Northeast
Nuclear Energy

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The Northeast Utilities System

JUL 31 2000

Docket No. 50-423
B18157

Re: 10 CFR 2.790
10 CFR 50.90

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

Millstone Nuclear Power Station, Unit No. 3
License Amendment Related to the Supplementary Leakage Collection and Release System (PLAR 3-98-5), Supplemental Information

This letter contains proprietary information provided by Stone & Webster Engineering Corporation (S&W). Pursuant to 10 CFR 2.790, it is requested that the report entitled "Analysis of Containment Mixing Rate During a Design Basis LOCA," (see Attachment 5) describing the S&W mixing model, be withheld from public disclosure. Upon separation of Attachment 5 from this letter, this letter may be decontrolled.

Background

In a letter dated June 6, 1998,[1] Northeast Nuclear Energy Company (NNECO) applied for an amendment to the Millstone Unit No. 3 Operating License to reflect changes in the licensing basis for post-accident operation of the Supplementary Leakage Collection and Release System (SLCRS) as described in the Final Safety Analysis Report (FSAR).

The Nuclear Regulatory Commission (NRC) staff requested additional information via letters dated August 20, 1998,[2] and January 25, 1999.[3] NNECO provided that

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(1) M. H. Brothers letter to the U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3 - Proposed License Amendment Request SLCRS Bypass Leakage (PLAR 3-98-5)," dated June 6, 1998.

(2) J. W. Andersen (USNRC) letter to M. L. Bowling, Jr., "Millstone Nuclear Power Station, Unit No. 3 - Request for Additional Information (TAC No. MA2035)," dated August 20, 1998.

(3) J. W. Andersen (USNRC) letter to M. L. Bowling, Jr., "Millstone Nuclear Power Station, Unit No. 3 - Request for Additional Information (TAC No. MA2035)," dated January 25, 1999.

A001

information in a letter dated April 5, 1999,[4] with additional supplemental information provided in a letter dated April 19, 2000.[5]

Discussion

The NRC staff provided a draft request for additional clarification on NNECO's last response in a facsimile transmission dated May 24, 2000.[6] On June 13, 2000, a telephone conference call between the NRC staff, NNECO staff, and appropriate S&W staff, was conducted to ensure that all parties had a clear understanding of the information being requested by the NRC staff.

The ultimate results of that telephone conference eliminated questions 2, 3, and 4 of the facsimile transmission of the draft request, and generated a request for Verified Revisions of the following calculations;

WM(B)-01	Normalized X/Q at the Unit 3 Control Room for Releases From the Unit 3 MSVB and ESFB
WM(B)-02	Normalized X/Q at the Unit 3 Control Room for Releases From the Unit 1 Stack
WM(B)-04	Normalized X/Q at the Unit 3 Control Room for Releases From the Unit 3 Containment and Turbine Bldg.

Another telephone conference between the same groups occurred on June 29, 2000, and the NRC staff requested some editorial changes to Enclosure 1 of the April 19, 2000, letter. The changes requested would make the Enclosure much easier to understand for future potential readers. S&W considers the material provided in the original Enclosure to be proprietary information, and requested that it be exempt from public disclosure for commercial reasons. The edited version provided as Attachment 5 to this letter is also considered proprietary information by S&W, and the same request is made.

Also requested at the same telephone conference was a copy of a table containing spray zone data, and a diagram of the containment identifying the mixing zones. This is provided in Attachment 6.

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(4) R. P. Necci letter to the U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3 - License Amendment Related to the Supplementary Leakage Collection and Release System (PLAR 3-98-5), Response to Request for Additional Information," dated April 5, 1999.

(5) M. H. Brothers letter to the U.S. Nuclear Regulatory Commission, "Millstone Nuclear Power Station, Unit No. 3 - License Amendment Related to the Supplementary Leakage Collection and Release System (PLAR 3-98-5) Supplemental Information," dated April 19, 2000.

(6) Jacob I. Zimmerman facsimile to Ravi Joshi, "Draft RAI Associated with Supplementary Leakage Collection and Release System, Millstone Unit No. 3 (TAC No. MA2035)," dated May 24, 2000.

In response to the NRC staff request in the facsimile transmission and the two telephone conferences, the following information is provided:

1. Attachment 1 - Response to Requests for Additional Information
2. Attachment 2 - Calculation WM(B)-01
3. Attachment 3 - Calculation WM(B)-02
4. Attachment 4 - Calculation WM(B)-04
5. Attachment 5 - Affidavit from S&W to withhold proprietary information and an edited revision of "Analysis of Containment Mixing Rate During a Design Basis LOCA"
6. Attachment 6 - "Containment Spray Zone Description and Data" and "Identification of Mixing Zones Within Containment"

There are no regulatory commitments contained within this letter.

If you have any questions or comments regarding this submittal, please contact Mr. David W. Dodson at (860) 447-1791, extension 2346.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

Raymond P. Necci
Vice President - Nuclear Technical Services

Subscribed and sworn to before me

this 31st day of July, 2000

Notary Public

Date Commission Expires: SANDRA J. ANTON NOTARY PUBLIC COMMISSION EXPIRES MAY 31, 2005

cc: See next page

Attachments (6): Response to Requests for Additional Information
Calculation WM(B)-01
Calculation WM(B)-02
Calculation WM(B)-04
Affidavit from Stone & Webster Engineering Corp. to Withhold Proprietary Information
Containment Spray Zone Description and Data and Identification of Mixing Zones Within Containment

cc: H. J. Miller, Region I Administrator
V. Nerses, NRC Senior Project Manager, Millstone Unit No. 3
A. C. Cerne, Senior Resident Inspector, Millstone Unit No. 3

Docket No. 50-423
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Attachment 1

Millstone Nuclear Power Station, Unit No. 3

License Amendment Related to the Supplementary Leakage Collection Release System (PLAR 3-98-5)
Response to Requests for Additional Information

License Amendment Related to the Supplementary Leakage Collection Release System (PLAR 3-98-5)
Response to Requests for Additional Information

Question 1

The sprayed region of Zone 3 is added to the "effectively sprayed volume" of Zones 1 and 2 for the mixing model. What fraction of the total containment volume is the unsprayed region in Zone 3? It is our understanding that this unsprayed region in Zone 3 is a slow mixing region due to structural interferences in the region. Assuming the volume of the unsprayed region in Zone 3 is not negligible or even substantial, was a qualitative or quantitative estimation or actual calculation of the mixing rate for this region done?

Response

The unsprayed region in Zone 3 represents approximately 47 percent of the containment net volume. The mixing rate for this region was obtained by actual calculation.

Question 2

Do the final mixing rates (time-dependent) include any correction(s) contributed by the Zone 3 unsprayed region for its slow mixing rate(s)? If not, please provide a brief discussion.

Response

This question was withdrawn per the telephone conference conducted on June 13, 2000, between the Nuclear Regulatory Commission (NRC) staff, Northeast Nuclear Energy Company (NNECO) staff, and Stone and Webster (S&W) staff.

Question 3

Is there any qualitative relationship or a discussion representing a relationship between the mixing rate and other removal coefficients by spray for first order elemental Iodine? Please provide a brief discussion.

Response

This question was withdrawn per the telephone conference conducted on June 13, 2000, between the NRC staff, NNECO staff, and S&W staff.

Question 4

Insert G in the submittal dated April 19, 2000, contains a list of parameters used in determining removal rates of elemental and particulate iodine from the post-accident containment atmosphere. We would like to know how did you arrive at the values of the following iodine removal coefficients (λ). Please, provide a description of the method and the values of input parameters used in calculation:

- **Elemental iodine coefficient by plate out in the sprayed region of containment**
- **Particulate iodine removal coefficients by sprays in the sprayed region of containment**

Response

This question was withdrawn per the telephone conference conducted on June 13, 2000, between the NRC staff, NNECO staff, and S&W staff.

Question 5

Stone and Webster calculation dated May 27, 1998, on X/Qs from the Unit 3 main steam building (MSVB) states that the postulated effluent release for the MSVB bypass scenario does not meet the Murphy-Campe criteria for using the diffuse source equation. However, a general statement is made that because of multiple flow disruptions due to buildings both upwind and downwind of the release, it is reasonable to assume that this equation may be used to estimate resultant X/Q values. The calculation assumes that the release occurs from the vent closest to the control room intake and mixes in the wake of the MSVB.

Response

S&W calculation WM(B)-01, dated May 27, 1998, calculates the X/Q from the Unit No. 3 Main Steam Valve Building (MSVB) to the MP3 control room using the diffuse source equation of Murphy-Campe. The diffuse source equation was used to estimate the X/Q even though the elevation difference between the MSVB release point and the control room intake meet the criteria of the point source - point receptor technique of Murphy - Campe. The justification for using the diffuse source equation is based upon the aerodynamic obstacles encountered by the plume in the straight line pathway between the two points. Figures 1 and 2 depict the postulated flow path that the plume would have to travel from the MSVB to the Unit 3 control room intake.

The MSVB has two exhaust vents as shown in Figure 2. These vents (elev. 85.9') are physically located between the containment structure and the Aux. Bay/Ventilation Enclosure structures. The MSVB vents discharge downward. The closest vent to the

control room intake is considered in the X/Q calculation. The prevailing wind necessary to transport postulated radioactivity released from the MSVB to the control room intake would need to flow around the containment structure, entrain the MSVB effluent discharged downward, flow up and over the Ventilation Enclosure roof (elev. 100'), be effected by the turbulent flow created by skirting the turbine building corner (elev. 132') at approximately a 45 degree angle, then decrease in elevation to the control room intake (elev. 94.6'). The accumulated affect of containment structure building wake and complex aerodynamic forces and obstacles encountered in the pathway between the source point and receptor, were justification for using the diffuse source equation of Murphy-Campe for this pathway.

Figure 1 - Plant Isometric

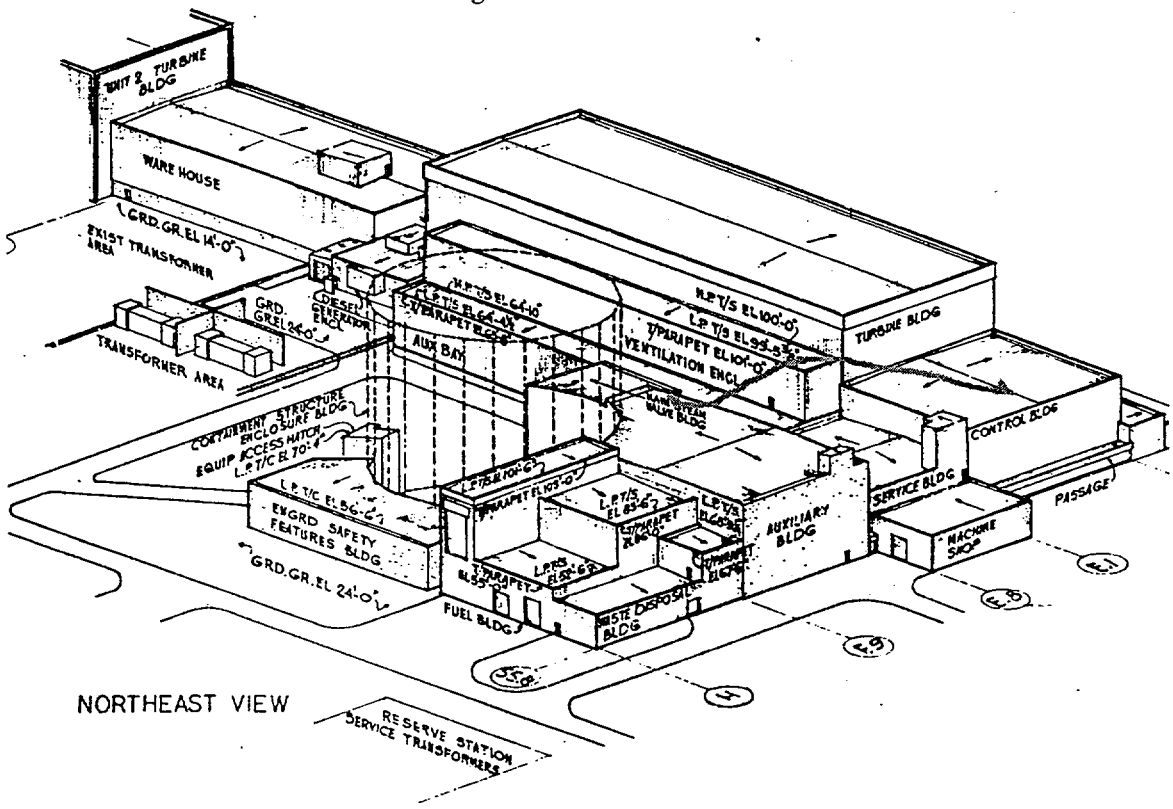
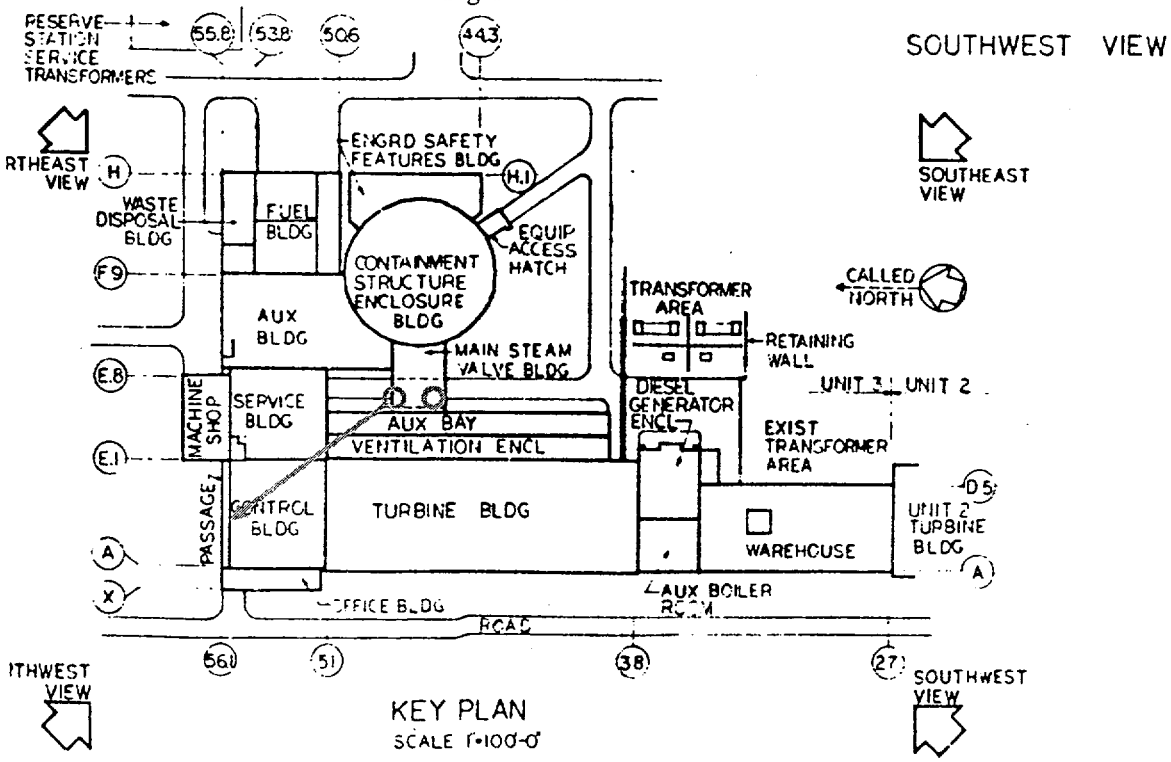


Figure 2 - Unit 3 Plot Plan



Both figures were obtained from Dwg. No. 12179-EA-200A-1 (Conceptual Design)

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Attachment 2

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	☒YES ☐ NO	☐YES ☒NO	Component
☐FPQA ☐ATWSQA ☐NON-QA			

↓ ↓

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.

RECD 6-8-98
ON HOLD
CDS 6/17/98
CDS QC 6/25/98
NRP ✓ JJ

Verified Revision ✓
Initial JW Date 6/13/98

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	0

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

Reference Drawing	Sheet	Rev. No.
25212-10002	~~A~~	11
25212-24114-~~0000I~~	~~N~~ 01	13
25212-24118-~~0000I~~	~~S~~ 01	11
25212-14045	~~B~~	15
25212-24215-~~0000I~~	~~L~~ 01	14

Comments:

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STONE & WEBSTER ENGINEERING CORPORATION

5010.65

CALCULATION TITLE PAGE

CLIENT & PROJECT:	PAGE 1 of 13
NORTHEAST UTILITIES - MILLSTONE UNIT 3	Total Pages: 53 w/attachments pages
CALCULATION TITLE:	QA CATEGORY (✓)
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.	☑ 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 Cronan Boston - 7~~				
NU. RAD PROT	RJ Schmidt New Britain	cc			
NUNDS	MP3 Site	original			

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO.	DISCIPLINE	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
037037002	WM(B)	01 Rev 0		2 OF 13

CHANGE HISTORY PAGE

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

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO. 037037002	DISCIPLINE WM(B)	CALCULATION NO. 01 Rev 0	OPTIONAL TASK CODE	PAGE 3 OF 13

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CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO. 037037002	DISCIPLINE WM(B)	CALCULATION NO. 01 Rev 0	OPTIONAL TASK CODE	PAGE 4 OF 13

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.

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO. 037037002	DISCIPLINE WM(B)	CALCULATION NO. 01 Rev 0	OPTIONAL TASK CODE	PAGE 6 OF 13

Determination of Intermediate Period Factors (Ref. 1)

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, within 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)

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

$X/Q = 5.78$ 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°
$A = 1439.7 \text{ m}^2$
$k = 3/(s/d)^{1.4} = 3/(2.74)^{1.4} = 0.73$
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)

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

$X/Q = 4.86$ 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.

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO. 037037002	DISCIPLINE WM(B)	CALCULATION NO. 01 Rev 0	OPTIONAL TASK CODE	PAGE 8 OF 13

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)

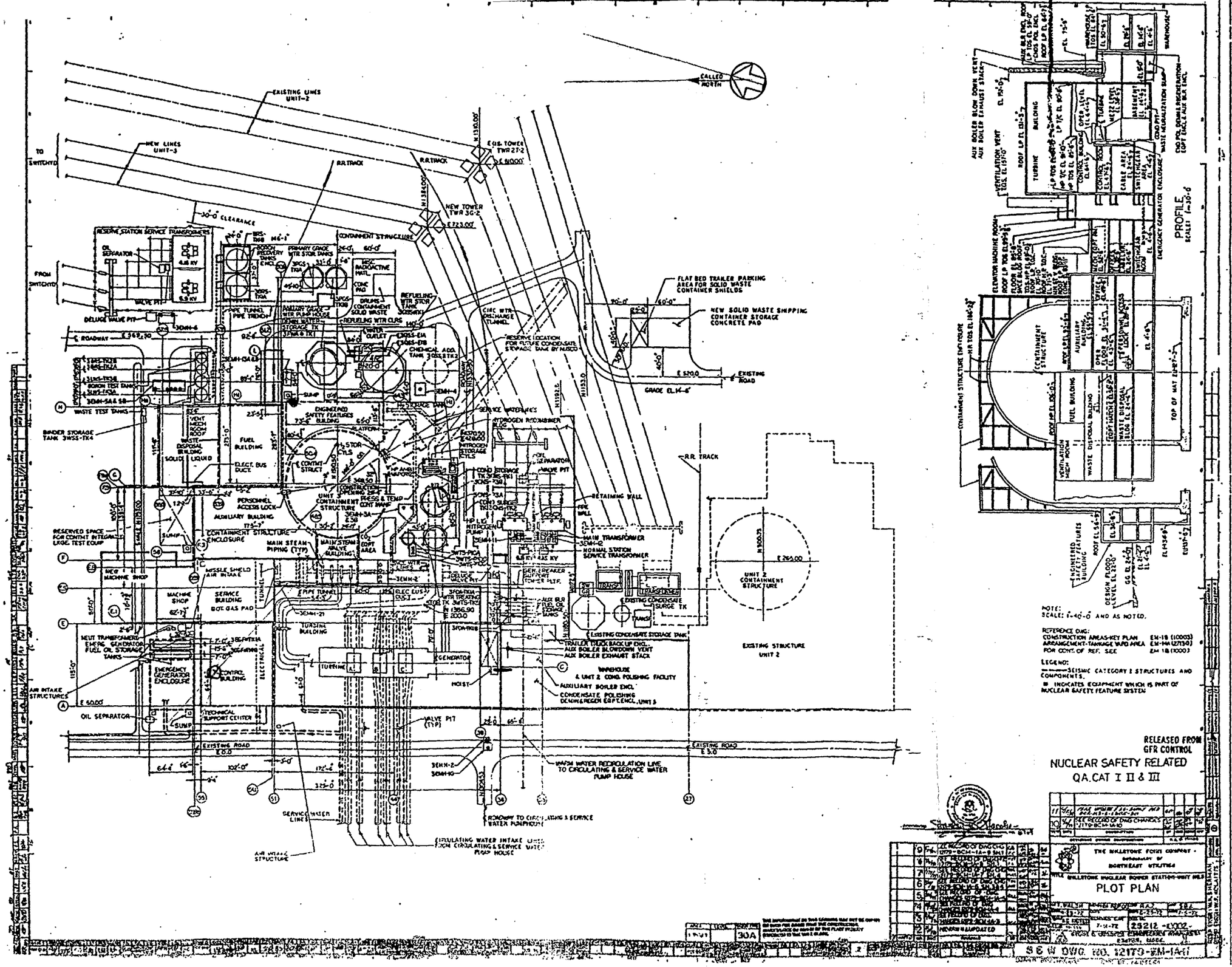
1. EN-200 Wind Speed/Wind Direction Distribution Computer Output:

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

WM(B)-01
Rev 0


CALLED NORTH
EXISTING LINES UNIT-2
NEW LINES UNIT-3
TO SWITCHYD
FROM SWITCHYD
30'-0" CLEARANCE
R.R. TRACK
EXIST. TOWER TWR 27-2
NEW TOWER TWR 3G-2
RESERVE STATION SERVICE TRANSFORMERS
CONTAINMENT STRUCTURE
PRIMARY GRADE WTR STOR. TANKS
MISC. RADIOACTIVE WASTE
REFUELING WTR STOR. TANK
DRUMS CONTAINMENT SOLID WASTE
AUXILIARY BLDG WTR CLEAN HOUSE
REFUELING WTR CLRS
CIRC WTR DISCHARGE TUNNEL
FLAT BED TRAILER PARKING AREA FOR SOLID WASTE CONTAINER SHIELDS
NEW SOLID WASTE SHIPPING CONTAINER STORAGE CONCRETE PAD
RESERVE LOCATION FOR FUTURE CONDENSATE SEEPAGE TANK BY NUSCO
EXISTING ROAD
GRADE EL 14'-6"
ROADWAY
WASTE TEST TANKS
BORON TEST TANK
BORIC ACID TANK
BINDER STORAGE TANK
WASTE DISPOSAL BUILDING SOLID LIQUID
FUEL BUILDING
ELECT BUS DUCT
ENGINEERED SAFETY FEATURES BUILDING
SERVICE WATER PIPE
NITROGEN RECOMBINER
NITROGEN STORAGE
UNIT CONTAINMENT STRUCTURE
PERSONNEL ACCESS LOCK
AUXILIARY BUILDING
CONTAINMENT STRUCTURE ENCLOSURE
RESERVED SPACE FOR CONTMT INTEGRATED LEAK TEST EQUIP
MAIN STEAM PIPING (TYP)
MAIN STEAM VALVE BUILDING
MAIN TRANSFORMER
NORMAL STATION SERVICE TRANSFORMER
RETAINING WALL
UNIT 2 CONTAINMENT STRUCTURE
EXISTING STRUCTURE UNIT 2
EXISTING CONDENSATE SURGE TK
EXISTING CONDENSATE STORAGE TANK
MISSILE SHIELD AIR INTAKE
MACHINE SHOP
SERVICE BUILDING
DIST GAS PAD
TURBINE BUILDING
GENERATOR
HOIST
EMERG GENERATOR FUEL OIL STORAGE TANKS
EMERGENCY GENERATOR ENCLOSURE
CONTROL BUILDING
ELECTRICAL
TECHNICAL SUPPORT CENTER
AIR INTAKE STRUCTURES
OIL SEPARATOR
SUMP
VALVE PIT (TYP)
TRAILER TRUCK BACK UP ENG.
AUX BOILER BLOWDOWN VENT
AUX BOILER EXHAUST STACK
WAREHOUSE & UNIT 2 COND. POLISHING FACILITY
AUXILIARY BOILER ENCL.
CONDENSATE POLISHING DEMIN & REGEN EQPT ENCL. UNIT 3
WASH WATER RECIRCULATION LINE TO CIRCULATING & SERVICE WATER PUMP HOUSE
ROADWAY TO CIRCULATING & SERVICE WATER PUMPHOUSE
SERVICE WATER LINES
CIRCULATING WATER INTAKE LINES FROM CIRCULATING & SERVICE WATER PUMP HOUSE
AIR INTAKE STRUCTURE
PROFILE
SCALE 1"=30'-0"
AUX BOILER BLOW DOWN VENT
AUX BOILER EXHAUST STACK
VENTILATION VENT
ROOF LP TOS EL 131'-5"
TURBINE BUILDING
CONTROL BUILDING
CABLE AREA
SWITCHGEAR
WASTE NEUTRALIZATION SUMP
DIESEL GENERATOR ENCLOSURE
ELEVATOR MACHINE ROOM
ROOF LP TOS EL 89'-8"
FLOOR EL 85'-8"
SPACE BLDG ROOF
CONTAINMENT STRUCTURE
AUXILIARY BUILDING
OPER. EL 103'-0"
OPER. EL 85'-0"
FUEL BUILDING
WASTE DISPOSAL BUILDING
TOP OF MAT EL 27'-2"
VENTILATION MECH. ROOM
ENGINEERED SAFETY FEATURES BUILDING
DESIGN FLOOD LEVEL EL 32'-0"
NOTE:
SCALE: 1"=40'-0" AND AS NOTED.
REFERENCE DWG:
CONSTRUCTION AREAS-KEY PLAN EM-1B (10003)
ARRANGEMENT-TANKAGE W/PD AREA EM-144 (27130)
FOR CONT. OF REF. SEE EM-1B (10003)
LEGEND:
SEISMIC CATEGORY I STRUCTURES AND COMPONENTS.
INDICATES EQUIPMENT WHICH IS PART OF NUCLEAR SAFETY FEATURE SYSTEM
RELEASED FROM GFR CONTROL
NUCLEAR SAFETY RELATED
QA CAT I II & III
THE MILLSTONE POINT COMPANY
A DIVISION OF NORTHEAST NUCLEAR ENERGY CO.
MILLSTONE NUCLEAR POWER STATION-UNIT NO.3
PLOT PLAN
25212-4002-
S&W DWG. NO. 12179-EM-1A01

P.10
03703.7002
WM(B)-01
Rev 0

12179-EB-15N

CONTAINMENT STRUCTURE
REACTOR CONTAINMENT
AUX. BLDG
CALLED NORTH

PART PLAN EL 24'-6"
PART PLAN EL 41'-0"
PART PLAN ROOF

DETAIL B (E-10) (G-7)
DETAIL-C (D-11)
DETAIL-D (D-10)
DETAIL A (E-10, I-8)
4-4 (B-5, B-10)

MSVB Diagonal

Release Point

HEATING COIL MARK NO	DIMENSION A	B	C	D	E
3HVV-CH1A	4 1/2"	6 3/4"	9 1/2"	17 1/2"	4"
3HVV-CH1B	4 1/2"	6 3/4"	9 1/2"	17 1/2"	4"

1. 5/16" BOLT (60 C MAX.)
2. 1/8"x1/8" GALVANIZED STEEL ROUNDED EDGES
3. 2" WIDE GASKET-GASKET MATERIAL IS THE SAME AS FLEXIBLE MATERIAL
4. FLEXIBLE MATERIAL AS SPECIFIED
5. SPECIFIED REINFORCING ANGLE (3 1/2"X 2 1/2"X 5/16"t)
6. LOCKWASHER (3"x3"x5/16"t)
7. NUT
8. BOLT CENTERS ON THE LEGS OF THE ANGLE SHALL BE STAGGERED WITH RESPECT TO BOLT CENTERS ON OTHER LEG
9. DSA SUPPORT # FOR HEATING COIL & MOD
10. HEATING COIL
11. MOD
12. 1/4" RIVETS-6"OC

LEGEND
S&W STDS M8H-1002-1-1, 1002-2-2 & 1002-3-2

NOTES
2 DUCT CONNECTIONS TO FANS OR OTHER EQUIPMENT SHALL BE FABRICATED TO SUIT EQUIPMENT FURNISHED
3 FOR DUCT SUPPORTS TABS & DETAILS SEE BF-513F
4 AN ASTERISK (*) WILL REPLACE THE DASH(-) IN THE PREFIX FOR EQUIPMENT OR INSTRUMENTS WHICH ARE A PART OF THE NUCLEAR SAFETY FEATURES SYSTEMS

REFERENCES
LIGHTING
FLOW DIAGRAM
VENT SPEC
CONC PLANS DETS ELEVS & SECTIONS
CONC EMBEDMENTS PLANS OPNGS
STL FRAMING PLANS & DETAILS
AXIAL FLOW FANS SPEC
PIPING THIMBLE LOCATION PLANS
PIPING S/E VLV DISCH MIN STM
COMPOSITES
AIR AND MOTOR OPERATED AIR DMP SPEC
SEISMIC & MECH DESIGN RESTRAINTS
BLDG SVCE FLOOR DRAINAGE
BLDG SVCE ROOF DRAINAGE
BLDG SVCE MTG
P&ID ESF & MSV BLDGS VENTILATION

EE-67M(35008)
F2K-32-26
2170-430-565
EC-31A THRU H(1205-1121 & 11617)
EC-31A THRU F(11620-11622)
EC-31D THRU K(31145-31148)
2170-430-540
EC-11B(THRU)(22317-22319)
EC-11A(20010)
EC-20SA THRU(E20411-20419)
2472-500-59-5
EC-66A THRU(E22253-22259)
EC-11B(24108)
EC-11A(24109)
EC-11B(24112)
EM-12B(20002 SH-2)

REASON FOR STRESS ANALYSIS
NO CHANGE IN DIMENSIONS OR SUPPORT OF VENTILATION DUCTS SHALL BE MADE WITHOUT THE APPROVAL OF THE PROJECT ENGINEER

NUCLEAR SAFETY RELATED
QA CAT I & II
RENUMBERED FROM 25212-24114
Q.A.

THE MILLSTONE POINT COMPANY
SUBSIDIARY OF
NORTHEAST UTILITIES

TITLE MILLSTONE NUCLEAR POWER STATION-UNIT NO 3
VENTILATION
MAIN STEAM VALVE BLDG

DES B/B/PS	DRN	CHKD	APPD
DATE 12-3-76	DATE	DATE	DATE 3/11/77
SCALE 1/4"=1'-0"	HONEYWELL DATE	SHT 25212-24114 SH 1	

STONE & WEBSTER ENGINEERING CORPORATION
BOSTON, MASS

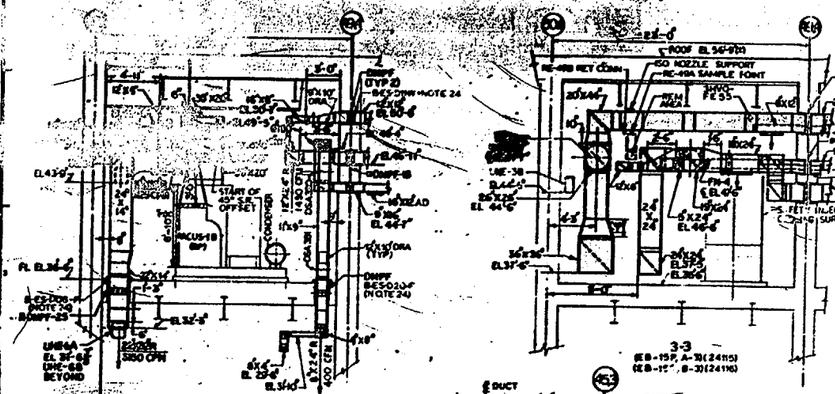
S & W DWG. NO. 12179-EB-15N-13

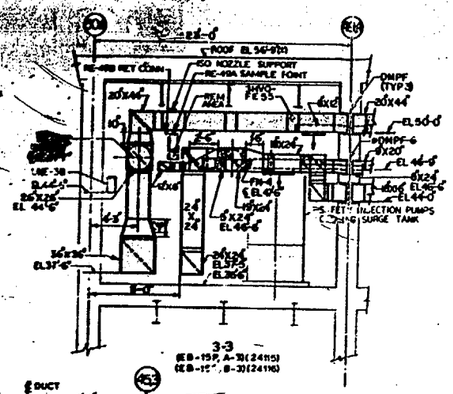
THE INFORMATION ON THIS DRAWING MAY NOT BE COPIED OR USED FOR OTHER THAN THE CONSTRUCTION MAINTENANCE OR REPAIR OF THE PLANT FACILITY DESCRIBED IN THE TITLE BLOCK

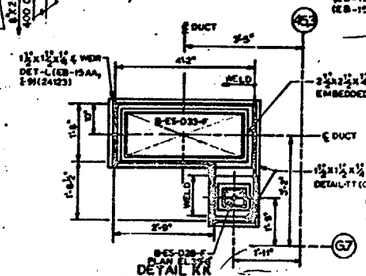
DESIGN	MATERIAL	WORK ORDER
4		NQ8

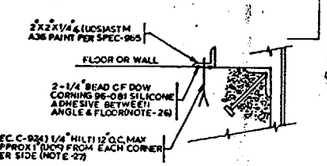
P.11
03703.7002
WM(B)-01
Rev 0

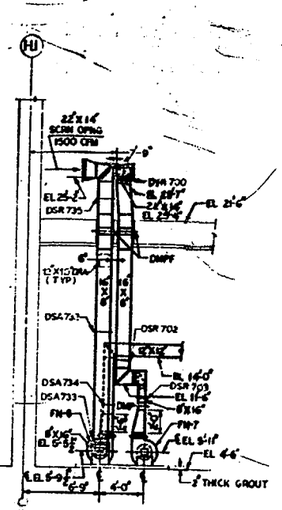
12179-EB-155-11

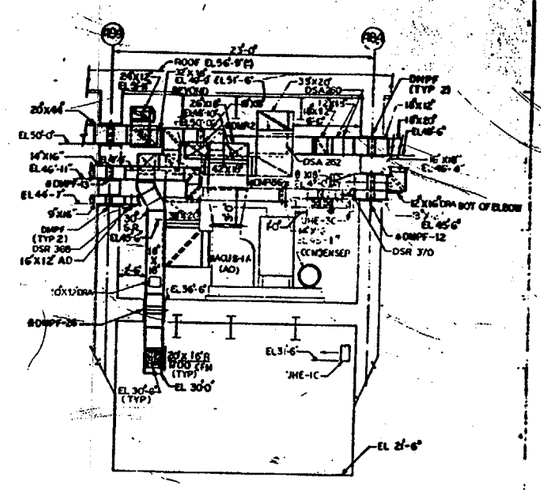


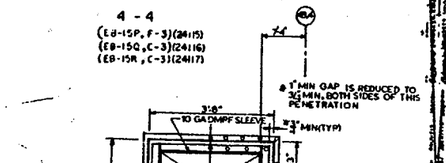


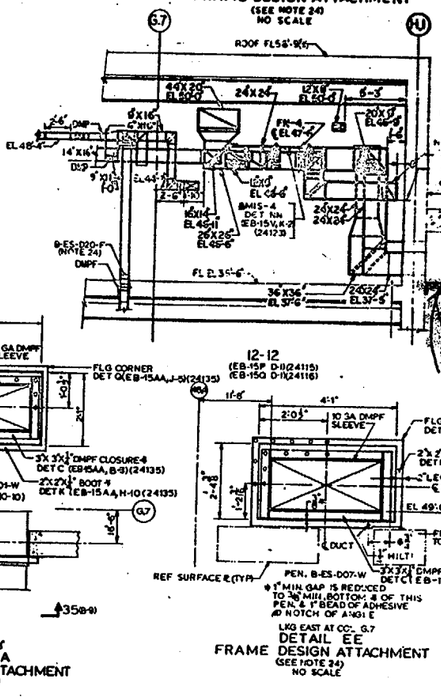


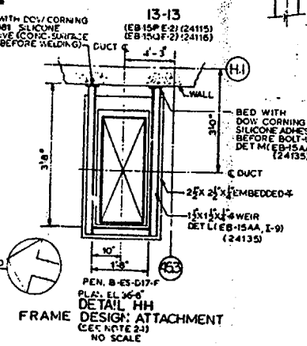


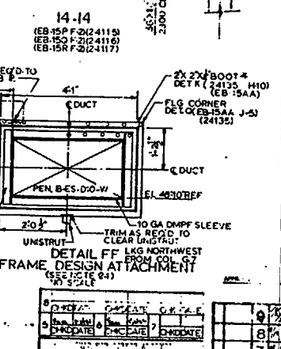


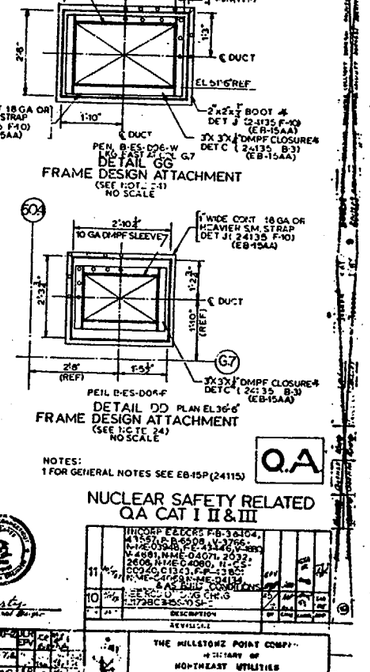


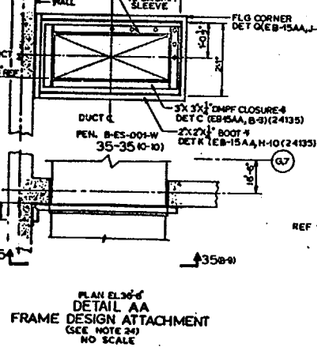


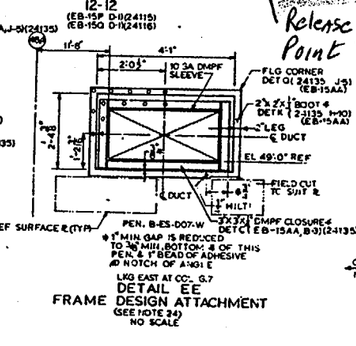












NOTES:
1 FOR GENERAL NOTES SEE EB-15P(24115)

Q.A

NUCLEAR SAFETY RELATED
Q.A CAT I II & III

NO.	DESCRIPTION
11	REVISED DUCT 20X8 TO AGREE W/PLAN
10	DELETE HOL-F-2 & F-4
9	SEE REC OF DWG CHG 12179-BCB-155-6 SH 1
8	SEE REC OF DWG CHG 12179-BCB-155-6 SH 1
7	SEE REC OF DWG CHG 12179-BCB-155-6 SH 1
6	ADD CHGS MADE TO AGREE W/PLANS EB-15003-REV-2
5	REVISIONS PER ECR's 5417 & 5414
4	DWG VOIDED & RENUMBERED 12179-EB-0010-2
3	
2	
1	

THE MILLSTONE POINT COMPANY
A DIVISION OF NORTHEAST UTILITIES
MILLSTONE POINT NUCLEAR POWER STATION-UNIT NO. 3
HEATING, VENT & AIR COND ENG SAFETY FEATURES BLDG SH-4
SCALE: NONE
DATE: 6-21-77
25212 - 24118 SH 1
STONE & WEBSTER ENGINEERING CORPORATION
BOSTON, MASS.
S & W DWG. NO. 12179-EB-155-11
DRAWN: J.L. KOOGHAN
CHECKED BY: M. NAIK

P.13

0370 3.700
WM(B)-01
Rev. 0

Northeast Utilities System

107 Selden Street, Berlin, CT 06037

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

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

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

DOWNWIND DISTANCE (METERS)	STONE & WEBSTER		POLYN (LONG)		POLYN (DESERT)		POLYN (XOQDOQ)	
	SIGMA Y	SIGMA Z	SIGMA Y	SIGMA Z	SIGMA Y	SIGMA Z	SIGMA Y	SIGMA Z
10.	0.4739	0.1971	0.4014	0.1395	2.4230	1.6073	0.5776	0.3454
20.	0.8969	0.4437	0.8020	0.3243	4.5718	1.9981	1.0802	0.6072
30.	1.3054	0.6928	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	1.1786	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	10.3425	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	67.8311	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	5.1583	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
03703.700
WM(81-01)
wd

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
```

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

P. 1
03703.7002
WM(B)-01

```
 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 WAS 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 WAS 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 - METWR01 , 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 WAS 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 WAS EXECUTED - COND CODE 0008
IEF285I   VIG7988.DISTRIB.JOB09666.D0000107.?            SYSOUT
IGD104I ENVIRONM.DISTRIB                               RETAINED,  DDNAME=SYSLIB
```

```
IEF285I   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, SHAPS -      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/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): 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
 74001    81365

EOF OF INPUT DATA REACHED

NUMBER OF CARDS SELECTED =  5844

NUMBER OF DAYS SELECTED  =  2922
```

STONE & WEBSTER 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      Stet MILLSTONE NUCLEAR POWER STATION 1974 - 1981 ONSITE DATA
  3          33-FT WIND DIRECTION VS. 33-FT WIND SPEED DISTRIBUTION
  4               WIND DIRECTION (DEGREES)                  3        0  999
  5     85 154 360
  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

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 SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 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

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

P. 11
03703.7002
WM(B)-01

lec 0

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

P. 12
03703.7002
WM(B)-01

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%

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 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%

ECO

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 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. 15
03703.7002
WM(B)-01

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%

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 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 SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 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

OBSERVATIONS READ = 70128
CHECKED = 70128
USED = 66332

JES2 JOB LOG -- SYSTEM C168 -- NODE JES2BOS

```
11.34.03 JOB09668  IRR010I  USERID VIG7988  IS ASSIGNED TO THIS JOB.
11.34.04 JOB09668  ICH70001I VIG7988  LAST ACCESS AT 11:33:39 ON FRIDAY, MAY 1, 1998
11.34.04 JOB09668  $HASP373 DISTRIB  STARTED - INIT    8 - CLASS A - SYS C168
11.34.09 JOB09668  +IHO002I STOP      1
11.34.09 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
 ICH70001I 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 0008
 IEF285I   VIG7988.DISTRIB.JOB09668.D0000107.?        SYSOUT
 IGD104I ENVIRONM.DISTRIB                           RETAINED,  DDNAME=SYSLIB
```

```
IEF285I   VIG7988.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, SHAPS -      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                       .
.....
```


Rev 0

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

JOB09668

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
74001     81365

EOF OF INPUT DATA REACHED

NUMBER OF CARDS SELECTED =  5844

NUMBER OF DAYS SELECTED  =  2922
```

STONE & WEBSTER 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): 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 * * * * * * * * * * * * * *
```

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

P. 9
03703.7002
WM(B)-01
Rev 0

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

FIRST YEAR = 1974, JSYR = 74001, JNYR = 81365, JMO1 = 0, JMO2 = 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)	0-55	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

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

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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%

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

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WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 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 %

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 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

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%

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

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WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 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

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Rev 0

CHECKED = 70128
USED = 66332

Docket No. 50-423
B18157

Attachment 3

Millstone Nuclear Power Station, Unit No. 3

Calculation WM(B)-02
Normalized X/Q at the Unit 3 Control Room for
Releases From the Unit 1 Stack

CALCULATION TITLE PAGE

Total Number of Pages: 30

Normalized X/Q at the Unit 3 Control Room For Releases From the Unit 1 Stack

TITLE

N/A	0	RBVS/SLCRS
CALCULATION #	**REVISION No.**	**SYSTEM NAME**
WM(B)-02	CB	3314I
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 **DCR/MMOD No.**	↓ N/A **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.

RECD 6-8-98
ON HOLD
CDS 6/17/98
CDS QC 6/24/98
NRP ✓ TJ

Verification ✓
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

C #

PassPort DATABASE INPUTs

CH #4

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

Vendor Calculation Number/Other: 03703.7002-WM(B)-02 Revision: 0

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

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

Discipline (Up to 10) N,A,Z

Unit	Project Reference (EWA)	Component Id	Computer Code	Rev. No./ Level No.
3	N/A	N/A	EN-113	6/8

PMMS CODES*				
Structure	System	Component	Reference Calculation	Rev No.
CB	RBV	N/A	N/A	N/A

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

Reference Drawing	Sheet	Rev. No.
25212-10002	A	11
25212-11000	A	9

Comments:

Table of Contents

5010.65

STONE & WEBSTER ENGINEERING CORPORATION
CALCULATION TITLE PAGE

CLIENT & PROJECT:	PAGE 1 of 12
NORTHEAST UTILITIES - MILLSTONE UNIT 3	Total Pages: 27 w/attachments pages
CALCULATION TITLE:	QA CATEGORY (✓)
Normalized Concentrations (X/Q) at Unit 3 Control Room Air Intake for Gaseous Releases from the Top of the Unit 1 Stack Under Fumigation and Non-Fumigation Conditions	☑ I

CALCULATION IDENTIFICATION NUMBER				OPTIONAL WORK PACKAGE NO.
JOB ORDER NO.	DISCIPLINE	CURRENT CALC NO	OPTIONAL TASK CODE	
037037002	WM(B)	02 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
S. A. Vigeant Stephen A. Vigeant 5/21/98	C. A. Mazzola Carl A Mazzola 5/21/98	C. A. Mazzola Carl A Mazzola 5/21/98	0			✓

DISTRIBUTION

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STONE & WEBSTER ENGINEERING CORPORATION

5010.65 **CALCULATION SHEET**

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO.	DISCIPLINE	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
037037002	WM(B)	02 Rev 0		2 OF 12

CHANGE HISTORY PAGE

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

TABLE OF CONTENTS

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO. 037037002	DISCIPLINE WM(B)	CALCULATION NO. 02 Rev 0	OPTIONAL TASK CODE	PAGE 4 OF 12

OBJECTIVE

To calculate the normalized atmospheric dispersion (X/Q) values at the Unit 3 Control Room air intake for a gaseous release from the top of the Unit 1 stack under fumigation conditions for the 0 - 4 hour period and under non-fumigation conditions for the remaining averaging periods of 4-8 hours, 8-24 hours, 1-4 days, and 4-30 days.

METHODOLOGY

The applicable methodology is identified in Regulatory Guide 1.145 (Ref. 1). The fumigation X/Q is used for the first 4 hours of the accident. The non-fumigation X/Qs for the longer averaging times are derived from the log-log interpolation between the 2-hour and annual average value obtained from Ref. 3 using 1974 to 1981 on-site meteorological data (Ref. 4). The highest annual average X/Q from among the affected downwind sectors is taken Ref. 3. The affected downwind sectors (W, WNW, NW, and NNW) are determined using the "s/d" method from Ref. 9 (see Data Section).

ASSUMPTIONS

1. It is conservatively assumed that the sea breeze fumigation condition is occurring simultaneously with the onset of an accident condition with the wind direction moving the plume centerline towards the Unit 3 CR intake located on the control building.

2. It is conservatively assumed that the NRC recommended wind speed of 2.0 meters per second in Regulatory Guide 1.145 is representative of the fumigation layer. Fumigation most frequently occurs at higher wind speeds (Ref. 5). The top of the fumigation layer is located at the centerline of the elevated plume, while the bottom of the fumigation layer is conservatively located at the shortest roof height in the control building complex (Ref. 8) rather than ground level. The stack effluent is uniformly mixed in the vertical fumigation layer which normally extends from stack top to ground level.

3. It is conservatively assumed that the effective stack height is the same as the actual stack height. Therefore, no credit is taken for plume rise that can occur due to either thermal buoyancy, where the plume is warmer than the ambient air it is being released into, or mechanical rise due to its efflux velocity.

4. The sea breeze fumigation condition is assumed to persist for the 0-4 hour period which is consistent with the NRC recommendation in Ref. 1 for off-site calculations. Although sea breeze fumigation can persist for longer periods of time, the point of fumigation moves with time due to sea breeze inland penetration and backing due to the Coriolis effect forming a helical track down the coastline (Ref. 5).

5. 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.

DATA

Top of stack = plant elevation 389.0 ft MSL (Ref. 6)
Bottom of stack = plant elevation 14.0 ft MSL (Ref. 6)
Height of lowest roof top in control building complex = plant elevation 64.5 ft MSL (Ref. 8)
h_e = Height from stack top to bottom of fumigation layer = 389.0 ft - 64.5 ft = 324.5 ft = 98.9 m
u_{he} = Wind speed representative of the fumigation layer = 2.0 m/sec (Ref. 1)
Distance (s) from stack to Unit 3 control room air intake = 1165 ft = 355 m (Ref. 7)
Direction from stack to Unit 3 control room air intake = 130° (Ref. 7)
Diameter (d) of stack top =7.0 ft = 2.1 m (Ref. 6)
s/d = 355 m/2.1 m = 169.1 or 3 sectors (3 x 22.5° = 68° or 130° - 34^0 = 96° to 130° + 34^0 = 164° (Ref. 9)
Wind directions 96° to 164° include the 22.5° downwind sectors of W, WNW, NW, and NNW
σ_y @ 355 m for F-stability class = 14.51 m (Ref. 2)

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO.	DISCIPLINE	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
037037002	WM(B)	02 Rev 0		5 OF 12

EQUATION

$X/Q = [(2\pi)^{1/2}(u_{he})\sigma_y(h_e)]^{-1}$ (Ref. 1)

CALCULATION

Unit 1 Stack to Unit 3 Control Room Air Intake

u_{he} = 2.0 m/sec (Ref. 1)
σ_y @ 355 m for F-stability class = 14.51 m (Ref. 2)
h_e = 98.9 m

Short-Term X/Q Value for Unit 3 Intake (0 - 4 Hours)

$X/Q = [(2.5066)\ (2\ m/sec)(14.51m)(98.9\ m)]^{-1}$

X/Q = 1.39 E-4 sec/m^3

CONCLUSIONS

The fumigation X/Q applicable to the Unit 3 intake for the 0-4 hour period of the accident is 1.39 E-4 sec/m^3. The non-fumigation X/Qs for the longer averaging times are derived from the log-log interpolation between the 2-hour and annual average value obtained from Ref. 3 using 1974 to 1981 on-site meteorological data (Ref. 4). This period of record (8 years) is temporally representative of the meteorological conditions encountered at the site. The highest annual average X/Q from among the affected downwind sectors is taken Ref. 3 (see Appendix 1, p. 15). The affected downwind sectors (W, WNW, NW, and NNW) are determined using the "s/d" method from Ref. 9 (see Data Section). The X/Q values are as follows:

Period (Hours after Accident)	Logarithmic Interpolation Point (Hr)	X/Q (sec/m^3)
4-8	8	3.23 E- 5
8-24	16	1.56 E- 5
24-96	72	3.20 E- 6
96-720	624	3.30 E- 7
Annual	8760	2.05 E- 8

The intermediate period X/Q values are calculated according to the expression:

$$X/Q_t = \exp\{\ln(X/Q_2) + \{[\ln(X/Q_a) - \ln(X/Q_2)] / [\ln(8760) - \ln(2)]\}\ [\ln(t) - \ln(2)]\}$$

where t is the time period in hours, X/Q_t is the X/Q value for time t, X/Q_2 is the 2-hour X/Q value, X/Q_a is the annual average X/Q value, and 8760 is the number of hours in a year.

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 representative of those for the Technical Support Center which is located adjacent to the control room.

REFERENCES

1. US Nuclear Regulatory Commission, Office of Standards Development, Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants", August, 1979.

2. U. S. Nuclear Regulatory Commission, Subroutine "POLYN", Horizontal and Vertical Dispersion Coefficients as a Function of Downwind Distance (see Attachment 1 for F-stability values), 1974.

3. Stone & Webster computer program EN-113, Version 6, Level 8. See output in Appendix 1.

4. On-site meteorological data for the period 1974 - 1981 provided by Northeast Utilities. The data are hourly values represented by one 15-minute average value per hour (see Attachment 2).

5. Lyons, W. A., "Turbulent Diffusion and Pollutant Transport in Shoreline Environments" from Lectures on Air Pollution and Environmental Impact Analyses, American Meteorological Society, Boston, Massachusetts, September 29 to October 3, 1975, pp. 182-194.

6. Telecopier transmittal from Bill Jones, Northeast Utilities to Joe Creamer, Stone & Webster dated 4/23/98 providing Millstone Unit 1 stack dimensions (see Attachment 3).

7. Stone & Webster Drawing No. 12179-EY-16A-7, Rev. 7, 8/18/81, "Station Plan" (see Attachment 4)

8. Stone & Webster Drawing No. 12179-EM-1A-11. (see Attachment 5)

9. 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.

ATTACHMENTS

1. "POLYN" Horizontal and Vertical Dispersion Coefficient Values as a Function of Downwind Distance (F-stability).

2. Letter from Northeast Utilities transmitting onsite meteorological data for the period 1974 - 1981.

3. Telecopier transmittal from Bill Jones, Northeast Utilities to Joe Creamer, Stone & Webster dated 4/23/98 providing Millstone Unit 1 stack dimensions

4. Stone & Webster Drawing No. 12179-EY-16A-7, Rev. 7, 8/18/81, "Station Plan"

5. Stone & Webster Drawing No. 12179-EM-1A-11, "Plot Plan".

APPENDICES (15 pages)

1. EN-113 computer output, Job No. 04820 dated 4/29/98.

10 MAR 1981

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

DOWNWIND DISTANCE (METERS)	STONE & WEBSTER		POLYN (LONG)		POLYN (DESERT)		POLYN (XOQDOQ)	
	SIGMA Y	SIGMA Z	SIGMA Y	SIGMA Z	SIGMA Y	SIGMA Z	SIGMA Y	SIGMA Z
10.	0.4739	0.1971	0.4014	0.1395	2.4230	1.6073	0.5776	0.3454
20.	0.8969	0.4437	0.8020	0.3243	4.5718	1.9981	1.0802	0.6072
30.	1.3054	0.6928	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	1.1786	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	10.3425	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	67.8311	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	5.1583	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 7
03703.7002
WM(B)-82
Rec-0

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.8
03703,7002
WM(B)-02
NU-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

03703,700

WM(B)-0.

kwo

Northeast Utilities System

TELECOPIER COVER LETTER (FAX)

FORM 2761-1 REV. 9-94

DATE:	TIME:	TOTAL NUMBER OF PAGES BEING SENT: (Including this page) 2

TO:

COMPANY		
DEPARTMENT/DIVISION		
ATTENTION JOE CREAMER		TELEPHONE NUMBER ( ) X1027
TELECOPIER TELEPHONE NUMBER ➤	(INCLUDE AREA CODE) ( )	

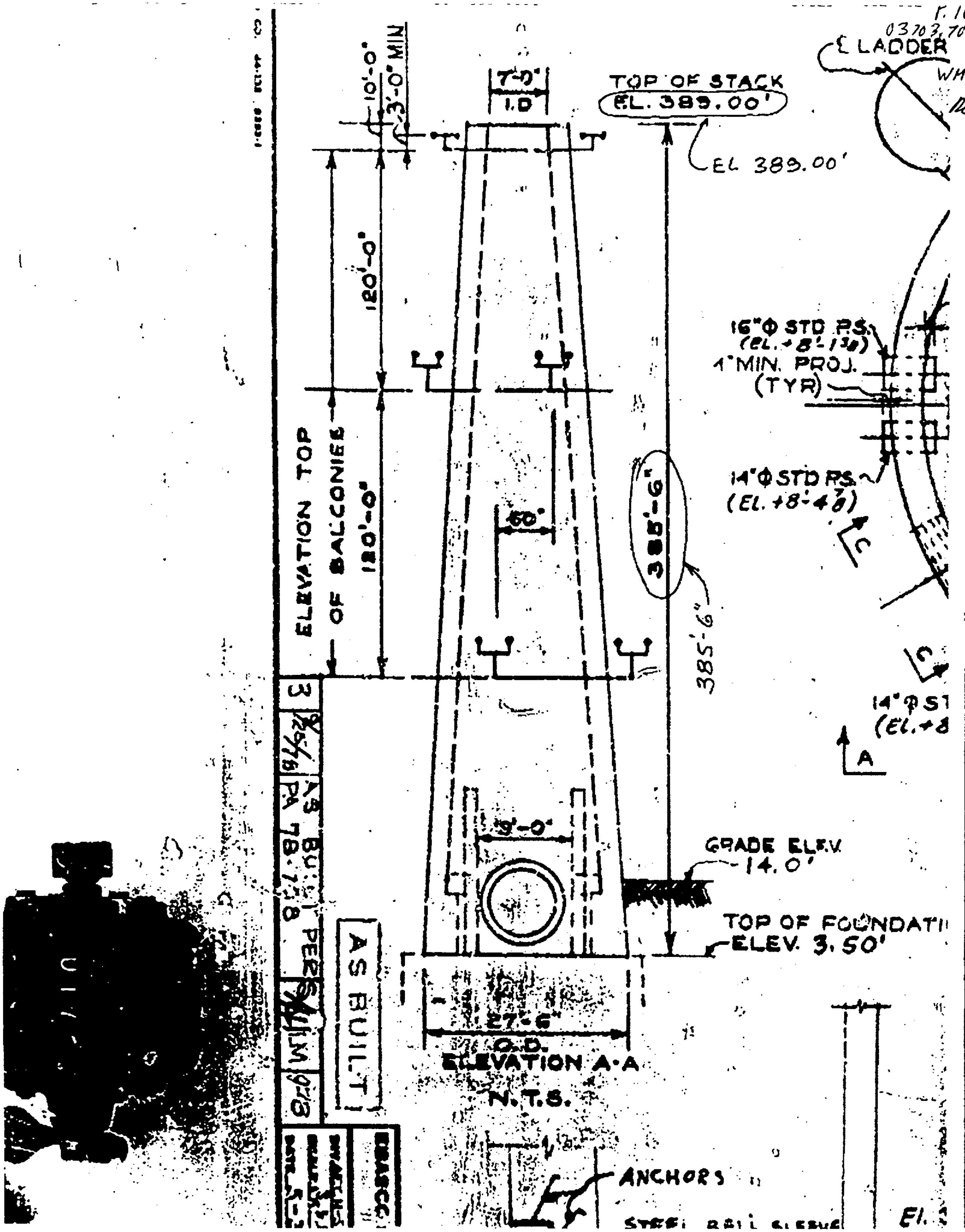
FROM:

NAME BILL JONES	ROOM NO.	TELEPHONE NUMBER * ( ) X0199
DEPARTMENT/DIVISION		
TELECOPIER TELEPHONE NUMBER ➤	(INCLUDE AREA CODE) ( )	

[redacted]

COMMENTS/DIRECTIONS

UNIT 1 STACK HEIGHT


r. 10
03703.701:
WH(B)
02
Rev 0
℄ LADDER
TOP OF STACK
EL. 389.00'
EL 389.00'
7'-0"
I.D
10'-0"
3'-0" MIN
120'-0"
120'-0"
ELEVATION TOP
OF BALCONIES
60"
385'-6"
385'-6"
16"Φ STD PS.
(EL.+8'-1 3/8)
1"MIN. PROJ.
(TYR)
14"Φ STD PS.
(EL.+8'-4 7/8)
C
C
14"Φ ST
(EL.+8
A
9'-0"
GRADE ELEV
14.0'
TOP OF FOUNDATI
ELEV. 3.50'
27'-6"
O.D.
ELEVATION A-A
N.T.S.
AS BUILT
ANCHORS
STEEL RAIL SLEEVE
El.

12179-EY-16A-7

P.11
03703
WMCB
new

N3500 N3000 N2500 N2000 N1500 N1000 N500 N000 S500

E1500 E1000 E500 E0.00

BASE LINE

CALLED NORTH

345 KV SWITCHYARD

CONTROL TOWER

GATE

LOCKED GATE

WOODS

RR TRACKS

MILLSTONE POINT

FOX ISLAND ROAD

TO FOX ISLAND

WAREHOUSE 3

TRAINING BLDG

REFUELING OUTAGE BLDG

SHOP

CONSTRUCTION PARKING

STORAGE AREA

BATCH PLANT AREA

FIELD OFFICE

ARMY

ELEC

DUST

BORON RECOVERY TANKS ENCLOSURE

RESERVE STATION SERVICE S.P.MPS

SHOP

WHSE GR WTR TKS

DEMIN WTR STOR TKS

REFUELING WTR STOR TKS

BORON'S WASTE TEST TANKS

CHEMICAL TANK VAULT

WASTE DISPOSAL BLDG

FUEL BLDG

ENGRD SAFETY FEATURES

UNIT 3

HYDROGEN RECOMBINER BLDG

CONTAINMENT STRUCTURE

N51050 E 36950

AUX. BLDG

MAIN STEAM VALVE HOUSE

MAIN AND NORMAL STATION EMPMS

RETAINING WALL

Unit #3 Control Room Air Intake

Ventilation Vent Stack

TURBINE BUILDING

SERVICE BLDG.

MACHINE SHOP

CONTROL BLDG

OFFICE BLDG

CHWS HOUSE

EMERGENCY GEN. ENCL.

UNDERGROUND DSL. FUEL OIL TKS VAULT

AUX BOILER ENCL

CHWS POLING ENCL

CHWS SURGE TK

WAREHOUSE 5 & UNIT 3 CHWS POLISH FACILITY

UNIT 2

UNIT 1

VENTILATION STACK

STORAGE AREA

3 A/P BLDG

DIESEL GEN. BLDG

WAREHOUSE 4

OFFICE

FIRE PMPHSE

FIRE WATER TANKS

KRYPTON BLDG

YARD VACUUM PRIMING PMPHSE

DISCHARGE 3

DISCHARGE 2

DISCHARGE 1

QUARRY

PARKING

BARGE SLIP

GAS TURB BLDG

HYDROGEN STOR

GRASS

MAP

SECURITY BLDG

INTAKE UNIT 2

INTAKE UNIT 1

OLD MILLSTONE ROAD

APPROXIMATE LOCATION ROCKFILL & SLOPE PROTECTION MATERIALS

CONSTRUCTION PARKING

LEACHING FIELD

SECURITY BLDG

CONSTRUCTION OFFICE

FIELD OFFICE

CIRCULATING WATER LINES

SERVICE WATER LINE

RECIRCULATING TEMPERING LINE

SEAWALL

CIRCULATING WATER PUMPHOUSE

WAREHOUSE

STORAGE PAD

STORAGE AREA

NIANTIC BAY

W500

VISITORS CENTER

BAY POINT

WOODS

QA CAT. III

Stanley E. Jacob

6-7-74

NO.	DATE	DESCRIPTION	BY	CHK'D	APP'D
		REVISIONS DURING CONSTRUCTION			
7	4/4/75	REF. BCD OF DWG CHNG 12179-BCY-16A-2 SH 1			
6	4/4/75	REDRAWN-SUPERSEDES DWG EY-16AVD-5			
5	4/4/75	DWG VOIDED & REINSTATED EY-16AVD-5			
4	4/4/75	REVISED UNIT 3 AREA			
3	4/4/75	G-8 REV EMER DIESEL GEN ENCL			
2	4/4/75	GENERAL REVISIONS			
1		Revisions			

THE INFORMATION ON THIS DRAWING MAY NOT BE COPIED OR USED FOR OTHER THAN THE CONSTRUCTION, MAINTENANCE OR REPAIR OF THE PLANT FACILITY DESCRIBED IN THE TITLE BLOCK.

AREA	SYSTEM	DRAWING
107	TKB	

THE MILLSTONE POINT COMPANY
SUBSIDIARY OF
NORTHEAST UTILITIES

TITLE MILLSTONE NUCLEAR POWER STATION-UNIT NO.3

STATION PLAN

DES.	MJF/CMA	DATE	4/8/74
DRN.		DATE	5-17-74
CHK'D		DATE	5-17-74
SCALE	1" = 100'	SCALE'D	DATE
FILE NO.		DWG. NO.	25212-11000

STONE & WEBSTER ENGINEERING CORPORATION
BOSTON, MASS.

S & W DWG. NO. 12179-EY-16A-7

P.12
03703700
WM(B)-02
Rev 0

12179-EM-1A-10

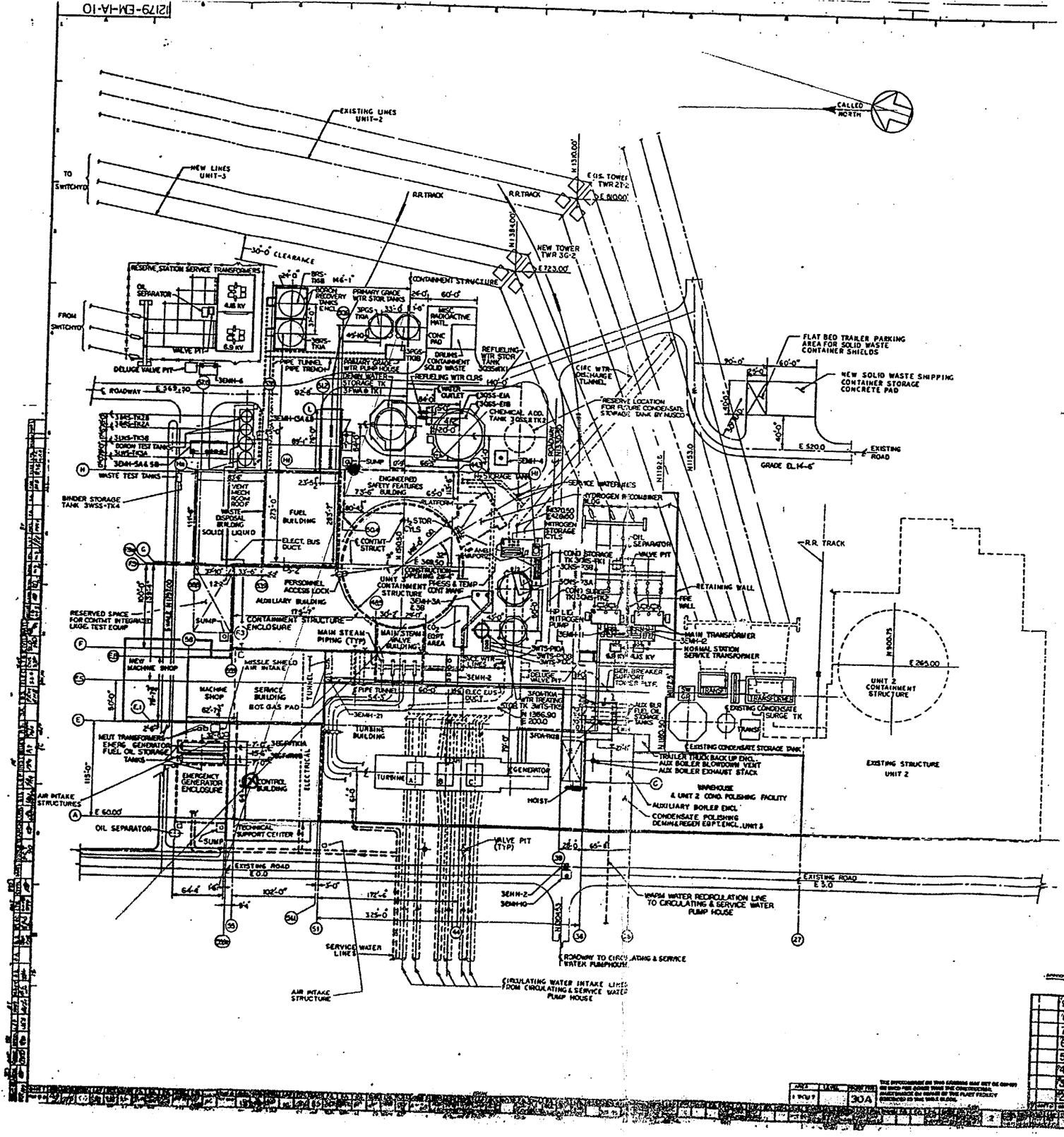


FIGURE 1.2-2

MAY 1992

```
                    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

10.02.03 JOB04820  IRR010I  USERID VIG7988  IS ASSIGNED TO THIS JOB.
10.02.37 JOB04820  ICH70001I VIG7988  LAST ACCESS AT 10:01:36 ON WEDNESDAY, APRIL 29, 1998
10.02.37 JOB04820  $HASP373 CQ68     STARTED - INIT   10 - CLASS A - SYS C168
10.02.47 JOB04820  IEC137I TRACK OVERFLOW RESET FOR FT11F001
10.03.06 JOB04820  IEC137I TRACK OVERFLOW RESET FOR FT10F001
10.03.10 JOB04820  IEC137I TRACK OVERFLOW RESET FOR FT16F001
10.03.10 JOB04820  IEC137I TRACK OVERFLOW RESET FOR FT31F001
10.05.13 JOB04820  +IHO002I STOP      1
10.05.14 JOB04820  $HASP395 CQ68     ENDED

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


  29 APR 1998 JOB EXECUTION DATE


          59 CARDS READ


       1,971 SYSOUT PRINT RECORDS


           0 SYSOUT PUNCH RECORDS


         148 SYSOUT SPOOL KBYTES


        2.62 MINUTES EXECUTION TIME
```

```
 1 //CQ68 JOB (0031,3),'VIGEANT-SA',                    29-APR-98JOB04820
   //  MSGLEVEL=2,MSGCLASS=A
   //* RJETRAN.VIG7988.DATA(CQ68EL)
   /*JOBPARM  ROOM=3                                    JOB04820
 2 //METRDISK EXEC METRPROC
 9 //DISK DD DISP=SHR,DSN=ENVIRONM.METDATA.MILSTONE.YR7481
12 //SYSIN     DD *              GENERATED STATEMENT
13 //CHIQ68 EXEC PGM=CHIOQ68,REGION=700K,TIME=20
14 //STEPLIB DD DSN=ENVIRONM.HXLOADLB,DISP=SHR
15 //GO.FT06F001 DD DCB=PRINT1,SYSOUT=*
16 //GO.FT08F001 DD DUMMY
17 //GO.FT09F001 DD DCB=PRINT1,SYSOUT=*
18 //GO.FT10F001 DD UNIT=DISK,SPACE=(19982,(100,10)),DISP=(,PASS),
   //  DCB=(RECFM=VBST,LRECL=X,BLKSIZE=19982)
19 //GO.FT11F001 DD UNIT=DISK,SPACE=(19982,(100,10)),DISP=(,PASS),
   //  DCB=(RECFM=VBST,LRECL=X,BLKSIZE=19982)
20 //GO.FT12F001 DD UNIT=DISK,DISP=(OLD,DELETE),DSN=&SAMPLE
21 //GO.FT16F001 DD UNIT=DISK,SPACE=(32760,(70,10)),DISP=(,PASS),
   //  DCB=(RECFM=VST,LRECL=X,BLKSIZE=32760,BUFNO=1)
22 //GO.FT31F001 DD UNIT=DISK,SPACE=(32760,(70,10)),DISP=(,PASS),
   //  DCB=(RECFM=VST,LRECL=X,BLKSIZE=32760,BUFNO=1)
23 //GO.FT05F001  DD  *
24 //IMBLIST EXEC PGM=IMBLIST
25 //SYSPRINT DD SYSOUT=*
26 //SYSLIB DD DSN=ENVIRONM.HXLOADLB,DISP=SHR
27 //SYSIN     DD *              GENERATED STATEMENT
```

```
 STMT NO. MESSAGE
        2 IEFC001I PROCEDURE METRPROC WAS EXPANDED USING SYSTEM LIBRARY SYS1.USER.PROCLIB
 ICH70001I VIG7988  LAST ACCESS AT 10:01:36 ON WEDNESDAY, APRIL 29, 1998
 IEF236I ALLOC. FOR CQ68 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 (SYS98119.T100237.RA000.CQ68.SAMPLE.H01      )
         STORCLAS (TEMP) MGMTCLAS (        ) DATACLAS (        )
         VOL SER NOS= VIO
 IEF237I JES2 ALLOCATED TO FT05F001
 IEF142I CQ68 METRPROC METRDISK - STEP WAS EXECUTED - COND CODE 0000
 IGD104I ENVIRONM.METOLOGY                          RETAINED,  DDNAME=STEPLIB
 IEF285I   VIG7988.CQ68.JOB04820.D0000104.?           SYSOUT
 IEF285I   VIG7988.CQ68.JOB04820.D0000105.?           SYSOUT
 IGD104I ENVIRONM.METDATA.MILSTONE.YR7481           RETAINED,  DDNAME=SYS010
 IGD106I SYS98119.T100237.RA000.CQ68.SAMPLE.H01     PASSED,    DDNAME=SYS011
 IEF285I   VIG7988.CQ68.JOB04820.D0000101.?           SYSIN
 ..........................................................................................................................
 .JOB - CQ68     , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   10.02.02,  04/29/98                  V09 .
 .STEP NUMBER -   1, STEP NAME - METRPROC, PROGRAM NAME - METWR01 , RAN FROM  10.02.37 TO  10.02.44                            .
 .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 -      .60 VECTOR TIME -       .00 SECS, EXCPS -(       354 NON-VIO,     1,754 VIO), CPU UNITS -      2.50 SECS    .
 .SYSIN RECORDS -     3, OPENS - (     0 TAPE,     0 TEMP,     0 PERM),                                  COST =     $4.17          .
 .EXCPS/DDNAME -                          9/STEPLIB          345/SYS010          1,754/SYS011                                 .
 ..........................................................................................................................
 IEF373I STEP/METRPROC/START 1998119.1002
 IEF374I STEP/METRPROC/STOP  1998119.1002 CPU     0MIN 00.56SEC SRB     0MIN 00.02SEC VIRT     88K SYS    292K EXT        4K SYS    10120K
 IEF236I ALLOC. FOR CQ68 CHIQ68
 IGD103I SMS ALLOCATED TO DDNAME STEPLIB
 IEF237I JES2 ALLOCATED TO FT06F001
 IEF237I DMY  ALLOCATED TO FT08F001
 IEF237I JES2 ALLOCATED TO FT09F001
 IGD101I SMS ALLOCATED TO DDNAME (FT10F001)
         DSN (SYS98119.T100237.RA000.CQ68.R0110984        )
         STORCLAS (TEMP) MGMTCLAS (        ) DATACLAS (        )
         VOL SER NOS= VIO
 IGD101I SMS ALLOCATED TO DDNAME (FT11F001)
         DSN (SYS98119.T100237.RA000.CQ68.R0110985        )
         STORCLAS (TEMP) MGMTCLAS (        ) DATACLAS (        )
         VOL SER NOS= VIO
 IGD103I SMS ALLOCATED TO DDNAME FT12F001
 IGD101I SMS ALLOCATED TO DDNAME (FT16F001)
         DSN (SYS98119.T100237.RA000.CQ68.R0110986        )
         STORCLAS (TEMP) MGMTCLAS (        ) DATACLAS (        )
         VOL SER NOS= VIO
 IGD101I SMS ALLOCATED TO DDNAME (FT31F001)
         DSN (SYS98119.T100237.RA000.CQ68.R0110987        )
         STORCLAS (TEMP) MGMTCLAS (        ) DATACLAS (        )
         VOL SER NOS= VIO
 IEF237I JES2 ALLOCATED TO FT05F001
 IEC137I TRACK OVERFLOW RESET FOR FT11F001
 IEC137I TRACK OVERFLOW RESET FOR FT10F001
 IEC137I TRACK OVERFLOW RESET FOR FT16F001
 IEC137I TRACK OVERFLOW RESET FOR FT31F001
 IEF142I CQ68 CHIQ68 - STEP WAS EXECUTED - COND CODE 0001
```

```
IGD104I ENVIRONM.HXLOADLB                              RETAINED,  DDNAME=STEPLIB
IEF285I   VIG7988.CQ68.JOB04820.D0000106.?               SYSOUT
IEF285I   VIG7988.CQ68.JOB04820.D0000107.?               SYSOUT
IGD106I SYS98119.T100237.RA000.CQ68.R0110984           PASSED,    DDNAME=FT10F001
IGD106I SYS98119.T100237.RA000.CQ68.R0110985           PASSED,    DDNAME=FT11F001
IGD105I SYS98119.T100237.RA000.CQ68.SAMPLE.H01         DELETED,   DDNAME=FT12F001
IGD106I SYS98119.T100237.RA000.CQ68.R0110986           PASSED,    DDNAME=FT16F001
IGD106I SYS98119.T100237.RA000.CQ68.R0110987           PASSED,    DDNAME=FT31F001
IEF285I   VIG7988.CQ68.JOB04820.D0000102.?               SYSIN
...................................................................................................................
.JOB - CQ68    , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   10.02.02,  04/29/98          V09 .
.STEP NUMBER -    2, STEP NAME - CHIQ68   , PROGRAM NAME - CHIQ68 , RAN FROM  10.02.44 TO  10.05.14                     .
.ENDING CONDITION - RETURN CODE     1, REGION USED -    864K, PERFORMANCE GROUP -  20, SWAPS -       0                   .
.PAGEINS -       0, PAGEOUTS -       0, VIO PAGEINS -       0, VIO PAGEOUTS -       0                                   .
.CPU TIME -    21.02 VECTOR TIME -       .00 SECS, EXCPS -(          30 NON-VIO,     10,311 VIO), CPU UNITS -     30.33 SECS .
.SYSIN RECORDS -     28, OPENS - (      0 TAPE,      0 TEMP,      0 PERM),                       COST =     $50.55        .
.EXCPS/DDNAME -                      30/STEPLIB              228/FT10F001            228/FT11F001       1,755/FT12F001     .
.              4,050/FT16F001       4,050/FT31F001                                                                       .
...................................................................................................................
IEF373I STEP/CHIQ68  /START 1998119.1002
IEF374I STEP/CHIQ68  /STOP  1998119.1005 CPU    0MIN 20.98SEC SRB    0MIN 00.03SEC VIRT    556K SYS   308K EXT       4K SYS   10404K
IEF236I ALLOC. FOR CQ68 IMBLIST
IEF237I JES2 ALLOCATED TO SYSPRINT
IGD103I SMS ALLOCATED TO DDNAME SYSLIB
IEF237I JES2 ALLOCATED TO SYSIN
IEF142I CQ68 IMBLIST - STEP WAS EXECUTED - COND CODE 0008
IEF285I   VIG7988.CQ68.JOB04820.D0000108.?               SYSOUT
IGD104I ENVIRONM.HXLOADLB                              RETAINED,  DDNAME=SYSLIB
IEF285I   VIG7988.CQ68.JOB04820.D0000103.?               SYSIN
...................................................................................................................
.JOB - CQ68    , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   10.02.02,  04/29/98          V09 .
.STEP NUMBER -    3, STEP NAME - IMBLIST , PROGRAM NAME - IMBLIST  , RAN FROM  10.05.14 TO  10.05.14                     .
.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 1998119.1005
IEF374I STEP/IMBLIST /STOP  1998119.1005 CPU    0MIN 00.03SEC SRB    0MIN 00.00SEC VIRT    156K SYS   272K EXT       4K SYS   10116K
IGD105I SYS98119.T100237.RA000.CQ68.R0110984           DELETED,   DDNAME=FT10F001
IGD105I SYS98119.T100237.RA000.CQ68.R0110985           DELETED,   DDNAME=FT11F001
IGD105I SYS98119.T100237.RA000.CQ68.R0110986           DELETED,   DDNAME=FT16F001
IGD105I SYS98119.T100237.RA000.CQ68.R0110987           DELETED,   DDNAME=FT31F001
IEF375I  JOB/CQ68    /START 1998119.1002
IEF376I  JOB/CQ68    /STOP  1998119.1005 CPU    0MIN 21.57SEC SRB    0MIN 00.05SEC
...................................................................................................................
.TOTAL CPU TIME -      21.65 SECS,   TOTAL VECTOR TIME -       .00 SECS,   TOTAL CPU UNITS -      32.85 SECS                 .
.TOTAL EXCPS -(        384 NON-VIO,     12,065 VIO)                                                                        .
.TOTAL JOB COST EXCLUDING PRINT CHARGES =     $54.77      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): 4/29/98

JOB NAME OF RUN: CQ68

LIBRARY REFERENCE NUMBER: EN-112

LEVEL OF PROGRAM: 01

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

TIME OF RUN (MILITARY): 1002

JOB04820

INPUT DATA TRACEBACK

DATA SUBMITTED ON DEVICE: 5

```
  CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
     1      3
     2   131 132 135
     3  74001     81365
  CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

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

```
INPUT TO METOWER PROGRAM
    3
 131 132 135
74001     81365

EOF OF INPUT DATA REACHED

NUMBER OF CARDS SELECTED =  8766

NUMBER OF DAYS SELECTED  =  2922
```

STONE & WEBSTER ENGINEERING CORPORATION

ENVIRONMENTAL ENGINEERING DIVISION

COMPUTER CODE IDENTIFICATION

PROGRAM NAME: ATMOSPHERIC DISPERSION FACTORS

VERSION OF PROGRAM: 06

LOAD MODULE: ENVIRONM.WXLOADLB

LINK EDIT DATE (JULIAN): 82.263

DATE OF RUN (MO/DAY/YR): 4/29/98

JOB NAME OF RUN: CQ68

LIBRARY REFERENCE NUMBER: EN-113

LEVEL OF PROGRAM: 08

MEMBER (PGM): CHIOQ68

LINK EDIT TIME (HRS.MINS.SECS): 12.40.03

TIME OF RUN (MILITARY): 1002

JOB04820

INPUT DATA TRACEBACK

DATA SUBMITTED ON DEVICE: 5

```
CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
   1  MILLSTONE NULCEAR POWER STATION - UNIT 3    037037002
   2  ONSITE METDATA (1974-1981)
   3  7400181365 2922    3  341    2
   4    131  132    0    0    0  135    0    0    0    0    0
   5    0.1    0    0    0    0  0.1    0    0    0    0    0    0    0    0    0
   6      2 ELEVATED RELEASE (355 M)
   7      1         0  389    0    0    0    0         0         00   2    0    0    0
   8      1    0    0    0   16    3    0         0         0    0    0    0   00    0
   9      1    0    0    0    0 1000    8    0  1.1  0.6  0.0  0.0                    0
  10    35599999

CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
  11    35199999
  12
  13      1 64.5 64.5
  14      2 64.5 64.5
  15      3 64.5 64.5
  16      4 64.5 64.5
  17      5 64.5 64.5
  18      6 64.5 64.5
  19      7 64.5 64.5
  20      8 64.5 64.5

CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
  21      9 64.5 64.5
  22     10 64.5 64.5
  23     11 64.5 64.5
  24     12 64.5 64.5
  25     13 64.5 64.5
  26     14 64.5 64.5
  27     15 64.5 64.5
  28     16 64.5 64.5
CARD# ----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8

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

********** PROGRAM OPTIONS AVALIABLE IN THE LOAD MODULE (ENVIRONM.WXLOADLB(CHIOQ68)) **********

METSTB - METHOD OF DETERMINING STABILITY CLASS. - ALL METHODS
IREDIS - REDISTRIBUTION OF CALMS - ALL
TPGRAD - SPECIFIED TEMPERATURE GRADIENTS FOR STABILITY CLASS DETERMINATION
IRETYP - RELEASE POINT AND CALCULATION TYPE
ISTTYP - STATION TYPE - NUCLEAR OR FOSSIL - BOTH
HLID - LIMITED MIXING LID HEIGHT
ISTRLN - CALCULATE TIME PERIOD AVERAGES USING STRAIGHT LINE
ICALM - RESET WIND SPEED TO CALM SPEED IF WIND SPEED FALLS BELOW CALM SPEED
UCU - UNSTABLE AND NETURAL WIND SPEED CORRECTION FACTOR
UCS - STABLE WIND SPEED HEIGHT CORRECTION FACTOR
ISECVG - SECTOR AVERAGING CORRECTION
MESHT - WIND SPEED MODIFICATION WITH HEIGHT (ASME)
IAECSG - DISPERSION COEFFICIENTS (SIGMA Y AND SIGMA Z), AEC, AEC DESERT AND S+H (TURNER'S)
IBHEFF - BUILDING WAKE EFFECT (SHORT TERM) - ALL
ITOPO - TOPOGRAPHIC DATA INPUT CONTROL
ITERIN - TERRAIN ADJUSTMENT FACTOR - ALL
ISIGMA - SIGMA VALUE PRINTOUT CONTROL
ISTABY - HORIZONTAL DISPERSION COEFFICIENT SELECTION ARRAY
ISTABZ - VERTICAL DISPERSION COEFFICIENT SELECTION ARRAY
NHR72 - 72 HOUR SLIDING AVERAGE HOURS TO BE SLID CONTROL
NHR624 - 624 HOUR SLIDING AVERAGE HOURS TO BE SLID CONTROL
LIMXQR - X/Q - D/Q WRITE LIMIT CONTROL
PRGHRS - NUMBER OF PURGE HOURS
RFCWSP - WIND SPEED BELOW WHICH TERRAIN RECIRCULATION FRACTION WILL BE APPLIED
JHRARY - TIME PERIOD CONTROL
IPLMEQ - PLUME RISE EQUATION CONTROL (14 METHODS)
BHT - BUILDING HEIGHT WAKE EFFECT (LONG TERM)
SPDBWE - GROUND TO ELEVATED RELEASE SHIFT AND DOWNWASH CONTROL
IAJDIR - ADJACENT DOWNWIND SECTOR DISTANCE SELECTION SWITCH

CALCULATION NUMBER
MILLSTONE NULCEAR POWER STATION - UNIT 3 ONSITE METDATA (1974-1981) 037037002
ELEVATED RELEASE (355 M)

********** READ1 (6.8) INPUT DATA **********
CLIENT(11)
MILLSTONE NULCEAR POWER STATION - UNIT 3
SITE(11)
ONSITE.METDATA (1974-1981)

JOBNO(3)
037037002
CALCNU(5)

ISTART	ISTOP	NDYSDT	METSTB	DHT	IREDIS
74001	81365	2922	3	341.0	2

SPEED	DIR	TEMP	RANGE	STD DEV	DELTA T
131	132	0	0	0	135

PARMUL(9)

0.10	1.00	1.00	1.00	1.00	0.10

ELEVATED CONDITIONS

SPEED	DIR	TEMP	ISPUNT	ITPUNT
0	0	0	0	0

1.00	1.00	1.00	0.0	0.0

TPGRAD(6)

0.0	0.0	0.0	0.0	0.0

********** READ2 (6.8) INPUT DATA **********
IRETYP RELSID(11)
2 ELEVATED RELEASE (355 M)

ISTTYP	WFLUE	STKHT	STKDIA	GASVEL	TS	HLID		WFUEL		HVALUE	ISTRLN	ICALM	UCU	UCS
1	0.	389.00	0.0	0.0	0.	0.		0.		0.	0 2	0	0.0	0.0
ISECVG	MESHT	IAECSG	IBWEFF	ITOPO	ITERIN	ISIGMA		ISTABY		ISTABZ	NHR72	NHR624	LIMXQR	PRGHRS	RFCWSP
1	0	0	0	16	3	0		0000000		0000000	0	0	0	0.0	0.0
	JHRARY(6)					IPLMEQ	PLUMRS	CALMAC	CALMAN	BHT	SPDBWE				IAJDIR
1	0	0	0	0	1000	8	0.0	1.1	0.6	0.0	0.0				0

DISITE(16)

355.0	355.0	355.0	355.0	355.0	355.0	355.0	355.0	355.0	355.0	355.0	355.0	355.0	355.0	355.0	355.0

DISLPZ(16)

351.0	351.0	351.0	351.0	351.0	351.0	351.0	351.0	351.0	351.0	351.0	351.0	351.0	351.0	351.0	351.0

IDSLP DISTAN(10)

0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

IDR TOPOHT(16,12)

1	64.5	64.5
2	64.5	64.5
3	64.5	64.5
4	64.5	64.5
5	64.5	64.5
6	64.5	64.5
7	64.5	64.5
8	64.5	64.5
9	64.5	64.5
10	64.5	64.5
11	64.5	64.5
12	64.5	64.5
13	64.5	64.5
14	64.5	64.5
15	64.5	64.5
16	64.5	64.5

********** TERRAIN ADJUSTMENT FACTORS USED **********

IDR	FACTORS (2)	
1	4.000	4.000
2	4.000	4.000
3	4.000	4.000
4	4.000	4.000
5	4.000	4.000
6	4.000	4.000
7	4.000	4.000
8	4.000	4.000

APPENDIX 1
EN-113 Program Output
Unit 1 Stack to Unit 3 Control Room Air Intake

9	4.000	4.000
10	4.000	4.000
11	4.000	4.000
12	4.000	4.000
13	4.000	4.000
14	4.000	4.000
15	4.000	4.000
16	4.000	4.000

CALCULATION NUMBER
MILLSTONE NULCEAR POWER STATION - UNIT 3 ONSITE METDATA (1974-1981) 037037002
ELEVATED RELEASE (355 M)
CHI/Q CALCULATION 1 HOUR PERIOD 1/01/74 - 12/31/81
RELEASE TYPE - ELEVATED NUCLEAR ZERO PLUME RISE
STABILITY DETERMINED BY DELTA TEMPERATURE TOPOGRAPHY USED - YES
WIND SPEED ASSIGNED TO CALM OBSERVATIONS = 1.10 MPH CALM REDISTRIBUTION - PROP TO 1.5 MPS W/S CLASS DIR FREQ
DISPERSION COEFFICIENTS (AEC GIFFORD'S)

********** CHI/Q VALUES **********

DOWNWIND SECTOR	DOWNWIND DISTANCE (M)	MAXIMUM VALUE	ARITHMETIC MEAN	50 PERCENT VALUE	50 PC EQUAL RISK VALUE	5 PERCENT VALUE	5 PC EQUAL RISK VALUE	8 PC EQUAL RISK VALUE
S	355.	0.8356E-05	0.5924E-07	0.5133E-14	0.7795E-23	0.5092E-07	0.2730E-07	0.1641E-13
SSW	355.	0.2051E-04	0.4650E-07	0.5191E-14	0.4313E-14	0.2850E-07	0.1945E-07	0.1641E-13
SW	355.	0.9601E-05	0.3937E-07	0.5966E-14	0.3547E-14	0.2850E-07	0.2964E-13	0.1641E-13
WSW	355.	0.7780E-05	0.7870E-08	0.6336E-14	0.3178E-59	0.2297E-13	0.1641E-13	0.1209E-13
W	355.	0.4600E-05	0.1766E-07	0.3995E-14	0.1626E-23	0.2552E-13	0.1413E-13	0.9571E-14
WNW	355.	0.8058E-05	0.3805E-07	0.4836E-14	0.9035E-59	0.2158E-07	0.1641E-13	0.1178E-13
NW	355.	0.1126E-04	0.7589E-07	0.7362E-23	0.1491E-59	0.4594E-13	0.1641E-13	0.1209E-13
NNW	355.	0.4102E-04	0.1217E-06	0.3118E-23	0.1000E-70	0.2137E-13	0.1371E-13	0.9987E-14
N	355.	0.1128E-04	0.6439E-07	0.2409E-23	0.1031E-23	0.1955E-13	0.1458E-13	0.1134E-13
NNE	355.	0.1456E-04	0.6309E-07	0.2120E-23	0.2409E-23	0.1458E-13	0.1641E-13	0.1134E-13
NE	355.	0.1253E-04	0.3063E-07	0.2120E-23	0.2648E-14	0.1242E-13	0.2042E-13	0.1242E-13
ENE	355.	0.2507E-04	0.2092E-07	0.2366E-23	0.4313E-14	0.1413E-13	0.1763E-07	0.1701E-13
E	355.	0.1003E-04	0.1550E-07	0.3797E-14	0.4940E-14	0.1407E-07	0.1970E-07	0.3675E-13
ESE	355.	0.2507E-04	0.3352E-07	0.5280E-14	0.6336E-14	0.2605E-07	0.6124E-07	0.2255E-07
SE	355.	0.9199E-05	0.8219E-07	0.5535E-14	0.8587E-14	0.4819E-06	0.8363E-06	0.5440E-06
SSE	355.	0.2256E-04	0.8636E-07	0.5405E-14	0.6425E-14	0.5326E-06	0.6571E-06	0.4306E-06
DIRECTION INDEPENDENT		0.4102E-04	0.4872E-07	0.4065E-14		0.2385E-07		

OBSERVATIONS EXAMINED 70128 GOOD OBSERVATIONS 65563 PERCENT DATA RECOVERY 93.49

GOOD DATA PERIODS	65563															
NUMBER CHI/Q = 0.0	62538	62314	62719	63469	63066	63362	63430	63523	62782	61111	58971	58276	59875	60166	57739	60104	0
	95.39	95.04	95.66	96.81	96.19	96.64	96.75	96.89	95.76	93.21	89.95	88.89	91.32	91.77	88.07	91.67	0.0
NON ZERO TOTAL	3025	3249	2844	2094	2497	2201	2133	2040	2781	4452	6592	7287	5688	5397	7824	5459	65563

APPENDIX 1
EN-113 Program Output
Unit 1 Stack to Unit 3 Control Room Air Intake

CALCULATION NUMBER

********** CUMULATIVE FREQUENCY SUMMARY **********

DOWNWIND SECTOR		S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE	DIRECTION
DOWNWIND DISTANCE (M)		355.	355.	355.	355.	355.	355.	355.	355.	355.	355.	355.	355.	355.	355.	355.	355.	INDEPENDENT
TOPOGRAPHIC HEIGHT		65.	65.	65.	65.	65.	65.	65.	65.	65.	65.	65.	65.	65.	65.	65.	65.	
CHI/Q RANGE GTE	LT																	
	0.10E-08	2792	3034	2672	2057	2411	2083	2039	1983	2710	4357	6448	7041	5383	4908	6610	4823	61351
		92.30	93.38	93.95	98.23	96.56	94.64	95.59	97.21	97.45	97.87	97.82	96.62	94.64	90.94	84.48	88.35	93.58
0.10E-08	0.39E-08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		92.30	93.38	93.95	98.23	96.56	94.64	95.59	97.21	97.45	97.87	97.82	96.62	94.64	90.94	84.48	88.35	93.58
0.40E-08	0.69E-08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		92.30	93.38	93.95	98.23	96.56	94.64	95.59	97.21	97.45	97.87	97.82	96.62	94.64	90.94	84.48	88.35	93.58
0.70E-08	0.99E-08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		92.30	93.38	93.95	98.23	96.56	94.64	95.59	97.21	97.45	97.87	97.82	96.62	94.64	90.94	84.48	88.35	93.58
0.10E-07	0.39E-07	69	85	63	12	31	37	14	5	6	9	38	116	188	278	536	235	1722
		94.58	96.00	96.17	98.81	97.80	96.32	96.25	97.45	97.66	98.07	98.39	98.22	97.94	96.09	91.33	92.65	96.20
0.40E-07	0.69E-07	30	37	31	12	9	22	22	5	10	15	20	14	2	7	40	41	317
		95.57	97.14	97.26	99.38	98.16	97.32	97.28	97.70	98.02	98.41	98.70	98.41	97.98	96.22	91.85	93.41	96.69
0.70E-07	0.99E-07	4	10	10	1	6	5	3	5	2	1	1	2	2	0	1	2	55
		95.70	97.45	97.61	99.43	98.40	97.55	97.42	97.94	98.09	98.43	98.71	98.44	98.01	96.22	91.86	93.44	96.77
0.10E-06	0.39E-06	3	8	5	4	2	6	6	2	2	1	7	33	47	68	121	14	329
		95.80	97.69	97.78	99.62	98.48	97.82	97.70	98.04	98.17	98.45	98.82	98.89	98.84	97.48	93.40	93.70	97.27
0.40E-06	0.69E-06	46	15	15	2	16	12	2	0	0	4	16	38	45	90	265	155	721
		97.32	98.15	98.31	99.71	99.12	98.36	97.80	98.04	98.17	98.54	99.06	99.41	99.63	99.15	96.79	96.54	98.37
0.70E-06	0.99E-06	33	23	21	3	13	11	5	2	2	5	18	7	3	7	63	64	280
		98.41	98.86	99.05	99.86	99.64	98.86	98.03	98.14	98.24	98.65	99.33	99.51	99.68	99.28	97.60	97.71	98.80
0.10E-05	0.29E-05	35	23	16	2	6	18	21	12	28	23	20	26	15	34	164	102	545
		99.57	99.57	99.61	99.95	99.88	99.68	99.02	98.73	99.24	99.17	99.64	99.86	99.95	99.91	99.69	99.58	99.63
0.30E-05	0.49E-05	10	9	6	0	3	5	11	8	8	11	9	5	1	3	23	15	127
		99.90	99.85	99.82	99.95	100.00	99.91	99.53	99.12	99.53	99.42	99.77	99.93	99.96	99.96	99.99	99.85	99.82
0.50E-05	0.69E-05	0	3	2	0	0	1	5	6	7	15	9	3	1	0	0	5	57
		99.90	99.94	99.89	99.95	100.00	99.95	99.77	99.41	99.78	99.75	99.91	99.97	99.98	99.96	99.99	99.95	99.91
0.70E-05	0.89E-05	3	1	2	1	0	1	3	5	3	7	2	1	0	0	0	1	30
		100.00	99.97	99.96	100.00	100.00	100.00	99.91	99.66	99.89	99.91	99.94	99.99	99.98	99.96	99.99	99.96	99.96
0.90E-05	0.11E-04	0	0	1	0	0	0	2	3	3	2	3	0	1	1	1	1	18
		100.00	99.97	100.00	100.00	100.00	100.00	100.00	99.80	100.00	99.96	99.98	99.99	100.00	99.98	100.00	99.98	99.98
0.12E-04	0.31E-04	0	1	0	0	0	0	0	3	0	2	1	1	0	1	0	1	10
		100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.95	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
0.32E-04	0.51E-04	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

CALCULATION NUMBER

MILLSTONE NULCEAR POWER STATION - UNIT 3 ONSITE METDATA (1974-1981) 037037002

ELEVATED RELEASE (355 M)

CHI/Q CALCULATION ANNUAL 1/01/74 - 12/31/81

RELEASE TYPE - ELEVATED NUCLEAR ZERO PLUME RISE

STABILITY DETERMINED BY DELTA TEMPERATURE TOPOGRAPHY USED - YES

WIND SPEED ASSIGNED TO CALM OBSERVATIONS = 0.60 MPH CALM REDISTRIBUTION - PROP TO 1.5 MPS W/S CLASS DIR FREQ

DISPERSION COEFFICIENTS (AEC GIFFORD'S)

RECIRCULATION FACTORS APPLIED (PLAIN (CURVE))

HEIGHT OF ELEVATED RELEASE 389.0 FEET (118.6 METERS)

********** ANNUAL CHI/Q AVERAGES ********** UNDECAYED UNDEPLETED CHI/Q VALUES.

DOWNWIND SECTOR — DOWNWIND DISTANCE (M) AND CHI/Q AVERAGES

	355.	351.	
S	0.133E-07	0.129E-07	
SSW	0.112E-07	0.108E-07	
SW	0.809E-08	0.782E-08	
WSW	0.118E-08	0.114E-08	
W	0.299E-08	0.286E-08	← 259° - 281°
WNW	0.628E-08	0.611E-08	← 282° - 305°
NW	0.126E-07	0.124E-07	← 306° - 329°
NNW	0.205E-07	0.202E-07	← 330° - 353°
N	0.138E-07	0.134E-07	
NNE	0.224E-07	0.220E-07	
NE	0.159E-07	0.156E-07	
ENE	0.116E-07	0.113E-07	
E	0.642E-08	0.622E-08	
ESE	0.133E-07	0.129E-07	
SE	0.484E-07	0.471E-07	
SSE	0.358E-07	0.349E-07	

OBSERVATIONS EXAMINED 70128 GOOD OBSERVATIONS 65563 PERCENT DATA RECOVERY 93.49

Maximum Value 2.05×10^{-8}

APPENDIX 1
EN-113 Program Output
Unit 1 Stack to Unit 3 Control Room Air Intake

Attachment 4

Millstone Nuclear Power Station, Unit No. 3

Calculation WM(B)-04
Normalized X/Q at the Unit 3 Control Room
Releases From the Unit 3 Containment and Turbine Bldg.

CALCULATION TITLE PAGE

Total Number of Pages: 49

Normalized X/Q at the Unit 3 Control Room For Releases From the Unit 3 Containment and Turbine Bldg

TITLE

N/A	0	RBVS/SLCRS
CALCULATION #	REVISION No.	SYSTEM NAME
WM(B)-04	CB,CE,TB	N/A
VENDOR CALCULATION NUMBER	Structure	System Number

NUCLEAR INDICATOR:	Calc. Supports DCR/MMOD?	Calc. Supports Ind. Analysis?	N/A
☒CAT1 ☐RWQA ☐SBOQA	☒YES ☐ NO	☐YES ☒NO	Component
☐FPQA ☐ATWSQA ☐NON-QA			

↓ ↓

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 ✓

Verified Revision ✓
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

C #

PassPort DATABASE INPUTs

CH #4

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

Vendor Calculation Number/Other: 03703.7002-WM(B)-04 Revision: 0

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

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

Discipline (Up to 10) N,A,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.
CB	RBV	N/A	ENVR-W210	0
CE			ENVR-W228	0
TB				

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

Reference Drawing	Sheet	Rev. No.
25212-14045	B	15
25212-24215	K 01	14

Comments:

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5010.65

STONE & WEBSTER ENGINEERING CORPORATION
CALCULATION TITLE PAGE

CLIENT & PROJECT:	PAGE 1 of 10 Total Pages: 46 w/attachments pages
NORTHEAST UTILITIES - MILLSTONE UNIT 3	
CALCULATION TITLE:	QA CATEGORY (✓)
Normalized Concentrations (X/Qs) at Unit 3 Control Room Air Intake for Releases from the Unit 3 Containment Structure and Turbine Bldg. Vent	☑ I ☐ II

CALCULATION IDENTIFICATION NUMBER				OPTIONAL WORK PACKAGE NO.
JOB ORDER NO.	DISCIPLINE	CURRENT CALC NO	OPTIONAL TASK CODE	
03703.7002	WM(B)	04 NW-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 Cronan Boston - 7~~				
NU RAD ~~PROT~~ PROT	Schmidt, R.J. New Britain	cc			
NUNDS	MP3 Site	original			

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO. 037037002	DISCIPLINE WM(B)	CALCULATION NO. 04 Rev 0	OPTIONAL TASK CODE	PAGE 2 OF 10

CHANGE HISTORY PAGE

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

TABLE OF CONTENTS

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 Containment Structure and Turbine Building Vent . These X/Q values will apply to the 0-2 hour through 30-day period for the containment and turbine building vent ground level release.

METHODOLOGY

The control room X/Q values are calculated using the methodology described in Murphy and Campe (Ref. 1). Given that the radiological releases are from the containment surface and from a point source (turbine bldg. vent) with a large elevation difference relative to the control room intake (see Data Section, p. 6), the diffuse source - point receptor technique for X/Q calculation from Section V(B)(1)(b) of Murphy and Campe (Ref. 1) is used. 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 (m)
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 difference (m)
d = building width (m)

The above relationship is used to calculate the 0 - 2 hour X/Q value based on site meteorological data, selecting the condition that represents the 5 percentile worst dispersion condition at the site. In this case, 1974 to 1981 on-site meteorological data (Ref. 2) are used. From earlier control room X/Q calculations (Ref. 3), the 5 percentile worst site stability class is F stability. The corresponding 5 percentile low wind speed is determined from the on-site meteorological data considering only those wind directions resulting in receptor exposure. 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 (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.

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

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO. 037037002	DISCIPLINE WM(B)	CALCULATION NO. 04 Rev 0	OPTIONAL TASK CODE	PAGE 5 OF 10

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 affected by the containment structure (containment release) and turbine building (turbine building vent).

2. For purposes of determining the appropriate dispersion equation to use in the analysis, the nature of the release and elevation difference between the release point and the control room air intake is compared to the appropriate building height. Point sources with elevation differences that are greater than 30 percent of the building height are evaluated using the diffuse source - point receptor equation from Ref. 1.

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 releases to these receptors are very similar.

EQUATIONS

$$X/Q = [u(\pi\sigma_y\sigma_z + A/(K+2))]^{-1}$$ (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)
$k = 3/(s/d)^{1.4}$

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

Determination of Intermediate Period Factors (Ref. 1)

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.

CALCULATION IDENTIFICATION NUMBER				
JOB ORDER NO.	DISCIPLINE	CALCULATION NO.	OPTIONAL TASK CODE	PAGE
037037002	WM(B)	04 Rev a		6 OF 10

DATA

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

Distance (s) from containment to Unit 3 control room air intake = 72.0 m (Ref. 6)
Wind direction from containment to Unit 3 control room air intake = 108 deg (Ref. 6)
Unit 3 control room air intake elevation = 94.6 ft (Ref. 8)
Containment structure enclosure height (top elevation - grade elevation) = 186.2 ft - 24.0 ft = 162.2 ft (Ref. 6)
Containment structure enclosure width (d) = 47.2 m (Ref. 6)
Containment structure enclosure area = 2336.4 m^2 (Ref. 6)

2. Unit 3 Turbine Bldg. to Unit 3 Control Room Air Intake

Distance from turbine bldg. vent to Unit 3 control room center = 38.1 m (Ref. 7)
Wind direction from turbine bldg. vent to Unit 3 control room center = 128 deg (Ref. 7)
d = turbine bldg. width = 36 m (Ref. 7)
Turbine bldg. vent elevation = 157 ft (Ref. 7)
Turbine bldg. roof height above grade = 113 ft (Ref. 7)
Unit 3 control room air intake elevation = 94.6 ft (Ref. 8)
Turbine bldg. vent-control room air intake elevation difference = 157 ft - 94.6 ft = 62.4 ft
Percentage difference in elevations = 62.4 ft/113 ft = 55 percent

CALCULATION

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

s = 72.0 m (Ref. 6)
direction = 108 deg (Ref. 6)
d =47.2 m (Ref. 6)
s/d = 72.0 m/47.2 m = 1.53 or 4 sectors (4 x 22.5° = 90° or 108° - 45^0 = 63° to 108° + 45^0 = 153°

A = 2336.4 m^2 (Ref. 6)
k = $3/(s/d)^{1.4}$ = $3/(1.53)^{1.4}$ = 1.65
σ_y @ 72.0 m for F stability class = 3.43 m (Ref. 4)
σ_z @ 72.0 m for F stability class = 1.72 m (Ref. 4)
u(5%) = 2.2 mph (1.0 m/sec) (Appendix 1, p. 11)
u(10%) = 3.1 mph (1.4 m/sec) (Appendix 1, p. 12)
u(20%) = 4.5 mph (2.0 m/sec) (Appendix 1, p. 13)
u(40%) = 6.7 mph (3.0 m/sec) (Appendix 1, p. 15)
F = 10,208/66332 = 0.16 (Appendix 1, p. 18)

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

$X/Q = [(1.0 m/sec) (3.14159275...) (3.43m) (1.72 m) + (2336.4 m^2)/(1.65 + 2)]^{-1}$

$X/Q = 1.52 E- 3 sec/m^3$

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	**1.52 E- 3**
8 - 24 hours	1	2.2/3.1 = 0.71	0.75 + 0.16/4 = 0.79	**8.53 E- 4**
1 - 4 days	0.6	2.2/4.5 = 0.49	0.50 + 0.16/2 = 0.58	**2.59 E- 4**
4 - 30 days	0.4	2.2/6.7 = 0.33	0.16	**3.21 E- 5**

2. Unit 3 Turbine Bldg. Vent to Unit 3 Control Room Air Intake

s = 38.1 m (Ref. 7)
direction = 128 deg (Ref. 7)
d = 36 m (Ref. 7)
s/d = 38.1 m/36 m = 1.06 or 5 sectors (5 x 22.5° = 113° or 128° - 57° = 71° to 128° + 57° = 185°

$k = 3/(s/d)^{1.4} = 3/(1.06)^{1.4} = 2.76$
A = 1239 m^2 (Ref. 7)
σ_y @ 38.1m for F stability class = 1.93 m (Ref. 4)
σ_z @ 38.1m for F stability class = 1.03 m (Ref. 4)
u(5%) = 2.2 mph (1.0 m/sec) (Appendix 2. P. 11)
u(10%) = 2.9 mph (1.3 m/sec) (Appendix 2, p. 12)
u(20%) = 4.0 mph (1.8 m/sec) (Appendix 2, p. 13)
u(40%) = 6.5 mph (2.9 m/sec) (Appendix 2, p. 15)
F = 12,724/66,332 = 0.19 (Appendix 2, p. 18)

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

$X/Q = [\ (1.0\ m/sec)\ (3.14159275...)\ (1.93m)\ (1.03\ m) + (1239\ m^2)/(2.76 + 2)\ ]^{-1}$

X/Q = 3.75 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	**3.75 E- 3**
8 - 24 hours	1	2.2/2.9 = 0.76	0.75 + 0.19/4 = 0.80	**2.28 E- 3**
1 - 4 days	0.6	2.2/4.0 = 0.55	0.50 + 0.19/2 = 0.60	**7.43 E- 4**
4 - 30 days	0.4	2.2/6.5 = 0.34	0.19	**9.69 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 releases 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 2 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 1 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 Calculation No. 12179.12-ENVR-W210, 11/23/82.

7. Stone & Webster Calculation No. 12179.12-ENVR-W228, 12/02/82.

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

ATTACHMENTS

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

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

APPENDICES (36 pages)

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

Release/Receptor Combination	Wind Direction Range	Job No
1. Unit 3 Containment to Unit 3 Control Room Intake	63 - 153 degrees	02236
2. Unit 3 Turbine Bldg. to Unit 3 Control Room Intake	71 - 185 degrees	00106

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 (XOQDOQ) SIGMA Y	POLYN (XOQDOQ) SIGMA Z
10.	0.4739	0.1971	0.4014	0.1395	2.4230	1.6073	0.5776	0.3454
20.	0.8969	0.4437	0.8020	0.3243	4.5718	1.9981	1.0802	0.6072
30.	1.3054	0.6928	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	1.1786	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	10.3425	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	67.8311	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	5.1583	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

03 763.7012

WMB)-04

Rev-0

P.9

P.10
03703.70
VH(B)-04
200-0

Northeast Utilities System

107 Selden Street, Berlin, CT 06037

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

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

```
 1 //DISTRIB JOB (0031,3),'VIGEANT-SA',                    01-MAY-98JOB02236
   //  MSGLEVEL=2,MSGCLASS=A
   //* RJETRAN.VIG7988.DATA(DISTRIB)
   /*JOBPARM  ROOM=3                                              JOB02236
 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
ICH70001I VIG7988  LAST ACCESS AT 12:52:23 ON THURSDAY, MAY 7, 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 (SYS98127.T125351.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.JOB02236.D0000104.?        SYSOUT
IEF285I   VIG7988.DISTRIB.JOB02236.D0000105.?        SYSOUT
IGD104I ENVIRONM.METDATA.MILSTONE.YR7481           RETAINED,  DDNAME=SYS010
IGD106I SYS98127.T125351.RA000.DISTRIB.SAMPLE.H01  PASSED,    DDNAME=SYS011
IEF285I   VIG7988.DISTRIB.JOB02236.D0000101.?        SYSIN
.....................................................................................................................
.JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3   , READER TIME, DATE -   12.53.51,  05/07/98                V09 .
.STEP NUMBER -   1, STEP NAME - METRPROC, PROGRAM NAME - METHR01 , RAN FROM  12.53.52 TO  12.53.55                            .
.ENDING CONDITION - RETURN CODE     0, REGION USED -    376K, PERFORMANCE GROUP -  20, SWAPS -      0                        .
.PAGEINS -      0, PAGEOUTS -      0, VIO PAGEINS -      0, VIO PAGEOUTS -      0                                              .
.CPU TIME -      .51 VECTOR TIME -      .00 SECS, EXCPS -(       352 NON-VIO,     1,169 VIO), CPU UNITS -      1.88 SECS    .
.SYSIN RECORDS -     3, OPENS - (     0 TAPE,     0 TEMP,     0 PERM),                                  COST =     $3.13        .
.EXCPS/DDNAME -                        9/STEPLIB          343/SYS010          1,169/SYS011                                  .
.....................................................................................................................
IEF373I STEP/METRPROC/START 1998127.1253
IEF374I STEP/METRPROC/STOP  1998127.1253 CPU    0MIN 00.47SEC SRB    0MIN 00.02SEC VIRT    88K SYS   288K EXT       4K SYS    9956K
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.JOB02236.D0000106.?        SYSOUT
IGD105I SYS98127.T125351.RA000.DISTRIB.SAMPLE.H01  DELETED,   DDNAME=FT10F001
IEF285I   VIG7988.DISTRIB.JOB02236.D0000102.?        SYSIN
.....................................................................................................................
.JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3   , READER TIME, DATE -   12.53.51,  05/07/98                V09 .
.STEP NUMBER -   2, STEP NAME - DISTRIB , PROGRAM NAME - DISTRB00, RAN FROM  12.53.55 TO  12.54.00                            .
.ENDING CONDITION - RETURN CODE     1, REGION USED -    336K, 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 1998127.1253
IEF374I STEP/DISTRIB /STOP  1998127.1254 CPU    0MIN 02.34SEC SRB    0MIN 00.01SEC VIRT    64K SYS   272K EXT       4K SYS    9964K
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 0008
IEF285I   VIG7988.DISTRIB.JOB02236.D0000107.?        SYSOUT
IGD104I ENVIRONM.DISTRIB                           RETAINED,  DDNAME=SYSLIB
```

```
IEF285I   VIG7988.DISTRIB.JOB02236.D0000103.?         SYSIN
.....................................................................................................................
.JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   12.53.51,  05/07/98                  V09 .
.STEP NUMBER -   3, STEP NAME - IMBLIST , PROGRAM NAME - IMBLIST , RAN FROM  12.54.00 TO  12.54.00                          .
.ENDING CONDITION - RETURN CODE     8, REGION USED -    424K, 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 1998127.1254
IEF374I STEP/IMBLIST /STOP  1998127.1254 CPU     0MIN 00.03SEC SRB     0MIN 00.00SEC VIRT   156K SYS   268K EXT       4K SYS    9868K
IEF375I  JOB/DISTRIB /START 1998127.1253
IEF376I  JOB/DISTRIB /STOP  1998127.1254 CPU     0MIN 02.84SEC SRB     0MIN 00.03SEC
.....................................................................................................................
.TOTAL CPU TIME -      2.89 SECS,   TOTAL VECTOR TIME -       .00 SECS,   TOTAL CPU UNITS -      5.32 SECS               .
.TOTAL EXCPS -(       360 NON-VIO,     2,339 VIO)                                                                       .
.TOTAL JOB COST EXCLUDING PRINT CHARGES =      $8.86       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): 5/07/98

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): 1253

JOB02236

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
74001     81365

EOF OF INPUT DATA REACHED

NUMBER OF CARDS SELECTED =  5844

NUMBER OF DAYS SELECTED  =  2922
```

STONE & WEBSTER 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): 5/07/98

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): 1253

JOB02236

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               WIND DIRECTION (DEGREES)                3      0  999
   5    62 153 360                                                        0
   6  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

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 SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 0- 62	63- 153	154- 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	147	109	265	14	535
PCT CLASS	27.48	20.37	49.53	2.62	100.00
PCT TOTAL	0.22	0.16	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

APPENDIX 1
Distribution Program Output
Unit 3 Containment Structure to Unit 3 Control Room Air Intake

P. 10
03703.7002
WM(B)-04

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 62	63- 153	154- 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	215	136	359	11	721
PCT CLASS	29.82	18.86	49.79	1.53	100.00
PCT TOTAL	0.32	0.21	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	241	139	428	13	821
PCT CLASS	29.35	16.93	52.13	1.58	100.00
PCT TOTAL	0.36	0.21	0.65	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	206	133	328	6	673
PCT CLASS	30.61	19.76	48.74	0.89	100.00
PCT TOTAL	0.31	0.20	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	269	165	553	11	998
PCT CLASS	26.95	16.53	55.41	1.10	100.00
PCT TOTAL	0.41	0.25	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

63° → 153°
← Cumulative Hours = 517
Total Hours = 10,208

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 62	63- 153	154- 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	320	214	629	8	1171
PCT CLASS	27.33	18.27	53.71	0.68	100.00
PCT TOTAL	0.48	0.32	0.95	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	298	213	643	6	1160
PCT CLASS	25.69	18.36	55.43	0.52	100.00
PCT TOTAL	0.45	0.32	0.97	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	334	204	733	10	1281
PCT CLASS	26.07	15.93	57.22	0.78	100.00
PCT TOTAL	0.50	0.31	1.11	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	342	223	793	11	1369
PCT CLASS	24.98	16.29	57.93	0.80	100.00
PCT TOTAL	0.52	0.34	1.20	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

63° → 153°
Cumulative Hours = 1,109
Total Hours = 10,208
1,109/10,208 = 10.9%

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 0- 62	63- 153	154- 360	361- 999	TOTAL
40 - 40	286	220	808	8	1322
PCT CLASS	21.63	16.64	61.12	0.61	100.00
PCT TOTAL	0.43	0.33	1.22	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	328	240	868	7	1443 ←
PCT CLASS	22.73	16.63	60.15	0.49	100.00
PCT TOTAL	0.49	0.36	1.31	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	211	141	579	7	938 ←
PCT CLASS	22.49	15.03	61.73	0.75	100.00
PCT TOTAL	0.32	0.21	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	331	211	918	9	1469
PCT CLASS	22.53	14.36	62.49	0.61	100.00
PCT TOTAL	0.50	0.32	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	297	245	870	9	1421
PCT CLASS	20.90	17.24	61.22	0.63	100.00
PCT TOTAL	0.45	0.37	1.31	0.01	2.14

63-153°
Cumulative Hours = 2,138
Total Hours = 10,208
2,138/10,208 = 20.9 %

Mw-0

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 0- 62	63- 153	154- 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	266	242	905	6	1419
PCT CLASS	18.75	17.05	63.78	0.42	100.00
PCT TOTAL	0.40	0.36	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	282	243	901	13	1439
PCT CLASS	19.60	16.89	62.61	0.90	100.00
PCT TOTAL	0.43	0.37	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	290	244	902	5	1441
PCT CLASS	20.12	16.93	62.60	0.35	100.00
PCT TOTAL	0.44	0.37	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	257	235	915	6	1413
PCT CLASS	18.19	16.63	64.76	0.42	100.00
PCT TOTAL	0.39	0.35	1.38	0.01	2.13

Rev 0

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 62	63- 153	154- 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	263	236	971	8	1478
PCT CLASS	17.79	15.97	65.70	0.54	100.00
PCT TOTAL	0.40	0.36	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	187	171	651	5	1014
PCT CLASS	18.44	16.86	64.20	0.49	100.00
PCT TOTAL	0.28	0.26	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	248	255	977	10	1490
PCT CLASS	16.64	17.11	65.57	0.67	100.00
PCT TOTAL	0.37	0.38	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	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	240	245	970	10	1465
PCT CLASS	16.38	16.72	66.21	0.68	100.00
PCT TOTAL	0.36	0.37	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

63°-153°
Cumulative Hours = 3,965
Total Hours = 10,206
3,965/10,206 = 38.8%

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 0- 62	63- 153	154- 360	361- 999	TOTAL
76 - 76	226	229	969	8	1432
PCT CLASS	15.78	15.99	67.67	0.56	100.00
PCT TOTAL	0.34	0.35	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	244	213	885	8	1350
PCT CLASS	18.07	15.78	65.56	0.59	100.00
PCT TOTAL	0.37	0.32	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	189	228	912	8	1337
PCT CLASS	14.14	17.05	68.21	0.60	100.00
PCT TOTAL	0.28	0.34	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	204	234	900	6	1344
PCT CLASS	15.18	17.41	66.96	0.45	100.00
PCT TOTAL	0.31	0.35	1.36	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	202	221	943	4	1370
PCT CLASS	14.74	16.13	68.83	0.29	100.00
PCT TOTAL	0.30	0.33	1.42	0.01	2.07

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 62	63- 153	154- 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	140	145	636	5	926
PCT CLASS	15.12	15.66	68.68	0.54	100.00
PCT TOTAL	0.21	0.22	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	182	177	871	5	1235
PCT CLASS	14.74	14.33	70.53	0.40	100.00
PCT TOTAL	0.27	0.27	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	193	201	880	6	1280
PCT CLASS	15.08	15.70	68.75	0.47	100.00
PCT TOTAL	0.29	0.30	1.33	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	184	191	937	7	1319
PCT CLASS	13.95	14.48	71.04	0.53	100.00
PCT TOTAL	0.28	0.29	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- 62	63- 153	154- 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	614	643	3411	14	4682
PCT CLASS	13.11	13.73	72.85	0.30	100.00
PCT TOTAL	0.93	0.97	5.14	0.02	7.06
111 - 120	352	385	2128	8	2873
PCT CLASS	12.25	13.40	74.07	0.28	100.00
PCT TOTAL	0.53	0.58	3.21	0.01	4.33
121 - 130	373	517	2822	20	3732
PCT CLASS	9.99	13.85	75.62	0.54	100.00
PCT TOTAL	0.56	0.78	4.25	0.03	5.63
131 -1000	863	2355	12791	139	16148
PCT CLASS	5.34	14.58	79.21	0.86	100.00
PCT TOTAL	1.30	3.55	19.28	0.21	24.34
TOTAL	9824	10208	45055	1245	66332
PCT CLASS	14.81	15.39	67.92	1.88	100.00
PCT TOTAL	14.81	15.39	67.92	1.88	100.00

← Total Valid Observations

Total Hours for 63° → 153°

```
 1 //DISTRIB JOB (0031,3),'VIGEANT-SA',                    01-MAY-98JOB00106
   //  MSGLEVEL=2,MSGCLASS=A
   //* RJETRAN.VIG7988.DATA(DISTRIB)
   /*JOBPARM  ROOM=3                                          JOB00106
 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
ICH70001I VIG7988  LAST ACCESS AT 15:43:00 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.T154342.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.JOB00106.D0000104.?        SYSOUT
IEF285I   VIG7988.DISTRIB.JOB00106.D0000105.?        SYSOUT
IGD104I ENVIRONM.METDATA.MILSTONE.YR7481           RETAINED,  DDNAME=SYS010
IGD106I SYS98121.T154342.RA000.DISTRIB.SAMPLE.H01  PASSED,    DDNAME=SYS011
IEF285I   VIG7988.DISTRIB.JOB00106.D0000101.?        SYSIN
.....................................................................................................................V09 .
.JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   15.43.41,  05/01/98                .
.STEP NUMBER -   1, STEP NAME - METRPROC, PROGRAM NAME - METWR01 , RAN FROM  15.43.43 TO  15.43.45                          .
.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 1998121.1543
IEF374I STEP/METRPROC/STOP  1998121.1543 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.JOB00106.D0000106.?        SYSOUT
IGD105I SYS98121.T154342.RA000.DISTRIB.SAMPLE.H01  DELETED,   DDNAME=FT10F001
IEF285I   VIG7988.DISTRIB.JOB00106.D0000102.?        SYSIN
.....................................................................................................................V09 .
.JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   15.43.41,  05/01/98                .
.STEP NUMBER -   2, STEP NAME - DISTRIB , PROGRAM NAME - DISTRB00, RAN FROM  15.43.45 TO  15.43.49                          .
.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 -     2.34 VECTOR TIME -      .00 SECS, EXCPS -(         8 NON-VIO,     1,170 VIO), CPU UNITS -      3.40 SECS     .
.SYSIN RECORDS -    16, OPENS - (     0 TAPE,     0 TEMP,     0 PERM),                                  COST =     $5.67       .
.EXCPS/DDNAME -                        8/STEPLIB        1,170/FT10F001                                                      .
.....................................................................................................................
IEF373I STEP/DISTRIB /START 1998121.1543
IEF374I STEP/DISTRIB /STOP  1998121.1543 CPU     0MIN 02.33SEC 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 0008
IEF285I   VIG7988.DISTRIB.JOB00106.D0000107.?        SYSOUT
IGD104I ENVIRONM.DISTRIB                           RETAINED,  DDNAME=SYSLIB
```

```
IEF285I   VIG7988.DISTRIB.JOB00106.D0000103.?          SYSIN
.....
.JOB - DISTRIB , SUBMITTER - VIGEANT-SA          , FLOOR - 3    , READER TIME, DATE -   15.43.41,  05/01/98                    V09 .
.STEP NUMBER -   3, STEP NAME - IMBLIST , PROGRAM NAME - IMBLIST , RAN FROM  15.43.49 TO  15.43.49                              .
.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 1998121.1543
IEF374I STEP/IMBLIST /STOP  1998121.1543 CPU     0MIN 00.03SEC SRB     0MIN 00.00SEC VIRT    156K SYS    272K EXT       4K SYS    10044K
IEF375I  JOB/DISTRIB /START 1998121.1543
IEF376I  JOB/DISTRIB /STOP  1998121.1543 CPU     0MIN 02.82SEC SRB     0MIN 00.03SEC
.....
.TOTAL CPU TIME -       2.86 SECS,   TOTAL VECTOR TIME -        .00 SECS,   TOTAL CPU UNITS -      5.29 SECS                    .
.TOTAL EXCPS -(       360 NON-VIO,      2,339 VIO)                                                                              .
.TOTAL JOB COST EXCLUDING PRINT CHARGES =       $8.82       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): 1543

JOB00106

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
74001      81365

EOF OF INPUT DATA REACHED

NUMBER OF CARDS SELECTED =  5844

NUMBER OF DAYS SELECTED  =  2922
```

STONE & WEBSTER 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): 1543

JOB00106

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                WIND DIRECTION (DEGREES)                3      0  999
   5    70 185 360                                                          0
   6  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

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- 70	71- 185	186- 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	165	123	233	14	535
PCT CLASS	30.84	22.99	43.55	2.62	100.00
PCT TOTAL	0.25	0.19	0.35	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

APPENDIX 2
Distribution Program Output
Unit 3 Turbine Bldg. Vent to Unit 3 Control Room Air Intake

P. 10
03703.7002
WM(B)-04

Wb-0

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 0- 70	71- 185	186- 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	237	162	311	11	721
PCT CLASS	32.87	22.47	43.13	1.53	100.00
PCT TOTAL	0.36	0.24	0.47	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	258	201	349	13	821
PCT CLASS	31.43	24.48	42.51	1.58	100.00
PCT TOTAL	0.39	0.30	0.53	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	220	175	272	6	673
PCT CLASS	32.69	26.00	40.42	0.89	100.00
PCT TOTAL	0.33	0.26	0.41	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	292	232	463	11	998
PCT CLASS	29.26	23.25	46.39	1.10	100.00
PCT TOTAL	0.44	0.35	0.70	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

$71^0 \rightarrow 185^0$

← Cumulative Hours = 661

Total Hours = 12,724

$661 / 12,724 = 5.2\%$

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 0-70	71-185	186-360	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	346	303	514	8	1171
PCT CLASS	29.55	25.88	43.89	0.68	100.00
PCT TOTAL	0.52	0.46	0.77	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	315	309	530	6	1160
PCT CLASS	27.16	26.64	45.69	0.52	100.00
PCT TOTAL	0.47	0.47	0.80	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	352	309	610	10	1281
PCT CLASS	27.48	24.12	47.62	0.78	100.00
PCT TOTAL	0.53	0.47	0.92	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	366	298	694	11	1369
PCT CLASS	26.73	21.77	50.69	0.80	100.00
PCT TOTAL	0.55	0.45	1.05	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

71° → 185°
Cumulative Hours = 1,196
Total Hours = 12,724
1,196 / 12,724 = 9.4%

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 0- 70	71- 185	186- 360	361- 999	TOTAL
40 - 40	304	309	701	8	1322
PCT CLASS	23.00	23.37	53.03	0.61	100.00
PCT TOTAL	0.46	0.47	1.06	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	347	334	755	7	1443
PCT CLASS	24.05	23.15	52.32	0.49	100.00
PCT TOTAL	0.52	0.50	1.14	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	219	209	503	7	938
PCT CLASS	23.35	22.28	53.62	0.75	100.00
PCT TOTAL	0.33	0.32	0.76	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	343	303	814	9	1469
PCT CLASS	23.35	20.63	55.41	0.61	100.00
PCT TOTAL	0.52	0.46	1.23	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	312	338	762	9	1421
PCT CLASS	21.96	23.79	53.62	0.63	100.00
PCT TOTAL	0.47	0.51	1.15	0.01	2.14

71° → 185°
Cumulative Hours = 2,422
Total Hours = 12,724
2,422 / 12,724 = 19.0%

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 0- 70	71- 185	186- 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	274	333	806	6	1419
PCT CLASS	19.31	23.47	56.80	0.42	100.00
PCT TOTAL	0.41	0.50	1.22	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	298	309	819	13	1439
PCT CLASS	20.71	21.47	56.91	0.90	100.00
PCT TOTAL	0.45	0.47	1.23	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	309	325	802	5	1441
PCT CLASS	21.44	22.55	55.66	0.35	100.00
PCT TOTAL	0.47	0.49	1.21	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	269	313	825	6	1413
PCT CLASS	19.04	22.15	58.39	0.42	100.00
PCT TOTAL	0.41	0.47	1.24	0.01	2.13

Rev 0

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 70	71- 185	186- 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	274	308	888	8	1478
PCT CLASS	18.54	20.84	60.08	0.54	100.00
PCT TOTAL	0.41	0.46	1.34	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	194	210	605	5	1014
PCT CLASS	19.13	20.71	59.66	0.49	100.00
PCT TOTAL	0.29	0.32	0.91	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	263	317	900	10	1490
PCT CLASS	17.65	21.28	60.40	0.67	100.00
PCT TOTAL	0.40	0.48	1.36	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	256	301	898	10	1465
PCT CLASS	17.47	20.55	61.30	0.68	100.00
PCT TOTAL	0.39	0.45	1.35	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

← 71° → 185°
Cumulative Hours = 5,194
Total Hours = 12,724
5,194/12,724 = 40.8 %

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 70	71- 185	186- 360	361- 999	TOTAL
76 - 76	248	259	917	8	1432
PCT CLASS	17.32	18.09	64.04	0.56	100.00
PCT TOTAL	0.37	0.39	1.38	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	263	266	813	8	1350
PCT CLASS	19.48	19.70	60.22	0.59	100.00
PCT TOTAL	0.40	0.40	1.23	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	204	269	856	8	1337
PCT CLASS	15.26	20.12	64.02	0.60	100.00
PCT TOTAL	0.31	0.41	1.29	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	213	282	843	6	1344
PCT CLASS	15.85	20.98	62.72	0.45	100.00
PCT TOTAL	0.32	0.43	1.27	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	224	255	887	4	1370
PCT CLASS	16.35	18.61	64.74	0.29	100.00
PCT TOTAL	0.34	0.38	1.34	0.01	2.07

WIND DIRECTION (DEGREES)

WIND SPEED (MPH) (TENTHS)	0- 70	71- 185	186- 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	150	175	596	5	926
PCT CLASS	16.20	18.90	64.36	0.54	100.00
PCT TOTAL	0.23	0.26	0.90	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	190	213	827	5	1235
PCT CLASS	15.38	17.25	66.96	0.40	100.00
PCT TOTAL	0.29	0.32	1.25	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	205	236	833	6	1280
PCT CLASS	16.02	18.44	65.08	0.47	100.00
PCT TOTAL	0.31	0.36	1.26	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	198	223	891	7	1319
PCT CLASS	15.01	16.91	67.55	0.53	100.00
PCT TOTAL	0.30	0.34	1.34	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

APPENDIX 2
Distribution Program Output
Unit 3 Turbine Bldg. Vent to Unit 3 Control Room Air Intake

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03703.7002
WM(B)-04

WIND SPEED (MPH) (TENTHS)	WIND DIRECTION (DEGREES) 0- 70	71- 185	186- 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	654	767	3247	14	4682
PCT CLASS	13.96	16.38	69.35	0.30	100.00
PCT TOTAL	0.99	1.16	4.90	0.02	7.06
111 - 120	382	439	2044	8	2873
PCT CLASS	13.30	15.28	71.15	0.28	100.00
PCT TOTAL	0.58	0.66	3.08	0.01	4.33
121 - 130	421	569	2722	20	3732
PCT CLASS	11.28	15.25	72.94	0.54	100.00
PCT TOTAL	0.63	0.86	4.10	0.03	5.63
131 -1000	975	2745	12289	139	16148
PCT CLASS	6.04	17.00	76.10	0.86	100.00
PCT TOTAL	1.47	4.14	18.53	0.21	24.34
TOTAL	10540	12724	41823	1245	66332 ← Total Valid Observations (All Sectors)
PCT CLASS	15.89	19.18	63.05	1.88	100.00
PCT TOTAL	15.89	19.18	63.05	1.88	100.00

Total Hours of Winds between 71°→185°

Docket No. 50-423
B18157

Attachment 5

Millstone Nuclear Power Station, Unit No. 3

AFFIDAVIT from Stone & Webster Engineering Corp. to Withhold Proprietary Information

and

Edited Revision 1 of

ANALYSIS OF CONTAINMENT MIZING RATE DURING A DESIGN BASIS LOCA
by Stone & Webster Engineering Corporation
© Stone & Webster Engineering Corporation, 1999,2000

Stone & Webster
Founded 1889

VIA TELECOPY AND NEXT-DAY DELIVERY

Mr. Raymond P. Necci
Vice President – Nuclear Technical Services
Northeast Utilities Service Company
Millstone Nuclear Power Station
P.O. Box 128
Waterford, Connecticut 06385

July 5, 2000

SRE-MP3-0003

SUBJECT: Request for Withholding from the Public Record
Containment Mixing Model Derivation and Application
MILLSTONE NUCLEAR POWER STATION - UNIT 3

References: 1. ***Analysis of Containment Mixing Rate During A Design Basis Accident by*** Stone & Webster Engineering Corporation, Revision 4

Dear Mr. Necci:

With this letter, Stone & Webster transmits to ref. 1 to Northeast Utilities and requests that this document be withheld from public disclosure in accordance with 10 CFR Part 2, Subpart G, Section 2.790 a (4) and that it be transmitted to the NRC in confidence. We are requesting Northeast Utilities' cooperation in seeking an exemption from public records disclosure for this material, for commercial reasons.

The following information is provided to support classification of ref. 1 as proprietary or privileged commercial as contemplated in the above-noted regulation:

- In previous correspondence, Stone & Webster stated that an earlier revision of ref. 1 document contents cannot be released to third parties without authorization.
- The methodology described in ref. 1 provides the basis for increasing the effectiveness credit for containment spray system in the fission product cleanup function. In very restrictive cases, the model provides the basis for avoiding redesign of the spray system. This makes the Stone & Webster Mixing Model commercially "valuable" to our company.
- The proprietary information contained in this document is not available through public sources.
- The Stone & Webster Mixing Model was developed at an estimated cost to the company of $250,000.

Stone & Webster Engineers and Constructors, Inc.
245 Summer Street
Boston, Massachusetts 02210
Phone: 617.589.5111
Fax: 617.589.2156
www.stoneweb.com

- The Stone & Webster Mixing Model constitutes a trade secret and an advancement in the state of the art, and therefore provides this company with a competitive advantage in obtaining and performing similar design projects. Making this model available to the public will forfeit this company's hard-earned competitive advantage.

If you have any questions or require any additional information, please contact Frank Elia at 617-589-7225.

Very truly yours,

James T. Callahan for
Senior Vice President

cc:

	F. Elia	245/6
	J. T. Creamer	245/7
	J. S. Lunde	245/6
	C. Zappile	Chill/30R

COMMONWEALTH OF MASSACHUSETTS
COUNTY OF SUFFOLK

AFFIDAVIT OF JAMES CALLAHAN IN SUPPORT OF APPLICATION FOR WITHHOLDING PURSUANT TO 10 C.F.R. PART 2, SUBPART G, SECTION 2.790

James T. Callahan, being duly sworn, does hereby depose and state:

1. I hold the position of Senior Vice President of Stone & Webster Engineering Corporation, and I am authorized to make the request for withholding accompanying this affidavit.

2. The work underlying the information in question was performed under my authority, and I am responsible for the engineering divisions (s) performing the work.

3. The information that we request be withheld appears in a letter dated July 5, 2000 from the undersigned to Mr. Raymond P. Necce of Northeast Utilities Service Company (letter number SRE-MP3-0003). It comprises this company's analysis of containment mixing rate during a design basis accident.

4. The analysis identified above constitutes a novel advance in the state of the art for such analysis, and as such constitutes a source of competitive advantage for our company in the competition and performance of such work in the industry.

Further affiant sayeth not.

James T. Callahan, Senior Vice President
Stone & Webster Engineering Corporation

Signed and sworn before me this 5TH day of July, 2000

Notary Public

SUSAN E. VIGORITO
Notary Public
My Commission Expires October 18, 2002