VERMONT YANKEE NUCLEAR POWER CORPORATION

Ferry Road, Brattleboro, VT 05301-7002

REPLY TO
ENGINEERING OFFICE
580 MAIN STREET
BOLTON, MA 01740
(508) 779-6711

March 29, 1996
BVY 96-38

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

References: (a) License No. DPR-28 (Docket No. 50-271)

Subject: 1995 Vermont Yankee Annual Effluent and Waste Disposal Report

Pursuant to Vermont Yankee Technical Specification 6.7.C.1 and 10CFR50.36a(a)(2) enclosed is the subject report.

We trust that the information provided is acceptable; however, should you have any questions, please contact this office.

Sincerely,

VERMONT YANKEE NUCLEAR POWER CORPORATION

James J. Duffy

James J. Duffy
Licensing Engineer

c: USNRC Region I Administrator
USNRC Resident Inspector - VYNPS
USNRC Project Manager - VYNPS

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VERMONT YANKEE NUCLEAR POWER CORPORATION

VERMONT YANKEE NUCLEAR POWER STATION

VERNON, VERMONT

EFFLUENT AND WASTE DISPOSAL
ANNUAL REPORT
FOR 1995

Vermont Yankee Nuclear Power Station

R12\60

TABLE 1A

Vermont Yankee

Effluent and Waste Disposal Annual Report

First and Second Quarters, 1995

Gaseous Effluents - Summation of All Releases

	Unit	Quarter 1	Quarter 2	Est. Total Error, %
A. Fission and Activation Gases				
1. Total release	Ci	6.18E+00	1.32E+00	±1.00E+02
2. Average release rate for period	µCi/sec	7.86E-01	1.68E-01	
3. Percent of Tech. Spec. limit (1)	%			
B. Iodines				
1. Total Iodine-131	Ci	9.23E-04	3.81E-04	±5.00E+01
2. Average release rate for period	µCi/sec	1.17E-04	4.85E-05	
3. Percent of Tech. Spec. limit (1)	%			
C. Particulates				
1. Particulates with T-1/2 > 8 days	Ci	2.96E-04	1.33E-04	±5.00E+01
2. Average release rate for period	µCi/sec	3.76E-05	1.69E-05	
3. Percent of Tech. Spec. limit (1)	%			
4. Gross alpha radioactivity	Ci	1.43E-06	1.76E-06	
D. Tritium				
1. Total release	Ci	7.40E+00	3.71E+00	
2. Average release rate for period	µCi/sec	9.41E-01	4.71E-01	
3. Percent of Tech. Spec. limit (1)	%			

(1) Percent of Technical Specification limit will be provided in the Supplemental Effluent and Waste Disposal Report to be submitted per Technical Specification 6.7.C.1.

TABLE 1A
(Continued)

Vermont Yankee

Effluent and Waste Disposal Annual Report

Third and Fourth Quarters, 1995

Gaseous Effluents - Summation of All Releases

	Unit	Quarter 3	Quarter 4	Est. Total Error, %
A. Fission and Activation Gases				
1. Total release	Ci	1.40E+00	9.74E-04	±1.00E+02
2. Average release rate for period	µCi/sec	1.78E-01	1.24E-04	
3. Percent of Tech. Spec. limit (1)	%			
B. Iodines				
1. Total Iodine-131	Ci	3.59E-04	2.42E-04	±5.00E+01
2. Average release rate for period	µCi/sec	4.57E-05	3.07E-05	
3. Percent of Tech. Spec. limit (1)	%			
C. Particulates				
1. Particulates with T-1/2 > 8 days	Ci	8.43E-05	1.64E-04	±5.00E+01
2. Average release rate for period	µCi/sec	1.07E-05	2.09E-05	
3. Percent of Tech. Spec. limit (1)	%			
4. Gross alpha radioactivity	Ci	3.05E-06	4.30E-06	
D. Tritium				
1. Total release	Ci	6.27E+00	4.89E+00	
2. Average release rate for period	µCi/sec	7.97E-01	6.22E-01	
3. Percent of Tech. Spec. limit (1)	%			

(1) Percent of Technical Specification limit will be provided in the Supplemental Effluent and Waste Disposal Report to be submitted per Technical Specification 6.7.C.1.

TABLE 1B

Vermont Yankee

Effluent and Waste Disposal Annual Report

First and Second Quarters, 1995

Gaseous Effluents - Elevated Releases

Nuclides Released	Unit	Continuous Mode Quarter 1	Continuous Mode Quarter 2	Batch Mode(1) Quarter 1	Batch Mode(1) Quarter 2
1. Fission Gases					
Krypton-85	Ci	ND	ND		
Krypton-85m	Ci	ND	ND		
Krypton-87	Ci	ND	ND		
Krypton-88	Ci	ND	ND		
Xenon-133	Ci	ND	ND		
Xenon-135	Ci	6.18E+00	1.32E+00		
Xenon-135m	Ci	ND	ND		
Xenon-138	Ci	ND	ND		
Unidentified	Ci	ND	ND		
Total for period	Ci	6.18E+00	1.32E+00		
2. Iodines					
Iodine-131	Ci	9.23E-04	3.81E-04		
Iodine-133	Ci	2.73E-03	1.03E-03		
Iodine-135	Ci	ND	ND		
Total for period	Ci	3.66E-03	1.41E-03		
3. Particulates					
Strontium-89	Ci	1.21E-04	2.62E-05		
Strontium-90	Ci	ND	ND		
Cesium-134	Ci	ND	ND		
Cesium-137	Ci	ND	1.15E-05		
Barium-Lanthanum-140	Ci	1.44E-04	ND		
Manganese-54	Ci	7.93E-06	3.72E-06		
Chromium-51	Ci	ND	ND		
Cobalt-58	Ci	ND	ND		
Cobalt-60	Ci	9.06E-06	7.63E-05		
Cerium-141	Ci	ND	ND		
Zinc-65	Ci	ND	ND		
Total for period	Ci	2.82E-04	1.18E-04		

(1) There were no batch mode gaseous releases for this reporting period.

ND - Not detected at the plant stack.

TABLE 1B
(Continued)

Vermont Yankee

Effluent and Waste Disposal Annual Report

Third and Fourth Quarters, 1995

Gaseous Effluents - Elevated Releases

Nuclides Released	Unit	Continuous Mode Quarter 3	Continuous Mode Quarter 4	Batch Mode[(1)] Quarter 3	Batch Mode[(1)] Quarter 4
1. Fission Gases					
Krypton-85	Ci	ND	4.24E-04		
Krypton-85m	Ci	ND	ND		
Krypton-87	Ci	ND	ND		
Krypton-88	Ci	ND	ND		
Xenon-133	Ci	ND	5.50E-04		
Xenon-135	Ci	1.40E+00	ND		
Xenon-135m	Ci	ND	ND		
Xenon-138	Ci	ND	ND		
Unidentified	Ci	ND	ND		
Total for period	Ci	1.40E+00	9.74E-04		
2. Iodines					
Iodine-131	Ci	3.59E-04	2.42E-04		
Iodine-133	Ci	1.97E-03	1.78E-03		
Iodine-135	Ci	ND	ND		
Total for period	Ci	2.33E-03	2.02E-03		
3. Particulates					
Strontium-89	Ci	4.65E-05	4.87E-05		
Strontium-90	Ci	ND	ND		
Cesium-134	Ci	ND	ND		
Cesium-137	Ci	3.61E-06	5.77E-06		
Barium-Lanthanum-140	Ci	ND	ND		
Manganese-54	Ci	3.22E-06	ND		
Chromium-51	Ci	ND	ND		
Cobalt-58	Ci	ND	ND		
Cobalt-60	Ci	3.10E-05	3.61E-05		
Cerium-141	Ci	ND	ND		
Zinc-65	Ci	ND	ND		
Total for period	Ci	8.43E-05	9.06E-05		

(1) There were no batch mode gaseous releases for this reporting period.

ND - Not detected at the plant stack.

TABLE 1C

Vermont Yankee

Effluent and Waste Disposal Annual Report

First and Second Quarters 1995

Gaseous Effluents - Ground Level Releases(2)

Nuclides Released	Unit	Continuous Mode Quarter 1	Continuous Mode Quarter 2	Batch Mode(1) Quarter 1	Batch Mode(1) Quarter 2
1. Fission Gases					
Krypton-85	Ci	ND	ND		
Krypton-85m	Ci	ND	ND		
Krypton-87	Ci	ND	ND		
Krypton-88	Ci	ND	ND		
Xenon-133	Ci	ND	ND		
Xenon-135	Ci	ND	ND		
Xenon-135m	Ci	ND	ND		
Xenon-138	Ci	ND	ND		
Xenon-131m	Ci	ND	ND		
Total for period	Ci	0.00E+00	0.00E+00		
2. Iodines(2)					
Iodine-131	Ci	ND	ND		
Iodine-133	Ci	ND	ND		
Iodine-135	Ci	ND	ND		
Total for period	Ci	0.00E+00	0.00E+00		
3. Particulates(2)					
Strontium-89	Ci	ND	ND		
Strontium-90	Ci	2.52E-[illegible]	1.05E-07		
Cesium-134	Ci	1.10E-07	6.16E-08		
Cesium-137	Ci	7.77E-06	3.86E-06		
Barium-Lanthanum-140	Ci	ND	ND		
Manganese-54	Ci	3.25E-09	2.14E-06		
Chromium-51	Ci	ND	ND		
Cobalt-58	Ci	ND	ND		
Cobalt-60	Ci	5.46E-06	8.77E-06		
Cerium-141	Ci	ND	ND		
Zinc-65	Ci	ND	ND		
Iron-55	Ci	ND	6.12E-07		
Total for period	Ci	1.36E-05	1.55E-05		

(1) There were no batch mode gaseous releases for this reporting period.
(2) Use of the North Warehouse stack as a ground level release point was initiated at the beginning of the fourth quarter of 1994.
ND - Not detected in the waste oil sample.

TABLE 1C
(Continued)

Vermont Yankee

Effluent and Waste Disposal Annual Report

Third and Fourth Quarters 1995

Gaseous Effluents - Ground Level Releases(2)

		Continuous Mode		Batch Mode(1)	
Nuclides Released	Unit	Quarter(3) 3	Quarter 4	Quarter 3	Quarter 4
1. Fission Gases					
Krypton-85	Ci	ND	ND		
Krypton-85m	Ci	ND	ND		
Krypton-87	Ci	ND	ND		
Krypton-88	Ci	ND	ND		
Xenon-133	Ci	ND	ND		
Xenon-135	Ci	ND	ND		
Xenon-135m	Ci	ND	ND		
Xenon-138	Ci	ND	ND		
Xenon-131m	Ci	ND	ND		
Total for period	Ci	0.00E+00	0.00E+00		
2. Iodines(2)					
Iodine-131	Ci	ND	ND		
Iodine-133	Ci	ND	ND		
Iodine-135	Ci	ND	ND		
Total for period	Ci	0.00E+00	0.00E+00		
3. Particulates(2)					
Strontium-89	Ci	ND	ND		
Strontium-90	Ci	ND	8.19E-08		
Cesium-134	Ci	ND	8.62E-08		
Cesium-137	Ci	ND	2.02E-06		
Barium-Lanthanum-140	Ci	ND	ND		
Manganese-54	Ci	ND	1.98E-05		
Chromium-51	Ci	ND	ND		
Cobalt-58	Ci	ND	2.47E-06		
Cobalt-60	Ci	ND	3.03E-05		
Cerium-141	Ci	ND	ND		
Zinc-65	Ci	ND	1.90E-05		
Iron-55	Ci	ND	1.59E-06		
Total for period	Ci	0.00E+00	7.52E-05		

(1) There were no batch mode gaseous releases for this reporting period.
(2) Use of the North Warehouse stack as a ground level release point was initiated at the beginning of the fourth quarter of 1994.
ND - Not detected in the waste oil sample.

TABLE 1D

Vermont Yankee

Effluent and Waste Disposal Annual Report

for 1995

Gaseous Effluents - Nonroutine Releases

There were no nonroutine or accidental gaseous releases during this reporting period.

TABLE 2A

Vermont Yankee

Effluent and Waste Disposal Annual Report

for 1995

Liquid Effluents - Summation of All Releases

There were no liquid releases during this reporting period.

TABLE 2B

Vermont Yankee

Effluent and Waste Disposal Annual Report

for 1995

Liquid Effluents - Nonroutine Releases

There were no liquid releases during this reporting period.

TABLE 3

Vermont Yankee

Effluent and Waste Disposal Annual Report

First and Second Quarters, 1995

Solid Waste and Irradiated Fuel Shipments

A. Solid Waste Shipped Off-Site for Burial or Disposal (Not Irradiated Fuel):

1. Type of Waste	Unit	6-Month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3		
	Ci		±7.50E+01
b. Dry compressible waste, contaminated equipment, etc.	m^3		
	Ci		±7.50E+01
c. Irradiated components, control rods, etc.	m^3		
	Ci		±7.50E+01

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

a.	Zinc-65	%	b.	Iron-55	%
	Cesium-137	%		Zinc-65	%
	Cobalt-60	%		Cobalt-60	%
	Cesium-134	%		Manganese-54	%
	Manganese-54	%		Cesium-137	%

3. Solid Waste Disposition:

Number of Shipments	Mode of Transportation	Destination

"No solid waste was disposed during this period."

B. Irradiated Fuel Shipments (Disposition): None

C. Supplemental information

1) Class of solid waste containers shipped:
2) Types of containers used:
3) Solidification agent or absorbent: None

TABLE 3
(Continued)

Vermont Yankee

Effluent and Waste Disposal Annual Report

Third and Fourth Quarters, 1995

Solid Waste and Irradiated Fuel Shipments

A. Solid Waste Shipped Off-Site for Burial or Disposal (Not Irradiated Fuel):

1. Type of Waste	Unit	6-Month Period	Est. Total Error, %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m^3	3.41E+00	
	Ci	1.35E+02	±7.50E+01
b. Dry compressible waste, contaminated equipment, etc.	m^3	0.00E+00	
	Ci	0.00E+00	±7.50E+01
c. Irradiated components, control rods, etc.	m^3	0.00E+00	
	Ci	0.00E+00	±7.50E+01

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

a.	Zinc-65	%	2.00E+01	b.	Iron-55	%
	Cesium-137	%	1.60E+00		Zinc-65	%
	Cobalt-60	%	2.70E+01		Cobalt-60	%
	Manganese-54	%	8.40E+00		Manganese-54	%
	Nickel-63	%	1.12E+01		Cesium-137	%
	Iron-55	%	3.02E+01			

3. Solid Waste Disposition:

Number of Shipments	Mode of Transportation	Destination
1	Truck	Barnwell, SC

B. Irradiated Fuel Shipments (Disposition): None

C. Supplemental information

1) Class of solid waste containers shipped: 1B
2) Types of containers used: 1 Type A
3) Solidification agent or absorbent: None

TABLE 5A

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS A CLASS FREQUENCY (PERCENT) = 3.02

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	0	1	0	1	1	3	0	3	0	1	0	0	0	0	0	0	0	10
(1)	.00	.41	.00	.41	.41	1.23	.00	1.23	.00	.41	.00	.00	.00	.00	.00	.00	.00	4.10
(2)	.00	.01	.00	.01	.01	.04	.00	.04	.00	.01	.00	.00	.00	.00	.00	.00	.00	.12
4-7	5	5	0	0	1	7	4	9	6	3	1	2	2	3	1	13	0	62
(1)	2.05	2.05	.00	.00	.41	2.87	1.64	3.69	2.46	1.23	.41	.82	.82	1.23	.41	5.33	.00	25.41
(2)	.06	.06	.00	.00	.01	.09	.05	.11	.07	.04	.01	.02	.02	.04	.01	.16	.00	.77
8-12	10	0	0	0	0	4	3	8	12	4	2	0	5	2	2	19	0	71
(1)	4.10	.00	.00	.00	.00	1.64	1.23	3.28	4.92	1.64	.82	.00	2.05	.82	.82	7.79	.00	29.10
(2)	.12	.00	.00	.00	.00	.05	.04	.10	.15	.05	.02	.00	.06	.02	.02	.24	.00	.88
13-18	4	2	0	0	0	3	1	2	7	4	0	0	4	13	5	19	0	64
(1)	1.64	.82	.00	.00	.00	1.23	.41	.82	2.87	1.64	.00	.00	1.64	5.33	2.05	7.79	.00	26.23
(2)	.05	.02	.00	.00	.00	.04	.01	.02	.09	.05	.00	.00	.05	.16	.06	.24	.00	.79
19-24	4	0	0	0	0	0	0	0	1	0	0	0	3	3	0	8	0	19
(1)	1.64	.00	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	1.23	1.23	.00	3.28	.00	7.79
(2)	.05	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.04	.04	.00	.10	.00	.24
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	12	0	18
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.23	1.23	4.92	.00	7.38
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.04	.15	.00	.22
ALL SPEEDS	23	8	0	1	2	17	8	22	26	12	3	2	14	24	11	71	0	244
(1)	9.43	3.28	.00	.41	.82	6.97	3.28	9.02	10.66	4.92	1.23	.82	5.74	9.84	4.51	29.10	.00	100.00
(2)	.28	.10	.00	.01	.02	.21	.10	.27	.32	.15	.04	.02	.17	.30	.14	.88	.00	3.02

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5B

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA   STABILITY CLASS B   CLASS FREQUENCY (PERCENT) = 2.80

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	2	0	2	0	0	0	0	1	0	0	0	0	0	0	0	1	0	6
(1)	.88	.00	.88	.00	.00	.00	.00	.44	.00	.00	.00	.00	.00	.00	.00	.44	.00	[illegible]
(2)	.02	.00	.02	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.01	.00	[illegible]
4-7	2	1	4	2	3	2	8	8	5	3	1	0	0	1	1	9	0	50
(1)	.88	.44	1.77	.88	1.33	.88	3.54	3.54	2.21	1.33	.44	.00	.00	.44	.44	3.98	.00	22.12
(2)	.02	.01	.05	.02	.04	.02	.10	.10	.06	.04	.01	.00	.00	.01	.01	.11	.00	.62
8-12	9	1	0	0	0	2	4	10	13	8	1	2	6	3	1	13	0	73
(1)	3.98	.44	.00	.00	.00	.88	1.77	4.42	5.75	3.54	.44	.88	2.65	1.33	.44	5.75	.00	32.30
(2)	.11	.01	.00	.00	.00	.02	.05	.12	.16	.10	.01	.02	.07	.04	.01	.16	.00	.90
13-18	7	0	0	0	2	1	1	0	13	3	4	1	4	11	1	21	0	69
(1)	3.10	.00	.00	.00	.88	.44	.44	.00	5.75	1.33	1.77	.44	1.77	4.87	.44	9.29	.00	30.53
(2)	.09	.00	.00	.00	.02	.01	.01	.00	.16	.04	.05	.01	.05	.14	.01	.26	.00	.85
19-24	1	0	0	0	0	0	0	0	3	0	0	0	1	4	3	8	0	20
(1)	.44	.00	.00	.00	.00	.00	.00	.00	1.33	.00	.00	.00	.44	1.77	1.33	3.54	.00	8.85
(2)	.01	.00	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00	.01	.05	.04	.10	.00	.25
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	4	0	8
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.33	.44	1.77	.00	3.54
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.01	.05	.00	.10
ALL SPEEDS	21	2	6	2	5	5	13	19	34	14	6	3	11	22	7	56	0	226
(1)	9.29	.88	2.65	.88	2.21	2.21	5.75	8.41	15.04	6.19	2.65	1.33	4.87	9.73	3.10	24.78	.00	100.00
(2)	.26	.02	.07	.02	.06	.06	.16	.24	.42	.17	.07	.04	.14	.27	.09	.69	.00	2.80

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5C

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS C CLASS FREQUENCY (PERCENT) = 3.91

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	1	0	1	2	0	1	3	1	0	1	0	0	0	1	0	1	0	12
(1)	.32	.00	.32	.63	.00	.32	.95	.32	.00	.32	.00	.00	.00	.32	.00	.32	.00	3.80
(2)	.01	.00	.01	.02	.00	.01	.04	.01	.00	.01	.00	.00	.00	.01	.00	.01	.00	.15
4-7	5	1	3	2	2	6	6	11	6	1	1	1	1	0	1	9	0	56
(1)	1.58	.32	.95	.63	.63	1.90	1.90	3.48	1.90	.32	.32	.32	.32	.00	.32	2.85	.00	17.72
(2)	.06	.01	.04	.02	.02	.07	.07	.14	.07	.01	.01	.01	.01	.00	.01	.11	.00	.69
8-12	11	1	0	0	3	8	5	7	16	6	1	2	10	9	6	24	0	109
(1)	3.48	.32	.00	.00	.95	2.53	1.58	2.22	5.06	1.90	.32	.63	3.16	2.85	1.90	7.59	.00	34.49
(2)	.14	.01	.00	.00	.04	.10	.06	.09	.20	.07	.01	.02	.12	.11	.07	.30	.00	1.35
13-18	10	1	1	0	0	0	0	3	10	4	2	1	7	16	9	29	0	93
(1)	3.16	.32	.32	.00	.00	.00	.00	.95	3.16	1.27	.63	.32	2.22	5.06	2.85	9.18	.00	29.43
(2)	.12	.01	.01	.00	.00	.00	.00	.04	.12	.05	.02	.01	.09	.20	.11	.36	.00	1.15
19-24	4	0	0	0	0	0	0	0	1	0	1	0	3	8	4	14	0	35
(1)	1.27	.00	.00	.00	.00	.00	.00	.00	.32	.00	.32	.00	.95	2.53	1.27	4.43	.00	11.08
(2)	.05	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01	.00	.04	.10	.05	.17	.00	.43
GT 24	2	0	0	0	0	0	0	0	0	0	0	0	0	3	2	4	0	11
(1)	.63	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.95	.63	1.27	.00	3.48
(2)	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.02	.05	.00	.14
ALL SPEEDS	33	3	5	4	5	15	14	22	33	12	5	4	21	37	22	81	0	316
(1)	10.44	.95	1.58	1.27	1.58	4.75	4.43	6.96	10.44	3.80	1.58	1.27	6.65	11.71	6.96	25.63	.00	100.00
(2)	.41	.04	.06	.05	.06	.19	.17	.27	.41	.15	.06	.05	.26	.46	.27	1.00	.00	3.91

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5D

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS D CLASS FREQUENCY (PERCENT) = 43.75

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	3
(1)	.00	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.03	.00	.00	.08
(2)	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.00	.00	.04
C-3	45	25	21	18	24	32	47	40	23	18	11	14	14	18	24	29	0	403
(1)	1.27	.71	.59	.51	.68	.91	1.33	1.13	.65	.51	.31	.40	.40	.51	.68	.82	.00	11.40
(2)	.56	.31	.26	.22	.30	.40	.58	.50	.28	.22	.14	.17	.17	.22	.30	.36	.00	4.99
4-7	119	48	21	15	42	67	93	105	102	23	10	12	10	21	32	177	0	897
(1)	3.37	1.36	.59	.42	1.19	1.90	2.63	2.97	2.89	.65	.28	.34	.28	.59	.91	5.01	.00	25.37
(2)	1.47	.59	.26	.19	.52	.83	1.15	1.30	1.26	.28	.12	.15	.12	.26	.40	2.19	.00	11.10
8-12	169	33	8	8	24	35	35	129	182	50	29	21	46	83	60	217	0	1129
(1)	4.78	.93	.23	.23	.68	.99	.99	3.65	5.15	1.41	.82	.59	1.30	2.35	1.70	6.14	.00	31.94
(2)	2.09	.41	.10	.10	.30	.43	.43	1.60	2.25	.62	.36	.26	.57	1.03	.74	2.69	.00	13.97
13-18	112	13	0	2	4	0	9	21	90	30	9	17	46	107	119	223	0	802
(1)	3.17	.37	.00	.06	.11	.00	.25	.59	2.55	.85	.25	.48	1.30	3.03	3.37	6.31	.00	22.69
(2)	1.39	.16	.00	.02	.05	.00	.11	.26	1.11	.37	.11	.21	.57	1.32	1.47	2.76	.00	9.93
19-24	18	1	0	1	0	0	1	7	24	10	2	0	8	40	40	102	0	254
(1)	.51	.03	.00	.03	.00	.00	.03	.20	.68	.28	.06	.00	.23	1.13	1.13	2.89	.00	7.19
(2)	.22	.01	.00	.01	.00	.00	.01	.09	.30	.12	.02	.00	.10	.50	.50	1.26	.00	3.14
GT 24	1	0	0	0	0	0	0	1	3	1	1	0	1	14	2	23	0	47
(1)	.03	.00	.00	.00	.00	.00	.00	.03	.08	.03	.03	.00	.03	.40	.06	.65	.00	1.33
(2)	.01	.00	.00	.00	.00	.00	.00	.01	.04	.01	.01	.00	.01	.17	.02	.28	.00	.58
ALL SPEEDS	464	121	50	44	94	134	185	303	424	132	62	64	125	284	278	771	0	3535
(1)	13.13	3.42	1.41	1.24	2.66	3.79	5.23	8.57	11.99	3.73	1.75	1.81	3.54	8.03	7.86	21.81	.00	100.00
(2)	5.74	1.50	.62	.54	1.16	1.66	2.29	3.75	5.25	1.63	.77	.79	1.55	3.51	3.44	9.54	.00	43.75

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2')=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5E

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS E CLASS FREQUENCY (PERCENT) = 31.13

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	2	1	0	1	0	1	1	0	1	0	2	0	1	2	0	1	0	13
(1)	.08	.04	.00	.04	.00	.04	.04	.00	.04	.00	.08	.00	.04	.08	.00	.04	.00	.52
(2)	.02	.01	.00	.01	.00	.01	.01	.00	.01	.00	.02	.00	.01	.02	.00	.01	.00	.16
C-3	85	56	47	40	48	53	54	60	38	17	16	13	19	27	48	58	0	679
(1)	3.38	2.23	1.87	1.59	1.91	2.11	2.15	2.39	1.51	.68	.64	.52	.76	1.07	1.91	2.31	.00	27.00
(2)	1.05	.69	.58	.50	.59	.66	.67	.74	.47	.21	.20	.16	.24	.33	.59	.72	.00	8.40
4-7	148	25	14	15	16	30	99	102	76	18	15	16	20	23	66	201	0	884
(1)	5.88	.99	.56	.60	.64	1.19	3.94	4.06	3.02	.72	.60	.64	.80	.91	2.62	7.99	.00	35.15
(2)	1.83	.31	.17	.19	.20	.37	1.23	1.26	.94	.22	.19	.20	.25	.28	.82	2.49	.00	10.94
8-12	88	8	0	0	1	8	13	72	64	30	8	13	37	45	59	203	0	649
(1)	3.50	.32	.00	.00	.04	.32	.52	2.86	2.54	1.19	.32	.52	1.47	1.79	2.35	8.07	.00	25.81
(2)	1.09	.10	.00	.00	.01	.10	.16	.89	.79	.37	.10	.16	.46	.56	.73	2.51	.00	8.03
13-18	21	2	0	0	0	1	4	12	41	18	4	2	15	30	23	80	0	253
(1)	.83	.08	.00	.00	.00	.04	.16	.48	1.63	.72	.16	.08	.60	1.19	.91	3.18	.00	10.06
(2)	.26	.02	.00	.00	.00	.01	.05	.15	.51	.22	.05	.02	.19	.37	.28	.99	.00	3.13
19-24	4	0	0	0	0	0	0	1	9	1	0	0	0	4	4	9	0	32
(1)	.16	.00	.00	.00	.00	.00	.00	.04	.36	.04	.00	.00	.00	.16	.16	.36	.00	1.27
(2)	.05	.00	.00	.00	.00	.00	.00	.01	.11	.01	.00	.00	.00	.05	.05	.11	.00	.40
GT 24	2	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	5
(1)	.08	.00	.00	.00	.00	.00	.00	.08	.04	.00	.00	.00	.00	.00	.00	.00	.00	.20
(2)	.02	.00	.00	.00	.00	.00	.00	.02	.01	.00	.00	.00	.00	.00	.00	.00	.00	.06
ALL SPEEDS	350	92	61	56	65	93	171	249	230	84	45	44	92	131	200	552	0	2515
(1)	13.92	3.66	2.43	2.23	2.58	3.70	6.80	9.90	9.15	3.34	1.79	1.75	3.66	5.21	7.95	21.95	.00	100.00
(2)	4.33	1.14	.75	.69	.80	1.15	2.12	3.08	2.85	1.04	.56	.54	1.14	1.62	2.48	6.83	.00	31.13

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5F

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA — STABILITY CLASS F — CLASS FREQUENCY (PERCENT) = 13.42

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	1	2	0	0	0	0	0	0	0	1	0	0	1	0	0	0	5
(1)	.00	.09	.18	.00	.00	.00	.00	.00	.00	.00	.09	.00	00	.09	.00	.00	.00	.46
(2)	.00	.01	.02	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.01	.00	.00	.00	.06
C-3	53	36	32	32	23	31	53	32	29	12	20	10	14	9	17	26	0	429
(1)	4.89	3.32	2.95	2.95	2.12	2.86	4.89	2.95	2.68	1.11	1.85	.92	1.29	.83	1.57	2.40	.00	39.58
(2)	.66	.45	.40	.40	.28	.38	.66	.40	.36	.15	.25	.12	.17	.11	.21	.32	.00	5.31
4-7	60	10	1	6	19	22	52	49	23	9	13	13	17	17	24	95	0	430
(1)	5.54	.92	.09	.55	1.75	2.03	4.80	4.52	2.12	.83	1.20	1.20	1.57	1.57	2.21	8.76	.00	39.67
(2)	.74	.12	.01	.07	.24	.27	.64	.61	.28	.11	.16	.16	.21	.21	.30	1.18	.00	5.32
8-12	18	1	0	0	0	2	7	11	7	7	8	8	14	12	12	92	0	199
(1)	1.66	.09	.00	.00	.00	.18	.65	1.01	.65	.65	.74	.74	1.29	1.11	1.11	8.49	.00	18.36
(2)	.22	.01	.00	.00	.00	.02	.09	.14	.09	.09	.10	.10	.17	.15	.15	1.14	.00	2.46
13-18	2	0	0	0	0	0	0	3	0	0	0	0	2	2	2	9	0	20
(1)	.18	.00	.00	.00	.00	.00	.00	.28	.00	.00	.00	.00	.18	.18	.18	.83	.00	1.85
(2)	.02	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.02	.02	.02	.11	.00	.25
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.09
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.01
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	133	48	35	38	42	55	112	95	59	28	42	31	47	42	55	222	0	1084
(1)	12.27	4.43	3.23	3.51	3.87	5.07	10.33	8.76	5.44	2.58	3.87	2.86	4.34	3.87	5.07	20.48	.00	100.00
(2)	1.65	.59	.43	.47	.52	.68	1.39	1.18	.73	.35	.52	.38	.58	.52	.68	2.75	.00	13.42

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
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C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5G

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS G CLASS FREQUENCY (PERCENT) = 1.98

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	2	2	1	1	2	2	7	4	2	2	3	1	2	4	4	3	0	42
(1)	1.25	1.25	.63	.63	1.25	1.25	4.38	2.50	1.25	1.25	1.88	.63	1.25	2.50	2.50	1.88	.00	26.25
(2)	.02	.02	.01	.01	.02	.02	.09	.05	.02	.02	.04	.01	.02	.05	.05	.04	.00	.52
4-7	6	0	0	1	0	2	9	10	8	1	7	3	8	4	4	5	0	68
(1)	3.75	.00	.00	.63	.00	1.25	5.63	6.25	5.00	.63	4.38	1.88	5.00	2.50	2.50	3.13	.00	42.50
(2)	.07	.00	.00	.01	.00	.02	.11	.12	.10	.01	.09	.04	.10	.05	.05	.06	.00	.84
8-12	1	0	0	0	0	1	1	4	3	1	2	1	8	4	1	17	0	44
(1)	.63	.00	.00	.00	.00	.63	.63	2.50	1.88	.63	1.25	.63	5.00	2.50	.63	10.63	.00	27.50
(2)	.01	.00	.00	.00	.00	.01	.01	.05	.04	.01	.02	.01	.10	.05	.01	.21	.00	.54
13-18	0	0	0	0	0	0	0	0	2	1	0	0	1	1	0	1	0	6
(1)	.00	.00	.00	.00	.00	.00	.00	.00	1.25	.63	.00	.00	.63	.63	.00	.63	.00	3.75
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.02	.01	.00	.00	.01	.01	.00	.01	.00	.07
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	9	2	1	2	2	5	17	18	15	5	12	5	19	13	9	26	0	160
(1)	5.63	1.25	.63	1.25	1.25	3.13	10.63	11.25	9.38	3.13	7.50	3.13	11.88	8.13	5.63	16.25	.00	100.00
(2)	.11	.02	.01	.02	.02	.06	.21	.22	.19	.06	.15	.06	.24	.16	.11	.32	.00	1.98

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
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C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 5H

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

297.0 FT WIND DATA STABILITY CLASS ALL CLASS FREQUENCY (PERCENT) = 100.00

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	2	3	2	1	0	1	1	0	1	0	3	0	1	4	1	1	0	21
(1)	.02	.04	.02	.01	.00	.01	.01	.00	.01	.00	.04	.00	.01	.05	.01	.01	.00	.26
(2)	.02	.04	.02	.01	.00	.01	.01	.00	.01	.00	.04	.00	.01	.05	.01	.01	.00	.26
C-3	188	120	104	94	98	122	164	141	92	51	50	38	49	59	93	118	0	1581
(1)	2.33	1.49	1.29	1.16	1.21	1.51	2.03	1.75	1.14	.63	.62	.47	.61	.73	1.15	1.46	.00	19.57
(2)	2.33	1.49	1.29	1.16	1.21	1.51	2.03	1.75	1.14	.63	.62	.47	.61	.73	1.15	1.46	.00	19.57
4-7	345	90	43	41	83	136	271	294	226	58	48	47	58	69	129	509	0	2447
(1)	4.27	1.11	.53	.51	1.03	1.68	3.35	3.64	2.80	.72	.59	.58	.72	.85	1.60	6.30	.00	30.28
(2)	4.27	1.11	.53	.51	1.03	1.68	3.35	3.64	2.80	.72	.59	.58	.72	.85	1.60	6.30	.00	30.28
8-12	306	44	8	8	28	60	68	241	297	106	51	47	126	158	141	585	0	2274
(1)	3.79	.54	.10	.10	.35	.74	.84	2.98	3.68	1.31	.63	.58	1.56	1.96	1.75	7.24	.00	28.14
(2)	3.79	.54	.10	.10	.35	.74	.84	2.98	3.68	1.31	.63	.58	1.56	1.96	1.75	7.24	.00	28.14
13-18	156	18	1	2	6	5	15	41	163	60	19	21	79	180	159	382	0	1307
(1)	1.93	.22	.01	.02	.07	.06	.19	.51	2.02	.74	.24	.26	.98	2.23	1.97	4.73	.00	16.18
(2)	1.93	.22	.01	.02	.07	.06	.19	.51	2.02	.74	.24	.26	.98	2.23	1.97	4.73	.00	16.18
19-24	31	1	0	1	0	0	1	8	38	11	3	0	15	60	51	141	0	361
(1)	.38	.01	.00	.01	.00	.00	.01	.10	.47	.14	.04	.00	.19	.74	.63	1.75	.00	4.47
(2)	.38	.01	.00	.01	.00	.00	.01	.10	.47	.14	.04	.00	.19	.74	.63	1.75	.00	4.47
GT 24	5	0	0	0	0	0	0	3	4	1	1	0	1	23	8	43	0	89
(1)	.06	.00	.00	.00	.00	.00	.00	.04	.05	.01	.01	.00	.01	.28	.10	.53	.00	1.10
(2)	.06	.00	.00	.00	.00	.00	.00	.04	.05	.01	.01	.00	.01	.28	.10	.53	.00	1.10
ALL SPEEDS	1033	276	158	147	215	324	520	728	821	287	175	153	329	553	582	1779	0	8080
(1)	12.78	3.42	1.96	1.82	2.66	4.01	6.44	9.01	10.16	3.55	2.17	1.89	4.07	6.84	7.20	22.02	.00	100.00
(2)	12.78	3.42	1.96	1.82	2.66	4.01	6.44	9.01	10.16	3.55	2.17	1.89	4.07	6.84	7.20	22.02	.00	100.00

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6A

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS A CLASS FREQUENCY (PERCENT) = 4.18

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	3	7	4	5	6	5	4	4	1	1	2	0	0	0	1	1	0	44
(1)	.87	2.03	1.16	1.45	1.74	1.45	1.16	1.16	.29	.29	.58	.00	.00	.00	.29	.29	.00	12.75
(2)	.04	.08	.05	.06	.07	.06	.05	.05	.01	.01	.02	.00	.00	.00	.01	.01	.00	.53
4-7	15	8	3	13	11	11	10	16	17	9	2	4	4	7	11	31	0	172
(1)	4.35	2.32	.87	3.77	3.19	3.19	2.90	4.64	4.93	2.61	.58	1.16	1.16	2.03	3.19	8.99	.00	49.86
(2)	.18	.10	.04	.16	.13	.13	.12	.19	.21	.11	.02	.05	.05	.08	.13	.38	.00	2.08
8-12	17	2	0	0	0	5	0	5	9	4	0	1	8	15	8	28	0	102
(1)	4.93	.58	.00	.00	.00	1.45	.00	1.45	2.61	1.16	.00	.29	2.32	4.35	2.32	8.12	.00	29.57
(2)	.21	.02	.00	.00	.00	.06	.00	.06	.11	.05	.00	.01	.10	.18	.10	.34	.00	1.24
13-18	5	0	0	0	0	0	0	0	0	0	0	0	3	7	2	6	0	23
(1)	1.45	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.87	2.03	.58	1.74	.00	6.67
(2)	.06	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.08	.02	.07	.00	.28
19-24	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	4
(1)	.58	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.29	.29	.00	.00	1.16
(2)	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01	.00	.00	.05
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	42	17	7	18	17	21	14	25	27	14	4	5	15	30	23	66	0	345
(1)	12.17	4.93	2.03	5.22	4.93	6.09	4.06	7.25	7.83	4.06	1.16	1.45	4.35	8.70	6.67	19.13	.00	100.00
(2)	.51	.21	.08	.22	.21	.25	.17	.30	.33	.17	.05	.06	.18	.36	.28	.80	.00	4.18

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6B

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS B CLASS FREQUENCY (PERCENT) = 2.73

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	1	1	2	2	3	2	1	1	1	2	1	0	0	0	0	1	0	18
(1)	.44	.44	.89	.89	1.33	.89	.44	.44	.44	.89	.44	.00	.00	.00	.00	.44	.00	8.00
(2)	.01	.01	.02	.02	.04	.02	.01	.01	.01	.02	.01	.00	.00	.00	.00	.01	.00	.22
4-7	18	4	3	5	3	10	4	6	5	4	0	3	4	2	6	16	0	93
(1)	8.00	1.78	1.33	2.22	1.33	4.44	1.78	2.67	2.22	1.78	.00	1.33	1.78	.89	2.67	7.11	.00	41.33
(2)	.22	.05	.04	.06	.04	.12	.05	.07	.06	.05	.00	.04	.05	.02	.07	.19	.00	1.13
8-12	19	3	0	0	0	3	1	1	14	6	0	2	4	16	4	13	0	86
(1)	8.44	1.33	.00	.00	.00	1.33	.44	.44	6.22	2.67	.00	.89	1.78	7.11	1.78	5.78	.00	38.22
(2)	.23	.04	.00	.00	.00	.04	.01	.01	.17	.07	.00	.02	.05	.19	.05	.16	.00	1.04
13-18	3	2	0	0	0	0	0	0	3	1	0	0	1	6	2	4	0	22
(1)	1.33	.89	.00	.00	.00	.00	.00	.00	1.33	.44	.00	.00	.44	2.67	.89	1.78	.00	9.78
(2)	.04	.02	.00	.00	.00	.00	.00	.00	.04	.01	.00	.00	.01	.07	.02	.05	.00	.27
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	5
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.89	1.33	.00	.00	2.22
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.04	.00	.00	.06
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.44	.00	.00	.44
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.01
ALL SPEEDS	41	10	5	7	6	15	6	8	23	13	1	5	9	26	16	34	0	225
(1)	18.22	4.44	2.22	3.11	2.67	6.67	2.67	3.56	10.22	5.78	.44	2.22	4.00	11.56	7.11	15.11	.00	100.00
(2)	.50	.12	.06	.08	.07	.18	.07	.10	.28	.16	.01	.06	.11	.32	.19	.41	.00	2.73

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6C

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA   STABILITY CLASS C   CLASS FREQUENCY (PERCENT) =   3.59

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	2	2	2	0	3	1	2	2	2	1	1	1	0	0	0	1	0	20
(1)	.68	.68	.68	.00	1.01	.34	.68	.68	.68	.34	.34	.34	.00	.00	.00	.34	.00	6.76
(2)	.02	.02	.02	.00	.04	.01	.02	.02	.02	.01	.01	.01	.00	.00	.00	.01	.00	.24
4-7	20	5	5	3	9	11	8	17	13	5	3	1	7	5	8	27	0	147
(1)	6.76	1.69	1.69	1.01	3.04	3.72	2.70	5.74	4.39	1.69	1.01	.34	2.36	1.69	2.70	9.12	.00	49.66
(2)	.24	.06	.06	.04	.11	.13	.10	.21	.16	.06	.04	.01	.08	.06	.10	.33	.00	1.78
8-12	20	2	0	0	1	2	0	2	16	6	2	2	13	9	16	14	0	105
(1)	6.76	.68	.00	.00	.34	.68	.00	.68	5.41	2.03	.68	.68	4.39	3.04	5.41	4.73	.00	35.47
(2)	.24	.02	.00	.00	.01	.02	.00	.02	.19	.07	.02	.02	.16	.11	.19	.17	.00	1.27
13-18	2	0	0	0	0	0	0	0	5	0	0	0	1	5	6	4	0	23
(1)	.68	.00	.00	.00	.00	.00	.00	.00	1.69	.00	.00	.00	.34	1.69	2.03	1.35	.00	7.77
(2)	.02	.00	.00	.00	.00	.00	.00	.00	.06	.00	.00	.00	.01	.06	.07	.05	.00	.28
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.34	.00	.00	.34
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.01
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	44	9	7	3	13	14	10	21	36	12	6	4	21	19	31	46	0	296
(1)	14.86	3.04	2.36	1.01	4.39	4.73	3.38	7.09	12.16	4.05	2.03	1.35	7.09	6.42	10.47	15.54	.00	100.00
(2)	.53	.11	.08	.04	.16	.17	.12	.25	.44	.15	.07	.05	.25	.23	.38	.56	.00	3.59

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6D

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA   STABILITY CLASS D   CLASS FREQUENCY (PERCENT) = 35.82

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00	.03
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.01
C-3	88	44	47	39	46	44	35	50	35	25	22	19	31	24	48	104	0	701
(1)	2.98	1.49	1.59	1.32	1.56	1.49	1.18	1.69	1.18	.85	.74	.64	1.05	.81	1.62	3.52	.00	23.72
(2)	1.07	.53	.57	.47	.56	.53	.42	.61	.42	.30	.27	.23	.38	.29	.58	1.26	.00	8.50
4-7	226	60	19	24	59	64	60	153	150	32	34	29	42	67	81	254	0	1354
(1)	7.65	2.03	.64	.81	2.00	2.17	2.03	5.18	5.08	1.08	1.15	.98	1.42	2.27	2.74	8.60	.00	45.82
(2)	2.74	.73	.23	.29	.72	.78	.73	1.85	1.82	.39	.41	.35	.51	.81	.98	3.08	.00	16.41
8-12	134	27	1	1	7	6	3	24	108	28	18	11	48	113	101	117	0	747
(1)	4.53	.91	.03	.03	.24	.20	.10	.81	3.65	.95	.61	.37	1.62	3.82	3.42	3.96	.00	25.28
(2)	1.62	.33	.01	.01	.08	.07	.04	.29	1.31	.34	.22	.13	.58	1.37	1.22	1.42	.00	9.05
13-18	15	1	0	0	0	1	0	2	18	4	1	0	8	48	37	9	0	144
(1)	.51	.03	.00	.00	.00	.03	.00	.07	.61	.14	.03	.00	.27	1.62	1.25	.30	.00	4.87
(2)	.18	.01	.00	.00	.00	.01	.00	.02	.22	.05	.01	.00	.10	.58	.45	.11	.00	1.75
19-24	0	0	0	0	0	0	0	0	1	0	0	0	0	5	2	0	0	8
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.17	.07	.00	.00	.27
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.06	.02	.00	.00	.10
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	463	132	67	64	112	115	98	229	312	89	76	59	129	257	269	484	0	2955
(1)	15.67	4.47	2.27	2.17	3.79	3.89	3.32	7.75	10.56	3.01	2.57	2.00	4.37	8.70	9.10	16.38	.00	100.00
(2)	5.61	1.60	.81	.78	1.36	1.39	1.19	2.78	3.78	1.08	.92	.72	1.56	3.12	3.26	5.87	.00	35.82

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6E

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS E CLASS FREQUENCY (PERCENT) = 33.73

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	1	1	0	0	0	2	0	2	1	2	0	0	2	0	11
(1)	.00	.00	.00	.04	.04	.00	.00	.00	.07	.00	.07	.04	.07	.00	.00	.07	.00	.40
(2)	.00	.00	.00	.01	.01	.00	.00	.00	.02	.00	.02	.01	.02	.00	.00	.02	.00	.13
C-3	90	43	35	32	30	33	47	81	96	106	169	131	142	119	122	182	0	1458
(1)	3.23	1.55	1.26	1.15	1.08	1.19	1.69	2.91	3.45	3.81	6.07	4.71	5.10	4.28	4.38	6.54	.00	52.39
(2)	1.09	.52	.42	.39	.36	.40	.57	.98	1.16	1.28	2.05	1.59	1.72	1.44	1.48	2.21	.00	17.67
4-7	93	19	7	5	10	29	36	134	96	36	22	34	77	79	123	204	0	1004
(1)	3.34	.68	.25	.18	.36	1.04	1.29	4.81	3.45	1.29	.79	1.22	2.77	2.84	4.42	7.33	.00	36.08
(2)	1.13	.23	.08	.06	.12	.35	.44	1.62	1.16	.44	.27	.41	.93	.96	1.49	2.47	.00	12.17
8-12	19	1	0	0	1	1	4	19	59	6	2	5	15	54	49	37	0	272
(1)	.68	.04	.00	.00	.04	.04	.14	.68	2.12	.22	.07	.18	.54	1.94	1.76	1.33	.00	9.77
(2)	.23	.01	.00	.00	.01	.01	.05	.23	.72	.07	.02	.06	.18	.65	.59	.45	.00	3.30
13-18	3	0	0	0	0	0	1	4	11	0	1	0	1	9	8	0	0	38
(1)	.11	.00	.00	.00	.00	.00	.04	.14	.40	.00	.04	.00	.04	.32	.29	.00	.00	1.37
(2)	.04	.00	.00	.00	.00	.00	.01	.05	.13	.00	.01	.00	.01	.11	.10	.00	.00	.46
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	205	63	42	38	42	63	88	238	264	148	196	171	237	261	302	425	0	2783
(1)	7.37	2.26	1.51	1.37	1.51	2.26	3.16	8.55	9.49	5.32	7.04	6.14	8.52	9.38	10.85	15.27	.00	100.00
(2)	2.48	.76	.51	.46	.51	.76	1.07	2.88	3.20	1.79	2.38	2.07	2.87	3.16	3.66	5.15	.00	33.73

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6F

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA   STABILITY CLASS F   CLASS FREQUENCY (PERCENT) = 15.56

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	3
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00	.00	.16	.00	.00	.23
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.02	.00	.00	.04
C-3	28	14	14	12	8	16	15	30	39	116	228	196	174	110	89	52	0	1141
(1)	2.18	1.09	1.09	.93	.62	1.25	1.17	2.34	3.04	9.03	17.76	15.26	13.55	8.57	6.93	4.05	.00	88.86
(2)	.34	.17	.17	.15	.10	.19	.18	.36	.47	1.41	2.76	2.38	2.11	1.33	1.08	.63	.00	13.83
4-7	8	2	0	0	1	2	4	6	2	13	21	9	17	17	17	17	0	136
(1)	.62	.16	.00	.C0	.08	.16	.31	.47	.16	1.01	1.64	.70	1.32	1.32	1.32	1.32	.00	10.59
(2)	.10	.02	.00	.00	.01	.02	.05	.07	.02	.16	.25	.11	.21	.21	.21	.21	.00	1.65
8-12	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	3
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00	.08	.08	.00	.00	.00	.23
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01	.01	.00	.00	.00	.04
13-18	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00	.00	.00	.08
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.01
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.C0	.00	.00	.00
ALL SPEEDS	36	16	14	12	9	18	19	36	41	129	250	206	192	129	108	69	0	1284
(1)	2.80	1.25	1.09	.93	.70	1.40	1.48	2.80	3.19	10.05	19.47	16.04	14.95	10.05	8.41	5.37	.00	100.00
(2)	.44	.19	.17	.15	.11	.22	.23	.44	.50	1.56	3.03	2.50	2.33	1.56	1.31	.84	.00	15.56

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6G

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA STABILITY CLASS G CLASS FREQUENCY (PERCENT) = 4.39

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
C-3	9	7	9	5	8	5	4	15	26	38	60	49	29	23	11	13	0	311
(1)	2.49	1.93	2.49	1.38	2.21	1.38	1.10	4.14	7.18	10.50	16.57	13.54	8.01	6.35	3.04	3.59	.00	85.91
(2)	.11	.08	.11	.06	.10	.06	.05	.18	.32	.46	.73	.59	.35	.28	.13	.16	.00	3.77
4-7	3	1	1	1	0	1	0	3	3	3	14	3	2	4	4	7	0	50
(1)	.83	.28	.28	.28	.00	.28	.00	.83	.83	.83	3.87	.83	.55	1.10	1.10	1.93	.00	13.81
(2)	.04	.01	.01	.01	.00	.01	.00	.04	.04	.04	.17	.04	.02	.05	.05	.08	.00	.61
8-12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13-18	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.28	.00	.00	.00	.28
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.01
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
ALL SPEEDS	12	8	10	6	8	6	4	18	29	41	74	52	31	28	15	20	0	362
(1)	3.31	2.21	2.76	1.66	2.21	1.66	1.10	4.97	8.01	11.33	20.44	14.36	8.56	7.73	4.14	5.52	.00	100.00
(2)	.15	.10	.12	.07	.10	.07	.05	.22	.35	.50	.90	.63	.38	.34	.18	.24	.00	4.39

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

TABLE 6H

VERMONT YANKEE JAN 95 - DEC 95 METEOROLOGICAL DATA JOINT FREQUENCY DISTRIBUTION

35.0 FT WIND DATA   STABILITY CLASS ALL   CLASS FREQUENCY (PERCENT) = 100.00

WIND DIRECTION FROM

SPEED(MPH)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	VRBL	TOTAL
CALM	0	0	0	1	1	0	0	0	2	0	3	2	2	0	2	2	0	15
(1)	.00	.00	.00	.01	.01	.00	.00	.00	.02	.00	.04	.02	.02	.00	.02	.02	.00	.18
(2)	.00	.00	.00	.01	.01	.00	.00	.00	.02	.00	.04	.02	.02	.00	.02	.02	.00	.18
C-3	221	118	113	95	104	106	108	183	200	289	483	396	376	276	271	354	0	3693
(1)	2.68	1.43	1.37	1.15	1.26	1.28	1.31	2.22	2.42	3.50	5.85	4.80	4.56	3.35	3.28	4.29	.00	44.76
(2)	2.68	1.43	1.37	1.15	1.26	1.28	1.31	2.22	2.42	3.50	5.85	4.80	4.56	3.35	3.28	4.29	.00	44.76
4-7	383	99	38	51	93	128	122	335	286	102	96	83	153	181	250	556	0	2956
(1)	4.64	1.20	.46	.62	1.13	1.55	1.48	4.06	3.47	1.24	1.16	1.01	1.85	2.19	3.03	6.74	.00	35.83
(2)	4.64	1.20	.46	.62	1.13	1.55	1.48	4.06	3.47	1.24	1.16	1.01	1.85	2.19	3.03	6.74	.00	35.83
8-12	209	35	1	1	9	17	8	51	206	50	23	21	89	208	178	209	0	1315
(1)	2.53	.42	.01	.01	.11	.21	.10	.62	2.50	.61	.28	.25	1.08	2.52	2.16	2.53	.00	15.94
(2)	2.53	.42	.01	.01	.11	.21	.10	.62	2.50	.61	.28	.25	1.08	2.52	2.16	2.53	.00	15.94
13-18	28	3	0	0	0	1	1	6	37	5	2	0	14	77	55	23	0	252
(1)	.34	.04	.00	.00	.00	.01	.01	.07	.45	.06	.02	.00	.17	.93	.67	.28	.00	3.05
(2)	.34	.04	.00	.00	.00	.01	[illegible]	.07	.45	.06	.02	.00	.17	.93	.67	.28	.00	3.05
19-24	2	0	0	0	0	0	0	0	1	0	0	0	0	8	7	0	0	18
(1)	.02	.00	.00	.00	.00	[illegible]	[illegible]	.00	.01	.00	.00	.00	.00	.10	.08	.00	.00	.22
(2)	.02	.00	.00	.00	.00	[illegible]	.00	.00	.01	.00	.00	.00	.00	.10	.08	.00	.00	.22
GT 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
(1)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.01
(2)	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.01
ALL SPEEDS	843	255	152	148	207	252	239	575	732	446	607	502	634	750	764	1144	0	8250
(1)	10.22	3.09	1.84	1.79	2.51	3.05	2.90	6.97	8.87	5.41	7.36	6.08	7.68	9.09	9.26	13.87	.00	100.00
(2)	10.22	3.09	1.84	1.79	2.51	3.05	2.90	6.97	8.87	5.41	7.36	6.08	7.68	9.09	9.26	13.87	.00	100.00

(1)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PAGE
(2)=PERCENT OF ALL GOOD OBSERVATIONS FOR THIS PERIOD
C= CALM (WIND SPEED LESS THAN OR EQUAL TO .95 MPH)

APPENDIX A

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT
Supplemental Information
for 1995

Facility: Vermont Yankee Nuclear Power Station

Licensee: Vermont Yankee Nuclear Power Corporation

1A. TECHNICAL SPECIFICATION LIMITS - DOSE AND DOSE RATE

Technical Specification and Category		Limit
a. Noble Gases		
3.8.E.1	Total body dose rate	500 mrem/yr
3.8.E.1	Skin dose rate	3000 mrem/yr
3.8.F.1	Gamma air dose	5 mrad in a quarter
3.8.F.1	Gamma air dose	10 mrad in a year
3.8.F.1	Beta air dose	10 mrad in a quarter
3.8.F.1	Beta air dose	20 mrad in a year
b. Iodine-131, Iodine-133, Tritium and Radionuclides in Particulate Form With Half-Lives Greater Than 8 Days		
3.8.E.1	Organ dose rate	1500 mrem/yr
3.8.G.1	Organ dose	7.5 mrem in a quarter
3.8.G.1	Organ dose	15 mrem in a year
c. Liquids		
3.8.B.1	Total body dose	1.5 mrem in a quarter
3.8.B.1	Total body dose	3 mrem in a year
3.8.B.1	Organ dose	5 mrem in a quarter
3.8.B.1	Organ dose	10 mrem in a year

APPENDIX A
(Continued)

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

2A. TECHNICAL SPECIFICATION LIMITS - CONCENTRATION

Technical Specification and Category	Limit
a. Noble Gases	No MPC Limits (No ECL Limits)
b. Iodine-131, Iodine-133, Tritium and Radionuclides in Particulate Form With Half-Lives	
Greater Than 8 Days	No MPC Limits (No ECL Limits)
c. Liquids	
3.8.A.1 Total fraction of MPC (ECL) excluding noble gases (10CFR20, Appendix B, Table II, Column 2):	≤1.0
3.8.A.1 Total noble gas concentration:	≤2E-04 µCi/cc

3. AVERAGE ENERGY

Provided below are the average energy ($\bar{E}$) of the radionuclide mixture in releases of fission and activation gases, if applicable.

a. Average gamma energy:	1st Quarter	8.11E-01 MeV/dis
	2nd Quarter	8.31E-01 MeV/dis
	3rd Quarter	8.17E-01 MeV/dis
	4th Quarter	8.18E-01 MeV/dis

b. Average beta energy: Not Applicable

4. MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY

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

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

a. Fission and Activation Gases

Continuous stack monitors monitor the gross Noble Gas radioactivity released from the plant stack. Because release rates are normally below the detection limit of these monitors, periodic grab samples are taken and analyzed for the gaseous isotopes present. These are used to calculate the individual isotopic releases indicated in Table 1B and the totals of Table 1A. The error involved in these steps may be approximately ±100 percent.

b. Iodines

Continuous isokinetic samples are drawn from the plant stack through a particulate filter and charcoal cartridge. The filters and cartridges are normally removed weekly and are analyzed for Iodine-131, 132, 133, 134, and 135. The error involved in these steps may be approximately ±50 percent.

c. Particulates

The particulate filters described in b. above are also counted for particulate radioactivity. The error involved in this sample is also approximately ±50 percent.

d. Waste Oil

Prior to issuing the permit to burn a drum of radioactively contaminated waste oil, one liter of the oil is analyzed by gamma spectroscopy to determine concentrations of radionuclides that meet or exceed the LLD for all of the liquid phase radionuclides listed in Technical Specification Table 4.8.1. Samples that have a visible water layer are not analyzed. The water must first be removed from the drum of oil and resampled.

Monthly, samples from drums that were issued burn permits are sent to the E-Lab for compositing and analysis. The E-Lab analyzes for tritium, alpha, Fe-55, Sr-89, and Sr-90 on the composite sample.

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

The waste oil samples are liquid effluents that end up as a gaseous ground level release.

The composite waste oil sample for March did not meet the required a priori LLDs because the sample volume available for the composite was not adequate to meet the LLDs. The required LLDs and the achieved LLDs are listed below:

	Required a priori LLD	LLD Achieved
Alpha	<1E-07 µCi/ml	<1.40E-06 µCi/ml
H-3	<1E-05 µCi/ml	<2.10E-04 µCi/ml
Fe-55	<1E-06 µCi/ml	<2.00E-05 µCi/ml
Sr-89	<5E-08 µCi/ml	<1.20E-06 µCi/ml
Sr-90	<5E-08 µCi/ml	<9.20E-07 µCi/ml

e. Liquid Effluents

Radioactive liquid effluents released from the facility are continuously monitored. Measurements are also made on a representative sample of each batch of radioactive liquid effluents released. For each batch, station records are retained of the total activity (mCi) released, concentration (µCi/ml) of gross radioactivity, volume (liters), and approximate total quantity of water (liters) used to dilute the liquid effluent prior to release to the Connecticut River.

Each batch of radioactive liquid effluent releases is analyzed for gross gamma and gamma isotopic radioactivity. A monthly proportional composite sample, comprising an aliquot of each batch released during a month, is analyzed for tritium and gross alpha radioactivity. A quarterly proportional composite sample, comprising an aliquot of each batch released during a quarter, is analyzed for Sr-89, Sr-90, and Fe-55.

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT

5. BATCH RELEASES

a. Liquid

There were no routine liquid batch releases during the reporting period.

b. Gaseous

There were no routine gaseous batch releases during the reporting period.

6. ABNORMAL RELEASES

a. Liquid

There were no nonroutine liquid releases during the reporting period.

b. Gaseous

There were no nonroutine gaseous releases during the reporting period.

APPENDIX B

LIQUID HOLDUP TANKS

Requirement: Technical Specification 3.8.D.1 limits the quantity of radioactive material contained in any outside tank. With the quantity of radioactive material in any outside tank exceeding the limits of Technical Specification 3.8.D.1, a description of the events leading to this condition is required in the next Annual Effluent Release Report per Technical Specification 6.7.C.1.

Response: The limits of Technical Specification 3.8.D.1 were not exceeded during this reporting period.

APPENDIX C

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

Requirement: Radioactive liquid effluent monitoring instrumentation channe are required to be operable in accordance with Technical Specification Table 3.9.1. If an inoperable radioactive liqu effluent monitoring instrument is not returned to operable status prior to a release pursuant to Note 4 of Table 3.9.1, an explanation in the next Annual Effluent Release Report of the reason(s) for delay in correcting the inoperability are required per Technical Specification 6.7.C.1.

Response: Since the requirements of Technical Specification Table 3.9.1 governing the operability of radioactive liquid effluent monitoring instrumentation were met for this reporting period, no response is required.

APPENDIX D

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Requirement: Radioactive gaseous effluent monitoring instrumentation channels are required to be operable in accordance with Technical Specification Table 3.9.2. If inoperable gaseous effluent monitoring instrumentation is not returned to operable status within 30 days pursuant to Note 5 of Table 3.9.2, an explanation in the next Annual Effluent Release Report of the reason(s) for the delay in correcting the inoperability is required per Technical Specification 6.7.C.1.

Response: Since the requirements of Technical Specification Table 3.9.2 governing the operability of radioactive gaseous effluent monitoring instrumentation were met for this reporting period, no response is required.

APPENDIX E

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Requirement: The radiological environmental monitoring program is conducted in accordance with Technical Specification 3.9.C. With milk samples no longer available from one or more of the sample locations required by Technical Specification Table 3.9.3, Technical Specification 6.7.C.1 requires the following to be included in the next Annual Effluent Release Report: (1) identify the cause(s) of the sample(s) no longer being available, (2) identify the new location(s) for obtaining available replacement samples and (3) include revised ODCM figure(s) and table(s) reflecting the new location(s).

Response: No changes were needed in the milk sampling locations specified in Technical Specification Table 3.9.3 due to sample unavailability during the reporting period.

APPENDIX F

LAND USE CENSUS

Requirement: A land use census is conducted in accordance with Technical Specification 3.9.D. With a land use census identifying a location(s) which yields at least a 20 percent greater dose or dose commitment than the values currently being calculated in Technical Specification 4.8.G.1, Technical Specification 6.7.C.1 requires the identification of the new location(s) in the next Annual Effluent Release Report.

Response: The Land Use Census was completed in the third quarter of 1995. No locations yielded a 20 percent greater dose or dose commitment than the values currently being calculated in Technical Specification 4.8.G.1.

APPENDIX G

PROCESS CONTROL PROGRAM

Requirement: Technical Specification 6.12.A.1 requires that licensee initiated changes to the Process Control Program (PCP) be submitted to the Commission in the Annual Radioactive Effluent Release Report for the period in which the change(s) was made.

Response: The following changes were made to the Process Control Program (PCP) and issued as Revision 4 during this reporting period.

1. The minimum dewatering time of 24 hours was removed from Section 4.0 and replaced with a reference to OP-2511, Radwaste Cask, Drum and Box Handling. OP-2511 controls the process of dewatering the filter liner based upon the type of liner in use. The procedure ensures that burial site criteria for freestanding water is met.

2. AP-0620, "Chemical Material Use," was added to the list of procedures which implement the PCP because this procedure is referenced in Section 6.0 of the PCP.

APPENDIX H

OFF-SITE DOSE CALCULATION MANUAL

Requirement: Technical Specification 6.13.A.1 requires that licensee initiated changes to the Off-Site ¯ose Calculation Manual (ODCM) be submitted to the Commission in the Annual Radioactive Effluent Release Report for the period in which the change(s) was made effective.

Response: There were two licensee-initiated changes to the Off-Site Dose Calculation Manual during this reporting period.

The major changes included in Revision 18 to the ODCM are:

(1) Page 3-3: A clarification is added that doses calculated by Method II can at times be higher than would be reported using Method I equations based solely on the differences between long-term and short-term dispersion parameters (X/Qs). Method I uses five-year historical average dispersion values for describing the maximum receptor location. Method II calculations typically use quarterly average dispersion values which are determined for periods that are concurrent with the reported time of release. Maximum receptor doses determined using quarterly meteorology may be greater than doses calculated with Method I due to short time period variability of meteorological conditions from the long-term average.

(2) Page 3-51: Administrative corrections are made by restating the direct dose equations for fixed radioactive sources which had been accidentally left out in the last revision to this page.

(3) Pages 4-1, 4-2a, 4-3, and Figure 4-3: The Dominick Farms, REMP location TM-12 and TC-12, is reported by the plant to be no longer available as a sampling location for milk and silage. Since this location had been listed as a non-Technical Specification required sampling station, it was dropped from the REMP without the need for a replacement location.

(4) Pages 5-8 and 5-9: The 1989 Service Water Monitor (SWM) Evaluation provided a methodology for the determination of

the minimum concentration of a mix of potential contaminates that the SWM would need to be able to detect above background in order to ensure that effluent discharges did not exceed the Technical Specification limits on radioactive discharge concentrations. Plant procedures incorporated this methodology that compared a calculated Composite Maximum Permissible Concentration (CMPC) with the SWM detection sensitivity to determine if the monitor could satisfy operability requirements. This change updates the previous minimum requirement that the SWM only need to be set at three times background. It requires that detection capability of the monitor be shown to be adequate to detect the mix of radionuclides that would most likely be the source of any contamination of the service water.

(5) Page 5-13: Editorial changes are made to reflect that a new digital ratemeter readout device has replace the analog ratemeter that was part of the original Plant Stack Gas Activity Monitor Channel.

These changes will not reduce the accuracy or reliability of the dose calculations or setpoint determinations previously approved for use in the ODCM. The reasons are: (a) the new setpoint calculations for the SWM with additional requirements are more restrictive than the original, (b) the other changes did not modify the calculation methods currently employed in the ODCM.

Revision 19 to the ODCM added the Back Tracks Farm (2.3 km south of the plant stack) as a new milk sampling location TM-10 and as a new silage sampling location TC-10. Table 4.1 and Figure 4-2 of the ODCM were revised to indicate the addition of TM-10 and TC-10 to the REMP. The inclusion of the new milk and silage sampling locations to the REMP has no impact on the methods, parameters, or assumptions contained in the ODCM for the calculation of doses or effluent monitor setpoints. Therefore, this change will not reduce the accuracy or reliability of any dose calculations or setpoint determinations previously approved for use in the ODCM.

APPENDIX H
(Continued)

OFF-SITE DOSE CALCULATION MANUAL

The revised pages for Revisions 18 and 19 are attached.

VERMONT YANKEE NUCLEAR POWER STATION

OFF-SITE DOSE CALCULATION MANUAL

REVISION 18

Reviewed: R McCullough 95088 — 7/7/95
Plant Operations Review Committee — Date

Approved: [signature] — 7/7/95
Plant Manager — Date

Approved: [signature] — 7/18/95
Vice President, Operations — Date

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3.0 OFF-SITE DOSE CALCULATION METHODS

Chapter 3 provides the basis for plant procedures required to meet the 10CFR50, Appendix I, ALARA dose objectives, and the 40CFR190 total dose limits to members of the public in unrestricted areas, as stated in the Radiological Effluent Technical Specifications (hereafter called RETS). A simple, conservative method (called Method I) is listed in Tables 1.1-2 to 1.1-7 for each of the requirements of the RETS. Each of the Method I equations is presented, along with their bases in Sections 3.2 through 3.9 and Section 3.11. Appendix A provides example calculations for all Method I dose equations as guidance to their use. In addition, reference is provided to more sophisticated but still conservative methods (called Method II) for use when more accurate results are needed. This chapter provides the methods, data, and reference material with which the operator can calculate the needed doses and dose rates. Setpoint methods for effluent monitor alarms are described in Chapter 5.

Demonstration of compliance with the dose limits of 40CFR190 is considered to be a demonstration of compliance with the 0.1 rem limit of 10CFR20.1301(a)(1) for members of the public in unrestricted areas (Reference 56 FR23374, 3rd column).

selection and definition of critical receptors. The radioisotope specific dose factors in each "Method I" dose equation represent the greatest dose to any organ of any age group accounting for existing or potential pathways of exposure. The critical receptor assumed by "Method I" equations is typically a hypothetical individual whose behavior - in terms of location and intake - results in a dose which is expected to be higher than any real individual. The Method I equations employ five-year historical average atmospheric dispersion factors to define receptors of maximum impact. Method II allows for a more exact dose calculation for real individuals, if necessary, by considering only existing pathways of exposure, or actual concurrent meteorology with the recorded release. Maximum receptor doses determined using quarterly meteorology may be greater than doses calculated with Method I due to short time period variability of meteorological conditions from the long-term average. Quarterly average dispersion values for maximum receptors have been observed to differ from five-year average values by as much as 54%.

$\dot{R}$ is the quantity calculated in the Chapter 3 dose <u>rate</u> equations. It is calculated using the plant's effluent monitoring system reading and an annual average or long-term atmospheric dispersion factor. Dispersion factors based on actual concurrent meteorology during effluent releases can also be used via Method II, if necessary, to demonstrate compliance with off-site dose rate limits.

Each of the methods to calculate dose or dose rate are presented in separate sections of Chapter 3, and are summarized in Tables 1.1-1 to 1.1-7. Each method has two levels of complexity and are called Method I and Method II. Method I is the simplest; generally a linear equation. Method II is a more detailed analysis which allows for use of site-specific factors and variable parameters to be selected to best fit the actual release conditions, within the bounds of the guidance provided.

The plant has both elevated and ground level gaseous release points: the main vent stack (elevated release), and the North Warehouse waste oil burner (ground level release). Therefore, total dose calculations for skin, whole body, and the critical organ from gaseous releases will be the sum of the elevated and ground level doses. Appendix D provides an assessment of the surveillance needs for waste oil to ensure that off-site doses from its incineration is maintained within the ALARA limits of the Technical Specifications.

3.11 Method to Calculate Direct Dose From Plant Operation

Technical Specification 3.8.M.1 restricts the dose to the whole body or any organ to any member of the public from all station sources (including direct radiation from fixed sources on-site) to 25 mrem in a calendar year (except the thyroid, which is limited to 75 mrem)..

3.11.1 Turbine Building

The maximum contribution of direct dose to the whole body or to any organ due to N-16 decay from the turbine is:

$$D_d = K_{N16}(L) \cdot E \qquad (3\text{-}27)$$

$$(\text{mrem}) \quad \frac{(\text{mrem})}{MW_e h} \quad (MW_e h)$$

where:

D_d = The dose contribution from N-16 decay at either the site boundary of maximum impact (west site boundary) or closest off-site residence - (mrem).

E = Gross electric output over the period of interest ($MW_e h$).

$K_{N16}(L)$ = The N-16 dose conversion factor for (L) equal to either: (1) 3.23E-06 for the maximum west site boundary; or (2) 1.29E-06 for the closest residence (mrem/$MW_e h$).

3.11.2 North Warehouse

Radioactive materials and low level waste can be stored in the north warehouse. The maximum annual dose contributions to off-site receptors (west site boundary line) from sources in the shielded (east) end and the unshielded (west) end of the north warehouse are:

$$D_S = 0.25 \times \dot{R}_S \quad \text{for the shielded end} \tag{3-28}$$

$$\left(\frac{mrem}{yr}\right) \quad \left(\frac{mrem/yr}{mrem/hr}\right) \quad \left(\frac{mrem}{hr}\right)$$

(3-29)

and

$$D_U = 0.53 \times \dot{R}_U \quad \text{for the shielded end}$$

$$\left(\frac{mrem}{yr}\right) \quad \left(\frac{mrem/yr}{mrem/hr}\right) \quad \left(\frac{mrem}{hr}\right)$$

where:

D_S = The annual dose contribution at the maximum site boundary location from fixed sources of radiation stored in the shielded east end of the North Warehouse $\left(\frac{mrem}{yr}\right)$.

D_U = The annual dose contribution at the maximum site boundary location from fixed sources of radiation stored in the unshielded west end of the North Warehouse $\left(\frac{mrem}{yr}\right)$.

$\dot{R}_S$ = Dose rate measured at 1 meter from the source in the shielded end of the north warehouse $\left(\frac{mrem}{hr}\right)$.

$\dot{R}_U$ = Dose rate measured at 1 meter from the source in the unshielded end of the north warehouse $\left(\frac{mrem}{hr}\right)$.

0.25 = Dose rate to dose conversion factor which relates mrem/yr at the west site boundary per mrem/hr measured at 1 meter from

Table 4.1

Radiological Environmental Monitoring Stations[1]

Exposure Pathway and/or Sample		Sample Location and Designated Code[2]		Distance (km)[5]	Direction[5]
1. AIRBORNE (Radioiodine and Particulate)					
		AP/CF-11	River Station No. 3.3	1.9	SSE
		AP/CF-12	N. Hinsdale, NH	3.6	NNW
		AP/CF-13	Hinsdale Substation	3.1	E
		AP/CF-14	Northfield, MA	11.3	SSE
		AP/CF-15	Tyler Hill Road[4]	3.2	WNW
		AP/CF-21	Spofford Lake	16.1	NNE
2. WATERBORNE					
a.	Surface	WR-11	River Station No. 3.3	1.9	Downriver
		WR-21	Rt. 9 Bridge	12.8	Upriver
b.	Ground	WG-11	Plant Well	--	On-Site
		WG-12	Vernon Nursing Well	2.0	SSE
		WG-22	Skibniowsky Well	14.3	N
c.	Sediment From Shoreline	SE-11	Shoreline Downriver	0.8	SSE
		SE-12	North Storm Drain Outfall[3]	0.15	E
3. INGESTION					
a.	Milk	TM-11	Miller Farm	0.8	WNW
		TM-14	Brown Farm	2.1	S
		TM-16	Meadow Crest Farm	4.4	WNW/NW
		TM-18	Blodgett Farm[4]	3.4	SE
		TM-24	County Farm	22.5	N
b.	Mixed Grasses	TG-11	River Station No. 3.3	1.9	SSE
		TG-12	N. Hinsdale, NH	3.6	NNW
		TG-13	Hinsdale Substation	3.1	E
		TG-14	Northfield, MA	11.3	SSE
		TG-15	Tyler Hill Rd.[4]	3.2	WNW
		TG-21	Spofford Lake	16.1	NNE

Table 4.1
(Continued)

Radiological Environmental Monitoring Stations[1]

Exposure Pathway and/or Sample	Sample Location and Designated Code[2]		Distance (km)[5]	Direction[5]
c. Silage	TC-11	Miller Farm	0.8	WNW
	TC-14	Brown Farm	2.1	S
	TC-16	Meadow Crest Farm	4.4	WNW/NW
	TC-18	Blodgett Farm[4]	3.4	SE
	TC-24	County Farm	22.5	N
d. Fish	FH-11	Vernon Pond	(6)	(6)
	FH-21	Rt. 9 Bridge	12.8	Upriver
4. DIRECT RADIATION				
	DR-1	River Station No. 3.3	1.6	SSE
	DR-2	N. Hinsdale, NH	3.9	NNW
	DR-3	Hinsdale Substation	3.0	E
	DR-4	Northfield, MA	11.0	SSE
	DR-5	Spofford Lake	16.3	NNE
	DR-6	Vernon School	0.46	WSW
	DR-7	Site Boundary	0.27	W
	DR-8	Site Boundary[7]	0.25	SW
	DR-9	Inner Ring	2.1	N
	DR-10	Outer Ring	4.6	N
	DR-11	Inner Ring	2.0	NNE
	DR-12	Outer Ring	3.6	NNE
	DR-13	Inner Ring	1.4	NE
	DR-14	Outer Ring	4.3	NE
	DR-15	Inner Ring	1.4	ENE
	DR-16	Outer Ring	2.9	ENE
	DR-17	Inner Ring	1.2	E
	DR-18	Outer Ring	3.0	E
	DR-19	Inner Ring	3.5	ESE
	DR-20	Outer Ring	5.3	ESE
	DR-21	Inner Ring	1.8	SE
	DR-22	Outer Ring	3.2	SE
	DR-23	Inner Ring	1.8	SSE
	DR-24	Outer Ring	3.9	SSE
	DR-25	Inner Ring	2.0	S

Table 4.1
(Continued)

Radiological Environmental Monitoring Stations[1]

Exposure Pathway and/or Sample	Sample Location and Designated Code[2]		Distance (km)[5]	Direction[5]
	DR-26	Outer Ring	3.7	S
	DR-27	Inner Ring	1.0	SSW
	DR-28	Outer Ring	2.2	SSW
	DR-29	Inner Ring	0.7	WSW
	DR-30	Outer Ring	2.3	SW
	DR-31	Inner Ring	0.8	W
	DR-32	Outer Ring	5.0	WSW
	DR-33	Inner Ring	0.9	WNW
	DR-34	Outer Ring	4.9	W
	DR-35	Inner Ring	1.4	WNW
	DR-36	Outer Ring	4.7	WNW
	DR-37	Inner Ring	3.0	NW
	DR-38	Outer Ring	7.7	NW
	DR-39	Inner Ring	3.2	NNW
	DR-40	Outer Ring	5.8	NNW

---

(1) Sample locations are shown on Figures 4.1 to 4.6.

(2) Station Nos. 10 through 19 are indicator stations. Station Nos. 20 through 29 are control stations (for all but the direct radiation stations).

(3) To be sampled and analyzed semiannually.

(4) Non-Tech Spec station.

(5) Distance and direction from the center of the Turbine Building for direct radiation monitors; from the plant stack for all others.

(6) Fish samples are collected from anywhere in Vernon Pond, which is adjacent to the plant (see Figure 4-1).

(7) DR-8 satisfies Technical Specification Table 3.9.3 for an inner ring direct radiation monitoring location. However, it is averaged as a Site Boundary TLD due to its close proximity to the plant.

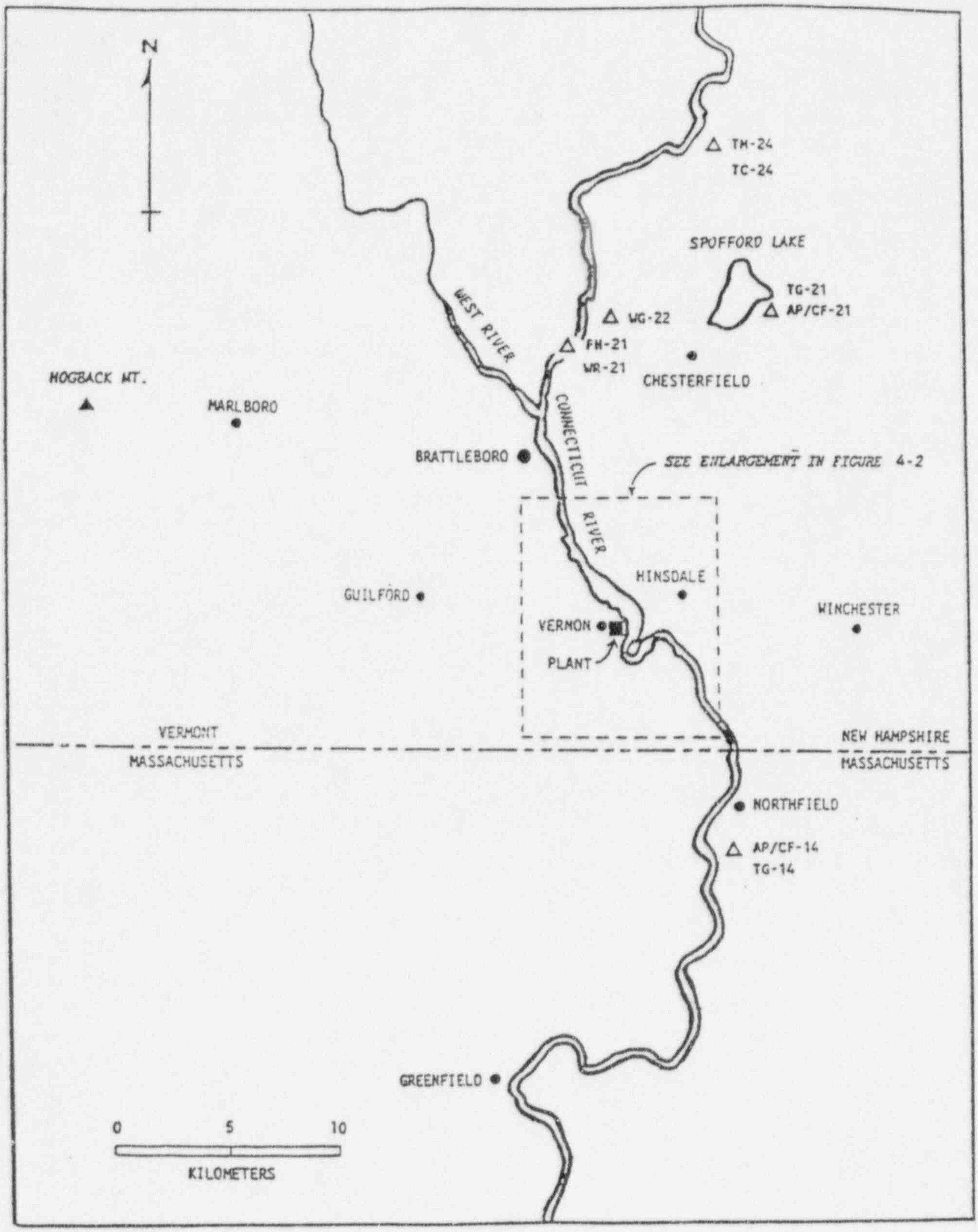

Figure 4-3 Environmental Sampling Locations Greater than 5 km from Plant

Revision 18 Date 07/20/95

5.1 Liquid Effluent Instrumentation Setpoints

Technical Specification 3.9.A.1 requires that the radioactive liquid effluent instrumentation in Table 3.9.1 of the Technical Specifications have alarm setpoints in order to ensure that Specification 3.8.A.1 is not exceeded. Specification 3.8.A.1 limits the activity concentration at any time in liquid effluents to the appropriate effluent concentration values in Appendix B, Table 2, Column 2 of 10CFR20, and a total noble gas concentration limit of 2E-04 μCi/ml.

5.1.1 Liquid Radwaste Discharge Monitor (RM-17-350)

The sample tank pathways shown on Figure 6-1 are monitored by the liquid radwaste discharge monitor (RM-17-350). Periodic batch releases may be made from the waste sample tanks, detergent waste tank or floor drain sample tank.

5.1.1.1 Method to Determine the Setpoint of the Liquid Radwaste Discharge Monitor (RM-17-350)

The instrument response (in counts per second) for the limiting concentration at the point of discharge is the setpoint, denoted $R_{setpoint}$, and is determined as follows:

$$R_{setpoint} = \frac{DF}{DF_{min}} \quad S_1 \quad \sum_i \quad C_{mi} \qquad (5\text{-}1)$$

$$(cps) \qquad (\#) \qquad \left(\frac{cps\text{-}ml}{\mu Ci}\right) \qquad \left(\frac{\mu Ci}{ml}\right)$$

Where:

DF = $\frac{F_d}{F_m}$ = Dilution factor (as a conservative measure, a DF of at least 1000 is used) (dimensionless). (5-2)

F_m = Flow rate past monitor (gpm)

F_d = Flow rate out of discharge canal (gpm)

DF_{min} = Minimum allowable dilution factor (dimensionless)

$$= \sum_i \frac{C_{mi}}{ECL_i} \qquad (5\text{-}3)$$

Usually F_d/F_m is greater than DF_{min} (i.e., there is more dilution than necessary to comply with Equation 5-7). The response of the liquid radwaste discharge monitor at the setpoint is therefore:

$$R_{setpoint} = \frac{DF}{DF_{min}} S_1 \sum_i C_{mi} \qquad (5\text{-}1)$$

$$(cps) \quad (\#) \quad \left(\frac{cps\text{-}ml}{\mu Ci}\right) \quad \left(\frac{\mu Ci}{ml}\right)$$

5.1.2 Service Water Discharge Monitor (RM-17-351)

The service water pathway shown on Figure 6-1 is continuously monitored by the service water discharge monitor (RM-17-351). The water in this line is not radioactive under normal operating conditions. The alarm setpoint on the Service Water Monitor (SWM) is set in accordance with the monitor's ability to detect dilute concentrations of radionuclide mixes that are based on measured nuclide distributions in reactor coolant. From routine coolant sample gamma isotopic analyses, a Composite Maximum Permissible Concentration (CMPC) is calculated as follows:

$$C(f_1/MPC_1 + f_2/MPC_2 \ldots) = C/CMPC$$

or

$$CMPC = 1/(f_1/MPC_1 + f_2/MPC_2 \ldots) \qquad (5\text{-}22)$$

where:

C = Total concentration of detected radioactivity in reactor coolant sample (µCi/ml)

f_i = Fraction of total radionuclide concentration represented by the ith radionuclide in the mix

MPC_i = Maximum Permissible Concentration limit for radionuclide "i" as listed in 10CFR20.106, Appendix B, Table II, Column 2 (µCi/ml)

The Composite Effluent Concentration Limit (CECL) is also calculated using the equation above by substituting the appropriate ECL value from 10CFR20.1001-20.2401, Appendix B, Table 2, Column 2, for MPC.

If the SWM's minimum achievable alarm setpoint is higher than the required CMPC equivalent count rate (or the CECL equivalent count rate if it is lower than the CMPC count rate), the monitor is declared inoperable, and daily SWM grab samples are collected and analyzed until the calculated coolant CMPC (or CECL) equivalent count rate is above the SWM's alarm setpoint.

For example, if the reactor coolant radionuclide mix distribution is as listed below, then the corresponding CMPC is calculated as follows:

Nuclides	Conc (µCi/ml)	f_i ($conc_i$/total conc)	10CFR20 MPC_i (µCi/ml)	f_i/MPC_i (ml/µCi)
I-131	6.00E-6	6.59E-2	3.0E-7	2.20E+5
I-133	5.00E-6	5.49E-2	1.0E-6	5.49E+4
Co-60	8.00E-5	8.79E-1	3.0E-5	2.93E+4
Totals	9.10E-5	1.00		3.04E+5

CMPC = 1/3.04E+5 = 3.29E-6 (µCi/ml)

The CECL is also calculated by using the above methodology and substituting the appropriate ECL listed in 10CFR20.1001-20.2401, Appendix B, Table 2, Column 2, for MPC values. For this example, the calculated CECL is equal to 2.73E-6 µCi/ml.)

If the SWM alarm is set at 5 CPS (300 CPM) above background, and the current calibration factor for this monitor is 1.17E+8 CPM/µCi/ml, then the SWM will alarm if a concentration as low as 2.56E-6 µCi/ml above background passes by the monitor. Since the most limiting CMPC or CECL (calculated above to be 2.73E-6 µCi/ml) is above the alarm setpoint (equal to 2.56E-6 µCi/ml), the SWM will be capable of alarming if radioactivity in excess of limiting concentration values for release to unrestricted areas passes by the monitor. However, if the composite concentration (CMPC or CECL) for the service water was found to be less than the SWM alarm setpoint of 2.56E-6 µCi/ml, then daily service water grab samples would have to be collected and analyzed until the composite concentration becomes greater than the concentration corresponding to the SWM's alarm setpoint.

Also, service water is sampled if the monitor is out of service or if the alarm sounds.

Under normal operating conditions, the concentration of radionuclides at the point of discharge to an unrestricted area from the service water effluent pathway will not exceed the effluent concentration limits specified in 10CFR20.1001-20.2401, Appendix B, Table 2, Column 2.

5.2 Gaseous Effluent Instrumentation Setpoints

Technical Specification 3.9.B.1 requires that the radioactive gaseous effluent instrumentation in Table 3.9.2 of the Technical Specifications have their alarm setpoints set to insure that Technical Specifications 3.8.E.1 and 3.8.K.1 are not exceeded. Technical Specification 3.8.K.1 limits the gross radioactivity release rate at the steam jet air ejector (SJAE) to 0.16 Ci/sec.

5.2.1 Plant Stack Noble Gas Activity Monitors (RM-17-156 and RM-17-157) and Augmented Off-Gas System Noble Gas Activity Monitors (RAN-OG-3127 and RAN-OG-3128)

The plant stack and AOG noble gas activity monitors are shown on Figure 6-2.

5.2.1.1 Method to Determine the Setpoint of the Plant Stack Noble Gas Activity Monitors (RM-17-156 and RM-17-157) and the Augmented Off-Gas System Noble Gas Activity Monitors (RAN-OG-3127 and RAN-OG-3128)

The setpoints of the plant stack and AOG system noble gas activity monitors are determined in the same manner. The plant stack or AOG system noble gas activity monitor response in counts per minute at the limiting off-site noble gas dose rate to the total body or to the skin is the setpoint, denoted R_{spt}. R_{spt} is the lesser of:

$$R_{spt}^{tb} = 818 \quad S_g \quad \frac{1}{F} \quad \frac{1}{DFB_c} \qquad (5\text{-}9)$$

$$(\text{cpm}) \quad \left(\frac{\text{mrem-}\mu\text{Ci-m}^3}{\text{yr-pCi-sec}}\right) \left(\frac{\text{cpm-cm}^3}{\mu\text{Ci}}\right) \left(\frac{\text{sec}}{\text{cm}^3}\right) \left(\frac{\text{pCi-yr}}{\text{mrem-m}^3}\right)$$

and:

$$R_{spt}^{skin} = 3{,}000 \quad S_g \quad \frac{1}{F} \quad \frac{1}{DF'_c} \qquad (5\text{-}10)$$

$$(\text{cpm}) \quad \left(\frac{\text{mrem}}{\text{yr}}\right) \left(\frac{\text{cpm-cm}^3}{\mu\text{Ci}}\right) \left(\frac{\text{sec}}{\text{cm}^3}\right) \left(\frac{\mu\text{Ci-yr}}{\text{mrem-sec}}\right)$$

where:

R_{spt}^{tb} = Response of the monitor at the limiting total body dose rate (cpm)

818 = $\frac{500}{(1E+06)\ (6.11E-07)}$ $(\frac{mrem\text{-}\mu Ci\text{-}m^3}{yr\text{-}pCi\text{-}sec})$

500 = Limiting total body dose rate (mrem/yr)

1E+06 = Number of pCi per µCi (pCi/µCi)

6.11E-07 = $[X/Q]^{\gamma}$, maximum five-year average gamma atmospheric dispersion factor (sec/m^3)

S_g = Appropriate (plant stack or AOG system) detector counting efficiency from the most recent calibration (cpm/(µCi/cc))

F = Appropriate (plant stack or AOG system) flow rate (cm^3/sec)

DFB_c = Composite total body dose factor (mrem-m^3/pCi-yr)

$$= \frac{\sum_i \dot{Q}_i DFB_i}{\sum_i \dot{Q}_i} \qquad (5\text{-}11)$$

$\dot{Q}_i$ = The relative release rate of noble gas "i" in the mixture at the monitor (either the stack, $\dot{Q}^{ST}$ or the AOG, $\dot{Q}^{AOG}$) for noble gases identified (µCi/sec)

DFB_i = Total body dose factor (see Table 1.1-10) (mrem-m^3/pCi-yr)

R_{spt}^{skin} = Response of the monitor at the limiting skin dose rate (cpm)

3,000 = Limiting skin dose rate (mrem/yr)

DF'_c = Composite skin dose factor (mrem-sec/µCi-yr)

$$= \frac{\sum_i \dot{Q}_i DF'_{is}}{\sum_i \dot{Q}_i} \qquad (5\text{-}12)$$

DF'_{is} = Combined skin dose factor (see Table 1.1-10) (mrem-sec/µCi-yr)

5.2.1.2 <u>Plant Stack Noble Gas Activity Monitor Setpoint Example</u>

The following setpoint example for the plant stack noble gas activity monitors demonstrates the use of Equations 5-9 and 5-10 for determining setpoints.

The plant stack noble gas activity monitors, referred to as "Stack Gas I" (RM-17-156) and "Stack Gas II" (RM-17-157), consist of beta sensitive scintillation detectors, electronics, a ratemeter readout, and a digital scaler which counts the detector output pulses. A strip chart recorder provides a permanent record of the ratemeter output. The monitors have typical calibration factors, S_g, of about 1E+08 cpm per µCi/cc of noble gas. The nominal plant stack flow is 8.3E+07 cc/sec ((175,000 cfm x 28,300 cc/ft^3)/60 sec/min).

When monitor responses indicate that activity levels are below the LLDs at the stack (or AOG) monitors, the relative contribution of each noble gas radionuclide can conservatively be approximated by analysis of a sample of off-gas obtained during plant operations at the steam jet air ejector (SJAE). This setpoint example is based on the following data (see Table 1.1-10 for DFB_i and DF'_i):

i	$\dot{Q}_i^{SJAE}$ $(\frac{\mu Ci}{sec})$	DFB_i $(\frac{mrem\text{-}m^3}{pCi\text{-}yr})$	DF'_{is} $(\frac{mrem\text{-}sec}{\mu Ci\text{-}yr})$
Xe-138	1.03E+04	8.83E-03	1.06E-02
Kr-87	4.73E+02	5.92E-03	1.43E-02
Kr-88	2.57E+02	1.47E-02	1.28E-02
Kr-85m	1.20E+02	1.17E-03	2.35E-03
Xe-135	3.70E+02	1.81E-03	3.24E-03
Xe-133	1.97E+01	2.94E-04	5.58E-04

$$DFB_c = \frac{\sum_i \dot{Q}_i^{SJAE} DFB_i}{\sum_i \dot{Q}_i^{SJAE}} \qquad (5\text{-}11)$$

$$\sum_i \dot{Q}_i^{SJAE} DFB_i = (1.03E+04)(8.83E-03) + (4.73E-02)(5.92E-03)$$

$$+ (2.57E+02)(1.47E-02) + (1.20E+02)(1.17E-03)$$

$$+ (3.70E+02)(1.81E-03) + (1.97E+01)(2.94E-04)$$

$$= 9.83E+01 \ (\mu Ci\text{-}mrem\text{-}m^3/sec\text{-}pCi\text{-}yr)$$

$$\sum_i \dot{Q}_i^{SJAE} = 1.03E+04 + 4.73E+02 + 2.57E+02$$

$$+ 1.20E+02 + 3.70E+02 + 1.97E+01$$

$$= 1.15E+04 \ \mu Ci/sec$$

$$DFB_c = \frac{9.83E+01}{1.15E+04}$$

$$= 8.52E-03 \ (mrem\text{-}m^3/pCi\text{-}yr)$$

$$R_{spt}^{tb} = 818 \ S_g \frac{1}{F} \frac{1}{DFB_c}$$

$$= (818)(1E+08) \frac{1}{(8.3E+07)} \frac{1}{(8.52E-03)}$$

$$= 115{,}674 \ cpm$$

Next:

$$DF'_c = \frac{\sum_i \dot{Q}_i^{SJAE} DF'_{is}}{\sum_i \dot{Q}_i^{SJAE}} \qquad (5\text{-}11)$$

$$\sum_i \hat{Q}_i^{SJAE} DF'_{is} = (1.03E{+}04)(1.06E{-}02) + (4.73E{-}02)(1.43E{-}02)$$

$$+ (2.57E{+}02)(1.28E{-}02) + (1.20E{+}02)(2.35E{-}03)$$

$$+ (3.70E{+}02)(3.24E{-}03) + (1.97E{+}01)(5.58E{-}04)$$

$$= 1.14E{+}02 \ (\mu Ci\text{-}mrem\text{-}sec/sec\text{-}\mu Ci\text{-}yr)$$

$$DF'_c = \frac{1.14E{+}02}{1.15E{+}04}$$

$$= 9.91E{-}03 \quad (mrem\text{-}sec/\mu Ci\text{-}yr)$$

$$R_{skin}^{spt} = 3{,}000\ S_g \frac{1}{F} \frac{1}{DF'_c}$$

$$= (3{,}000)\ (1E{+}08)\ \frac{1}{(8.3E{+}07)} \frac{1}{(9.91E{-}03)}$$

$$= 364{,}728 \text{ cpm}$$

The setpoint, R_{spt}, is the lesser of R_{spt}^{tb} and R_{spt}^{skin}. For the noble gas mixture in this example R_{spt}^{tb} is less than R_{spt}^{skin}, indicating that the total body dose rate is more restrictive. Therefore, in this example the "Stack Gas I" and "Stack Gas II" noble gas activity monitors should each be set at 115,674 cpm above background or at some conservative value below this (such as that which might be based on controlling release rates from the plant in order to maintain off-site air concentrations below 20 x ECL when averaged over an hour), or to account for other minor releases from the waste oil burner. For example, if an administrative limit of 70 percent of the Technical Specification whole body dose limit 500 rem/yr (115,674 cpm) is chosen, then the noble gas monitor alarms should be set at no more than 80,972 cpm above background (0.7 x 115,674 = 80,972).

5.2.1.3 Basis for the Plant Stack and AOG System Noble Gas Activity Monitor Setpoints

The setpoints of the plant stack and AOG system noble gas activity monitors must ensure that Technical Specification 3.8.E.1.a is not exceeded. Sections 3.4 and 3.5 show that Equations 3-5 and 3-7 are acceptable methods for determining compliance with that Technical Specification. Which equation (i.e., dose to total body or skin) is more limiting depends on the noble gas mixture. Therefore, each equation must be considered separately. The

derivations of Equations 5-9 and 5-10 begin with the general equation for the response R of a radiation monitor:

$$R = \sum_i S_{gi} \quad C_{mi} \tag{5-13}$$

$$(cpm) \quad \left(\frac{cpm\text{-}cm^3}{\mu Ci}\right)\left(\frac{\mu Ci}{cm^3}\right)$$

where:

R = Response of the instrument (cpm)

S_{gi} = Detector counting efficiency for noble gas "i" (cpm/(μCi/cm^3))

C_{mi}' = Activity concentration of noble gas "i" in the mixture at the noble gas activity monitor (μCi/cm^3)

The relative release rate of each noble gas, $\dot{Q}_i$ (μCi/sec), in the total release rate is normally determined by analysis of a sample of off-gas obtained at the Steam Jet Air Ejector (SJAE). Noble gas release rates at the plant stack and the AOG discharge are usually so low that the activity concentration is below the Lower Limit of Detection (LLD) for sample analysis. As a result, the release rate mix ratios measured at the SJAE are used to represent any radioactivity being discharged from the stack, such as may have resulted from plant steam leaks that have been collected by building ventilation. For the AOG monitor downstream of the charcoal delay beds, this leads to a conservative setpoint since several short-lived (high dose factor) noble gas radionuclides are then assumed to be present at the monitor, which in reality, would not be expected to be present in the system at that point. During periods when the plant is shutdown (after five days), and no radioactivity release rates can be measured at the SJAE, Xe-133 is the dominant long-lived noble gas and may be used as the referenced radionuclide to determine off-site dose rates and monitor setpoints. Alternately, a relative radionuclide, "i", mix fraction, (f_i), may be taken from Table 5.2-1 as a function of time after shutdown (including periods shorter than five days) to determine the relative fraction of each noble gas potentially available for release to the total. However, prior to plant startup before a SJAE sample can be taken and analyzed, the monitor alarm setpoints should be based on Xe-138 as representing the most prevalent high dose factor noble gas expected to be present shortly after the plant returns to power. Monitor alarm setpoints which have been determined to be conservative under any plant conditions may be utilized at any time in lieu of the above assumptions. C_{mi}, the activity concentration of noble gas "i" at the noble gas activity

monitor, may be expressed in terms of $\dot{Q}_i$ by dividing by F, the appropriate flow rate. In the case of the plant stack noble gas activity monitors the appropriate flow rate is the plant stack flow rate and for the AOG noble gas activity monitors the appropriate flow rate is the AOG system flow rate.

$$C_{mi} = \dot{Q}_i \quad \frac{1}{F} \qquad (5\text{-}14)$$

$$\left(\frac{\mu Ci}{cm^3}\right) \left(\frac{\mu Ci}{sec}\right) \left(\frac{sec}{cm^3}\right)$$

where:

$\dot{Q}_i$ = The release rate of noble gas "i" in the mixture for each noble gas identified (μCi/sec).

F = Appropriate flow rate (cm^3/sec)

Substituting the right half of Equation 5-14 into Equation 5-13 for C_{mi} yields:

$$R = \sum_i S_{gi} \quad \dot{Q}_i \quad \frac{1}{F} \qquad (5\text{-}15)$$

$$(cpm) \quad \left(\frac{cpm\text{-}cm^3}{\mu Ci}\right) \left(\frac{\mu Ci}{sec}\right) \left(\frac{sec}{cm^3}\right)$$

The detector calibration procedure establishes a counting efficiency for a given mix of nuclides seen by the detector. Therefore, in Equation 5-15 one may substitute S_g for S_{gi}, where S_g represents the counting efficiency determined for the current mix of nuclides. If the mix of nuclides changes significantly, a new counting efficiency should be determined for calculating the setpoint.

$$R = S_g \quad \frac{1}{F} \sum_i \dot{Q}_i \qquad (5\text{-}16)$$

$$(cpm) \left(\frac{cpm\text{-}cm^3}{\mu Ci}\right) \left(\frac{sec}{cm^3}\right) \left(\frac{\mu Ci}{sec}\right)$$

The total body dose rate due to noble gases is determined with Equation 3-5:

$$\dot{R}_{tbs} = 0.61 \sum_i \dot{Q}_i \; DFB_i \qquad (3\text{-}5)$$

$$\left(\frac{mrem}{yr}\right) \left(\frac{pCi\text{-}sec}{\mu Ci\text{-}m^3}\right) \left(\frac{\mu Ci}{sec}\right) \left(\frac{mrem\text{-}m^3}{pCi\text{-}yr}\right)$$

Where:

$\dot{R}_{tbs}$	=	total body dose rate (mrem/yr) due to noble gases from stack release
0.61	=	(1.0E+06) x (6.11E-07) ($pCi\text{-}sec/\mu Ci\text{-}m^3$)
1E + 06	=	number of pCi per μCi (pCi/μCi)
6.11E - 07	=	$[X/Q]^{\gamma}$, maximum long term average gamma atmospheric dispersion factor (sec/m^3)
$\dot{Q}_i$	=	the release rate of noble gas "i" in the mixture for each noble gas identified (μCi/sec) (Equivalent to $\dot{Q}_i^{ST}$ for noble gases released at the plant stack.)
DFB_i	=	total body dose factor (see Table 1.1-10) ($mrem\text{-}m^3/pCi\text{-}yr$)

A composite total body gamma dose factor, DFB_c, may be defined such that:

$$DFB_c \sum_i \dot{Q}_i = \sum_i \dot{Q}_i \; DFB_i \qquad (5\text{-}17)$$

$$\left(\frac{mrem\text{-}m^3}{pCi\text{-}yr}\right) \left(\frac{\mu Ci}{sec}\right) \quad \left(\frac{\mu Ci}{sec}\right) \left(\frac{mrem\text{-}m^3}{pCi\text{-}yr}\right)$$

Solving Equation 5-23 for DFB_c yields:

$$DFB_c = \frac{\sum_i \dot{Q}_i \, DFB_i}{\sum_i \dot{Q}_i} \qquad (5\text{-}11)$$

Technical Specification 3.8.E.1.a limits the dose rate to the total body from noble gases at any location at or beyond the site boundary to 500 mrem/yr. By setting $\dot{R}_{tb}$ equal to 500 mrem/yr and substituting DFB_c for DFB_i in Equation 3-5, one may solve for $\sum_i \dot{Q}_i$ at the limiting whole body noble gas dose rate:

$$\sum_i \dot{Q}_i = 818 \quad \frac{1}{DFB_c} \qquad (5\text{-}18)$$

$$\left(\frac{\mu Ci}{sec}\right) \quad \left(\frac{mrem\text{-}\mu Ci\text{-}m^3}{yr\text{-}pCi\text{-}sec}\right) \quad \left(\frac{pCi\text{-}yr}{mrem\text{-}m^3}\right)$$

Substituting this result for $\sum_i \dot{Q}_i$ in Equation 5-16 yields R_{spt}^{tb}, the response of the monitor at the limiting noble gas total body dose rate:

$$R_{spt}^{tb} = 818 \quad S_g \quad \frac{1}{F} \quad \frac{1}{DFB_c} \qquad (5\text{-}9)$$

$$(cpm) \quad \left(\frac{mrem\text{-}\mu Ci\text{-}m^3}{yr\text{-}pCi\text{-}sec}\right) \left(\frac{cpm\text{-}cm^3}{\mu Ci}\right) \quad \left(\frac{sec}{cm^3}\right) \quad \left(\frac{pCi\text{-}yr}{mrem\text{-}m^3}\right)$$

The skin dose rate due to noble gases is determined with Equation 3-7:

$$\dot{R}_{spt}^{skin} = \sum_i \quad \dot{Q}_i \quad DF'_{is} \qquad (3\text{-}7)$$

$$\left(\frac{mrem}{yr}\right) \quad \left(\frac{\mu Ci}{sec}\right) \left(\frac{mrem\text{-}sec}{\mu Ci\text{-}yr}\right)$$

Where:

$\dot{R}_{spt}^{skin}$ = Skin dose rate (mrem/yr)

$\dot{Q}_i$ = The release rate of noble gas "i" in the mixture for each noble gas identified (μCi/sec)

(equivalent to $\dot{Q}_i^{ST}$ for noble gases released at the plant stack).

DF'_{is} = Combined skin dose factor (see Table 1.1-10) (mrem-sec/μCi-yr).

A composite combined skin dose factor, DF'_c, may be defined such that:

$$DF'_c \sum_i \dot{Q}_i = \sum_i \dot{Q}_i \quad DF'_{is} \qquad (5\text{-}19)$$

$$\left(\frac{\text{mrem-sec}}{\mu\text{Ci-yr}}\right) \quad \left(\frac{\mu\text{Ci}}{\text{sec}}\right) \qquad \left(\frac{\mu\text{Ci}}{\text{sec}}\right)\left(\frac{\text{mrem-sec}}{\mu\text{Ci-yr}}\right)$$

Solving Equation 5-19 for DF′ yields:

$$DF'_c = \frac{\sum_i \dot{Q}_i \, DF'_{is}}{\sum_i \dot{Q}_i}$$

Technical Specification 3.8.E.1.a limits the dose rate to the skin from noble gases at any location at or beyond the site boundary to 3,000 mrem/yr. By setting $\dot{R}^{skin}$ equal to 3,000 mrem/yr and substituting DF'_c for DF'_i in Equation 3-7 one may solve for $\sum_i \dot{Q}_i$ at the limiting skin noble gas dose rate:

$$\sum_i \dot{Q}_i = 3{,}000 \quad \frac{1}{DF'_c}$$

$$\left(\frac{\mu\text{Ci}}{\text{sec}}\right) \quad \left(\frac{\text{mrem}}{\text{yr}}\right) \quad \left(\frac{\mu\text{Ci-yr}}{\text{mrem-sec}}\right)$$

Substituting this result for $\sum_i \dot{Q}_i$ in Equation 5-16 yields R_{spt}^{skin}, the response of the monitor at the limiting noble gas skin dose rate:

$$R_{spt}^{skin} = 3{,}000 \quad S_g \quad \frac{1}{F} \quad \frac{1}{DF'_c} \qquad (5\text{-}10)$$

$$(cpm) \quad (\frac{mrem}{yr}) \; (\frac{cpm\text{-}cm^3}{\mu Ci}) \; (\frac{sec}{cm^3}) \; (\frac{\mu Ci\text{-}yr}{mrem\text{-}sec})$$

TABLE 5.2-1

Relative Fractions of Core Inventory
Noble Gases After Shutdown

Time	Kr-83m	Kr-85m	Kr-85	Kr-87	Kr-88	Xe-131m	Xe-133m	Xe-133	Xe-135m	Xe-135	Xe-138
t < 24 h	.02	.043	.001	.083	.118	.002	.010	.306	.061	.093	.263
24 hr ≤ t < 48 h	---	.003	.004	---	.001	.004	.022	.758	.010	.198	---
48 h ≤ t < 5 d	---	---	.005	---	---	.006	.024	.907	.001	.058	---
5 d ≤ t < 10 d	---	---	.007	---	---	.008	.016	.969	---	---	---
10 d ≤ t < 15 d	---	---	.014	---	---	.014	.006	.966	---	---	---
15 ≤ t < 20 d	---	---	.026	---	---	.022	.002	.950	---	---	---
20 ≤ t < 30 d	---	---	.048	---	---	.034	.001	.917	---	---	---
30 ≤ t < 40 d	---	---	.152	---	---	.070	---	.777	---	---	---
40 ≤ t < 50 d	---	---	.378	---	---	.105	---	.517	---	---	---
50 ≤ t < 60 d	---	---	.652	---	---	.108	---	.240	---	---	---
60 ≤ t < 70 d	---	---	.835	---	---	.083	---	.082	---	---	---
t ≥ 70 d	---	---	.920	---	---	.055	---	.024	---	---	---

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5.2.2 Steam Jet Air Ejector (SJAE) Noble Gas Activity Monitors (RM-17-150A and RM-17-150B)

The SJAE noble gas activity monitors are shown in Figure 6-2.

5.2.2.1 Method to Determine the Setpoints of the Steam Jet Air Ejector Offgas Activity Monitors (RM-17-150A and RM-17-150B)

The SJAE noble gas activity monitor response in mR/hr at the limiting release rate is the setpoint, denoted R_{spt}^{SJAE}, and is determined as follows:

$$R_{spt}^{SJAE} = 1.6E{+}05 \quad S_g \quad \frac{1}{F} \qquad (5\text{-}21)$$

$$(mR/hr) \quad \left(\frac{\mu Ci}{sec}\right) \quad \left(\frac{mR\text{-}cc}{hr\text{-}\mu Ci}\right) \quad \left(\frac{sec}{cc}\right)$$

Where:

R_{spt}^{SJAE}	=	Response of the monitor at the limiting release rate (mR/hr)
1.6E+05	=	Limiting release rate for the SJAE specified in Technical Specification 3.8.K.1 (μCi/sec)
S_g	=	Detector counting efficiency from the most recent calibration ((mR/hr)/(μCi/cc))
F	=	SJAE gaseous discharge flow (cc/sec)

5.2.2.2 Basis for the SJAE Noble Gas Activity Monitor Setpoint

The SJAE noble gas activity monitor setpoint must ensure that Technical Specification 3.8.K.1 is not exceeded. The derivation of Equation 5-21 is straightforward. Simply taking Equation 5-16 and substituting the limiting release rate at the SJAE for $\dot{Q}$ yields Equation 5-21, the setpoint equation for the SJAE noble gas activity monitor.

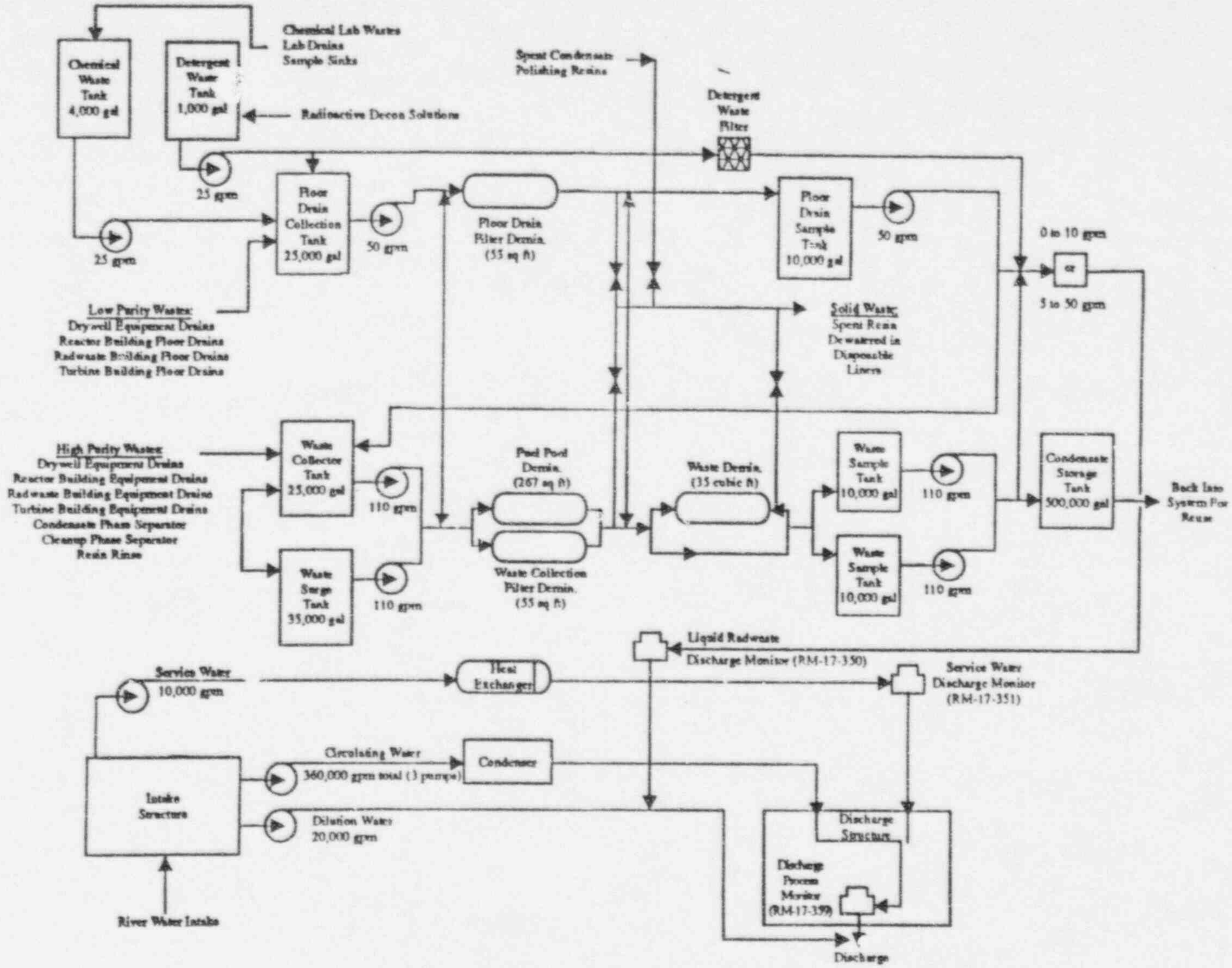

FIGURE 6-1: Radioactive Liquid Effluent Streams, Radiation Monitors, and Radwaste Treatment System at Vermont Yankee*

*Normal (design) radioactive process streams only are shown.

CNTRLDOC\WYODCM\NEWFIGS

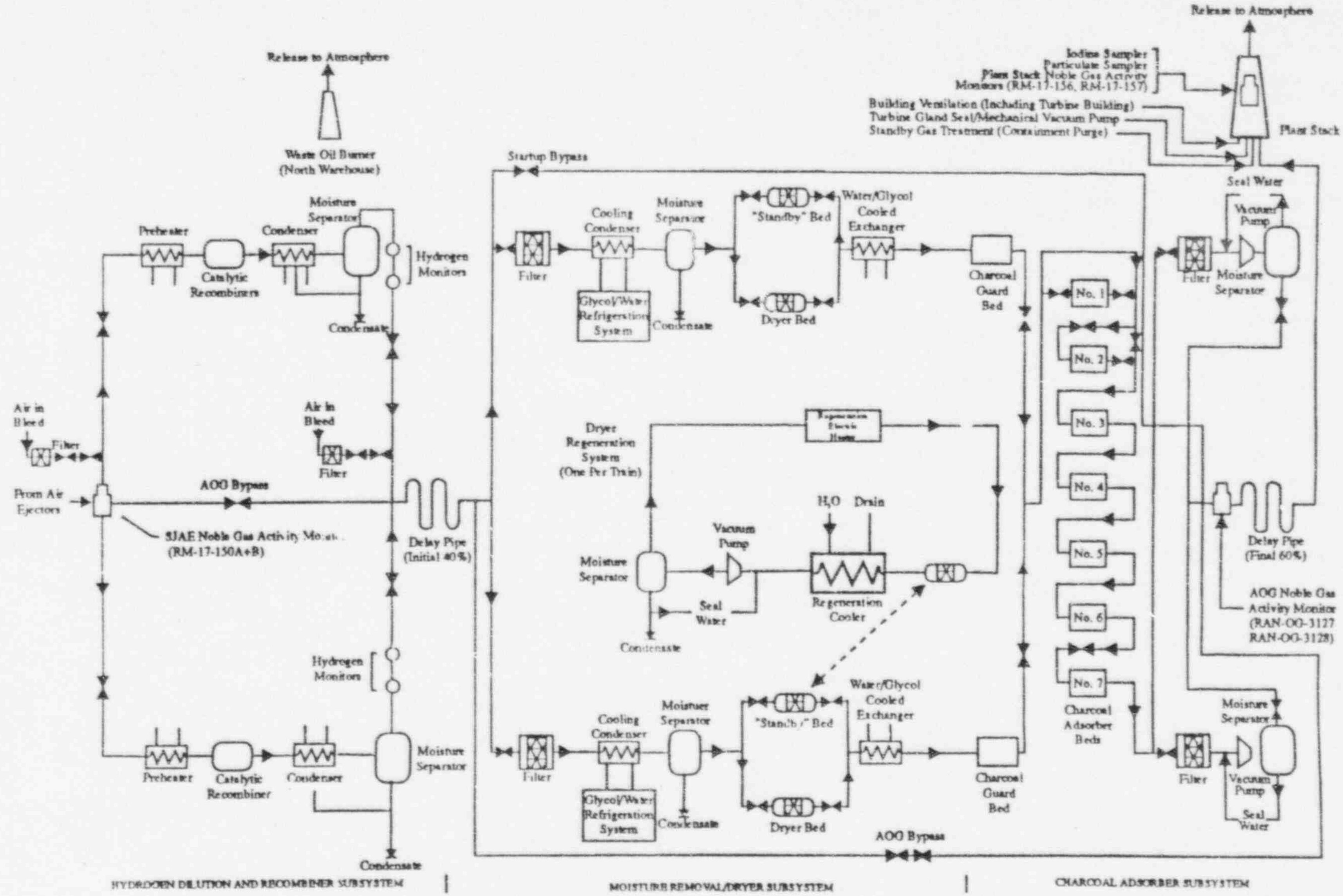

FIGURE 6-2: Radioactive Gaseous Effluent Streams, Radiation Monitors, and Radwaste Treatment System at Vermont Yankee*

*Normal (design) radioactive process streams only are shown.

CNTRLDOC\WYODCM\NEWFIGS

VERMONT YANKEE NUCLEAR POWER STATION

OFF-SITE DOSE CALCULATION MANUAL

REVISION 19

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Plant Operations Review Committee — Date

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Plant Manager — Date

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4-2	19	11/01/95
4-2a	19	11/01/95
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4-5	19	11/01/95
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1.0 INTRODUCTION

This ODCM (Off-Site Dose Calculation Manual) provides formal and approved methods for the calculation of off-site concentration, off-site doses, and effluent monitor setpoints in order to comply with the Vermont Yankee Technical Specifications 3.8/4.8 and 3.9/4.9, hereafter referred to as the Radiological Effluent Technical Specifications. The ODCM forms the basis for plant procedures and is designed for use by the procedure writer. In addition, the ODCM will be useful to the writer of periodic reports required by the NRC on the dose consequences of plant operation. The dose methods contained herein follow accepted NRC guidance for calculation of doses necessary to demonstrate compliance with the dose objectives of Appendix I to 10CFR50 (Regulatory Guide 1.109) unless otherwise noted in the text.

Demonstration of compliance with the dose limits of 40CFR190 (see Technical Specification 3.8.M) will be considered as demonstrating compliance with the 0.1 rem limit of 10CFR20.1301(a)(1) for members of the public in unrestricted areas (Reference 56 FR 23374, third column).

It shall be the responsibility of the Chemistry Manager and Radiation Protection Manager to ensure that the ODCM is used in the performance of the surveillance requirements of the appropriate portions of Technical Specifications. The administration of the program for the disposal of slightly contaminated septic waste, as described in Appendix B, is the responsibility of the Senior Environmental Program Manager.

All changes to the ODCM must be reviewed by PORC and approved by MOO, in accordance with Technical Specification 6.13, prior to implementation. All approved changes shall be submitted to the NRC for their information in the Annual Radioactive Effluent Report for the period in which the change(s) was made effective. The plant's Document Control Center (DCC) shall maintain the current version of the ODCM and issue under controlled distribution all approved changes to it.

4.3 Distances and Directions to Monitoring Stations

It should be noted that the distances and directions for direct radiation monitoring locations in Table 4.1, as well as the sectors shown in Figures 4.5 and 4.6, are keyed to the center of the Turbine Building due to the critical nature of the Turbine Building-to-TLD distance for close-in stations. For simplicity, all other radiological environmental sampling locations use the plant stack as the origin.

Technical Specification 6.7 and Table 3.9.3, Footnote a, specify that in the Annual Radiological Environmental Surveillance Report and ODCM, the reactor shall be used as the origin for all distances and directions to sampling locations. Vermont Yankee interprets "the reactor" to mean the reactor site which includes the plant stack and the Turbine Building. The distances to the plant stack and Turbine Building will, therefore, be used in the Annual Radiological Environmental Surveillance Reports and ODCM for the sampling and TLD monitoring stations, respectively.

Table 4.1

Radiological Environmental Monitoring Stations[1]

Exposure Pathway and/or Sample		Sample Location and Designated Code[2]		Distance (km)[5]	Direction[5]
1.	AIRBORNE (Radioiodine and Particulate)				
		AP/CF-11	River Station No. 3.3	1.9	SSE
		AP/CF-12	N. Hinsdale, NH	3.6	NNW
		AP/CF-13	Hinsdale Substation	3.1	E
		AP/CF-14	Northfield, MA	11.3	SSE
		AP/CF-15	Tyler Hill Road[4]	3.2	WNW
		AP/CF-21	Spofford Lake	16.1	NNE
2.	WATERBORNE				
	a. Surface	WR-11	River Station No. 3.3	1.9	Downriver
		WR-21	Rt. 9 Bridge	12.8	Upriver
	b. Ground	WG-11	Plant Well	--	On-Site
		WG-12	Vernon Nursing Well	2.0	SSE
		WG-22	Skibniowsky Well	14.3	N
	c. Sediment From Shoreline	SE-11	Shoreline Downriver	0.8	SSE
		SE-12	North Storm Drain Outfall[3]	0.15	E
3.	INGESTION				
	a. Milk[8]	TM-10	Back Tracks Farm	2.3	S
		TM-11	Miller Farm[4]	0.8	WNW
		TM-14	Brown Farm	2.1	S
		TM-16	Meadow Crest Farm	4.4	WNW/NW
		TM-18	Blodgett Farm[4]	3.4	SE
		TM-24	County Farm	22.5	N
	b. Mixed Grasses	TG-11	River Station No. 3.3	1.9	SSE
		TG-12	N. Hinsdale, NH	3.6	NNW
		TG-13	Hinsdale Substation	3.1	E
		TG-14	Northfield, MA	11.3	SSE
		TG-15	Tyler Hill Rd.[4]	3.2	WNW
		TG-21	Spofford Lake	16.1	NNE

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Table 4.1
(Continued)

Radiological Environmental Monitoring Stations(1)

Exposure Pathway and/or Sample	Sample Location and Designated Code(2)		Distance (km)(5)	Direction(5)
c. Silage	TC-10	Back Tracks Farm	2.3	S
	TC-11	Miller Farm	0.8	WNW
	TC-14	Brown Farm	2.1	S
	TC-16	Meadow Crest Farm	4.4	WNW/NW
	TC-18	Blodgett Farm(4)	3.4	SE
	TC-24	County Farm	22.5	N
d. Fish	FH-11	Vernon Pond	(6)	(6)
	FH-21	Rt. 9 Bridge	12.8	Upriver
4. DIRECT RADIATION				
	DR-1	River Station No. 3.3	1.6	SSE
	DR-2	N. Hinsdale, NH	3.9	NNW
	DR-3	Hinsdale Substation	3.0	E
	DR-4	Northfield, MA	11.0	SSE
	DR-5	Spofford Lake	16.3	NNE
	DR-6	Vernon School	0.46	WSW
	DR-7	Site Boundary	0.27	W
	DR-8	Site Boundary(7)	0.25	SW
	DR-9	Inner Ring	2.1	N
	DR-10	Outer Ring	4.6	N
	DR-11	Inner Ring	2.0	NNE
	DR-12	Outer Ring	3.6	NNE
	DR-13	Inner Ring	1.4	NE
	DR-14	Outer Ring	4.3	NE
	DR-15	Inner Ring	1.4	ENE
	DR-16	Outer Ring	2.9	ENE
	DR-17	Inner Ring	1.2	E
	DR-18	Outer Ring	3.0	E
	DR-19	Inner Ring	3.5	ESE
	DR-20	Outer Ring	5.3	ESE
	DR-21	Inner Ring	1.8	SE
	DR-22	Outer Ring	3.2	SE
	DR-23	Inner Ring	1.8	SSE
	DR-24	Outer Ring	3.9	SSE
	DR-25	Inner Ring	2.0	S

Table 4.1
(Continued)

Radiological Environmental Monitoring Stations[1]

Exposure Pathway and/or Sample	Sample Location and Designated Code[2]		Distance (km)[5]	Direction[5]
	DR-26	Outer Ring	3.7	S
	DR-27	Inner Ring	1.0	SSW
	DR-28	Outer Ring	2.2	SSW
	DR-29	Inner Ring	0.7	WSW
	DR-30	Outer Ring	2.3	SW
	DR-31	Inner Ring	0.8	W
	DR-32	Outer Ring	5.0	WSW
	DR-33	Inner Ring	0.9	WNW
	DR-34	Outer Ring	4.9	W
	DR-35	Inner Ring	1.4	WNW
	DR-36	Outer Ring	4.7	WNW
	DR-37	Inner Ring	3.0	NW
	DR-38	Outer Ring	7.7	NW
	DR-39	Inner Ring	3.2	NNW
	DR-40	Outer Ring	5.8	NNW

(1) Sample locations are shown on Figures 4.1 to 4.6.

(2) Station Nos. 10 through 19 are indicator stations. Station Nos. 20 through 29 are control stations (for all but the direct radiation stations).

(3) To be sampled and analyzed semiannually.

(4) Non-Tech Spec station.

(5) Distance and direction from the center of the Turbine Building for direct radiation monitors; from the plant stack for all others.

(6) Fish samples are collected from anywhere in Vernon Pond, which is adjacent to the plant (see Figure 4-1).

(7) DR-8 satisfies Technical Specification Table 3.9.3 for an inner ring direct radiation monitoring location. However, it is averaged as a Site Boundary TLD due to its close proximity to the plant.

(8) In accordance with Technical Specification Table 3.9.3, notation a, samples will be collected on the required schedule as availability of milk permits. All deviations from the sample schedule will be reported in the Annual Radiological Environmental Surveillance Report.

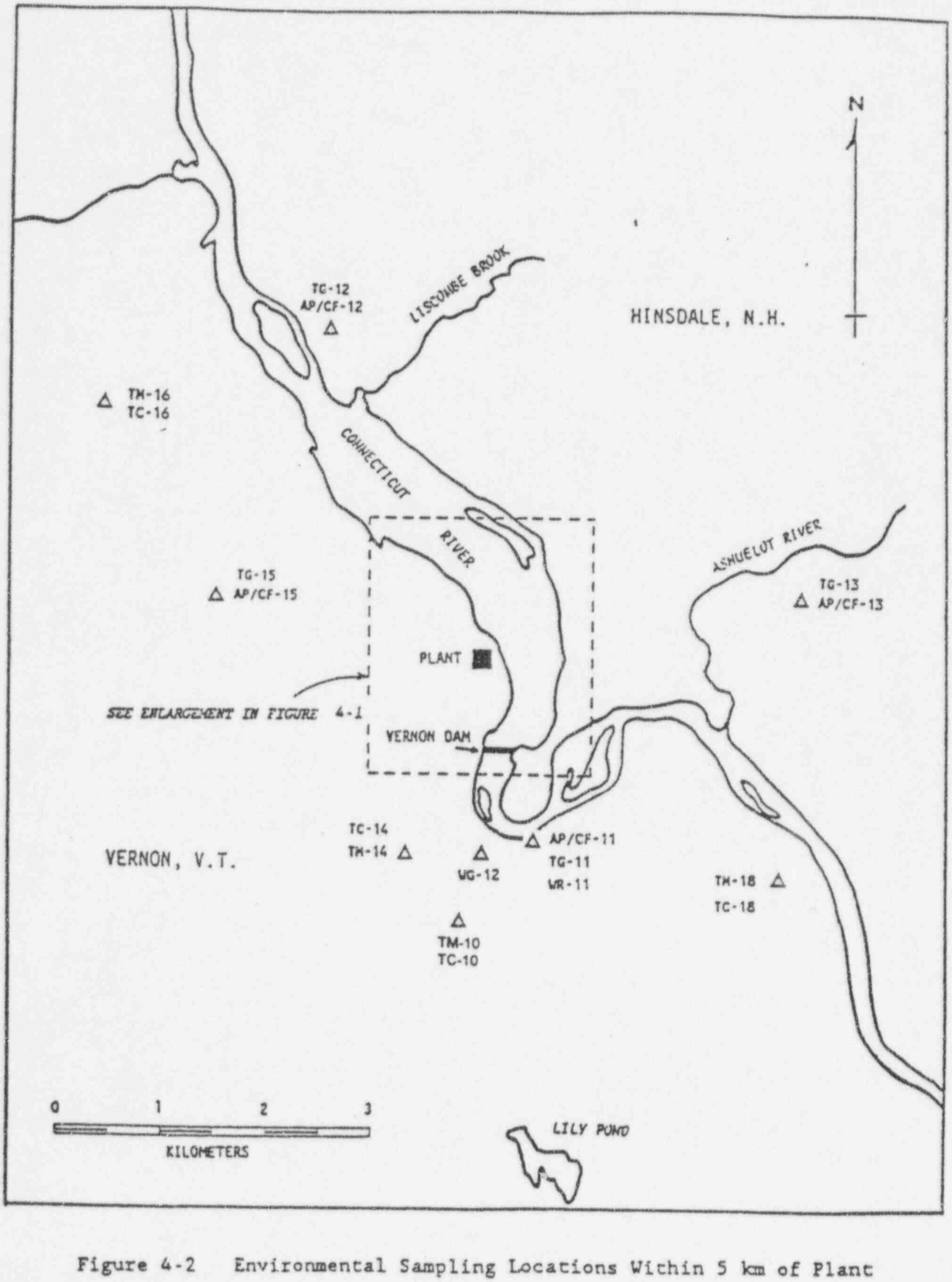

Figure 4-2 Environmental Sampling Locations Within 5 km of Plant

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APPENDIX I

RADIOACTIVE LIQUID, GASEOUS, AND SOLID WASTE TREATMENT SYSTEMS

Requirement: Technical Specification 6.14.A requires that licensee initiated major changes to the radioactive waste systems (liquid, gaseous, and solid) be reported to the Commission in the Semiannual Radioactive Effluent Release Report for the period in which the evaluation was reviewed by the Plant Operation Review Committee.

Response: There were no licensee-initiated major changes to the radioactive waste systems during this reporting period.

APPENDIX J

ON-SITE DISPOSAL OF SEPTIC WASTE

Requirement: Off-Site Dose Calculational Manual, Appendix B requires that the dose impact due to on-site disposal of septic waste during the reporting year and from previous years be reported to the Commission in the Annual Radioactive Effluent Report if disposals occur during the reporting year.

Response: There was one on-site disposal of septic waste during the reporting year. The total volume of septage spread was approximately 9,500 gallons. The total activity spread on the 1.9 acres (southern) on-site disposal field during 1995 and from previous years was:

Nuclide	Activity (Ci)
Mn-54	1.14E-07
Co-60	1.28E-05
Zn-65	1.33E-07
Cs-137	2.24E-06

The projected hypothetical dose from on-site disposals of septic waste is 9.14E-03 mrem/year. This dose was calculated according to the model and the assumptions of Off-Site Dose Calculational Manual, Appendix B.