

EFFLUENT AND WASTE DISPOSAL SEMI ANNUAL REPORT
January 1, 1980-June 30, 1980
SUPPLEMENTAL INFORMATION

FACILITY TMI-UNIT II LICENSEE DPR-73-320

1. Regulatory Limits

- a. Fission and activation gases:
- b. Iodines:
- c. Particulates, half-lives > 8 days: Environmental Tech Specs,
Article 2.3
- d. Liquid effluents:

2. Maximum Permissible Concentrations

Provide the MPCs used in determining allowable release rates or concentrations.

- a. Fission and activation gases:
- b. Iodines:
- c. Particulates, half-lives 8 days: 10 CFR, Part 20, Appendix B
- d. Liquid effluents:

3. Average Energy

Provide the average energy (\bar{E}) of the radionuclide mixture in releases of fission and activation gases, if applicable - 0.253 MeV

4. Measurements and Approximations of Total Radioactivity

Provide the methods used to measure or approximate the total radioactivity in effluents and the methods used to determine radionuclide composition.

- a. Fission and activation gases: Ge(Li) Spectrometry, Liquid Scintillation
- b. Iodines: Ge(Li) Spectrometry
- c. Particulates: Ge(Li) Spectrometry, Gas Flow Proportional
- d. Liquid effluents: Ge(Li) Spectrometry, Liquid Scintillation

5. Batch Releases

Provide the following information relating to batch releases of radioactive materials in liquid and gaseous effluents.

A. Liquid

- 1. Number of batch releases: None
- 2. Total time period for batch release: N/A
- 3. Maximum time period for a batch release: N/A
- 4. Average time period for batch releases: N/A
- 5. Minimum time period for a batch release: N/A
- 6. Average stream flow during periods of
release of effluent into flowing stream: N/A

5 Batch Releases (cont.)

B. Gaseous

1st Quarter 2nd Quarter

1. Number of batch releases:	0	1
2. Total time period for batch releases:	N/A	4E1 hours
3. Maximum time period for a batch release:	N/A	4E1 hours
4. Average time period for batch release:	N/A	4E1 hours
5. Minimum time period for a batch release:	N/A	4E1 hours

6. Abnormal Releases

A. Liquid

1. Number of releases: None
2. Total activity released:

B. Gaseous

1. Number of releases: None
2. Total activity released:

TABLE IA
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	UNIT II	1st QUARTER	2nd QUARTER	EST. TOTAL ERROR, %
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A. Fission & activation gases

1. Total release	Ci	218	6117	2.5E1
2. Average release rate for period	μCi/sec.	2.77E1	7.76E2	Tech. Spec. Limit = 2.4E4 m ³ /sec x 80% = 1.92E4 m ³ /sec = 5.76E3 μCi/sec for Kr-85
3. Percent of Tech Spec limit	%	4.80E-1	1.35E1	

B. Iodines

1. Total Iodine-131 Note (1)	μCi/cc	<1E-12	<1E-12	2.5E1
2. Average release rate for period	μCi/sec.	N/A	N/A	Tech. Spec. Limit = 0.024 μCi/cc x 80% = 0.0192 μCi/sec
3. Percent of Tech Spec limit	%	N/A	N/A	

C. Particulates

1. Particulates with half-lives ≥ 8 Days	Ci	2.77E-6	4.83E-4	2.5E1
2. Average release rate for period	μCi/sec.	3.51E-7	6.12E-5	Tech. Spec. Limit = 0.024 μCi/sec x 80% = 1.92E4 μCi/sec
3. Percent of Tech Spec limit	%	1.46E-3	3.19E-7	
4. Gross alpha radioactivity	Ci	7.54E-9	1.18E-7	

D. Tritium

1. Total release	Ci	1.31E2	2.47E2	2.5E1
2. Average release rate for period	μCi/sec.	1.66E1	3.13E1	Tech. Spec. Limit = 2.4E4 m ³ /sec x 80% = 1.92E4 m ³ /sec = 5.76E3 μCi/sec for Kr-85
3. Percent of Tech Spec limit	%	3.5E1	6.53E-1	

Note (1) - all less than (<) numbers are the LLD concentrations in units of μCi/cc

Note (2) - all less than (<) numbers are for a 1640 Marinelli Beaker sample and a sample counting time of 1000 seconds.

TABLE 1B
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
GASEOUS EFFLUENTS-GROUND LEVEL RELEASE

Nuclides Released	UNIT II	Continuous Mode		Batch Mode	
		1st QUARTER	2nd QUARTER	1st QUARTER	2nd QUARTER
1. Fission gases				No Batch Releases	
krypton-85	Ci	2.18E2	2.95E2		5822
krypton-85m	μCi/cc	<4E-8	<4E-8		<4E-8
krypton-87	μCi/cc	<4E-8	<4E-8		<4E-8
krypton-88	μCi/cc	<2E-7	<2E-7		<2E-7
xenon-133	μCi/cc	<1E-7	<1E-7		<1E-7
xenon-135	μCi/cc	<3E-8	<3E-8		<3E-8
xenon-135m	μCi/cc	<4E-8	<4E-8		<4E-8
xenon-138	μCi/cc	<5E-8	<5E-8		<5E-8
Others (specify)	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
Unidentified	Ci				
Total for period	Ci	2.18E2	2.95E2	↓	5822

2. Iodines
Notes (1), (3), and (4)

iodine-31	μCi/cc	<1E-13	<1E-13	↓	<1E-13
iodine-133	μCi/cc	<1E-13	<1E-13	↓	<1E-13
iodine-135	μCi/cc	<1E-12	<1E-12	↓	<1E-12
Total for period	μCi/cc	<1E-12	<1E-12	↓	<1E-12

TABLE 1B (cont.)
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
GASEOUS EFFLUENTS-GROUND LEVEL RELEASES

Nuclides Released	UNIT II	Continuous Mode		Batch Mode	
		1st QUARTER	2nd QUARTER	1st QUARTER	2nd QUARTER
3. Particulates Notes (1),(3), and (5)				No Batch Releases	
strontium-89	Ci	2.14E-7	2.47E-6		<1E-12 µCi/cc
strontium-90	Ci	1.84E-7	8.34E-6		<1E-13 µCi/cc
cesium-134	µCi/cc	<1E-16	<1E-16		<1E-16 µCi/cc
cesium-137	Ci	<1E-16	4.72E-4		<1E-16 µCi/cc
barium-lanthanum-140	µCi/cc	<1E-15	<1E-15		<1E-15 µCi/cc
Others (specify)					
Unidentified				↓	

Note (3) - all less than (<) numbers are calculated for a sample volume of 5.7E8 cc which is obtained using the following assumptions;

- a) sampling rate of 2 cfm (lowest rate used) or 5.66E4 cc/min.
- b) sample counting time of 1000 seconds
- c) typical sampling time of one (1) week or 1E4 minutes

Note (4) - with a sample counting time of 1000 seconds and a sampling rate of 2 cfm, it would take 2.5 days to achieve Tech Spec requirements for detectable concentrations.

Note (5) - with a sample counting time of 1000 seconds and a sampling rate of 2 cfm, it would take 20 minutes to achieve Tech Spec requirements for detectable concentrations.

TABLE 2A
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
LIQUID EFFLUENTS-SUMMATION OF ALL RELEASES

	UNIT II	1st QUARTER	2nd QUARTER	EST. TOTAL ERROR %
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A. Fission and activation products - No Liquid Releases from Unit II during the First Half of 1980

1. Total releases (not including tritium, gases, alpha)	Ci			
2. Average diluted concentration during period	µCi/ml			
3. Percent of applicable limit	%			

B. Tritium

1. Total release	Ci			
2. Average diluted concentration during period	µCi/ml			
3. Percent of applicable limit	%			

C. Dissolved and entrained gases

1. Total release	Ci			
2. Average diluted concentration during period	µCi/ml			
3. Percent of applicable limit	%			

D. Gross alpha radioactivity

1. Total release	Ci			
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E. Volume of waste released (prior to dilution)	liters			
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F. Volume of dilution water used during period	liters			
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TABLE 2B
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
LIQUID EFFLUENTS

No Liquid Releases in First Half of 1980
Continuous Mode
Batch Mode

Nuclides Released	UNIT II	1st QUARTER	2nd QUARTER	1st QUARTER	2nd QUARTER
strontium-89	Ci				
strontium-90	Ci				
cesium-134	Ci				
cesium-137	Ci				
iodine-131	Ci				

cobalt-58	Ci				
cobalt-60	Ci				
iron-59	Ci				
zinc-65	Ci				
managanese-54	Ci				
chromium-51	Ci				

zirconium-niobium-95	Ci				
molybdenum-99	Ci				
technetium-99m	Ci				
barium-lanthanum-140	Ci				
cerium-141	Ci				
Other (specify)	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
	Ci				
Unidentified	Ci				
Total for period	Ci				

xenon-133	Ci				
xenon-135	Ci				

TABLE 3A
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. Solid waste shipped off-site for burial or disposal (not irradiated fuel)

1. Type of waste	UNIT II	6 month period	EST. TOTAL ERROR %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	35.29 41.25	
b. Dry compressible waste, contaminated equipment, etc.	m ³ Ci	159.44 4.45	
c. Irradiated components, control rods, etc.	m ³ Ci		
d. Other (describe) Solidified Radiac Wash	m ³ Ci	19.54 9.911	

2. Estimate of major nuclide composition (by type of waste)			
a.	Cs-137	69.26 %	
	Cs-134	18.12 %	
	Sr-89	5.32 %	
	Co-58	3.56 %	
b.	Cs-137	80 %	
	Cs-134	12 %	
	Sr-89	2 %	
	Sr-90	6 %	
		%	
c.		%	
		%	
		%	
		%	
		%	
		%	
d.	Cs-137	43.04 %	
	Cs-134	10.57 %	
	Sr-89	15.41 %	
	Sr-90	30.98 %	

3. Solid Waste Disposition	Mode of Transportation	Destination
Number of Shipments		
Thirteen	Tractor/Trailer	Richland, Washington

B. Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination

Three Mile Island First Quarter 1980 (1/1/80-3/31/80)
 Joint Frequency Table of Wind Speed and Direction 100ft
 Versus Delta Temperature 150-33ft

JOINT FREQUENCY TABLES
 TEMPERATURE DIFFERENCE .LE. -1.0 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+	32.6+	TOTAL	%			
N	0	12	6	0	0	0	0	0	18	5.3	6.8		
NNE	0	1	0	0	0	0	0	0	1	.3	3.1		
NE	0	3	0	0	0	0	0	0	3	.9	2.3		
ENE	0	2	4	1	0	0	0	0	7	2.1	5.1		
E	0	15	1	0	0	0	0	0	17	5.0	5.4		
ESE	0	6	3	0	0	0	0	0	14	4.1	5.4		
SE	0	9	4	0	0	0	0	0	15	4.4	6.1		
SSE	0	4	11	0	0	0	0	0	15	4.4	4.5		
S	0	2	2	0	0	0	0	0	5	1.5	5.8		
SSW	0	3	3	0	0	0	0	0	7	2.1	7.1		
SU	0	2	1	0	0	0	0	0	5	1.5	4.7		
USU	0	2	1	1	0	0	0	0	5	1.5	7.2		
U	0	4	10	1	0	0	0	0	18	5.3	9.3		
UNW	0	12	25	11	0	0	0	0	49	14.4	10.2		
NW	0	21	49	28	11	0	0	0	112	32.8	11.6		
NNW	0	5	18	5	0	0	0	0	50	14.7	7.5		
TOTAL	0	35	124	46	12	0	0	0	341	100.0			
X	0.0	10.3	36.4	13.5	3.5	0.0	0.0	0.0	100.0				

AVE SPEED FOR THIS TABLE = 8.7 MPH
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 6

JOINT FREQUENCY TABLES
 TEMPERATURE DIFFERENCE .GT. -1.0 BUT .LE. -.9 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+	32.6+	TOTAL	%			
N	0	3	1	0	0	0	0	0	5	5.9	5.2		
NNE	0	1	1	0	0	0	0	0	2	2.4	5.1		
NE	0	0	1	0	0	0	0	0	1	1.2	11.6		
ENE	0	1	2	0	0	0	0	0	4	4.7	16.4		
E	0	3	2	0	0	0	0	0	5	5.9	7.5		
ESE	0	7	1	0	0	0	0	0	9	10.6	6.6		
SE	0	1	1	0	0	0	0	0	3	3.5	6.0		
SSE	0	0	1	0	0	0	0	0	3	3.5	6.0		
S	0	0	1	0	0	0	0	0	4	4.7	5.5		
SSW	0	1	0	0	0	0	0	0	2	2.4	5.1		
SU	0	2	1	0	0	0	0	0	3	3.5	9.1		
USU	0	1	1	0	0	0	0	0	4	4.7	9.1		
U	0	3	10	3	2	0	0	0	26	27.1	15.7		
UNW	0	11	23	11	5	0	0	0	50	37.6	15.4		
NW	0	1	11	2	0	0	0	0	15	15.7	15.4		
NNW	0	1	1	0	0	0	0	0	2	2.4	18.9		
TOTAL	0	11	25	13	7.1	0.0	0.0	0.0	85	100.0			
X	0.0	12.0	20.4	27.1	15.3	8.2	7.1	0.0	100.0				

AVE SPEED FOR THIS TABLE = 10.8 MPH
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 2

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. -.9 BUT .LE. -.8 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	X	AVE SPEED	
	CALM	3.5-	7.5-	12.5-	18.5-	24.5-	32.5-	32.6+	TOTAL	X				
N	0	1	2	6	0	0	0	0	0	0	0	9	9.4	8.6
NNE	0	1	1	0	0	0	0	0	0	0	0	1	1.0	5.2
NE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	2	0	4	0	0	0	0	0	0	0	6	6.3	7.9
E	0	3	3	3	2	0	0	0	0	0	0	8	8.3	9.1
ESE	0	3	4	0	0	0	0	0	0	0	0	7	7.3	4.3
SE	0	0	1	0	0	0	0	0	0	0	0	1	1.0	7.4
SSE	0	0	1	0	0	0	0	0	0	0	0	1	1.0	6.9
S	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	1	1	0	0	0	0	0	0	0	0	2	2.1	4.9
SJ	0	2	0	0	0	0	0	0	0	0	0	2	2.1	6.4
USU	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
U	0	0	0	0	0	4	0	0	0	0	0	4	4.2	14.0
UNW	0	3	3	3	8	2	0	0	0	0	0	16	16.7	13.6
NJ	0	1	4	6	13	4	1	0	0	0	0	29	30.2	13.7
NW	0	2	1	5	2	0	0	0	0	0	0	10	10.4	9.3
TOTAL	0	10	23	27	29	6	1	0	0	0	0	96	100.0	
X	0.0	10.4	24.0	28.1	30.2	6.3	1.0	0.0	0.0	100.0				

AVE SPEED FOR THIS TABLE = 10.8 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 4

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. -.8 BUT .LE. -.3 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	X	AVE SPEED	
	CALM	3.5-	7.5-	12.5-	18.5-	24.5-	32.5-	32.6+	TOTAL	X				
N	0	5	11	9	0	0	0	0	0	0	0	29	4.4	9.7
NNE	0	6	16	4	0	0	0	0	0	0	0	16	2.4	4.9
NE	0	3	12	2	0	0	0	0	0	0	0	17	2.6	5.2
ENE	0	8	15	0	2	0	0	0	0	0	0	25	3.8	5.0
E	0	14	8	8	6	0	0	0	0	0	0	36	5.5	6.6
ESE	0	10	26	3	0	0	0	0	0	0	0	39	5.0	4.0
SE	0	6	26	4	0	0	0	0	0	0	0	36	5.5	5.6
SSE	0	4	8	5	2	0	0	0	0	0	0	17	2.6	6.3
S	0	11	18	6	5	0	0	0	0	0	0	34	3.7	7.2
SSW	0	4	18	0	0	0	0	0	0	0	0	10	1.5	4.4
SJ	0	6	7	1	0	0	0	0	0	0	0	16	2.4	6.1
USU	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
U	0	7	26	7	2	0	0	0	0	0	0	42	6.4	9.6
UNW	0	5	32	7	18	4	0	0	0	0	0	133	20.2	13.0
NJ	0	3	11	48	58	15	1	0	0	0	0	133	20.2	13.0
NW	0	3	16	15	15	1	0	0	0	0	0	50	7.6	10.1
TOTAL	0	100	235	102	108	20	1	0	0	0	0	657	100.0	
X	0.0	15.2	35.8	20.2	18.1	3.0	.2	0.0	0.0	100.0				

AVE SPEED FOR THIS TABLE = 8.5 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 26

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. -.3 BUT .LE. .8 DEG.F/100 FT

SPEED (MPH)

DIR	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
	- 3.5	- 7.5	-12.5	-18.5	-24.5	-32.5					
N	0	4	4	2	0	0	1	2	13	4.8	11.2
NNE	0	2	0	0	0	0	0	0	2	.7	1.4
NE	0	7	1	0	0	0	0	0	8	3.0	2.2
ENE	0	4	5	0	0	0	0	0	9	3.3	3.6
E	0	4	7	0	0	0	0	0	11	4.1	3.8
ESE	0	9	6	0	0	0	0	0	15	5.6	3.5
SE	0	9	8	0	0	0	0	0	17	6.3	3.8
SSE	0	8	3	0	0	0	0	0	11	4.1	3.5
S	0	6	1	0	0	0	0	0	7	2.6	2.4
SSW	0	8	7	0	1	0	0	0	16	5.9	4.3
SW	0	5	3	0	0	0	0	0	8	3.0	4.0
WSW	0	10	5	0	0	0	0	0	15	5.6	2.9
W	0	8	15	1	2	1	0	0	27	10.0	5.8
WNW	0	10	16	3	0	0	1	0	30	11.2	5.8
NW	0	7	14	7	6	0	3	0	37	13.8	9.3
NNW	0	11	12	13	6	1	0	0	43	16.0	7.6
TOTAL	0	112	107	26	15	2	5	2	269	100.0	
%	0.0	41.6	39.8	9.7	5.6	.7	1.9	.7	100.0		

AVE SPEED FOR THIS TABLE= 5.8 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 19

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. .8 BUT .LE. 2.2 DEG.F/100 FT

SPEED (MPH)

DIR	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
	- 3.5	- 7.5	-12.5	-18.5	-24.5	-32.5					
N	0	3	0	1	1	0	0	0	5	4.2	6.2
NNE	0	4	0	0	0	0	0	0	4	3.4	2.1
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	2	0	0	0	0	0	0	2	1.7	2.2
E	0	7	5	0	0	0	0	0	12	10.2	3.6
ESE	0	5	3	0	0	0	0	0	8	6.8	3.5
SE	0	4	0	0	0	0	0	0	4	3.4	2.4
SSE	0	4	0	0	0	0	0	0	4	3.4	2.0
S	0	3	0	0	0	0	0	0	3	2.5	2.3
SSW	0	7	2	0	0	0	0	0	9	7.6	2.8
SW	0	7	0	0	0	0	0	0	7	5.9	1.0
WSW	0	7	0	0	0	0	0	0	7	5.9	2.0
W	0	5	4	0	0	0	0	0	9	7.6	3.4
WNW	0	3	1	0	0	0	0	0	4	3.4	2.0
NW	0	5	0	2	1	0	0	0	17	14.4	5.5
NNW	0	5	0	12	0	0	0	0	23	19.5	6.8
TOTAL	0	71	30	15	2	0	0	0	118	100.0	
%	0.0	60.2	25.4	12.7	1.7	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.1 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 8

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. 2.2 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.5-	7.5-	12.5-	18.5-	24.5-	32.5-	32.6+	TOTAL	%			
N	0	1	0	0	0	0	0	0	0	0	2	3.1	3.6
NNE	0	3	0	0	0	0	0	0	0	0	3	4.6	1.5
NE	0	4	0	0	0	0	0	0	0	0	4	6.2	1.9
ENE	0	1	2	0	0	0	0	0	0	0	3	4.6	3.0
E	0	2	2	0	0	0	0	0	0	0	4	6.2	2.6
ESE	0	5	0	0	0	0	0	0	0	0	5	7.7	1.5
SE	0	5	0	0	0	0	0	0	0	0	6	9.2	1.8
SSE	0	6	0	0	0	0	0	0	0	0	7	12.3	2.5
S	0	7	0	0	0	0	0	0	0	0	8	12.3	2.7
SSU	0	5	3	0	0	0	0	0	0	0	8	12.3	2.3
SU	0	6	0	0	0	0	0	0	0	0	6	9.2	2.9
USU	0	3	0	0	0	0	0	0	0	0	3	4.6	2.6
U	0	2	0	0	0	0	0	0	0	0	2	3.1	1.9
UMU	0	2	0	0	0	0	0	0	0	0	3	4.6	1.9
MU	0	1	2	0	0	0	0	0	0	0	3	4.6	1.9
MNU	0	1	0	0	0	0	0	0	0	0	2	3.1	1.9
TOTAL	0	52	10	1	0	0	0	1	0	0	65	100.0	8.9
%	0.0	80.0	15.4	1.5	0.0	0.0	3.1	0.0	1.0	0.0	100.0		

AVE SPEED FOR THIS TABLE = 3.5 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 3

JOINT FREQUENCY TABLES

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED	
	CALM	3.5-	7.5-	12.5-	18.5-	24.5-	32.5-	32.6+	TOTAL	%				
N	0	15	33	25	1	0	0	0	0	0	5	81	5.0	8.5
NNE	0	17	13	5	0	0	0	0	0	0	0	29	1.8	3.9
NE	0	20	27	7	0	0	0	0	0	0	0	33	1.8	4.0
ENE	0	28	43	14	0	0	0	0	0	0	0	56	3.4	5.0
E	0	37	52	17	0	0	0	0	0	0	0	93	5.7	5.8
ESE	0	27	45	9	0	0	0	0	0	0	0	97	5.9	4.0
SE	0	26	27	5	0	0	0	0	0	0	0	81	5.0	4.0
SSE	0	25	27	5	0	0	0	0	0	0	0	54	3.3	4.4
S	0	28	36	8	0	0	0	0	0	0	0	42	2.6	4.9
SSU	0	25	14	10	0	0	0	0	0	0	0	80	4.0	5.5
SU	0	26	17	2	0	0	0	0	0	0	0	40	2.5	3.7
USU	0	20	17	1	0	0	0	0	0	0	0	49	3.0	3.8
U	0	26	50	10	0	0	0	0	0	0	0	106	6.5	6.7
UMU	0	21	85	105	40	0	0	0	0	0	0	241	14.8	10.6
MU	0	21	84	123	110	35	2	0	0	0	0	363	22.3	12.0
MNU	0	30	58	85	30	2	1	0	0	0	0	180	11.4	8.3
TOTAL	0	391	554	408	211	47	15	0	0	0	5	1631	100.0	
%	0.0	24.0	34.0	25.0	12.0	2.0	0.0	0.0	0.0	0.0	0.3	100.0		

AVE SPEED FOR THIS TABLE = 7.8 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 88

Attachment 2

Three Mile Island Joint Frequency Table of Wind Speed and Wind Direction 100ft Versus Delta Temperature 150-33ft for Specific Dates Only During the First Quarter 1980

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .LE. -1.0 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	X	AVE SPEED	
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+							
N	0	0	0	0	0	0	0	0	0	0	0	1	3.0	12.1
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
NLE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0	0	2	6.1	1.0
ESE	0	0	0	0	0	0	0	0	0	0	0	3	9.1	2.1
SE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SSU	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SU	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
USU	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
U	0	0	0	0	0	0	0	0	0	0	0	1	3.0	4.1
UNU	0	0	0	0	0	0	0	0	0	0	0	7	21.2	6.0
NU	0	0	0	0	0	0	0	0	0	0	0	16	48.5	8.5
NNU	0	0	0	0	0	0	0	0	0	0	0	2	6.1	5.4
TOTAL	0	5	13	15	0	0	0	0	0	0	0	33	100.0	
X	0.0	15.2	39.4	45.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	

AVE SPEED FOR THIS TABLE = 6.0 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 0

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. -1.0 BUT .LE. -.9 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	X	AVE SPEED	
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+							
N	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
NLE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0	0	1	25.0	1.8
E	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SSU	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SU	0	0	0	0	0	0	0	0	0	0	0	2	59.0	6.3
USU	0	0	0	0	0	0	0	0	0	0	0	1	25.0	2.0
U	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
UNU	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
NU	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
NNU	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	2	2	0	0	0	0	0	0	0	0	4	100.0	
X	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	

AVE SPEED FOR THIS TABLE = 4.3 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 0

JOINT FREQUENCY TABLES
 TEMPERATURE DIFFERENCE .GT. -.9 BUT .LE. -.8 DEG.F./100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.6 - 7.5	7.6 - 12.5	12.6 - 18.5	18.6 - 24.5	24.6 - 32.5	32.6+						
N	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NENE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
E	0	0	0	0	0	0	0	0	0	0	0	0	0.0
ESE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
SE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
SSE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
S	0	0	0	0	0	0	0	0	0	0	0	0	0.0
SSW	0	1	0	0	0	0	0	0	0	0	1	100.0	7.1
SW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
WSW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
W	0	0	0	0	0	0	0	0	0	0	0	0	0.0
WNW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NNW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
TOTAL	0	1	0	0	0	0	0	0	0	0	1	100.0	0.0
AVE SPEED FOR THIS TABLE* 7.1 MPH													
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION* 0													

JOINT FREQUENCY TABLES
 TEMPERATURE DIFFERENCE .GT. -.8 BUT .LE. -.3 DEG.F./100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.6 - 7.5	7.6 - 12.5	12.6 - 18.5	18.6 - 24.5	24.6 - 32.5	32.6+						
N	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NNE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NENE	0	1	0	0	0	0	0	0	0	0	1	3.1	2.4
E	0	0	0	0	0	0	0	0	0	0	0	0	0.0
ESE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
SE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
SSE	0	0	0	0	0	0	0	0	0	0	0	0	0.0
S	0	0	0	0	0	0	0	0	0	0	0	0	0.0
SSW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
SW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
WSW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
W	0	0	0	0	0	0	0	0	0	0	0	0	0.0
WNW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NNW	0	0	0	0	0	0	0	0	0	0	0	0	0.0
TOTAL	0	8	10	4	2	2	0	0	0	0	10	31.3	6.5
AVE SPEED FOR THIS TABLE* 8.8 MPH													
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION* 0													

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. -.3 BUT .LE. .8 DEG.F./100 FT

DIR	SPEED (MPH)							TOTAL	%	AVE SPEED
	CALM	3.6	7.2	12.6	18.6	24.6	32.6+			
N	0	1	0	0	0	0	0	2	20.0	3.8
NNE	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	1	0	0	0	0	0	1	10.0	2.7
SSE	0	0	0	0	0	0	0	2	20.0	2.8
S	0	1	0	0	0	0	0	1	10.0	2.7
SSU	0	0	0	0	0	0	0	0	0.0	0.0
SU	0	0	0	0	0	0	0	0	0.0	0.0
USU	0	0	0	0	0	0	0	0	0.0	0.0
U	0	1	0	0	0	0	0	1	10.0	3.1
UNU	0	0	0	0	0	0	0	0	0.0	0.0
NU	0	0	0	0	0	0	0	2	20.0	5.0
NNU	0	0	0	0	0	0	0	1	10.0	14.5
TOTAL	0	6	3	0	1	0	0	10	100.0	
AVE SPEED FOR THIS TABLE = 4.6 MPH										
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 0										

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. .8 BUT .LE. 2.2 DEG.F./100 FT

DIR	SPEED (MPH)							TOTAL	%	AVE SPEED
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+			
N	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	1	9.1	2.2
ESE	0	1	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0.0	0.0
SSU	0	2	1	0	0	0	0	3	27.3	3.3
SU	0	0	0	0	0	0	0	1	9.1	1.3
USU	0	0	0	0	0	0	0	0	0.0	0.0
U	0	0	0	0	0	0	0	0	0.0	0.0
UNU	0	0	0	0	0	0	0	0	0.0	0.0
NU	0	0	0	0	0	0	0	0	0.0	0.0
NNU	0	1	2	0	1	0	0	3	27.3	8.5
TOTAL	0	5	5	0	1	0	0	11	100.0	
AVE SPEED FOR THIS TABLE = 4.5 MPH										
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 0										

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. 2.2 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED			
N	0	1	0	0	0	0	0	0	0	0	1	33.3	3.2
NNE	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	1	0	0	0	0	0	0	0	0	1	33.3	2.1
SU	0	1	0	0	0	0	0	0	0	0	1	33.3	3.1
WSU	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
U	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	3	0	0	0	0	0	0	0	0	3	100.0	0.0
%	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0

AVE SPEED FOR THIS TABLE = 2.8 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 0

JOINT FREQUENCY TABLES
SPEED (MPH)

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED			
N	0	2	1	0	0	0	0	0	0	0	5	5.3	5.3
NNE	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	2	0	0	0	0	0	0	0	0	2	2.1	2.1
E	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	3	0	0	0	0	0	0	0	0	3	3.2	3.2
SE	0	2	0	0	0	0	0	0	0	0	2	2.1	2.1
SSE	0	6	0	0	0	0	0	0	0	0	6	6.4	6.4
S	0	2	0	0	0	0	0	0	0	0	2	2.1	2.1
SSW	0	3	6	1	0	0	0	0	0	0	10	10.6	10.6
SU	0	4	1	0	0	0	0	0	0	0	5	5.3	5.3
WSU	0	2	0	0	0	0	0	0	0	0	2	2.1	2.1
U	0	1	2	0	0	0	0	0	0	0	3	3.2	3.2
WNW	0	1	11	5	0	0	0	0	0	0	17	18.1	18.1
NW	0	0	8	12	7	2	0	0	0	0	29	30.9	30.9
NNW	0	1	4	0	3	0	0	0	0	0	8	8.5	8.5
TOTAL	0	29	34	19	10	2	0	0	0	0	94	100.0	0.0
%	0.0	30.9	36.2	20.2	10.6	2.1	0.0	0.0	0.0	0.0	100.0	0.0	0.0

AVE SPEED FOR THIS TABLE = 6.8 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 0

Three Mile Island Second Quarter 1980 (4/1/80-6/30/80)
 Joint Frequency Table of Wind Speed and Direction 100ft
 Versus Delta Temperature 150-33ft

JOINT FREQUENCY TABLES
 TEMPERATURE DIFFERENCE .LE. -1.0 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+						
N	0	8	16	2	1	0	0	0	0	0	27	5.4	5.2
NNE	0	2	3	0	0	0	0	0	0	0	5	1.0	3.6
NE	0	0	3	1	0	0	0	0	0	0	4	.8	6.3
ENE	0	0	4	2	0	0	0	0	0	0	6	1.2	5.6
E	0	3	12	0	0	0	0	0	0	0	15	3.0	4.6
ESE	0	7	1	2	0	0	0	0	0	0	10	2.0	4.5
SF	0	0	10	0	0	0	0	0	0	0	10	2.0	7.4
SSE	0	7	13	4	0	0	0	0	0	0	24	4.8	4.8
S	0	5	12	5	0	0	0	0	0	0	22	4.4	5.5
SSW	0	4	13	3	1	0	0	0	0	0	21	4.2	5.5
SJ	0	5	16	10	2	0	0	0	0	0	33	6.6	6.5
USU	0	11	5	7	0	0	0	0	0	0	23	4.6	5.5
U	0	12	6	4	0	0	0	0	0	0	22	4.4	4.6
UNU	0	14	29	14	15	3	0	0	0	0	75	15.1	8.5
NU	0	8	45	31	14	3	0	0	0	0	101	20.3	8.4
MNU	0	15	41	22	12	0	0	0	0	0	90	18.1	7.4
TOTAL	0	101	229	116	45	6	0	0	0	0	497	100.0	
X AVE SPEED FOR THIS TABLE = 6.9 MPH HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 52													

JOINT FREQUENCY TABLES
 TEMPERATURE DIFFERENCE .GT. -1.0 BUT .LE. -.9 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+						
N	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	1	0	0	0	0	0	0	0	0	1	2.4	1.4
NE	0	1	3	0	0	0	0	0	0	0	4	9.8	5.8
ENE	0	0	3	1	0	0	0	0	0	0	4	9.8	6.8
E	0	0	1	0	0	0	0	0	0	0	1	2.4	5.5
ESE	0	2	0	0	0	0	0	0	0	0	2	4.9	3.1
SF	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	2	1	0	0	0	0	0	0	0	3	7.3	3.7
S	0	0	1	0	0	0	0	0	0	0	1	2.4	3.7
SSW	0	0	2	1	0	0	0	0	0	0	3	7.3	3.7
SJ	0	0	0	4	0	0	0	0	0	0	4	9.8	5.5
USU	0	0	1	1	0	0	0	0	0	0	2	4.9	3.1
U	0	0	0	1	0	0	0	0	0	0	1	2.4	3.7
UNU	0	0	0	3	1	0	0	0	0	0	4	9.8	5.8
NU	0	1	2	2	1	0	0	0	0	0	6	14.6	7.3
MNU	0	0	1	1	1	0	0	0	0	0	3	7.3	3.7
TOTAL	0	7	16	13	7	2	0	0	0	0	41	100.0	
X AVE SPEED FOR THIS TABLE = 7.0 MPH HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 4													

Attachment 3 (continued)

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. -.0 BUT .LE. -.8 DEG.F./100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED	
	CALM	3.6	7.6	12.6	18.6	24.6	32.6	32.6+						
N	0	1	0	0	0	0	0	0	0	0	0	1	1.7	2.4
NNE	0	0	2	0	0	0	0	0	0	0	0	2	3.4	4.5
NE	0	0	2	1	0	0	0	0	0	0	0	3	5.2	5.5
ENE	0	2	5	3	0	0	0	0	0	0	0	10	17.2	6.2
E	0	1	1	0	0	0	0	0	0	0	0	2	3.4	3.4
ESE	0	1	2	0	0	0	0	0	0	0	0	3	5.2	4.7
SE	0	2	0	2	0	0	0	0	0	0	0	2	3.4	10.0
SSE	0	2	0	0	0	0	0	0	0	0	0	3	5.2	2.7
S	0	2	0	3	3	0	0	0	0	0	0	6	10.3	4.6
SSW	0	2	0	1	0	0	0	0	0	0	0	4	6.9	4.6
SW	0	2	1	1	0	0	0	0	0	0	0	4	7.9	7.9
WSW	0	0	0	2	1	0	0	0	0	0	0	3	5.2	7.5
W	0	0	3	2	1	0	0	0	0	0	0	6	10.3	8.8
WNW	0	1	1	4	0	0	0	0	0	0	0	6	10.3	8.0
NW	0	0	1	1	0	0	0	0	0	0	0	3	5.2	12.9
NNW	0	12	24	19	2	0	1	0	0	0	0	58	100.0	
TOTAL	0.0	20.7	41.4	32.8	3.4	0.0	1.7	0.0	0.0	100.0				

AVE SPEED FOR THIS TABLE= 6.7 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 5

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. -.8 BUT .LE. -.3 DEG.F./100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED	
	CALM	3.6	7.6	12.6	18.6	24.6	32.6	32.6+						
N	0	7	9	0	0	0	0	0	0	0	0	17	3.9	5.0
NNE	0	0	9	1	0	0	0	0	0	0	0	19	4.4	4.4
NE	0	7	13	3	0	0	0	0	0	0	0	23	5.0	5.0
ENE	0	7	19	11	0	0	0	0	0	0	0	27	6.3	6.3
E	0	16	10	6	0	0	0	0	0	0	0	32	7.4	4.8
ESE	0	17	13	1	0	0	0	0	0	0	0	21	4.9	4.9
SE	0	12	28	21	0	0	0	0	0	0	0	61	14.1	5.9
SSE	0	10	20	9	0	0	0	0	0	0	0	38	8.8	5.8
S	0	1	10	6	0	0	0	0	0	0	0	17	3.9	7.1
SSW	0	6	7	5	2	0	0	0	0	0	0	19	4.4	6.5
SW	0	6	7	2	1	0	0	0	0	0	0	14	3.2	5.9
WSW	0	5	6	3	1	0	0	0	0	0	0	16	3.5	2.5
W	0	5	11	5	0	0	0	0	0	0	0	15	3.5	5.5
WNW	0	8	11	22	3	0	0	0	0	0	0	41	9.5	7.7
NW	0	8	18	18	5	0	0	0	0	0	0	45	10.4	8.7
NNW	0	4	17	8	2	0	0	0	0	0	0	27	6.3	6.7
TOTAL	0.0	113	180	121	16	3	0	0	0	0	0	432	100.0	
AVE SPEED FOR THIS TABLE=	0.0	26.2	41.7	28.0	3.6	.7	0.0	0.0	0.0	100.0				

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 40

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. -.3 BUT .LE. .8 DEG.F/100 FT

A
H

SPEED (MPH)

DIR	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
	- 3.5	- 7.5	-12.5	-18.5	-24.5	-32.5					
N	0	5	21	3	0	0	0	0	29	5.2	5.2
NNE	0	8	10	3	0	0	0	0	21	3.7	4.6
NL	0	9	8	1	0	0	0	0	18	3.2	4.0
ENE	0	6	8	0	0	0	0	0	14	2.5	4.1
E	0	18	17	0	0	0	0	0	35	6.2	3.6
ESE	0	14	17	0	0	0	0	0	31	5.5	3.7
SE	0	14	19	7	0	0	0	0	40	7.1	4.8
SSE	0	7	11	7	0	0	0	0	25	4.4	5.4
S	0	21	10	3	0	0	0	0	34	6.0	4.2
SSW	0	18	11	4	1	0	0	0	34	6.0	4.3
SU	0	21	24	3	0	0	0	0	48	8.6	4.3
USW	0	10	15	6	0	0	0	0	31	5.5	4.0
U	0	16	13	6	0	0	0	0	35	6.2	4.5
UNW	0	17	21	19	5	0	0	0	62	11.0	6.4
NW	0	17	28	18	3	0	0	0	66	11.7	6.2
NNW	0	12	16	6	4	0	1	0	39	6.9	6.8
TOTAL	0	213	249	86	13	0	1	0	562	100.0	
%	0.0	37.9	44.3	15.3	2.3	0.0	.2	0.0	100.0		

AVE SPEED FOR THIS TABLE= 5.0 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 47

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. .8 BUT .LE. 2.2 DEG.F/100 FT

SPEED (MPH)

DIR	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
	- 3.5	- 7.5	-12.5	-18.5	-24.5	-32.5					
N	0	7	11	3	0	0	0	0	21	8.1	4.7
NNE	0	7	0	0	0	0	0	0	7	2.7	2.2
NE	0	3	0	0	0	0	0	0	3	1.2	2.0
ENE	0	4	2	0	0	0	0	0	6	2.3	3.3
E	0	18	7	0	0	0	0	0	25	9.7	3.2
ESE	0	17	5	0	0	0	0	0	22	8.5	2.6
SE	0	7	4	0	0	0	0	0	11	4.2	2.5
SSE	0	16	3	0	0	0	0	0	19	7.3	2.2
S	0	15	3	0	0	0	0	0	18	6.9	2.4
SSW	0	11	3	0	0	0	0	0	14	5.4	2.0
SU	0	14	0	1	0	0	0	0	15	5.8	2.8
USW	0	15	3	0	0	0	0	0	18	6.9	2.3
U	0	8	12	0	0	0	0	0	20	7.7	4.3
UNW	0	11	3	0	0	0	0	0	14	5.4	2.7
NW	0	11	10	4	1	0	0	0	26	10.0	5.2
NNW	0	9	8	2	1	0	0	0	20	7.7	5.1
TOTAL	0	173	74	10	2	0	0	0	259	100.0	
%	0.0	60.8	28.0	3.0	.8	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 3.4 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 51

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. 2.2 DEG.F/100 FT

DIR	SPEED (MPH)										TOTAL	N	AVE SPEED	
	CALM	3.5-	7.5-	7.6	12.5-	12.6	18.5-	18.6	24.5-	24.6				32.6+
N	0	3	2	0	0	0	0	0	0	0	0	5	4.0	4.2
NNE	0	3	1	0	0	0	0	0	0	0	0	4	3.2	2.8
NE	0	4	1	0	0	0	0	0	0	0	0	5	4.0	1.9
ENE	0	1	0	0	0	0	0	0	0	0	0	1	.8	2.1
E	0	12	0	0	0	0	0	0	0	0	0	12	9.7	2.5
ESE	0	4	0	0	0	0	0	0	0	0	0	4	3.2	1.9
SE	0	8	2	0	0	0	0	0	0	0	0	10	8.1	2.3
SSE	0	9	4	0	0	0	0	0	0	0	0	13	10.5	3.0
S	0	12	4	0	0	0	0	0	0	0	0	16	12.9	2.9
SSW	0	11	1	0	0	0	0	0	0	0	0	12	9.7	2.4
SW	0	8	1	0	0	0	0	0	0	0	0	9	7.3	2.4
WSW	0	4	3	0	0	0	0	0	0	0	0	7	5.6	2.2
W	0	3	1	0	0	0	0	0	0	0	0	4	3.2	2.4
WNW	0	1	1	0	0	0	0	0	0	0	0	2	1.6	2.2
NW	0	1	1	0	0	0	0	0	0	0	0	2	1.6	2.2
NNW	0	7	3	0	0	0	0	0	0	0	0	10	7.3	2.4
N	0	30	4	0	0	0	0	0	0	0	0	34	24.4	5.2
TOTAL	0	90	30	4	0	0	0	0	0	0	0	124	100.0	10.5
X	0.0	72.6	24.2	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE = 3.0 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 11

JOINT FREQUENCY TABLES

DIR	SPEED (MPH)										TOTAL	N	AVE SPEED	
	CALM	3.5-	7.5-	7.6	12.5-	12.6	18.5-	18.6	24.5-	24.6				32.6+
N	0	31	59	8	2	0	0	0	0	0	0	100	5.1	5.0
NNE	0	30	25	4	0	0	0	0	0	0	0	59	3.0	4.0
NE	0	24	30	6	0	0	0	0	0	0	0	60	3.4	4.5
ENE	0	20	31	17	0	0	0	0	0	0	0	68	5.9	5.5
E	0	60	50	6	0	0	0	0	0	0	0	116	6.0	4.0
ESE	0	60	38	3	0	0	0	0	0	0	0	101	5.1	3.6
SE	0	37	61	30	0	0	0	0	0	0	0	127	6.0	5.5
SSE	0	61	50	20	0	0	0	0	0	0	0	121	6.1	4.6
S	0	63	40	15	0	0	0	0	0	0	0	108	5.0	4.5
SSW	0	51	42	10	4	0	0	0	0	0	0	116	5.0	5.0
SW	0	57	50	18	3	0	0	0	0	0	0	128	6.5	4.7
WSW	0	50	32	17	1	0	0	0	0	0	0	100	5.1	4.5
W	0	45	41	16	1	0	0	0	0	0	0	103	5.2	4.6
WNW	0	51	68	80	25	0	0	0	0	0	0	207	10.5	7.2
NW	0	46	68	78	24	0	0	0	0	0	0	254	12.0	9.0
NNW	0	43	87	43	20	0	0	0	0	0	0	195	9.0	7.8
TOTAL	0	709	802	380	80	11	0	0	0	0	0	1973	100.0	6.8
X	0.0	35.0	40.6	18.7	4.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE = 5.5 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 210

Three Mile Island Joint Frequency Table of Wind Speed and
Wind Direction 100ft Versus Delta Temperature 150-33ft for
Specific Dates Only During the Second Quarter 1980

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .LE. -1.0 DEG.F/100 FT

DIR	SPEED (MPH)							TOTAL	%	AVE SPEED
	CALM	CALM+	3.6	7.6	12.6	18.6	24.6			
	- 3.5	- 7.5	-12.5	-18.5	-24.5	-32.5				
M	0	3	3	1	0	0	0	7	3.2	3.9
NNE	0	1	0	0	0	0	0	1	.5	1.8
NE	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0.0	0.0
E	0	1	4	0	0	0	0	5	2.3	4.1
ESE	0	4	0	0	0	0	0	4	1.8	2.7
SE	0	3	6	1	0	0	0	7	3.2	3.8
SSE	0	2	7	0	0	0	0	9	4.1	3.8
S	0	3	5	5	0	0	0	13	5.9	6.4
SSW	0	2	11	1	0	0	0	14	6.4	4.5
SU	0	2	12	2	0	0	0	16	7.3	5.1
USU	0	5	4	6	0	0	0	15	6.8	6.4
U	0	5	3	3	0	0	0	11	5.0	5.1
UNW	0	7	12	9	2	0	0	30	17.7	9.1
NW	0	2	16	12	8	0	0	38	17.3	8.7
NNW	0	7	19	9	6	0	0	41	18.6	7.2
TOTAL	0	44	102	49	23	2	0	220	100.0	
%	0.0	20.0	46.4	22.3	10.5	.9	0.0	0.0	100.0	

AVE SPEED FOR THIS TABLE* 6.8 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION* 27

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. -1.0 BUT .LE. -.9 DEG.F/100 FT

DIR	SPEED (MPH)							TOTAL	%	AVE SPEED
	CALM	CALM+	3.6	7.6	12.6	18.6	24.6			
	- 3.5	- 7.5	-12.5	-18.5	-24.5	-32.5				
N	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	1	0	0	0	0	0	1	6.7	1.4
NE	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	1	0	0	0	0	1	6.7	7.0
E	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	1	0	0	0	0	0	1	6.7	3.3
SE	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	1	0	0	0	0	1	6.7	5.2
S	0	0	1	0	0	0	0	1	6.7	3.7
SSW	0	0	2	1	0	0	0	3	20.0	6.7
SU	0	0	1	0	0	0	0	1	6.7	6.3
USU	0	0	0	0	0	0	0	0	0.0	0.0
U	0	0	0	1	0	0	0	1	6.7	8.4
UNW	0	0	0	2	1	0	0	3	20.0	10.7
NW	0	0	0	1	0	1	0	2	13.3	15.5
NNW	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	2	6	5	1	1	0	15	100.0	
%	0.0	13.3	40.0	33.3	6.7	6.7	0.0	0.0	100.0	

AVE SPEED FOR THIS TABLE* 7.9 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION* 1

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .07. -.9 BUT .LE. -.8 DEG.F/100 FT

DIR	SPEED (MPH)							TOTAL	N	AVE SPEED
	CALM*	3.6	7.6	12.6	18.6	24.6	32.6+			
N	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	1	0	0	0	0	0	1	4.5	4.0
ENE	0	3	1	0	0	0	0	4	18.2	6.7
E	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	1	0	0	0	0	0	1	4.5	2.4
SE	0	0	2	0	0	0	0	2	9.1	10.0
SSE	0	1	0	0	0	0	0	1	4.5	2.0
S	0	0	1	0	0	0	0	1	4.5	7.6
SSU	0	0	1	0	0	0	0	2	9.1	8.7
SU	0	2	1	0	0	0	0	3	13.6	4.6
USU	0	0	1	0	0	0	0	1	4.5	6.3
U	0	0	1	0	0	0	0	1	4.5	3.9
UNU	0	0	2	0	0	0	0	2	9.1	10.0
NU	0	0	2	0	0	0	0	2	9.1	9.4
NNU	0	0	0	0	0	0	0	1	4.5	24.9
TOTAL	0	4	7	10	0	0	0	22	100.0	
%	0.0	18.2	31.8	45.5	0.0	0.0	4.5	0.0	100.0	

AVE SPEED FOR THIS TABLE= 7.6 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 2

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .07. -.8 BUT .LE. -.3 DEG.F/100 FT

DIR	SPEED (MPH)							TOTAL	N	AVE SPEED
	CALM*	3.6	7.6	12.6	18.6	24.6	32.6+			
N	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	1	0	0	0	0	0	2	1.8	6.5
NE	0	1	0	0	0	0	0	2	1.8	5.0
ENE	0	3	4	0	0	0	0	12	10.0	6.3
E	0	4	1	2	0	0	0	7	6.4	4.9
ESE	0	1	3	0	0	0	0	4	3.6	4.7
SE	0	6	8	3	0	0	0	17	15.5	4.8
SSE	0	2	4	1	0	0	0	7	6.4	5.7
S	0	0	4	2	0	0	0	6	5.5	7.1
SSU	0	1	2	1	0	0	0	4	3.6	5.1
SU	0	2	3	2	1	0	0	8	7.3	7.1
USU	0	2	4	2	0	0	0	8	7.3	5.0
U	0	0	2	5	0	0	0	7	6.4	8.0
UNU	0	0	1	2	0	0	0	3	0.1	8.7
NU	0	0	3	4	0	0	0	7	8.2	9.4
NNU	0	0	0	5	0	0	0	5	8.2	8.2
TOTAL	0	28	44	33	3	0	0	110	100.0	
%	0.0	25.5	40.0	30.0	2.7	1.8	0.0	0.0	100.0	

AVE SPEED FOR THIS TABLE= 6.3 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 12

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. -.3 BUT .LE. .8 DEG.F./100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.5-	7.5-	12.5-	18.5-	24.5-	32.6+	32.6+	TOTAL	%			
N	0	2	5	1	0	0	0	0	0	0	8	3.3	5.9
NNE	0	3	2	0	0	0	0	0	0	0	5	2.0	3.3
NE	0	4	3	0	0	0	0	0	0	0	7	2.9	3.3
ENE	0	5	2	0	0	0	0	0	0	0	7	2.9	3.3
E	0	7	6	0	0	0	0	0	0	0	13	5.3	3.5
ESE	0	6	8	0	0	0	0	0	0	0	14	5.7	4.4
SE	0	9	8	2	0	0	0	0	0	0	19	7.8	4.4
SSE	0	1	5	6	0	0	0	0	0	0	12	4.9	6.8
S	0	2	4	2	0	0	0	0	0	0	14	3.3	6.4
SSU	0	6	6	2	0	0	0	0	0	0	14	5.7	4.6
SU	0	9	19	1	0	0	0	0	0	0	29	11.9	4.7
WSW	0	6	8	3	0	0	0	0	0	0	17	7.0	4.7
W	0	5	10	4	0	0	0	0	0	0	19	7.8	5.2
WNW	0	8	12	14	5	0	0	0	0	0	39	16.0	7.2
NW	0	8	7	8	3	0	0	0	0	0	26	10.7	7.1
NNW	0	3	2	1	1	0	0	0	0	0	7	2.9	6.8
TOTAL	0	84	107	44	9	0	0	0	0	0	244	100.0	
%	0.0	34.4	43.9	18.0	3.7	0.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE = 5.4 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 20

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. .8 BUT .LE. 2.2 DEG.F./100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.5-	7.5-	12.5-	18.5-	24.5-	32.6+	32.6+	TOTAL	%			
N	0	2	3	1	0	0	0	0	0	0	6	4.4	1.8
NNE	0	2	0	0	0	0	0	0	0	0	2	1.5	1.9
NE	0	3	2	0	0	0	0	0	0	0	5	3.7	2.4
ENE	0	10	6	0	0	0	0	0	0	0	16	11.9	3.3
E	0	15	4	0	0	0	0	0	0	0	19	14.1	3.5
ESE	0	13	1	0	0	0	0	0	0	0	14	10.7	2.2
SE	0	17	1	0	0	0	0	0	0	0	18	13.0	1.9
SSE	0	11	0	0	0	0	0	0	0	0	11	8.1	1.7
S	0	17	1	0	0	0	0	0	0	0	18	13.0	2.2
SSU	0	8	3	0	0	0	0	0	0	0	11	8.1	2.9
SU	0	14	7	0	0	0	0	0	0	0	21	15.4	3.9
WSW	0	3	7	0	0	0	0	0	0	0	10	7.8	2.9
W	0	4	6	0	0	0	0	0	0	0	10	7.8	3.9
WNW	0	6	4	0	0	0	0	0	0	0	10	7.8	4.4
NW	0	5	8	0	0	0	0	0	0	0	13	9.7	5.9
NNW	0	5	3	0	0	0	0	0	0	0	8	6.0	7.9
TOTAL	0	92	39	4	0	0	0	0	0	0	135	100.0	
%	0.0	68.1	28.9	3.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE = 3.2 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION = 31

Attachment 4 (continued)

JOINT FREQUENCY TABLES
TEMPERATURE DIFFERENCE .GT. 2.2 DEG.F.100 FT

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED			
	-3.5	-7.5	-12.5	-18.5	-24.5	-32.5							
N	0	0	0	0	0	0	0	0	0	0	0	0	0.0
NNE	0	2	0	0	0	0	0	0	0	0	0	0	0.0
N E	0	3	0	0	0	0	0	0	0	0	0	0	4.7
E NE	0	0	0	0	0	0	0	0	0	0	0	0	7.0
E	0	1	0	0	0	0	0	0	0	0	0	0	0.0
ESE	0	8	0	0	0	0	0	0	0	0	0	0	4.7
SE	0	2	0	0	0	0	0	0	0	0	0	0	2.3
SSE	0	4	0	0	0	0	0	0	0	0	0	0	1.8
S	0	5	0	0	0	0	0	0	0	0	0	0	2.1
SSW	0	3	2	0	0	0	0	0	0	0	0	0	2.2
SU	0	4	0	0	0	0	0	0	0	0	0	0	3.1
USW	0	3	0	0	0	0	0	0	0	0	0	0	1.5
U	0	1	0	0	0	0	0	0	0	0	0	0	7.0
UNW	0	1	0	0	0	0	0	0	0	0	0	0	2.1
NU	0	0	0	0	0	0	0	0	0	0	0	0	4.7
NW	0	0	0	0	0	0	0	0	0	0	0	0	2.3
TOTAL	0	37	6	0	0	0	0	0	0	0	0	0	0.0
%	0.0	86.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

AVE SPEED FOR THIS TABLE= 2.3 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 4

JOINT FREQUENCY TABLES

DIR	SPEED (MPH)										TOTAL	%	AVE SPEED
	CALM	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED			
	-3.5	-7.5	-12.5	-18.5	-24.5	-32.5							
N	0	7	11	3	0	0	0	0	0	0	0	0	2.7
NNE	0	10	12	1	0	0	0	0	0	0	0	0	1.6
N E	0	10	5	0	0	0	0	0	0	0	0	0	1.0
E NE	0	11	13	5	0	0	0	0	0	0	0	0	3.7
E	0	23	18	2	0	0	0	0	0	0	0	0	5.2
ESE	0	36	15	0	0	0	0	0	0	0	0	0	3.0
SE	0	20	23	8	0	0	0	0	0	0	0	0	6.5
SSE	0	17	18	7	0	0	0	0	0	0	0	0	4.7
S	0	21	14	10	0	0	0	0	0	0	0	0	4.5
SSW	0	19	25	6	0	0	0	0	0	0	0	0	5.3
SU	0	27	35	6	0	0	0	0	0	0	0	0	4.8
USW	0	19	20	11	0	0	0	0	0	0	0	0	4.5
U	0	15	24	13	0	0	0	0	0	0	0	0	8.7
UNW	0	23	28	32	17	0	0	0	0	0	0	0	6.3
NU	0	17	29	30	11	0	0	0	0	0	0	0	6.6
NW	0	0	31	11	3	0	0	0	0	0	0	0	12.0
TOTAL	0	291	311	145	38	1	0	0	0	0	0	0	7.8
%	0.0	36.0	39.4	18.4	4.8	.6	.1	0.0	0.0	0.0	0.0	0.0	100.0

AVE SPEED FOR THIS TABLE= 5.5 MPH
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 97