)
F = 8.266/66.332 = 0.12	(Appendix 1, p. 19)

Short-Term X/Q Value for Unit 3 Intake (0 - 2 Hours)

X/Q = { (1.0 m/sec)[(3.14159275...) (3.27m) (1.65 m) + (411.8 m^2)/(0.64 + 2)] }$^{-1}$

X/Q = 5.78 E- 3 sec/m^3

Intermediate Period X/Q Value for Unit 3 Intake

Averaging Period	Occupancy Factor	Wind Speed Factor	Wind Direction Factor	X/Q (sec/m^3)
0 - 8 hours	1	1	1	**5.78 E- 3**
8 - 24 hours	1	2.2/3.1 = 0.71	0.75 + 0.12/4 = 0.78	**3.20 E- 3**
1 - 4 days	0.6	2.2/4.5 = 0.49	0.50 + 0.12/2 = 0.56	**9.52 E- 4**
4 - 30 days	0.4	2.2/6.7 = 0.33	0.12	**9.16 E- 5**

2. Unit 3 ESFB to Unit 3 Control Room Air Intake

s = 120.5 m (Ref. 6)
direction = 90 deg (Ref. 6)
d = 43.9 m (Ref. 8)
s/d = 120.5 m/43.9 m = 2.74 or 3 sectors (3 x 22.5° = 68° or 90° - 34° = 56° to 90° + 34° = 124°
A = 1439.7 m^2
k = 3/(s/d)$^{1.4}$ = 3/(2.74)$^{1.4}$ = 0.73
σ_y @ 120.5m for F stability class = 5.47 m (Reference 4)
σ_z @ 120.5m for F stability class = 2.63 m (Reference 4)
u(5%) = 2.2 mph (1.0 m/sec) (Appendix 2, p. 12)
u(10%) = 3.1 mph (1.4 m/sec) (Appendix 2, p. 13)
u(20%) = 4.5 mph (2.0 m/sec) (Appendix 2, p. 14)
u(40%) = 7.6 mph (3.4 m/sec) (Appendix 2, p. 17)
F = 7,922/66,332 = 0.12 (Appendix 2, p. 19)

Short-Term X/Q Value for Unit 3 Intake (0 - 2 Hours)

X/Q = { (1.0 m/sec)[(3.14159275...) (5.47m) (2.63 m) + (438.8 m^2)/(0.73 + 2)] }$^{-1}$

X/Q = 4.86 E- 3 sec/m^3

Intermediate Period X/Q Value for Unit 3 Intake

Averaging Period	Occupancy Factor	Wind Speed Factor	Wind Direction Factor	X/Q (sec/m^3)
0 - 8 hours	1	1	1	**4.86 E- 3**
8 - 24 hours	1	2.2/3.1 = 0.71	0.75 + 0.12/4 = 0.78	**2.69 E- 3**
1 - 4 days	0.6	2.2/4.5 = 0.49	0.50 + 0.12/2 = 0.56	**8.00 E- 4**
4 - 30 days	0.4	2.2/7.6 = 0.29	0.12	**6.77 E- 5**

CONCLUSIONS

The Unit 3 control room X/Qs are summarized in the body of the calculation. The Unit 3 control room air intake X/Q values are representative of the X/Q values for the center of the Unit 3 control room given that the distances and directions from the release to these receptors are very similar. The Unit 3 control room air intake X/Q values are also conservative when applied to the Technical Support Center which is located at a farther distance from the releases than the control room

REFERENCES

1. Murphy, K.G. and K.M. Campe., "Nuclear Power Plant Control Room Ventilation System Design for Meeting General Design Criterion 19". Presented at the 13th AEC Air Cleaning Conference, August, 1974.

2. Millstone onsite meteorological data for the period 1974 - 1981 provided by H. L. Chamberlain, Jr. of Northeast Utilities, April 28, 1998. The data are hourly values represented by one 15-minute average value per hour. See Attachment 5 for transmittal letter.

3. Stone& Webster Calculation No. 12179.12-ENVR-W223, dated 11/29/82

4. U. S. Nuclear Regulatory Commission, Subroutine "POLYN", Horizontal and Vertical Dispersion Coefficients as a Function of Downwind Distance (see Attachment 5 for F-stability values).

5. EN-200, Version 0, Level 0. SWEC computer code "Distribution of Two Parameters". Output is provided in Appendices 1 and 2.

6. Stone & Webster Drawing No. 12179-EM-1A-11, Rev. 11, "Plot Plan", Millstone Unit 3. See Attachment 1.

7. Stone & Webster Drawing No. 12179-EB-15N-13, "Ventilation Main Steam Valve Building", Millstone Unit 3, Rev. 13, 6/9/94. See Attachment 2.

8. Stone & Webster Drawing No. 12179-EB-15S-11, Rev. 11, 10/14/87, "Heating Vent & Air Cond ENG Safety Features Bldg SH-4". See Attachment 3.

9. Stone & Webster Drawing Nos. 12179-EA-1B-15 and 12179-EB-39L-14.

ATTACHMENTS

1. Stone & Webster Drawing No. 12179-EM-1A-11, Rev. 11, "Plot Plan", Millstone Unit 3

2. Stone & Webster Drawing No. 12179-EB-15N-13, "Ventilation Main Steam Valve Building", Millstone Unit 3, Rev. 13,6/9/94.

3. Stone & Webster Drawing No. 12179-EB-15S-11, Rev. 11, 10/14/87, "Heating Vent & Air Cond ENG Safety Features Bldg SH-4".

4. Subroutine "POLYN", Horizontal and Vertical Dispersion Coefficients as a Function of Downwind Distance (F-stability).

5. Millstone onsite meteorological data transmittal letter from H. L. Chamberlain to J. Creamer, April 28, 1998.

APPENDICES (40 pages)

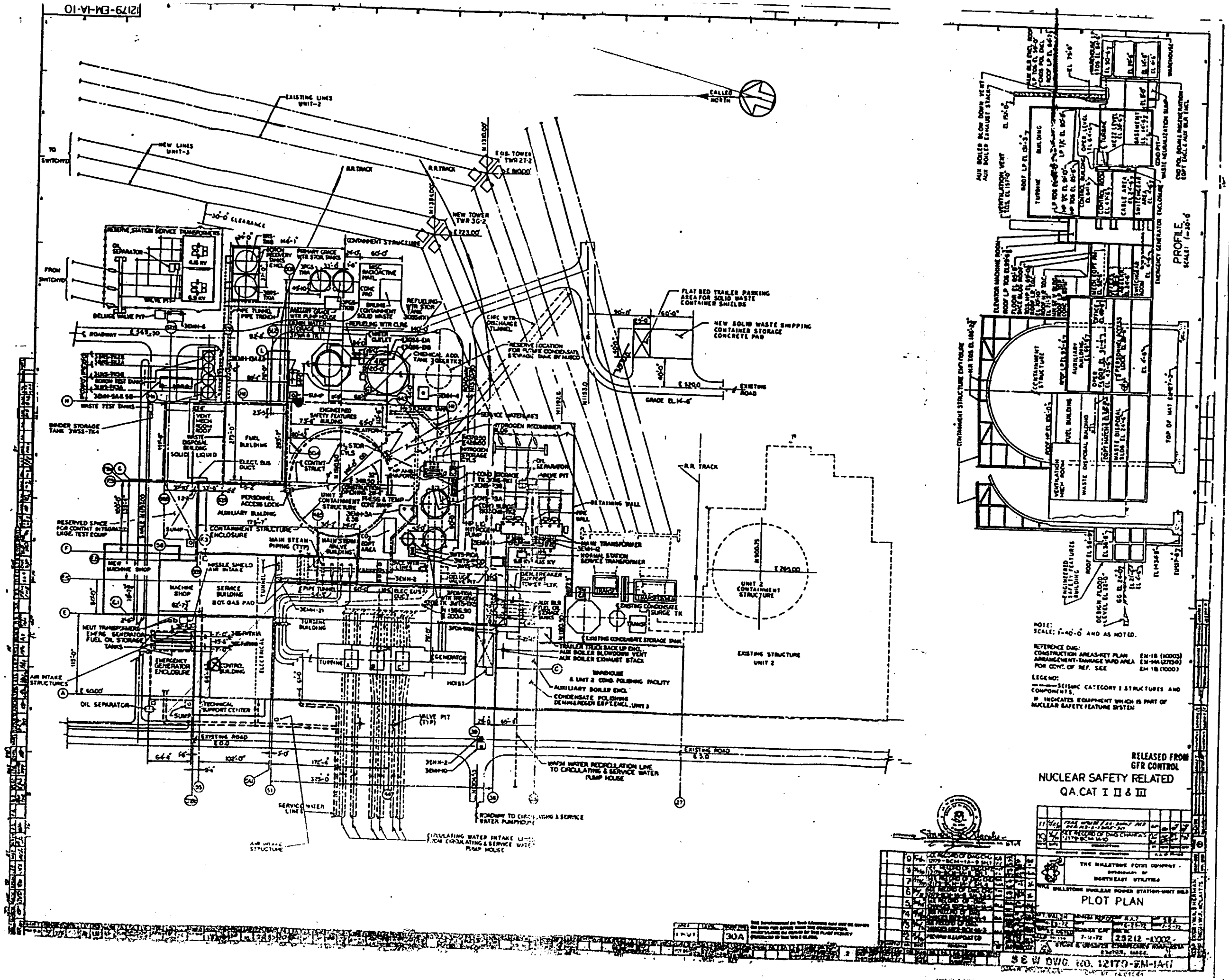
1. EN-200 Wind Speed/Wind Direction Distribution Computer Output:

Release/Receptor Combination	Wind Direction Range	Job No.
Unit 3 MSVB to Unit 3 Control Room Air Intake	86 - 154 degrees	09666

2. EN-200 Wind Speed/Wind Direction Distribution Computer Output:

Release/Receptor Combination	Wind Direction Range	Job No.
Unit 3 ESFB to Unit 3 Control Room Air Intake	56 - 124 degrees	09668

P.9
03703.70
WM(B)-01
Rev 0



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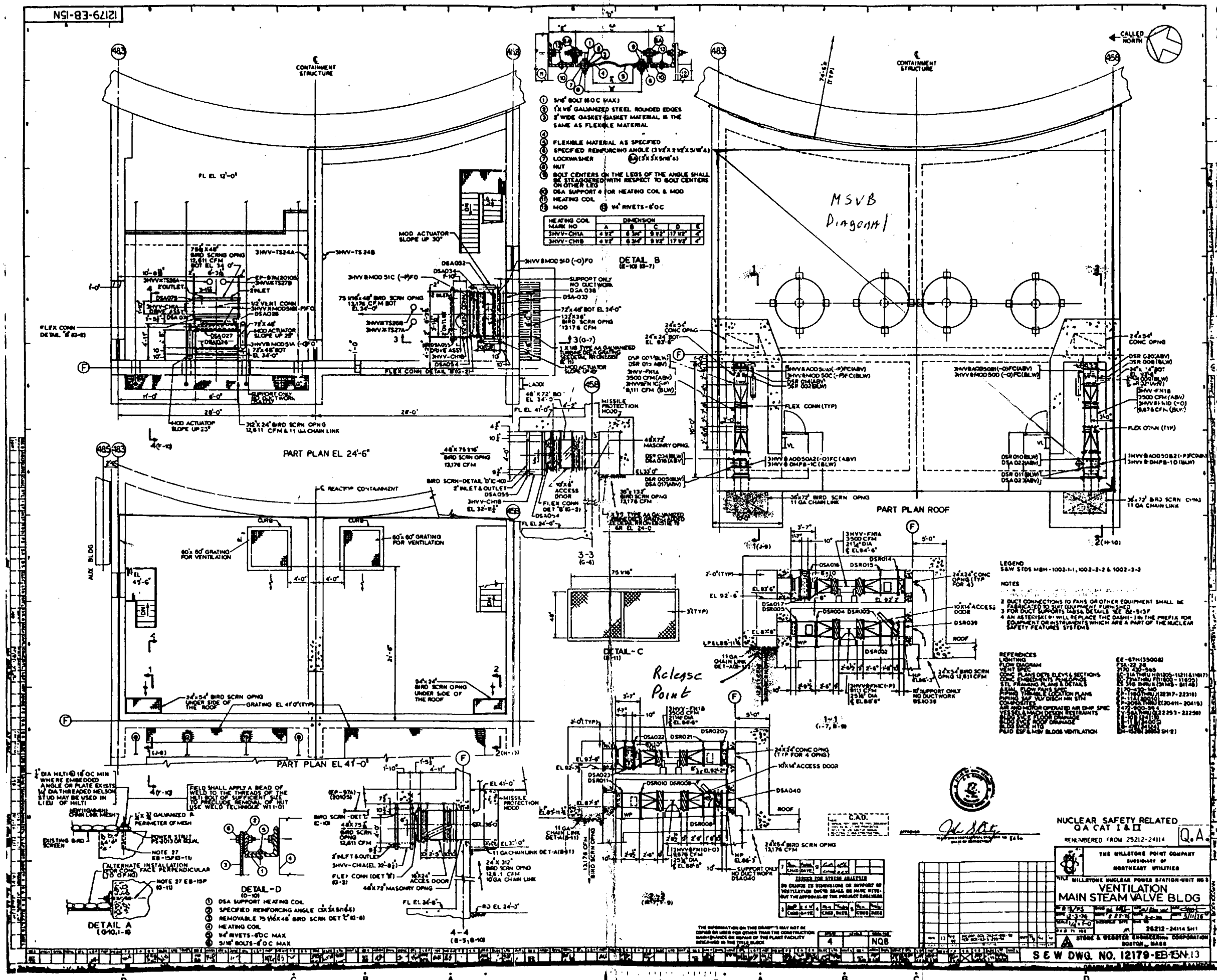
WM(B)-01
Rev 0

12179-EB-15N



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Rev 0

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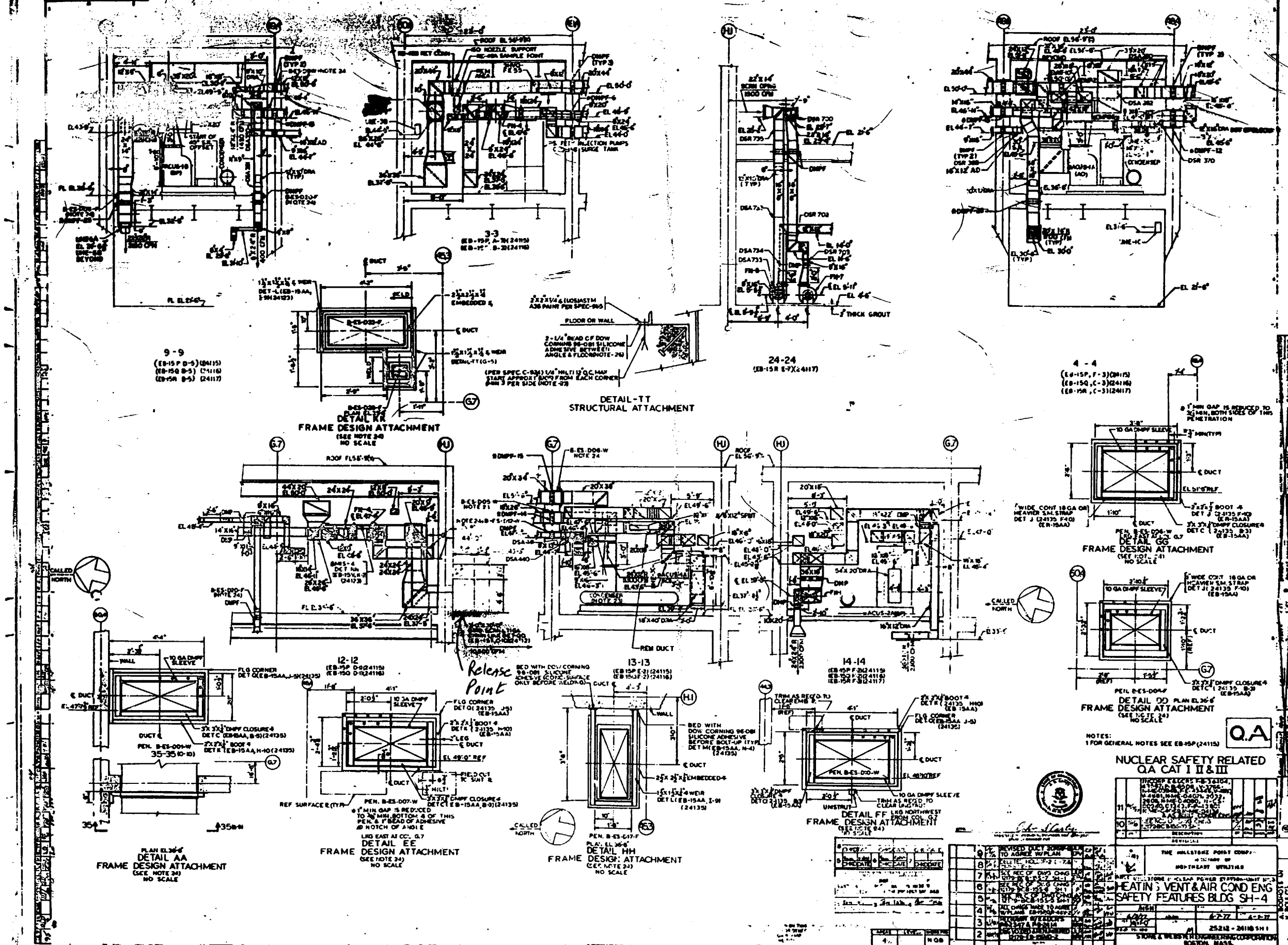

DISPERSION COEFFICIENTS AS A FUNCTION OF DOWNWIND DISTANCE
PASQUILL STABILITY CLASS (F)

DOWNWIND DISTANCE (METERS)	STONE & WEBSTER SIGMA Y	STONE & WEBSTER SIGMA Z	POLYN (LONG) SIGMA Y	POLYN (LONG) SIGMA Z	POLYN (DESERT) SIGMA Y	POLYN (DESERT) SIGMA Z	POLYN (XOODOQ) SIGMA Y	POLYN (XOODOQ) SIGMA Z
10.	0.4739	0.1971	0.4014	0.1395	2.4230	1.6073	0.5776	0.3454
20.	0.8769	0.4437	0.8020	0.3243	4.5718	1.9981	1.0002	0.6072
30.	1.3054	0.6920	1.2022	0.5313	6.6281	2.2694	1.5578	0.8446
40.	1.7048	0.9383	1.6022	0.7540	8.6265	2.4839	2.0200	1.0675
50.	2.0977	1.1726	2.0021	0.9893	10.5829	2.6642	2.4710	1.2801
60.	2.4855	1.4134	2.4019	1.2351	12.5064	2.8212	2.9133	1.4849
70.	2.8691	1.6427	2.8015	1.4900	14.4031	2.9611	3.3485	1.6834
80.	3.2490	1.8667	3.2011	1.7530	16.2771	3.0879	3.7776	1.8767
90.	3.6259	2.0857	3.6006	2.0232	18.1315	3.2043	4.2016	2.0655
100.	4.0000	2.3000	4.0000	2.3000	19.9686	3.3120	4.6210	2.2472
110.	4.3716	2.5098	4.3994	2.5829	21.7903	3.4126	5.0364	2.4369
120.	4.7409	2.7153	4.7987	2.7365	23.5981	3.5072	5.4481	2.6223
130.	5.1082	2.9169	5.1979	2.8894	25.3933	3.5964	5.8565	2.8037
140.	5.4736	3.1146	5.5971	3.0416	27.1769	3.6811	6.2619	2.9815
150.	5.8372	3.3088	5.9963	3.1930	28.9499	3.7617	6.6645	3.1560
160.	6.1991	3.4995	6.3954	3.3437	30.7129	3.8387	7.0644	3.3275
170.	6.5595	3.6870	6.7945	3.4937	32.4667	3.9125	7.4620	3.4962
180.	6.9184	3.8714	7.1936	3.6430	34.2119	3.9834	7.8573	3.6624
190.	7.2759	4.0528	7.5926	3.7916	35.9489	4.0516	8.2505	3.8261
200.	7.6321	4.2314	7.9916	3.9395	37.6782	4.1174	8.6417	3.9877
210.	7.9871	4.4073	8.3905	4.0867	39.4003	4.1809	9.0309	4.1472
220.	8.3409	4.5806	8.7895	4.2332	41.1156	4.2424	9.4184	4.3047
230.	8.6935	4.7514	9.1884	4.3790	42.8242	4.3021	9.8042	4.4603
240.	9.0451	4.9198	9.5872	4.5241	44.5267	4.3599	10.1884	4.6143
250.	9.3956	5.0860	9.9861	4.6685	46.2232	4.4162	10.5710	4.7665
260.	9.7451	5.2499	10.3825	4.8123	47.9140	4.4709	10.9521	4.9172
270.	10.0936	5.4117	10.6986	4.9553	49.5994	4.5242	11.3319	5.0664
280.	10.4412	5.5714	11.0542	5.0977	51.2795	4.5762	11.7102	5.2141
290.	10.7878	5.7292	11.4095	5.2395	52.9546	4.6269	12.0873	5.3605
300.	11.1337	5.8850	11.7643	5.3805	54.6248	4.6764	12.4631	5.5056
310.	11.4786	6.0390	12.1188	5.5209	56.2904	4.7248	12.8377	5.6494
320.	11.8228	6.1912	12.4729	5.6607	57.9515	4.7721	13.2111	5.7920
330.	12.1661	6.3416	12.8266	5.7997	59.6082	4.8185	13.5833	5.9335
340.	12.5087	6.4903	13.1799	5.9382	61.2607	4.8638	13.9546	6.0738
350.	12.8505	6.6374	13.5328	6.0759	62.9091	4.9083	14.3247	6.2131
360.	13.1916	6.7830	13.8854	6.2131	64.5535	4.9519	14.6938	6.3513
370.	13.5320	6.9269	14.2375	6.3496	66.1942	4.9947	15.0619	6.4886
380.	13.8718	7.0694	14.5893	6.4854	67.0311	5.0367	15.4291	6.6249
390.	14.2107	7.2104	14.9407	6.6206	69.4644	5.0780	15.7953	6.7603
400.	14.5491	7.3500	15.2917	6.7552	71.0942	5.1185	16.1606	6.8947
410.	14.8868	7.4882	15.6424	6.8892	72.7205	5.1503	16.5250	7.0283
420.	15.2239	7.6251	15.9927	7.0225	74.3436	5.1975	16.8886	7.1611
430.	15.5604	7.7607	16.3426	7.1552	75.9634	5.2360	17.2513	7.2930
440.	15.8963	7.8949	16.6921	7.2872	77.5800	5.2740	17.6132	7.4242
450.	16.2316	8.0280	17.0413	7.4187	79.1935	5.3113	17.9743	7.5545
460.	16.5663	8.1598	17.3901	7.5496	80.8041	5.3481	18.3347	7.6841
470.	16.9005	8.2904	17.7385	7.6798	82.4117	5.3843	18.6943	7.8130
480.	17.2340	8.4199	18.0865	7.8094	84.0164	5.4201	19.0531	7.9412
490.	17.5670	8.5482	18.4342	7.9384	85.6184	5.4553	19.4112	8.0687

"POLYN" Dispersion Coefficients

P.12
03703.72
WM(B)-7
Lwc

Northeast
Utilities System

107 Selden Street, Berlin, CT 06037

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 665-5000

P.13
0370 3.7002
WM(B)-01
ev.0

April 28, 1998

Mr. Joseph Creamer
Stone and Webster
245 Summer Street, 7th Floor
Boston, MA 02210

Dear Mr. Creamer:

Millstone Nuclear Power Station
Meteorological Data

Accompanying this memo are four computer diskettes containing the meteorological data from 1974 through 1981, for your use in the Millstone Unit 3 X/Q calculations. Each diskette contains two years of data, as noted on the labels. The year of data is represented in each dataset name.

Each line of the datasets represents one hour of data. There is a nine character "time stamp" on each line; columns 1 and 2 are the year, columns 3 through 5 are the Julian day, and columns 6 through 9 are the time (military time, always on Eastern Standard Time). Columns 10 through 54 are, in order, the AT033, WS033, WD033, WS142, WD142, DT142, WS374, WD374, & DT374 (AT = air temperature, WS = wind speed, WD = wind direction, DT = delta-temperature, and numbers are instrument height). These are all in "F5.1" format. Missing data are represented by "999.0."

The data generated by our meteorological monitoring system consist of four fifteen-minute averages per hour. However, the attached datasets only contain one fifteen-minute average per hour. Historically, most of our analyses involving meteorological data, including Category 1 X/Q calculations, have been based on one fifteen-minute average representing an entire hour of data. It was found that this methodology introduced very small errors into the analyses results, compared to calculating an average of the available fifteen-minute averages for each hour.

If you have any questions, please call me, at (860) 665-3183.

Very truly yours,

H. L. Chamberlain, Jr.
Environmental Services

Enclosures

```
J E S 2  J O B  L O G  --  S Y S T E M  C 1 6 8  --  N O D E  J E S 2 B O S

11.33.37 JOB09666  IRR010I  USERID VIG7988  IS ASSIGNED TO THIS JOB.
11.33.39 JOB09666  ICH70001I VIG7988  LAST ACCESS AT 11:21:00 ON FRIDAY, MAY 1, 1998
11.33.39 JOB09666  $HASP373 DISTRIB  STARTED - INIT    8 - CLASS A - SYS C168
11.33.45 JOB09666  +IH0002I STOP      1
11.33.46 JOB09666  $HASP395 DISTRIB  ENDED

------ JES2 JOB STATISTICS ------

  01 MAY 1998 JOB EXECUTION DATE

          37 CARDS READ

         840 SYSOUT PRINT RECORDS

           0 SYSOUT PUNCH RECORDS

          34 SYSOUT SPOOL KBYTES

        0.12 MINUTES EXECUTION TIME
```

```
 1 //DISTRIB JOB (0031,3),'VIGEANT-SA',                    01-MAY-98JOB09666
   //  MSGLEVEL=2,MSGCLASS=A
   //* RJETRAN.VIG7988.DATA(DISTRIB)
   /*JOBPARM  ROOM=3                                          JOB09666
 2 //METRDISK EXEC METRPROC
 9 //DISK DD DISP=SHR,DSN=ENVIRONM.METDATA.MILSTONE.YR7481
12 //SYSIN     DD *                GENERATED STATEMENT
13 //DISTRIB EXEC PGM=DISTRB00,REGION=284K,TIME=1
14 //STEPLIB DD DSN=ENVIRONM.DISTRIB,DISP=SHR
15 //GO.FT06F001 DD DCB=PRINT1,SYSOUT=*
16 //GO.FT10F001 DD UNIT=DISK,DISP=(OLD,DELETE),DSN=&SAMPLE
17 //GO.FT05F001  DD  *
18 //IMBLIST EXEC PGM=IMBLIST
19 //SYSPRINT DD SYSOUT=*
20 //SYSLIB DD DSN=ENVIRONM.DISTRIB,DISP=SHR
21 //SYSIN     DD *                GENERATED STATEMENT
```

```
STMT NO. MESSAGE
        2 IEFC001I PROCEDURE METRPROC HAS EXPANDED USING SYSTEM LIBRARY SYS1.USER.PROCLIB
ICH70001I VIG7988  LAST ACCESS AT 11:21:00 ON FRIDAY, MAY 1, 1998
IEF236I ALLOC. FOR DISTRIB METRPROC METRDISK
IGD103I SMS ALLOCATED TO DDNAME STEPLIB
IEF237I JES2 ALLOCATED TO FT06F001
IEF237I JES2 ALLOCATED TO SYSPRINT
IGD103I SMS ALLOCATED TO DDNAME SYS010
IGD101I SMS ALLOCATED TO DDNAME (SYS011 )
        DSN (SYS98121.T113339.RA000.DISTRIB.SAMPLE.H01    )
        STORCLAS (TEMP) MGMTCLAS (          ) DATACLAS (          )
        VOL SER NOS= VIO
IEF237I JES2 ALLOCATED TO FT05F001
IEF142I DISTRIB METRPROC METRDISK - STEP HAS EXECUTED - COND CODE 0000
IGD104I ENVIRONM.METOLOGY                          RETAINED,  DDNAME=STEPLIB
IEF285I   VIG7988.DISTRIB.JOB09666.D0000104.?        SYSOUT
IEF285I   VIG7988.DISTRIB.JOB09666.D0000105.?        SYSOUT
IGD104I ENVIRONM.METDATA.MILSTONE.YR7481           RETAINED,  DDNAME=SYS010
IGD106I SYS98121.T113339.RA000.DISTRIB.SAMPLE.H01  PASSED,    DDNAME=SYS011
IEF285I   VIG7988.DISTRIB.JOB09666.D0000101.?        SYSIN
.......................................................................................................................
.JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   11.33.37,  05/01/98                V09 .
.STEP NUMBER -    1, STEP NAME - METRPROC, PROGRAM NAME - METHR01 , RAN FROM  11.33.39 TO  11.33.41                          .
.ENDING CONDITION - RETURN CODE      0, REGION USED -    380K, PERFORMANCE GROUP -  20, SWAPS -      0                      .
.PAGEINS -       0, PAGEOUTS -       0, VIO PAGEINS -       0, VIO PAGEOUTS -       0                                       .
.CPU TIME -       .50 VECTOR TIME -       .00 SECS, EXCPS -(       352 NON-VIO,      1,169 VIO), CPU UNITS -      1.87 SECS   .
.SYSIN RECORDS -      3, OPENS - (      0 TAPE,      0 TEMP,      0 PERM),                                COST =     $3.12      .
.EXCPS/DDNAME -                                9/STEPLIB          343/SYS010          1,169/SYS011                          .
.......................................................................................................................
IEF373I STEP/METRPROC/START 1998121.1133
IEF374I STEP/METRPROC/STOP  1998121.1133 CPU    0MIN 00.46SEC SRB    0MIN 00.02SEC VIRT    88K SYS   292K EXT       4K SYS   10132K
IEF236I ALLOC. FOR DISTRIB DISTRIB
IGD103I SMS ALLOCATED TO DDNAME STEPLIB
IEF237I JES2 ALLOCATED TO FT06F001
IGD103I SMS ALLOCATED TO DDNAME FT10F001
IEF237I JES2 ALLOCATED TO FT05F001
IEF142I DISTRIB DISTRIB - STEP HAS EXECUTED - COND CODE 0001
IGD104I ENVIRONM.DISTRIB                           RETAINED,  DDNAME=STEPLIB
IEF285I   VIG7988.DISTRIB.JOB09666.D0000106.?        SYSOUT
IGD105I SYS98121.T113339.RA000.DISTRIB.SAMPLE.H01  DELETED,   DDNAME=FT10F001
IEF285I   VIG7988.DISTRIB.JOB09666.D0000102.?        SYSIN
.......................................................................................................................
.JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   11.33.37,  05/01/98                V09 .
.STEP NUMBER -    2, STEP NAME - DISTRIB , PROGRAM NAME - DISTRB00, RAN FROM  11.33.41 TO  11.33.45                          .
.ENDING CONDITION - RETURN CODE      1, REGION USED -    340K, PERFORMANCE GROUP -  20, SWAPS -      0                      .
.PAGEINS -       0, PAGEOUTS -       0, VIO PAGEINS -       0, VIO PAGEOUTS -       0                                       .
.CPU TIME -      2.35 VECTOR TIME -       .00 SECS, EXCPS -(         8 NON-VIO,      1,170 VIO), CPU UNITS -      3.41 SECS   .
.SYSIN RECORDS -     16, OPENS - (      0 TAPE,      0 TEMP,      0 PERM),                                COST =     $5.68      .
.EXCPS/DDNAME -                                8/STEPLIB          1,170/FT10F001                                            .
.......................................................................................................................
IEF373I STEP/DISTRIB /START 1998121.1133
IEF374I STEP/DISTRIB /STOP  1998121.1133 CPU    0MIN 02.34SEC SRB    0MIN 00.01SEC VIRT    64K SYS   276K EXT       4K SYS   10140K
IEF236I ALLOC. FOR DISTRIB IMBLIST
IEF237I JES2 ALLOCATED TO SYSPRINT
IGD103I SMS ALLOCATED TO DDNAME SYSLIB
IEF237I JES2 ALLOCATED TO SYSIN
IEF142I DISTRIB IMBLIST - STEP HAS EXECUTED - COND CODE 0000
IEF285I   VIG7988.DISTRIB.JOB09666.D0000107.?        SYSOUT
IGD104I ENVIRONM.DISTRIB                           RETAINED,  DDNAME=SYSLIB
```

```
IEF236I   VIG7988.DISTRIB.JOB09666.D0000103.?          SYSIN
.JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   11.33.37,  05/01/98                    V09 .
.STEP NUMBER -   3, STEP NAME - IMBLIST , PROGRAM NAME - IMBLIST , RAN FROM  11.33.45 TO  11.33.46                              .
.ENDING CONDITION - RETURN CODE      8, REGION USED -    428K, PERFORMANCE GROUP -  20, SWAPS -      0                        .
.PAGEINS -      0, PAGEOUTS -      0, VIO PAGEINS -      0, VIO PAGEOUTS -      0                                                 .
.CPU TIME -      .03 VECTOR TIME -      .00 SECS, EXCPS -(         0 NON-VIO,         0 VIO), CPU UNITS -       .03 SECS      .
.SYSIN RECORDS -      1, OPENS - (      0 TAPE,      0 TEMP,      0 PERM),                                COST =     $0.05        .
IEF373I STEP/IMBLIST /START 1998121.1133
IEF374I STEP/IMBLIST /STOP  1998121.1133 CPU    0MIN 00.03SEC SRB    0MIN 00.00SEC VIRT   156K SYS   272K EXT       4K SYS   10044K
IEF375I  JOB/DISTRIB /START 1998121.1133
IEF376I  JOB/DISTRIB /STOP  1998121.1133 CPU    0MIN 02.83SEC SRB    0MIN 00.03SEC
.TOTAL CPU TIME -      2.88 SECS,   TOTAL VECTOR TIME -       .00 SECS,   TOTAL CPU UNITS -      5.31 SECS                    .
.TOTAL EXCPS -(       360 NON-VIO,      2,339 VIO)                                                                              .
.TOTAL JOB COST EXCLUDING PRINT CHARGES =      $8.85       CHARGED TO AUTH = 0031 , JO/HO = 022685067                           .
```

STONE & WEBSTER ENGINEERING CORPORATION

ENVIRONMENTAL ENGINEERING DIVISION

COMPUTER CODE IDENTIFICATION

PROGRAM NAME: SITE DATA RETREIVAL PROGAM

VERSION OF PROGRAM: 00

LINK EDIT DATE (JULIAN): 80.184

DATE OF RUN (MO/DAY/YR): 5/01/98

JOB NAME OF RUN: DISTRIB

LIBRARY REFERENCE NUMBER: EN-112

LEVEL OF PROGRAM: 01

LINK EDIT TIME (HRS.MINS.SECS): 14.21.36

TIME OF RUN (MILITARY): 1133

JOB09666

INPUT DATA TRACEBACK

```
DATA SUBMITTED ON DEVICE: 5

 CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
    1       2
    2   111 112
    3  74001     81365
 CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

      * * * * * * * * * * * * * END OF INPUT ON DEVICE 5 * * * * * * * * * * * * *
```

```
INPUT TO METOWER PROGRAM
      2
    111 112
    14001     81365

EOF OF INPUT DATA REACHED

NUMBER OF CARDS SELECTED =  5844

NUMBER OF DAYS SELECTED  =  2922
```

STONE & HEBSTER ENGINEERING CORPORATION

ENVIRONMENTAL ENGINEERING DIVISION

COMPUTER CODE IDENTIFICATION

PROGRAM NAME: FREQ OF OCCUR OF TWO PARAMETERS

VERSION OF PROGRAM: 00

LOAD MODULE: ENVIRONM.DISTRIB

LINK EDIT DATE (JULIAN): 81.182

DATE OF RUN (MO/DAY/YR): 5/01/98

JOB NAME OF RUN: DISTRIB

LIBRARY REFERENCE NUMBER: EN-200

LEVEL OF PROGRAM: 00

MEMBER (PGM): DISTRB00

LINK EDIT TIME (HRS.MINS.SECS): 12.11.26

TIME OF RUN (MILITARY): 1133

JOB09666

INPUT DATA TRACEBACK

```
DATA SUBMITTED ON DEVICE:  5

CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
   1      2
   2      Stat MILLSTONE NUCLEAR POWER STATION 1974 - 1981 ONSITE DATA
   3          33-FT WIND DIRECTION VS. 33-FT WIND SPEED DISTRIBUTION
   4              HIND DIRECTION (DEGREES)                3      0  999
   5    85 154 360
   6  0                                                                          0
   7  HIND SPEED     (MPH)      (TENTHS)                  99      0 1000
   8     5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24
   9    25  26  27  28  29  30  31  32  33  34  35  36  37  38  39  40  41  42  43  44
  10    45  46  47  48  49  50  51  52  53  54  55  56  57  58  59  60  61  62  63  64

CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
  11    65  66  67  68  69  70  71  72  73  74  75  76  77  78  79  80  81  82  83  84
  12    85  86  87  88  89  90  91  92  93  94  95  96  97  98  99 100 110 120 130 140
  13  1  999
  14     74
  15  7400181365    0    0
  16    112       0.0       0.0  111       0.0       0.0
CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

     * * * * * * * * * * * * * END OF INPUT ON DEVICE   5 * * * * * * * * * * * * *
```

```
----- SITE WEATHER DATA *****

FIRST YEAR = 1974, JSYR = 74001, JNYR = 81365, JM01 =  0, JM02 =  0

TOP PARAMETER CODE = 112     MULT =   1.00000     ADD =   0.0

SIDE PARAMETER CODE = 111    MULT =   1.00000     ADD =   0.0

FIRST DATE RETURNED = 74001

LAST DATE RETURNED = 81365
```

MILLSTONE NUCLEAR POWER STATION 1974 - 1981 ONSITE DATA

33-FT WIND DIRECTION VS. 33-FT WIND SPEED DISTRIBUTION

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 85	86- 154	155- 360	361- 999	TOTAL
0 - 5	0	0	0	87	87
PCT CLASS	0.0	0.0	0.0	100.00	100.00
PCT TOTAL	0.0	0.0	0.0	0.13	0.13
6 - 6	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
7 - 7	0	0	0	123	123
PCT CLASS	0.0	0.0	0.0	100.00	100.00
PCT TOTAL	0.0	0.0	0.0	0.19	0.19
8 - 8	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
9 - 9	0	0	0	237	237
PCT CLASS	0.0	0.0	0.0	100.00	100.00
PCT TOTAL	0.0	0.0	0.0	0.36	0.36
10 - 10	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
11 - 11	0	0	0	367	367
PCT CLASS	0.0	0.0	0.0	100.00	100.00
PCT TOTAL	0.0	0.0	0.0	0.55	0.55
12 - 12	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
13 - 13	182	75	264	14	535
PCT CLASS	34.02	14.02	49.35	2.62	100.00
PCT TOTAL	0.27	0.11	0.40	0.02	0.81
14 - 14	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
15 - 15	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 85	86- 154	155- 360	361- 999	TOTAL
16 - 16	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
17 - 17	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
18 - 18	262	89	359	11	721
PCT CLASS	36.34	12.34	49.79	1.53	100.00
PCT TOTAL	0.39	0.13	0.54	0.02	1.09
19 - 19	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
20 - 20	281	101	426	13	821
PCT CLASS	34.23	12.30	51.89	1.58	100.00
PCT TOTAL	0.42	0.15	0.64	0.02	1.24
21 - 21	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
22 - 22	247	93	327	6	673
PCT CLASS	36.70	13.82	48.59	0.89	100.00
PCT TOTAL	0.37	0.14	0.49	0.01	1.01
23 - 23	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
24 - 24	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
25 - 25	308	130	549	11	998
PCT CLASS	30.86	13.03	55.01	1.10	100.00
PCT TOTAL	0.46	0.20	0.83	0.02	1.50
26 - 26	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
27 - 27	0	0	1	0	1
PCT CLASS	0.0	0.0	100.00	0.0	100.00
PCT TOTAL	0.0	0.0	0.00	0.0	0.00

86° → 154°
Cumulative Hours = 358
Total Hours = 8266
358/8266 = 4.3%

APPENDIX 1
DISTRIBUTION Program Output
Unit 3 MSVB to Unit 3 Control Room Air Intake

P. 12
03703.7002
WM(B)-01

Rev 0

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 85	86- 154	155- 360	361- 999	TOTAL
28 - 28	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
29 - 29	372	166	625	8	1171
PCT CLASS	31.77	14.18	53.37	0.68	100.00
PCT TOTAL	0.56	0.25	0.94	0.01	1.77
30 - 30	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
31 - 31	345	169	640	6	1160
PCT CLASS	29.74	14.57	55.17	0.52	100.00
PCT TOTAL	0.52	0.25	0.96	0.01	1.75
32 - 32	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
33 - 33	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
34 - 34	374	165	732	10	1281
PCT CLASS	29.20	12.88	57.14	0.78	100.00
PCT TOTAL	0.56	0.25	1.10	0.02	1.93
35 - 35	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
36 - 36	390	176	792	11	1369
PCT CLASS	28.49	12.86	57.85	0.80	100.00
PCT TOTAL	0.59	0.27	1.19	0.02	2.06
37 - 37	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
38 - 38	1	0	1	0	2
PCT CLASS	50.00	0.0	50.00	0.0	100.00
PCT TOTAL	0.00	0.0	0.00	0.0	0.00
39 - 39	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0

86' → 154'
Cumulative Hours = 823
Total Hours = 8266
823/8266 = 10.0%

APPENDIX 1
DISTRIBUTION Program Output
Unit 3 MSVB to Unit 3 Control Room Air Intake

P. 13
03703.7002
WM(B)-01

Ex 0

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 85	86- 154	155- 360	361- 999	TOTAL
40 - 40	336	173	805	8	1322
PCT CLASS	25.42	13.09	60.89	0.61	100.00
PCT TOTAL	0.51	0.26	1.21	0.01	1.99
41 - 41	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
42 - 42	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
43 - 43	371	201	864	7	1443
PCT CLASS	25.71	13.93	59.88	0.49	100.00
PCT TOTAL	0.56	0.30	1.30	0.01	2.18
44 - 44	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
45 - 45	240	112	579	7	938
PCT CLASS	25.59	11.94	61.73	0.75	100.00
PCT TOTAL	0.36	0.17	0.87	0.01	1.41
46 - 46	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
47 - 47	361	185	914	9	1469
PCT CLASS	24.57	12.59	62.22	0.61	100.00
PCT TOTAL	0.54	0.28	1.38	0.01	2.21
48 - 48	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
49 - 49	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
50 - 50	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
51 - 51	342	202	868	9	1421
PCT CLASS	24.07	14.22	61.08	0.63	100.00
PCT TOTAL	0.52	0.30	1.31	0.01	2.14

86° → 154°

Cumulative Hours = 1,650

Total Hours = 8,266

1,650/8,266 = 20.0%

APPENDIX 1
DISTRIBUTION Program Output
Unit 3 MSVB to Unit 3 Control Room Air Intake

P. 14
03703.7002
WM(B)-01

RCO

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 85	86- 154	155- 360	361- 999	TOTAL
52 - 52	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
53 - 53	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
54 - 54	301	211	901	6	1419
PCT CLASS	21.21	14.87	63.50	0.42	100.00
PCT TOTAL	0.45	0.32	1.36	0.01	2.14
55 - 55	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
56 - 56	318	208	900	13	1439
PCT CLASS	22.10	14.45	62.54	0.90	100.00
PCT TOTAL	0.48	0.31	1.36	0.02	2.17
57 - 57	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
58 - 58	336	199	901	5	1441
PCT CLASS	23.32	13.81	62.53	0.35	100.00
PCT TOTAL	0.51	0.30	1.36	0.01	2.17
59 - 59	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
60 - 60	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
61 - 61	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
62 - 62	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
63 - 63	302	193	912	6	1413
PCT CLASS	21.37	13.66	64.54	0.42	100.00
PCT TOTAL	0.46	0.29	1.37	0.01	2.13

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 85	86- 154	155- 360	361- 999	TOTAL
64 - 64	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
65 - 65	293	208	969	8	1478
PCT CLASS	19.82	14.07	65.56	0.54	100.00
PCT TOTAL	0.44	0.31	1.46	0.01	2.23
66 - 66	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
67 - 67	205	153	651	5	1014
PCT CLASS	20.22	15.09	64.20	0.49	100.00
PCT TOTAL	0.31	0.23	0.98	0.01	1.53
68 - 68	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
69 - 69	282	223	975	10	1490
PCT CLASS	18.93	14.97	65.44	0.67	100.00
PCT TOTAL	0.43	0.34	1.47	0.02	2.25
70 - 70	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
71 - 71	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
72 - 72	1	1	0	0	2
PCT CLASS	50.00	50.00	0.0	0.0	100.00
PCT TOTAL	0.00	0.00	0.0	0.0	0.00
73 - 73	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
74 - 74	280	207	968	10	1465
PCT CLASS	19.11	14.13	66.08	0.68	100.00
PCT TOTAL	0.42	0.31	1.46	0.02	2.21
75 - 75	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0

86° → 154°

Cumulative Hours = 3,209

Total Hours = 8,266

3,209/8,266 = 38.8%

APPENDIX 1
DISTRIBUTION Program Output
Unit 3 MSVB to Unit 3 Control Room Air Intake

P. 16
03703.7002
WM(B)-01

Rev 0

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 85	86- 154	155- 360	361- 999	TOTAL
76 - 76	276	181	967	8	1432
PCT CLASS	19.27	12.64	67.53	0.56	100.00
PCT TOTAL	0.42	0.27	1.46	0.01	2.16
77 - 77	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
78 - 78	286	176	880	8	1350
PCT CLASS	21.19	13.04	65.19	0.59	100.00
PCT TOTAL	0.43	0.27	1.33	0.01	2.04
79 - 79	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
80 - 80	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
81 - 81	225	193	911	8	1337
PCT CLASS	16.83	14.44	68.14	0.60	100.00
PCT TOTAL	0.34	0.29	1.37	0.01	2.02
82 - 82	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
83 - 83	0	2	2	0	4
PCT CLASS	0.0	50.00	50.00	0.0	100.00
PCT TOTAL	0.0	0.00	0.00	0.0	0.01
84 - 84	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
85 - 85	238	202	898	6	1344
PCT CLASS	17.71	15.03	66.82	0.45	100.00
PCT TOTAL	0.36	0.30	1.35	0.01	2.03
86 - 86	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
87 - 87	244	180	942	4	1370
PCT CLASS	17.81	13.14	68.76	0.29	100.00
PCT TOTAL	0.37	0.27	1.42	0.01	2.07

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 85	86- 154	155- 360	361- 999	TOTAL
88 - 88	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
89 - 89	168	118	635	5	926
PCT CLASS	18.14	12.74	68.57	0.54	100.00
PCT TOTAL	0.25	0.18	0.96	0.01	1.40
90 - 90	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
91 - 91	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
92 - 92	208	152	870	5	1235
PCT CLASS	16.84	12.31	70.45	0.40	100.00
PCT TOTAL	0.31	0.23	1.31	0.01	1.86
93 - 93	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
94 - 94	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
95 - 95	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
96 - 96	222	176	876	6	1280
PCT CLASS	17.34	13.75	68.44	0.47	100.00
PCT TOTAL	0.33	0.27	1.32	0.01	1.93
97 - 97	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
98 - 98	219	158	935	7	1319
PCT CLASS	16.60	11.98	70.89	0.53	100.00
PCT TOTAL	0.33	0.24	1.41	0.01	1.99
99 - 99	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 85	86- 154	155- 360	361- 999	TOTAL
100 - 100	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
101 - 110	734	528	3406	14	4682
PCT CLASS	15.68	11.28	72.75	0.30	100.00
PCT TOTAL	1.11	0.80	5.13	0.02	7.06
111 - 120	437	303	2125	8	2873
PCT CLASS	15.21	10.55	73.96	0.28	100.00
PCT TOTAL	0.66	0.46	3.20	0.01	4.33
121 - 130	474	418	2820	20	3732
PCT CLASS	12.70	11.20	75.56	0.54	100.00
PCT TOTAL	0.71	0.63	4.25	0.03	5.63
131 -1000	1392	1839	12778	139	16148
PCT CLASS	8.62	11.39	79.13	0.86	100.00
PCT TOTAL	2.10	2.77	19.26	0.21	24.34
TOTAL	11853	8266	44968	1245	66332
PCT CLASS	17.87	12.46	67.79	1.88	100.00
PCT TOTAL	17.87	12.46	67.79	1.88	100.00

Total Valid Observations (All Sectors)

Total Observations (86° → 154°)

Rev 0

APPENDIX 1
DISTRIBUTION Program Output
Unit 3 MSVB to Unit 3 Control Room Air Intake

OBSERVATIONS READ = 70128
CHECKED = 70128
USED = 66332

```
J E S 2   J O B   L O G   --   S Y S T E M   C 1 6 8   --   N O D E   J E S 2 B O S

..34.03 JOB09668  IRR010I  USERID VIG7988  IS ASSIGNED TO THIS JOB.
..34.04 JOB09668  ICH70001I VIG7988  LAST ACCESS AT 11:33:39 ON FRIDAY, MAY 1, 1998
..34.04 JOB09668  $HASP373 DISTRIB  STARTED - INIT    8 - CLASS A - SYS C168
..34.09 JOB09668  +IH0002I STOP      1
..34.09 JOB09668  $HASP395 DISTRIB  ENDED

------ JES2 JOB STATISTICS ------

 01 MAY 1998 JOB EXECUTION DATE

          37 CARDS READ

         840 SYSOUT PRINT RECORDS

           0 SYSOUT PUNCH RECORDS

          34 SYSOUT SPOOL KBYTES

        0.09 MINUTES EXECUTION TIME
```

```
 1 //DISTRIB JOB (0031,3),'VIGEANT-SA',                    01-MAY-98JOB09668
   //  MSGLEVEL=2,MSGCLASS=A
   //* RJETRAN.VIG7988.DATA(DISTRIB)
   /*JOBPARM  ROOM=3                                          JOB09668
 2 //METRDISK EXEC METRPROC
 9 //DISK DD DISP=SHR,DSN=ENVIRONM.METDATA.MILSTONE.YR7481
12 //SYSIN     DD *                GENERATED STATEMENT
13 //DISTRIB EXEC PGM=DISTRB00,REGION=284K,TIME=1
14 //STEPLIB DD DSN=ENVIRONM.DISTRIB,DISP=SHR
15 //GO.FT06F001 DD DCB=PRINT1,SYSOUT=*,
16 //GO.FT10F001 DD UNIT=DISK,DISP=(OLD,DELETE),DSN=&SAMPLE
17 //GO.FT05F001  DD  *
18 //IMBLIST EXEC PGM=IMBLIST
19 //SYSPRINT DD SYSOUT=*
20 //SYSLIB DD DSN=ENVIRONM.DISTRIB,DISP=SHR
21 //SYSIN     DD *                GENERATED STATEMENT
```

```
STMT NO. MESSAGE
      2 IEFC001I PROCEDURE METRPROC WAS EXPANDED USING SYSTEM LIBRARY SYS1.USER.PROCLIB
IGH70001I VIG7988  LAST ACCESS AT 11:33:39 ON FRIDAY, MAY 1, 1998
IEF236I ALLOC. FOR DISTRIB METRPROC METRDISK
IGD103I SMS ALLOCATED TO DDNAME STEPLIB
IEF237I JES2 ALLOCATED TO FT06F001
IEF237I JES2 ALLOCATED TO SYSPRINT
IGD103I SMS ALLOCATED TO DDNAME SYS010
IGD101I SMS ALLOCATED TO DDNAME (SYS011  )
       DSN (SYS98121.T113403.RA000.DISTRIB.SAMPLE.H01    )
       STORCLAS (TEMP) MGMTCLAS (         ) DATACLAS (         )
       VOL SER NOS= VIO
IEF237I JES2 ALLOCATED TO FT05F001
IEF142I DISTRIB METRPROC METRDISK - STEP WAS EXECUTED - COND CODE 0000
IGD104I ENVIRONM.METOLOGY                          RETAINED,  DDNAME=STEPLIB
IEF285I   VIG7988.DISTRIB.JOB09668.D0000104.?        SYSOUT
IEF285I   VIG7988.DISTRIB.JOB09668.D0000105.?        SYSOUT
IGD104I ENVIRONM.METDATA.MILSTONE.YR7481           RETAINED,  DDNAME=SYS010
IGD106I SYS98121.T113403.RA000.DISTRIB.SAMPLE.H01  PASSED,    DDNAME=SYS011
IEF285I   VIG7988.DISTRIB.JOB09668.D0000101.?        SYSIN
.....................................................................................................................
JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -  11.34.03,  05/01/98                V09 .
STEP NUMBER -   1, STEP NAME - METRPROC, PROGRAM NAME - METHR01 , RAN FROM  11.34.04 TO  11.34.06                          .
ENDING CONDITION - RETURN CODE      0, REGION USED -    380K, PERFORMANCE GROUP -  20, SWAPS -      0                      .
PAGEINS -       0, PAGEOUTS -       0, VIO PAGEINS -       0, VIO PAGEOUTS -       0                                       .
CPU TIME -       .49 VECTOR TIME -       .00 SECS, EXCPS -(       352 NON-VIO,      1,169 VIO), CPU UNITS -      1.86 SECS   .
SYSIN RECORDS -      3, OPENS - (      0 TAPE,      0 TEMP,      0 PERM),                                  COST =     $3.10    .
EXCPS/DDNAME -                          9/STEPLIB          343/SYS010          1,169/SYS011                                .
.....................................................................................................................
IEF373I STEP/METRPROC/START 1998121.1134
IEF374I STEP/METRPROC/STOP  1998121.1134 CPU    0MIN 00.46SEC SRB    0MIN 00.02SEC VIRT    88K SYS   292K EXT       4K SYS   10132K
IEF236I ALLOC. FOR DISTRIB DISTRIB
IGD103I SMS ALLOCATED TO DDNAME STEPLIB
IEF237I JES2 ALLOCATED TO FT06F001
IGD103I SMS ALLOCATED TO DDNAME FT10F001
IEF237I JES2 ALLOCATED TO FT05F001
IEF142I DISTRIB DISTRIB - STEP WAS EXECUTED - COND CODE 0001
IGD104I ENVIRONM.DISTRIB                           RETAINED,  DDNAME=STEPLIB
IEF285I   VIG7988.DISTRIB.JOB09668.D0000106.?        SYSOUT
IGD105I SYS98121.T113403.RA000.DISTRIB.SAMPLE.H01  DELETED,   DDNAME=FT10F001
IEF285I   VIG7988.DISTRIB.JOB09668.D0000102.?        SYSIN
.....................................................................................................................
JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -  11.34.03,  05/01/98                V09 .
STEP NUMBER -   2, STEP NAME - DISTRIB , PROGRAM NAME - DISTRB00, RAN FROM  11.34.06 TO  11.34.09                          .
ENDING CONDITION - RETURN CODE      1, REGION USED -    340K, PERFORMANCE GROUP -  20, SWAPS -      0                      .
PAGEINS -       0, PAGEOUTS -       0, VIO PAGEINS -       0, VIO PAGEOUTS -       0                                       .
CPU TIME -      2.35 VECTOR TIME -       .00 SECS, EXCPS -(         8 NON-VIO,      1,170 VIO), CPU UNITS -      3.41 SECS   .
SYSIN RECORDS -     16, OPENS - (      0 TAPE,      0 TEMP,      0 PERM),                                  COST =     $5.68    .
EXCPS/DDNAME -                          8/STEPLIB          1,170/FT10F001                                                  .
.....................................................................................................................
IEF373I STEP/DISTRIB /START 1998121.1134
IEF374I STEP/DISTRIB /STOP  1998121.1134 CPU    0MIN 02.34SEC SRB    0MIN 00.01SEC VIRT    64K SYS   276K EXT       4K SYS   10140K
IEF236I ALLOC. FOR DISTRIB IMBLIST
IEF237I JES2 ALLOCATED TO SYSPRINT
IGD103I SMS ALLOCATED TO DDNAME SYSLIB
IEF237I JES2 ALLOCATED TO SYSIN
IEF142I DISTRIB IMBLIST   STEP WAS EXECUTED   COND CODE 0000
IEF285I   VIG7988.DISTRIB.JOB09668.D0000107.?        SYSOUT
IGD104I ENVIRONM.DISTRIB                           RETAINED,  DDNAME=SYSLIB
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Rev 0

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IEF236I   VIC7988.DISTRIB.JOB09668.D0000103.?          SYSIN
.....................................................................................................................
JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   11.34.03,  05/01/98                    V09 .
STEP NUMBER -   3, STEP NAME - IMBLIST , PROGRAM NAME - IMBLIST , RAN FROM  11.34.09 TO  11.34.09                          .
ENDING CONDITION - RETURN CODE      8, REGION USED -     428K, PERFORMANCE GROUP -  20, SWAPS -       0                    .
PAGEINS -       0, PAGEOUTS -       0, VIO PAGEINS -       0, VIO PAGEOUTS -       0                                      .
CPU TIME -       .03 VECTOR TIME -       .00 SECS, EXCPS -(          0 NON-VIO,          0 VIO), CPU UNITS -        .03 SECS   .
SYSIN RECORDS -      1, OPENS - (      0 TAPE,      0 TEMP,      0 PERM),                                  COST =      $0.05     .
.....................................................................................................................
IEF373I STEP/IMBLIST /START 1998121.1134
IEF374I STEP/IMBLIST /STOP  1998121.1134 CPU    0MIN 00.03SEC SRB    0MIN 00.00SEC VIRT   156K SYS   272K EXT       4K SYS   10044K
IEF375I  JOB/DISTRIB /START 1998121.1134
IEF376I  JOB/DISTRIB /STOP  1998121.1134 CPU    0MIN 02.83SEC SRB    0MIN 00.03SEC
.....................................................................................................................
TOTAL CPU TIME -       2.87 SECS,   TOTAL VECTOR TIME -       .00 SECS,   TOTAL CPU UNITS -       5.30 SECS                .
TOTAL EXCPS -(        360 NON-VIO,      2,339 VIO)                                                                          .
TOTAL JOB COST EXCLUDING PRINT CHARGES =       $8.83       CHARGED TO AUTH = 0031 , JO/WO = 022685067                       .
.....................................................................................................................
```

STONE & WEBSTER ENGINEERING CORPORATION

ENVIRONMENTAL ENGINEERING DIVISION

COMPUTER CODE IDENTIFICATION

PROGRAM NAME: SITE DATA RETREIVAL PROGAM

VERSION OF PROGRAM: 00

LINK EDIT DATE (JULIAN): 80.184

DATE OF RUN (MO/DAY/YR): 5/01/98

JOB NAME OF RUN: DISTRIB

LIBRARY REFERENCE NUMBER: EN-112

LEVEL OF PROGRAM: 01

LINK EDIT TIME (HRS.MINS.SECS): 14.21.36

TIME OF RUN (MILITARY): 1134

JOB09660

Rev C

INPUT DATA TRACEBACK

```
TA SUBMITTED ON DEVICE: 5

CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
   1       2
   2   111 112
   3  74001     81365
CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

      * * * * * * * * * * * * * * END OF INPUT ON DEVICE 5 * * * * * * * * * * * * * *
```

APPENDIX 2
DISTRIBUTION Program Output
Unit 3 ESFB to Unit 3 Control Room Air Intake

INPUT TO METOWER PROGRAM
2
[illegible] 112
[illegible] 01365

END OF INPUT DATA REACHED

NUMBER OF CARDS SELECTED = 5844

NUMBER OF DAYS SELECTED = 2922

STONE & HEBSTER ENGINEERING CORPORATION

ENVIRONMENTAL ENGINEERING DIVISION

COMPUTER CODE IDENTIFICATION

PROGRAM NAME: FREQ OF OCCUR OF THO PARAMETERS

VERSION OF PROGRAM: 00

LOAD MODULE: ENVIRONM.DISTRIB

LINK EDIT DATE (JULIAN): 81.182

DATE OF RUN (MO/DAY/YR): 5/01/98

JOB NAME OF RUN: DISTRIB

LIBRARY REFERENCE NUMBER: EN-200

LEVEL OF PROGRAM: 00

MEMBER (PGM): DISTRB00

LINK EDIT TIME (HRS.MINS.SECS): 12.11.26

TIME OF RUN (MILITARY): 1134

JOB09668

```
                    INPUT DATA TRACEBACK

DATA SUBMITTED ON DEVICE:  5

CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
  1      2
  2          MILLSTONE NUCLEAR POWER STATION 1974 - 1981 ONSITE DATA
  3          33-FT WIND DIRECTION VS. 33-FT WIND SPEED DISTRIBUTION
  4   56          WIND DIRECTION (DEGREES)                3      0  999
  5   55 124 360
  6  0                                                                          0
  7  WIND SPEED      (MPH)       (TENTHS)                  99      0 1000
  8     5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24
  9    25  26  27  28  29  30  31  32  33  34  35  36  37  38  39  40  41  42  43  44
 10    45  46  47  48  49  50  51  52  53  54  55  56  57  58  59  60  61  62  63  64

CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
 11    65  66  67  68  69  70  71  72  73  74  75  76  77  78  79  80  81  82  83  84
 12    85  86  87  88  89  90  91  92  93  94  95  96  97  98  99 100 110 120 130 140
 13  1  999
 14     74
 15  7400181365     0     0
 16    112        0.0        0.0  111        0.0        0.0
CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

     * * * * * * * * * * * * * END OF INPUT ON DEVICE   5 * * * * * * * * * * * * *
```

----- SITE WEATHER DATA *****

FIRST YEAR = 1974, JSYR = 74001, JNYR = 81365, JM01 = 0, JM02 = 0

TLP PARAMETER CODE = 112 MULT = 1.00000 ADD = 0.0

TDE PARAMETER CODE = 111 MULT = 1.00000 ADD = 0.0

FIRST DATE RETURNED = 74001

LAST DATE RETURNED = 81365

MILLSTONE NUCLEAR POWER STATION 1974 - 1981 ONSITE DATA

33-FT WIND DIRECTION VS. 33-FT WIND SPEED DISTRIBUTION

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0-55	56-124	125-360	361-999	TOTAL
0 - 5	0	0	0	87	87
PCT CLASS	0.0	0.0	0.0	100.00	100.00
PCT TOTAL	0.0	0.0	0.0	0.13	0.13
6 - 6	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
7 - 7	0	0	0	123	123
PCT CLASS	0.0	0.0	0.0	100.00	100.00
PCT TOTAL	0.0	0.0	0.0	0.19	0.19
8 - 8	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
9 - 9	0	0	0	237	237
PCT CLASS	0.0	0.0	0.0	100.00	100.00
PCT TOTAL	0.0	0.0	0.0	0.36	0.36
10 - 10	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
11 - 11	0	0	0	367	367
PCT CLASS	0.0	0.0	0.0	100.00	100.00
PCT TOTAL	0.0	0.0	0.0	0.55	0.55
12 - 12	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
13 - 13	136	83	302	14	535
PCT CLASS	25.42	15.51	56.45	2.62	100.00
PCT TOTAL	0.21	0.13	0.46	0.02	0.81
14 - 14	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
15 - 15	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0

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WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 55	56- 124	125- 360	361- 999	TOTAL
16 - 16	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
17 - 17	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
18 - 18	193	122	395	11	721
PCT CLASS	26.77	16.92	54.79	1.53	100.00
PCT TOTAL	0.29	0.18	0.60	0.02	1.09
19 - 19	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
20 - 20	217	119	472	13	821
PCT CLASS	26.43	14.49	57.49	1.58	100.00
PCT TOTAL	0.33	0.18	0.71	0.02	1.24
21 - 21	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
22 - 22	187	106	374	6	673
PCT CLASS	27.79	15.75	55.57	0.89	100.00
PCT TOTAL	0.28	0.16	0.56	0.01	1.01
23 - 23	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
24 - 24	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
25 - 25	244	121	622	11	998
PCT CLASS	24.45	12.12	62.32	1.10	100.00
PCT TOTAL	0.37	0.18	0.94	0.02	1.50
26 - 26	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
27 - 27	0	0	1	0	1
PCT CLASS	0.0	0.0	100.00	0.0	100.00
PCT TOTAL	0.0	0.0	0.00	0.0	0.00

56° → 124°
Cumulative Hours = 430 Total Hours = 7,922
430/7,922 = 5.4%

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WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0-55	56-124	125-360	361-999	TOTAL
28 - 28	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
29 - 29	299	150	714	8	1171
PCT CLASS	25.53	12.81	60.97	0.68	100.00
PCT TOTAL	0.45	0.23	1.08	0.01	1.77
30 - 30	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
31 - 31	276	140	738	6	1160
PCT CLASS	23.79	12.07	63.62	0.52	100.00
PCT TOTAL	0.42	0.21	1.11	0.01	1.75
32 - 32	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
33 - 33	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
34 - 34	315	129	827	10	1281
PCT CLASS	24.59	10.07	64.56	0.78	100.00
PCT TOTAL	0.47	0.19	1.25	0.02	1.93
35 - 35	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
36 - 36	319	137	902	11	1369
PCT CLASS	23.30	10.01	65.89	0.80	100.00
PCT TOTAL	0.48	0.21	1.36	0.02	2.06
37 - 37	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
38 - 38	0	1	1	0	2
PCT CLASS	0.0	50.00	50.00	0.0	100.00
PCT TOTAL	0.0	0.00	0.00	0.0	0.00
39 - 39	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0

56° → 124°
Cumulative Observations = 841
Total Observations = 7,922
841 / 7,922 = 10.6%

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 55	56- 124	125- 360	361- 999	TOTAL
40 - 40	266	154	894	8	1322
PCT CLASS	20.12	11.65	67.62	0.61	100.00
PCT TOTAL	0.40	0.23	1.35	0.01	1.99
41 - 41	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
42 - 42	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
43 - 43	311	149	976	7	1443
PCT CLASS	21.55	10.33	67.64	0.49	100.00
PCT TOTAL	0.47	0.22	1.47	0.01	2.18
44 - 44	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
45 - 45	198	102	631	7	938
PCT CLASS	21.11	10.87	67.27	0.75	100.00
PCT TOTAL	0.30	0.15	0.95	0.01	1.41
46 - 46	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
47 - 47	309	141	1010	9	1469
PCT CLASS	21.03	9.60	68.75	0.61	100.00
PCT TOTAL	0.47	0.21	1.52	0.01	2.21
48 - 48	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
49 - 49	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
50 - 50	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
51 - 51	282	150	980	9	1421
PCT CLASS	19.85	10.56	68.97	0.63	100.00
PCT TOTAL	0.43	0.23	1.48	0.01	2.14

56° → 124°
Cumulative Hours = 1,513
Total Hours = 7,922
1,513 / 7,922 = 19.0 %

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WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 55	56- 124	125- 360	361- 999	TOTAL
52 - 52	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
53 - 53	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
54 - 54	257	155	1001	6	1419
PCT CLASS	18.11	10.92	70.54	0.42	100.00
PCT TOTAL	0.39	0.23	1.51	0.01	2.14
55 - 55	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
56 - 56	272	153	1001	13	1439
PCT CLASS	18.90	10.63	69.56	0.90	100.00
PCT TOTAL	0.41	0.23	1.51	0.02	2.17
57 - 57	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
58 - 58	265	174	997	5	1441
PCT CLASS	18.39	12.07	69.19	0.35	100.00
PCT TOTAL	0.40	0.26	1.50	0.01	2.17
59 - 59	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
60 - 60	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
61 - 61	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
62 - 62	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
63 - 63	243	165	999	6	1413
PCT CLASS	17.20	11.68	70.70	0.42	100.00
PCT TOTAL	0.37	0.25	1.51	0.01	2.13

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WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 55	56- 124	125- 360	361- 999	TOTAL
64 - 64	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
65 - 65	251	148	1071	8	1478
PCT CLASS	16.98	10.01	72.46	0.54	100.00
PCT TOTAL	0.38	0.22	1.61	0.01	2.23
66 - 66	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
67 - 67	176	121	712	5	1014
PCT CLASS	17.36	11.93	70.22	0.49	100.00
PCT TOTAL	0.27	0.18	1.07	0.01	1.53
68 - 68	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
69 - 69	233	177	1070	10	1490
PCT CLASS	15.64	11.88	71.81	0.67	100.00
PCT TOTAL	0.35	0.27	1.61	0.02	2.25
70 - 70	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
71 - 71	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
72 - 72	0	2	0	0	2
PCT CLASS	0.0	100.00	0.0	0.0	100.00
PCT TOTAL	0.0	0.00	0.0	0.0	0.00
73 - 73	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
74 - 74	225	176	1054	10	1465
PCT CLASS	15.36	12.01	71.95	0.68	100.00
PCT TOTAL	0.34	0.27	1.59	0.02	2.21
75 - 75	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 55	56- 124	125- 360	361- 999	TOTAL
76 - 76	208	185	1031	8	1432
PCT CLASS	14.53	12.92	72.00	0.56	100.00
PCT TOTAL	0.31	0.28	1.55	0.01	2.16
77 - 77	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
78 - 78	225	162	955	8	1350
PCT CLASS	16.67	12.00	70.74	0.59	100.00
PCT TOTAL	0.34	0.24	1.44	0.01	2.04
79 - 79	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
80 - 80	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
81 - 81	180	158	991	8	1337
PCT CLASS	13.46	11.82	74.12	0.60	100.00
PCT TOTAL	0.27	0.24	1.49	0.01	2.02
82 - 82	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
83 - 83	0	2	2	0	4
PCT CLASS	0.0	50.00	50.00	0.0	100.00
PCT TOTAL	0.0	0.00	0.00	0.0	0.01
84 - 84	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
85 - 85	187	182	969	6	1344
PCT CLASS	13.91	13.54	72.10	0.45	100.00
PCT TOTAL	0.28	0.27	1.46	0.01	2.03
86 - 86	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
87 - 87	182	171	1013	4	1370
PCT CLASS	13.28	12.48	73.94	0.29	100.00
PCT TOTAL	0.27	0.26	1.53	0.01	2.07

56° → 124°
Cumulative Hours = 3,260
Total Hours = 7,922
3,260/7,922 = 41.2%

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WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 55	56- 124	125- 360	361- 999	TOTAL
88 - 88	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
89 - 89	128	115	678	5	926
PCT CLASS	13.82	12.42	73.22	0.54	100.00
PCT TOTAL	0.19	0.17	1.02	0.01	1.40
90 - 90	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
91 - 91	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
92 - 92	169	132	929	5	1235
PCT CLASS	13.68	10.69	75.22	0.40	100.00
PCT TOTAL	0.25	0.20	1.40	0.01	1.86
93 - 93	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
94 - 94	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
95 - 95	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
96 - 96	176	164	934	6	1280
PCT CLASS	13.75	12.81	72.97	0.47	100.00
PCT TOTAL	0.27	0.25	1.41	0.01	1.93
97 - 97	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
98 - 98	165	154	993	7	1319
PCT CLASS	12.51	11.68	75.28	0.53	100.00
PCT TOTAL	0.25	0.23	1.50	0.01	1.99
99 - 99	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 55	56- 124	125- 360	361- 999	TOTAL
100 - 100	0	0	0	0	0
PCT CLASS	0.0	0.0	0.0	0.0	0.0
PCT TOTAL	0.0	0.0	0.0	0.0	0.0
101 - 110	558	536	3574	14	4682
PCT CLASS	11.92	11.45	76.33	0.30	100.00
PCT TOTAL	0.84	0.81	5.39	0.02	7.06
111 - 120	312	348	2205	8	2873
PCT CLASS	10.86	12.11	76.75	0.28	100.00
PCT TOTAL	0.47	0.52	3.32	0.01	4.33
121 - 130	326	465	2921	20	3732
PCT CLASS	8.74	12.46	78.27	0.54	100.00
PCT TOTAL	0.49	0.70	4.40	0.03	5.63
131 -1000	761	2073	13175	139	16148
PCT CLASS	4.71	12.84	81.59	0.86	100.00
PCT TOTAL	1.15	3.13	19.86	0.21	24.34
TOTAL	9051	7922	48114	1245	66332
PCT CLASS	13.64	11.94	72.54	1.88	100.00
PCT TOTAL	13.64	11.94	72.54	1.88	100.00

Total Valid Observations (All Sectors)

Total Observations (56° → 124°)

APPENDIX 2
DISTRIBUTION Program Output
Unit 3 ESFB to Unit 3 Control Room Air Intake

P. 19
03703.7002
WM(B)-01

Rev 0

APPENDIX 2
DISTRIBUTION Program Output
Unit 3 ESFB to Unit 3 Control Room Air Intake

CHECKED = 70128
USED = 66332