

**Summary of Radioactive Liquid and Gaseous Effluents
Released from TMI during 2014**

TABLE 1A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
GASEOUS EFFLUENTS – SUMMATION OF ALL RELEASES
TMI-1

	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	EST TOTAL ERROR %
A. FISSION AND ACTIVATION GASES						
1. Total Release	Ci	3.98E-03	2.65E-01	1.54E-01	1.64E-01	25%
2. Avg release rate for period	μCi/S	5.12E-04	3.37E-02	1.93E-02	2.07E-02	
3. Percent of applicable limit	%	*	*	*	*	
B. IODINES						
1. Total Iodine I131	Ci	<LLD	<LLD	<LLD	<LLD	25%
2. Avg release rate for period	μCi/S	N/A	N/A	N/A	N/A	
3. Percent of applicable limit	%	*	*	*	*	
C. PARTICULATES						
1. Part. With half-life >8 days	Ci	<LLD	<LLD	<LLD	<LLD	25%
2. Avg release rate for period	μCi/S	N/A	N/A	N/A	N/A	
3. Percent of applicable limit	%	*	*	*	*	
D. TRITIUM						
1. Total Release	Ci	2.74E+01	3.23E+01	2.78E+01	1.58E+01	15%
2. Avg release rate for period	μCi/S	3.53E+00	4.11E+00	3.50E+00	1.99E+00	
3. Percent of applicable limit	%	*	*	*	*	
E. GROSS ALPHA						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	25%
2. Avg release rate for period	μCi/S	N/A	N/A	N/A	N/A	
3. Percent of applicable limit	%	*	*	*	*	
F. CARBON 14						
1. Total Release	Ci	2.38E+00	2.01E+00	2.49E+00	1.41E+00	**
2. Avg release rate for period	μCi/S	3.06E-01	2.56E-01	3.13E-01	1.78E-01	
3. Percent of applicable limit	%	*	*	*	*	

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

*ODCM Limits – Listed on Dose summary Table.

**C-14 production was estimated using EPRI Technical Report 1021106 Methodology.

TABLE 1B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
GASEOUS EFFLUENTS - GROUND-LEVEL RELEASES - BATCH MODE
TMI-1

Fission And Activation Gasses	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Radioiodines	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
I-131	Ci	<LLD	<LLD	<LLD	<LLD
I-132	Ci	<LLD	<LLD	<LLD	<LLD
I-133	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Particulates	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

TABLE 1B (CONTINUED)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
GASEOUS EFFLUENTS - GROUND-LEVEL RELEASES - CONTINUOUS MODE
TMI-1

Fission And Activation Gasses	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Radioiodines	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
I-131	Ci	<LLD	<LLD	<LLD	<LLD
I-132	Ci	<LLD	<LLD	<LLD	<LLD
I-133	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Particulates	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD
Fe-55	Ci	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	<LLD
Ni-63	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Tritium	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H3	Ci	<LLD	7.26E-01	5.16E-01	2.63E-02

Carbon 14	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
C-14	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

TABLE 1D
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
GASEOUS EFFLUENTS – MIXED MODE RELEASES - BATCH MODE
TMI-1

Fission And Activation Gasses	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Ar-41	Ci	3.89E-03	2.65E-01	1.23E-01	1.27E-01
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	9.71E-05	3.47E-05	3.07E-02	3.76E-02
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	3.98E-03	2.65E-01	1.54E-01	1.64E-01

Radioiodines	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
I-131	Ci	<LLD	<LLD	<LLD	<LLD
I-132	Ci	<LLD	<LLD	<LLD	<LLD
I-133	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Particulates	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Tritium	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H3	Ci	1.22E-02	9.56E-01	9.32E-01	2.16E+00

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

TABLE 1D (CONTINUED)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
GASEOUS EFFLUENTS – MIXED MODE RELEASES - CONTINUOUS MODE
TMI-1

Fission And Activation Gasses	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Radioiodines	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
I-131	Ci	<LLD	<LLD	<LLD	<LLD
I-132	Ci	<LLD	<LLD	<LLD	<LLD
I-133	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Particulates	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD
Fe-55	Ci	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	<LLD
Ni-63	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Tritium	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H3	Ci	2.74E+01	3.06E+01	2.64E+01	1.36E+01

Carbon 14	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
C-14	Ci	2.38E+00	2.01E+00	2.49E+00	1.41E+00

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

TABLE 2A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
LIQUID EFFLUENTS – SUMMATION OF ALL RELEASES
TMI-1

	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	EST TOTAL ERROR %
A. FISSION AND ACTIVATION PRODUCTS						
1. Total Release (Not incl. Tritium, gases, alpha)	Ci	<LLD	4.14E-05	3.16E-06	<LLD	25%
2. Avg diluted concentration during period	µCi/ml	N/A	6.33E-12	5.35E-13	N/A	
3. Percent of applicable limit	%	*	*	*	*	
B. TRITIUM						
1. Total Release	Ci	2.22E-02	5.31E+01	6.27E+01	7.61E-02	25%
2. Avg diluted concentration during period	µCi/ml	3.48E-09	8.12E-06	1.06E-05	1.32E-08	
3. Percent of applicable limit	%	*	*	*	*	
C. DISSOLVED AND ENTRAINED GASES						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	25%
2. Avg diluted concentration during period	µCi/ml	N/A	N/A	N/A	N/A	
3. Percent of applicable limit	%	*	*	*	*	
D. GROSS ALPHA RADIOACTIVITY						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	25%
E. VOLUME OF WASTE RELEASE (PRIOR TO DILUTION)						
	LITERS	9.15E+07	9.33E+07	9.47E+07	9.33E+07	10%
F. VOLUME OF DILUTION WATER USED						
	LITERS	6.36E+09	6.54E+09	5.91E+09	5.75E+09	10%

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).
*ODCM Limits – Listed on Dose summary Table

TABLE 2B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
LIQUID EFFLUENTS - BATCH MODE
TMI-1

Fission and Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H-3	Ci	<LLD	5.31E+01	6.26E+01	<LLD
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD
Fe-55	Ci	<LLD	3.34E-05	<LLD	<LLD
Co-58	Ci	<LLD	1.45E-06	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	5.16E-06	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD
I-131	Ci	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	1.48E-06	3.16E-06	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	5.31E+01	6.26E+01	N/A

Dissolved and Entrained Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

TABLE 2C
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
LIQUID EFFLUENTS - CONTINUOUS MODE
TMI-1

Fission and Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H-3	Ci	2.22E-02	5.24E-02	7.27E-02	7.61E-02
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD
Fe-55	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD
I-131	Ci	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	2.22E-02	5.24E-02	7.27E-02	7.61E-02

Dissolved and Entrained Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
SUPPLEMENTAL INFORMATION
FACILITY: TMI UNIT 1 LICENSE: DPR 50-289

1. Regulatory Limits – Please refer to TMI Offsite Dose Calculation Manual

- A. Fission and Activation Gases:
- B. Iodines:
- C. Particulates, Half-Lives > 8 Days:
- D. Liquid Effluents:

2. Maximum Effluent Concentrations – 10 Times CFR 20, Appendix B Table II

Provide the maximum effluent concentrations used in determining allowable release rates or concentrations

- A. Fission and Activation Gases:
- B. Iodines:
- C. Particulates, Half-Lives > 8 Days:
- D. Liquid Effluents:

3. Average Energy

Provide the average energy (E-BAR) of the radionuclide mixture in releases of fission and activation gases, if applicable

E-BAR = 1.81E-01

4. Measurements and Approximations of Total Radioactivity

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

- A. Fission and Activ. Gases: HPGE Spectrometry, Liquid Scintillation
- B. Iodines: HPGE Spectrometry
- C. Particulates: HPGE Spectrometry, Gas Flow Proportional, Beta Spectrometry
- D. Liquid Effluents: HPGE Spectrometry, Liquid Scintillation
- E. Gross Alpha Gas Flow Proportional
- F. Carbon 14 Estimated using the methodology included in the EPRI Technical Report 1021106.

5. Batch Releases

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

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
A. LIQUID (ALL TIMES IN MINUTES)				
1. Number of batch releases	0	27	5	0
2. Total time period for batch releases (min)	0	6110	1380	0
3. Maximum time period for a batch release (min)	0	240	350	0
4. Average time period for a batch release (min)	0	226	276	0
5. Minimum time period for a batch release (min)	0	210	225	0
6. Average stream flow during periods of release of effluent into a flowing stream (cfm)	2.63E+06	2.10E+06	1.10E+06	1.37E+06
B. GASEOUS				
1. Number of batch releases	7	7	7	8
2. Total time period for batch releases (min)	4770	5270	4110	5110
3. Maximum time period for a batch release (min)	910	930	795	880
4. Average time period for a batch release (min)	681	752	587	639
5. Minimum time period for a batch release (min)	7	440	40	3

6. Abnormal Releases

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
A. LIQUID				
1. Number of releases	3	3	3	3
2. Total activity released (curies)	5.43E-04	5.49E-04	5.55E-04	5.55E-04
B. GASEOUS				
1. Number of releases	0	0	0	0
2. Total activity released (curies)	0	0	0	0

TABLE 1A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
GASEOUS EFFLUENTS – SUMMATION OF ALL RELEASES
TMI-2

	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	EST TOTAL ERROR %
A. FISSION AND ACTIVATION GASES						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	25%
2. Avg release rate for period	μCi/S	N/A	N/A	N/A	N/A	
3. Percent of applicable limit	%	*	*	*	*	
B. IODINES						
1. Total Iodine I131	Ci	N/A	N/A	N/A	N/A	25%
2. Avg release rate for period	μCi/S	N/A	N/A	N/A	N/A	
3. Percent of applicable limit	%	*	*	*	*	
C. PARTICULATES						
1. Part. With half-life >8 days	Ci	<LLD	<LLD	<LLD	<LLD	25%
2. Avg release rate for period	μCi/S	N/A	N/A	N/A	N/A	
3. Percent of applicable limit	%	*	*	*	*	
4. Gross alpha radioactivity	Ci	<LLD	<LLD	<LLD	<LLD	
D. TRITIUM						
1. Total Release	Ci	4.37E-02	7.90E-01	5.41E-02	1.08E-02	25%
2. Avg release rate for period	μCi/S	5.62E-03	1.00E-01	6.80E-03	1.36E-03	
3. Percent of applicable limit	%	*	*	*	*	

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

*ODCM Limits – Listed on Dose summary Table

TABLE 1D
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
GASEOUS EFFLUENTS – MIXED MODE RELEASES - BATCH MODE
TMI-2

Fission And Activation Gasses	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Ar-41	Ci	N/A	N/A	N/A	N/A
Kr-85	Ci	N/A	N/A	N/A	N/A
Kr-85m	Ci	N/A	N/A	N/A	N/A
Kr-87	Ci	N/A	N/A	N/A	N/A
Kr-88	Ci	N/A	N/A	N/A	N/A
Xe-133	Ci	N/A	N/A	N/A	N/A
Xe-135	Ci	N/A	N/A	N/A	N/A
Xe-135m	Ci	N/A	N/A	N/A	N/A
Xe-138	Ci	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A

Radioiodines	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
I-131	Ci	N/A	N/A	N/A	N/A
I-133	Ci	N/A	N/A	N/A	N/A
I-135	Ci	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A

Particulates	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Cr-51	Ci	N/A	N/A	N/A	N/A
Mn-54	Ci	N/A	N/A	N/A	N/A
Co-58	Ci	N/A	N/A	N/A	N/A
Fe-59	Ci	N/A	N/A	N/A	N/A
Co-60	Ci	N/A	N/A	N/A	N/A
Sr-89	Ci	N/A	N/A	N/A	N/A
Sr-90	Ci	N/A	N/A	N/A	N/A
Mo-99	Ci	N/A	N/A	N/A	N/A
Ag-110m	Ci	N/A	N/A	N/A	N/A
Cs-134	Ci	N/A	N/A	N/A	N/A
Cs-137	Ci	N/A	N/A	N/A	N/A
Ba-140	Ci	N/A	N/A	N/A	N/A
La-140	Ci	N/A	N/A	N/A	N/A
Ce-141	Ci	N/A	N/A	N/A	N/A
Ce-144	Ci	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

TABLE 1D (CONTINUED)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
GASEOUS EFFLUENTS – MIXED MODE RELEASES - CONTINUOUS MODE
TMI-2

Fission And Activation Gasses	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Radioiodines	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
I-131	Ci	N/A	N/A	N/A	N/A
I-133	Ci	N/A	N/A	N/A	N/A
I-135	Ci	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A

Particulates	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Tritium	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H3	Ci	4.37E-02	7.90E-01	5.41E-02	1.08E-02

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

TABLE 2A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
LIQUID EFFLUENTS – SUMMATION OF ALL RELEASES
TMI-2

	UNIT	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	EST TOTAL ERROR %
A. FISSION AND ACTIVATION PRODUCTS						
1. Total Release (Not incl. Tritium, gases, alpha)	Ci	2.09E-06	6.36E-06	2.04E-06	9.79E-07	25%
2. Avg diluted concentration during period	µCi/ml	4.52E-09	4.74E-11	4.17E-11	2.16E-11	
3. Percent of applicable limit	%	*	*	*	*	
B. TRITIUM						
1. Total Release	Ci	<LLD	7.79E-06	1.18E-05	<LLD	25%
2. Avg diluted concentration during period	µCi/ml	N/A	5.81E-11	2.40E-10	N/A	
3. Percent of applicable limit	%	*	*	*	*	
C. DISSOLVED AND ENTRAINED GASES						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	25%
2. Avg diluted concentration during period	µCi/ml	N/A	N/A	N/A	N/A	
3. Percent of applicable limit	%	*	*	*	*	
D. GROSS ALPHA RADIOACTIVITY						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	25%
E. VOLUME OF WASTE RELEASE (PRIOR TO DILUTION)						
	LITERS	2.09E+03	2.54E+05	7.86E+04	7.39E+04	10%
F. VOLUME OF DILUTION WATER USED						
	LITERS	4.62E+05	1.34E+08	4.90E+07	4.53E+07	10%

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).
*ODCM Limits – Listed on Dose summary Table

TABLE 2B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
LIQUID EFFLUENTS - BATCH MODE
TMI-2

Fission and Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H-3	Ci	<LLD	7.79E-06	1.18E-05	<LLD
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD
Fe-55	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD
I-131	Ci	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	2.09E-06	6.36E-06	2.04E-06	9.79E-07
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	2.09E-06	1.42E-05	1.38E-05	9.79E-07

Dissolved and Entrained Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	N/A	N/A

Note: Table 3 contains a listing of TMI ODCM Lower Limit of Detection (LLD).

TABLE 2C
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2014
LIQUID EFFLUENTS - CONTINUOUS MODE
TMI-2

Fission and Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H-3	Ci	N/A	N/A	N/A	N/A
Cr-51	Ci	N/A	N/A	N/A	N/A
Mn-54	Ci	N/A	N/A	N/A	N/A
Fe-55	Ci	N/A	N/A	N/A	N/A
Co-58	Ci	N/A	N/A	N/A	N/A
Fe-59	Ci	N/A	N/A	N/A	N/A
Co-60	Ci	N/A	N/A	N/A	N/A
Zn-65	Ci	N/A	N/A	N/A	N/A
Sr-89	Ci	N/A	N/A	N/A	N/A
Sr-90	Ci	N/A	N/A	N/A	N/A
Zr-95	Ci	N/A	N/A	N/A	N/A
Nb-95	Ci	N/A	N/A	N/A	N/A
Mo-99	Ci	N/A	N/A	N/A	N/A
Tc-99m	Ci	N/A	N/A	N/A	N/A
Ag-110m	Ci	N/A	N/A	N/A	N/A
I-131	Ci	N/A	N/A	N/A	N/A
Cs-134	Ci	N/A	N/A	N/A	N/A
Cs-137	Ci	N/A	N/A	N/A	N/A
Ba-140	Ci	N/A	N/A	N/A	N/A
La-140	Ci	N/A	N/A	N/A	N/A
Ce-141	Ci	N/A	N/A	N/A	N/A
Ce-144	Ci	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A

Dissolved and Entrained Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Kr-87	Ci	N/A	N/A	N/A	N/A
Kr-88	Ci	N/A	N/A	N/A	N/A
Xe-133	Ci	N/A	N/A	N/A	N/A
Xe-133m	Ci	N/A	N/A	N/A	N/A
Xe-135	Ci	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A

TABLE 3
ODCM REQUIRED LOWER LIMIT OF DETECTION (LLD)

Gaseous Sampling	
Radioisotope:	LLD Value
Tritium	1E-06 µCi/ml
Principal Gamma Emitters Gas (Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135)	1E-04 µCi/ml
Principal Gamma Emitters Particulate	
Mn-54	1E-11 µCi/ml
Fe-59	1E-11 µCi/ml
Co-58	1E-11 µCi/ml
Co-60	1E-11 µCi/ml
Zn-65	1E-11 µCi/ml
Mo-99	1E-11 µCi/ml
Cs-137	1E-11 µCi/ml
Ce-141	1E-11 µCi/ml
Ce-144	1E-11 µCi/ml
Iodine 131	1E-12 µCi/ml
Gross Alpha	1E-11 µCi/ml
Sr-89	1E-11 µCi/ml
Sr-90	1E-11 µCi/ml

Liquid Sampling	
Radioisotope:	LLD Value
Tritium	1E-05 µCi/ml
Principal Gamma Emitters	
Mn-54	5E-07 µCi/ml
Fe-59	5E-07 µCi/ml
Co-58	5E-07 µCi/ml
Co-60	5E-07 µCi/ml
Zn-65	5E-07 µCi/ml
Mo-99	5E-07 µCi/ml
Cs-134	5E-07 µCi/ml
Cs-137	5E-07 µCi/ml
Ce-141	5E-07 µCi/ml
Ce-144	5E-07 µCi/ml
Iodine 131	1E-06 µCi/ml
Dissolved and Entrained Gases (Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135)	1E-05 µCi/ml
Fe-55	1E-06 µCi/ml
Gross Alpha	1E-07 µCi/ml
Sr-89	5E-08 µCi/ml
Sr-90	5E-08 µCi/ml

Solid Waste Shipped Offsite During 2014

2014 Annual Radioactive Effluent Release Report Solid Waste and Irradiated Fuel Shipments TMI-1

A. Solid Waste Shipped Offsite for Burial or Disposal (Not irradiated fuel)

1. Types of Waste

Types of Waste	Total Quantity (m ³)	Total Activity (Ci)	Period	Est. Total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc.	1.05E+02	5.26E+02	01/01/14-12/31/14	+/- 25%
b. Dry compressible waste, contaminated equip, etc.	7.76E+02	1.14E+01	01/01/14-12/31/14	+/- 25%
c. Irradiated components, control rods, etc.	2.38E+00	4.56E+01	01/01/14-12/31/14	+/- 25%
d. Other (describe) Oil, Blast Grit	1.41E+01	1.01E+00	01/01/14-12/31/14	+/- 25%

2. Estimate of major nuclide composition (by waste type)

Major Nuclide Composition		%
a.	Fe-55	1.52%
	Co-60	13.22%
	Ni-63	68.16%
	Cs-134	2.51%
	Cs-137	12.77%
b.	Fe-55	29.30%
	Co-58	8.28%
	Co-60	16.08%
	Ni-63	27.84%
	Cs-137	12.98%
c.	Ni-63	6.22%
	Fe-55	15.78%
	Co-60	6.03%
	Co-58	52.11%
	Nb-95	3.20%
	Zr-95	2.59%
	Cr-51	12.07%
d.	Ni-63	64.9 %
	Fe-55	8.26%
	Cs-137	6.31%
	Co-60	8.12%
	Co-58	8.66%
	Cs-134	1.47%

**2014 Annual Radioactive Effluent Release Report
Solid Waste and Irradiated Fuel Shipments
TMI-1**

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
61	Hittman Transport Services	Energy Solutions
2	Interstate Ventures, Inc.	Energy Solutions
4	Norfolk Southern	Energy Solutions

B. Irradiated Fuel Shipments (disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
0	NA	NA

C. Changes to the Process Control Program

There was one change to RW-AA-100 in 2014.

2014 Annual Radioactive Effluent Release Report Solid Waste and Irradiated Fuel Shipments TMI-2

A. Solid Waste Shipped Offsite for Burial or Disposal (Not irradiated fuel)

1. Types of Waste

Types of Waste	Total Quantity (m ³)	Total Activity (Ci)	Period	Est. Total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc.	0.00E+00	0.00E+00	01/01/14-12/31/14	+/- 25%
b. Dry compressible waste, contaminated equip, etc.	2.85E+01	2.05E-02	01/01/14-12/31/14	+/- 25%
c. Irradiated components, control rods, etc.	0.00E+00	0.00E+00	01/01/14-12/31/14	+/- 25%
d. Other (describe) Waste Oil	0.00E+00	0.00E+00	01/01/14-12/31/14	+/- 25%

2. Estimate of major nuclide composition (by waste type)

Major Nuclide Composition		%
a.	None	
b.	Ni-63	1.662%
	Sr-90	27.407%
	Cs-137	70.578%
c.	None	
d.	None	

3. Solid Waste Disposition

Number of Shipments

1

Mode of Transportation

Hittman Transportation Services

Destination

Energy Solutions

B. Irradiated Fuel Shipments (disposition)

Number of Shipments

0

Mode of Transportation

NA

Destination

NA

Summary of Unplanned Releases from the TMI Site During 2014

There were no unplanned releases from TMI-2 in 2014. The unplanned releases for TMI-1 are summarized in the supplemental information in Attachment 1. The information is reported separately for liquid and gaseous releases, and the number of releases is reported for each quarter with a total curies released. The activity for these releases is also included in Tables 2A and 2C.

The abnormal liquid releases are monthly releases to account for the tritium in groundwater released into the river. There we no unplanned gaseous releases for TMI-1.

**CHANGES TO THE PROCESS CONTROL PROGRAM AND THE
OFFSITE DOSE CALCULATION MANUAL DURING 2014
AND A LISTING OF NEW LOCATIONS FOR DOSE CALCULATIONS AND/OR
ENVIRONMENTAL MONITORING IDENTIFIED BY THE LAND USE CENSUS**

1. Changes to the Process Control Program

There was one change to the Process Control Program. The procedure change is attached as Enclosure 2.

2. Changes to the Offsite Dose Calculation Manual

There were no changes to the Offsite Dose Calculation Manual.

3. A listing of new locations for dose calculations and/or environmental monitoring identified by the Land Use Census.

Based on the results of the 2014 Land Use Census, no changes were required to the Radiological Environmental Monitoring Program. The Land Use Census identified minor changes to new or relocated gardens for Sectors A (N), C (NE), H (SSE), M (WSW) and P (WNW).

Instrumentation Not Returned to Operable Status Within 30 Days During 2014

There was one instrument not returned to operable status within 30 days per the TMI ODCM Part 1, Sections 2.1.1.b and 2.1.2.b, and Part 2, Section 2.1.2.b, during 2014.

SR-FT-146 was out of service at the start of the year. The instrument was calibrated and the propeller and the lower gearbox were replaced. All drive columns were rebuilt and the instrument was returned to service in March 2014.

Annual Summary of Hourly Meteorological Data for 2014

The osprey did return and nest on the TMI meteorological tower. However, the station was able to calibrate the sensors and instrumentation before and after the osprey nested. The percent data recovery for meteorological information for 2014 was 99.8 percent. The data is presented by quarter.

2014 Annual Radioactive Effluent Release Report for TMI
Attachment 6 - Page 2 of 17

Three Mile Island Alpha
Period of Record: **January - March 2014**
Stability Class - **Extremely Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	1	2	0	0	0	3
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	5	2	0	0	7
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	1	0	0	0	1
NNW	0	0	2	1	7	0	10
Variable	0	0	0	0	0	0	0
Total	0	2	11	3	7	0	23

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Three Mile Island Alpha
Period of Record: **January - March 2014**
Stability Class - **Moderately Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	0	1	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	1	0	2	0	0	0	3
SW	0	1	0	0	0	0	1
WSW	0	1	0	0	0	0	1
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	2	0	4	0	6
NNW	0	0	0	3	3	1	7
Variable	0	0	0	0	0	0	0
Total	1	2	6	3	7	1	20

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

2014 Annual Radioactive Effluent Release Report for TMI
Attachment 6 - Page 3 of 17

Three Mile Island Alpha
Period of Record: **January - March 2014**
Stability Class - **Slightly Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	1	0	0	0	1	0	2
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	1	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	1	3	0	0	0	4
SSW	0	1	2	0	0	0	3
SW	0	0	0	0	0	0	0
WSW	1	0	0	0	0	0	1
W	1	0	0	3	0	0	4
WNW	3	0	0	1	0	0	4
NW	0	0	2	2	9	1	14
NNW	1	2	1	4	5	0	13
Variable	0	0	0	0	0	0	0
Total	7	5	9	10	15	1	47

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Three Mile Island Alpha
Period of Record: **January - March 2014**
Stability Class - **Neutral** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	14	14	12	14	2	0	56
NNE	10	26	9	0	0	0	45
NE	14	23	7	2	0	0	46
ENE	22	31	12	0	0	0	65
E	14	25	16	0	0	0	55
ESE	10	23	19	1	0	0	53
SE	4	12	8	0	0	0	24
SSE	3	6	5	0	0	0	14
S	3	7	16	0	0	0	26
SSW	3	12	25	3	0	0	43
SW	8	12	10	1	0	0	31
WSW	3	23	5	3	0	0	34
W	4	26	28	25	4	0	87
WNW	2	17	37	52	13	0	121
NW	2	13	68	47	23	6	159
NNW	7	11	27	38	25	2	110
Variable	0	0	0	0	0	0	0
Total	123	281	304	186	67	8	969

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 1
Hours of missing stability measurements in all stability classes: 0

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Three Mile Island Alpha
Period of Record: **January - March 2014**
Stability Class - **Slightly Stable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

<u>Wind Direction</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8 - 12</u>	<u>13 - 18</u>	<u>19 - 24</u>	<u>> 24</u>	<u>Total</u>
N	13	16	12	2	0	0	43
NNE	13	9	3	0	0	0	25
NE	11	6	1	0	0	0	18
ENE	20	7	0	0	0	0	27
E	10	21	2	0	0	0	33
ESE	9	11	3	0	0	0	23
SE	6	21	3	0	0	0	30
SSE	6	10	2	0	0	0	18
S	6	6	6	0	0	0	18
SSW	9	13	8	7	0	0	37
SW	8	16	9	5	0	0	38
WSW	12	23	14	0	0	0	49
W	12	30	21	1	0	0	64
WNW	11	25	32	20	2	0	90
NW	13	26	40	24	2	1	106
NNW	29	23	14	10	7	0	83
Variable	0	0	0	0	0	0	0
Total	188	263	170	69	11	1	702

Hours of calm in this stability class: 5
Hours of missing wind measurements in this stability class: 1
Hours of missing stability measurements in all stability classes: 0

Three Mile Island Alpha
Period of Record: **January - March 2014**
Stability Class - **Moderately Stable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

<u>Wind Direction</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8 - 12</u>	<u>13 - 18</u>	<u>19 - 24</u>	<u>> 24</u>	<u>Total</u>
N	7	10	1	0	0	0	18
NNE	3	1	0	0	0	0	4
NE	10	0	0	0	0	0	10
ENE	3	1	0	0	0	0	4
E	2	3	0	0	0	0	5
ESE	2	5	0	0	0	0	7
SE	8	1	0	0	0	0	9
SSE	5	2	0	0	0	0	7
S	6	5	0	0	0	0	11
SSW	7	7	1	0	0	0	15
SW	8	11	0	0	0	0	19
WSW	6	3	1	1	0	0	11
W	11	7	0	0	0	0	18
WNW	5	9	1	1	0	0	16
NW	11	11	3	0	0	0	25
NNW	11	6	1	0	0	0	18
Variable	0	0	0	0	0	0	0
Total	105	82	8	2	0	0	197

Hours of calm in this stability class: 5
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

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Three Mile Island Alpha
 Period of Record: **January - March 2014**
 Stability Class - **Extremely Stable** - 145Ft-31Ft Delta-T (F)
 Winds Measured at 98 Feet
 Wind Speed (in mph)

<u>Wind Direction</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8 - 12</u>	<u>13 - 18</u>	<u>19 - 24</u>	<u>> 24</u>	<u>Total</u>
N	10	6	0	0	0	0	16
NNE	2	1	0	0	0	0	3
NE	4	0	0	0	0	0	4
ENE	7	1	0	0	0	0	8
E	3	1	0	0	0	0	4
ESE	12	1	0	0	0	0	13
SE	10	0	0	0	0	0	10
SSE	8	1	0	0	0	0	9
S	7	4	0	0	0	0	11
SSW	11	4	1	0	0	0	16
SW	6	7	0	0	0	0	13
WSW	9	6	0	0	0	0	15
W	9	4	0	0	0	0	13
WNW	8	2	0	0	0	0	10
NW	11	3	0	0	0	0	14
NNW	15	7	2	0	0	0	24
Variable	4	0	0	0	0	0	4
Total	136	48	3	0	0	0	187

Hours of calm in this stability class: 3
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 0

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Three Mile Island Alpha
Period of Record: **April - June 2014**
Stability Class - **Extremely Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	1	0	0	0	0	1
ESE	0	7	15	5	0	0	27
SE	0	1	5	1	0	0	7
SSE	0	0	0	0	0	0	0
S	0	1	5	0	0	0	6
SSW	1	6	14	7	0	0	28
SW	0	6	0	0	0	0	6
WSW	0	0	0	0	0	0	0
W	1	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	4	4	1	0	0	0	9
NNW	4	3	2	1	1	0	11
Variable	0	0	0	0	0	0	0
Total	10	29	43	14	1	0	97

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Three Mile Island Alpha
Period of Record: **April - June 2014**
Stability Class - **Moderately Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	2	0	0	0	0	2
ESE	0	1	7	1	0	0	9
SE	0	2	0	0	0	0	2
SSE	0	2	0	0	0	0	2
S	0	2	3	2	0	0	7
SSW	0	6	6	0	0	0	12
SW	0	1	1	0	0	0	2
WSW	4	1	0	0	0	0	5
W	0	0	0	0	0	0	0
WNW	1	1	0	0	0	0	2
NW	4	1	3	0	0	0	8
NNW	1	2	1	1	2	0	7
Variable	0	0	0	0	0	0	0
Total	10	22	21	4	2	0	59

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
Period of Record: April - June 2014
Stability Class - **Slightly Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	1	0	4	0	0	0	5
NNE	0	0	0	0	0	0	0
NE	0	1	0	0	0	0	1
ENE	0	1	0	0	0	0	1
E	0	3	0	0	0	0	3
ESE	0	1	6	1	0	0	8
SE	0	1	1	1	0	0	3
SSE	0	0	0	0	0	0	0
S	1	4	4	0	0	0	9
SSW	0	8	10	3	3	1	25
SW	0	0	2	0	0	0	2
WSW	1	0	1	0	0	0	2
W	0	0	1	0	0	0	1
WNW	0	2	2	0	0	0	4
NW	0	4	2	1	1	0	8
NNW	0	5	12	3	1	0	21
Variable	0	0	0	0	0	0	0
Total	3	30	45	9	5	1	93

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Three Mile Island Alpha
Period of Record: April - June 2014
Stability Class - **Neutral** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	3	17	7	1	0	0	28
NNE	2	13	2	0	0	0	17
NE	8	7	0	0	0	0	15
ENE	5	22	2	0	0	0	29
E	7	22	47	1	0	0	77
ESE	8	31	81	17	0	0	137
SE	4	13	25	9	0	0	51
SSE	4	17	8	1	0	0	30
S	2	35	25	6	0	0	68
SSW	3	38	29	5	4	0	79
SW	11	19	7	1	0	0	38
WSW	7	10	6	1	0	0	24
W	9	11	15	4	2	0	41
WNW	6	23	39	26	1	0	95
NW	10	30	103	58	25	0	226
NNW	7	33	28	10	2	0	80
Variable	0	0	0	0	0	0	0
Total	96	341	424	140	34	0	1035

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
Period of Record: April - June 2014
Stability Class - **Slightly Stable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

<u>Wind Direction</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8 - 12</u>	<u>13 - 18</u>	<u>19 - 24</u>	<u>> 24</u>	<u>Total</u>
N	6	14	3	0	0	0	23
NNE	7	14	3	0	0	0	24
NE	11	12	0	0	0	0	23
ENE	6	14	1	0	0	0	21
E	15	10	4	0	0	0	29
ESE	8	19	9	0	0	0	36
SE	12	8	3	0	0	0	23
SSE	2	23	3	0	0	0	28
S	6	26	9	0	0	0	41
SSW	9	34	10	1	0	0	54
SW	9	14	7	1	0	0	31
WSW	22	15	3	0	0	0	40
W	15	28	9	0	0	0	52
WNW	14	28	11	2	0	0	55
NW	14	27	17	8	5	0	71
NNW	18	34	9	3	0	0	64
Variable	2	0	0	0	0	0	2
Total	176	320	101	15	5	0	617

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Three Mile Island Alpha
Period of Record: April - June 2014
Stability Class - **Moderately Stable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

<u>Wind Direction</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8 - 12</u>	<u>13 - 18</u>	<u>19 - 24</u>	<u>> 24</u>	<u>Total</u>
N	4	8	0	0	0	0	12
NNE	1	1	0	0	0	0	2
NE	6	3	0	0	0	0	9
ENE	6	5	0	0	0	0	11
E	7	2	0	0	0	0	9
ESE	9	0	0	0	0	0	9
SE	6	1	0	0	0	0	7
SSE	11	1	0	0	0	0	12
S	11	3	0	0	0	0	14
SSW	5	1	0	0	0	0	6
SW	13	3	0	0	0	0	16
WSW	15	3	0	0	0	0	18
W	8	6	0	0	0	0	14
WNW	9	7	0	0	0	0	16
NW	10	2	0	0	0	0	12
NNW	7	5	0	0	0	0	12
Variable	1	1	0	0	0	0	2
Total	129	52	0	0	0	0	181

Hours of calm in this stability class: 10
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
 Period of Record: **April - June 2014**
 Stability Class - **Extremely Stable** - 145Ft-31Ft Delta-T (F)
 Winds Measured at 98 Feet
 Wind Speed (in mph)

<u>Wind Direction</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8 - 12</u>	<u>13 - 18</u>	<u>19 - 24</u>	<u>> 24</u>	<u>Total</u>
N	3	1	0	0	0	0	4
NNE	1	0	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	4	2	0	0	0	0	6
ESE	7	0	0	0	0	0	7
SE	6	0	0	0	0	0	6
SSE	3	0	0	0	0	0	3
S	4	0	0	0	0	0	4
SSW	7	2	0	0	0	0	9
SW	8	4	0	0	0	0	12
WSW	4	0	0	0	0	0	4
W	3	2	0	0	0	0	5
WNW	5	1	0	0	0	0	6
NW	4	2	0	0	0	0	6
NNW	4	3	0	0	0	0	7
Variable	1	0	0	0	0	0	1
Total	64	18	0	0	0	0	82

Hours of calm in this stability class: 5
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
Period of Record: **July - September 2014**
Stability Class - **Extremely Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	0	4	1	0	0	0	5
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	1	1	0	0	0	2
ESE	0	6	5	0	0	0	11
SE	0	3	4	0	0	0	7
SSE	0	1	2	0	0	0	3
S	0	3	2	0	0	0	5
SSW	0	3	13	2	0	0	18
SW	1	9	12	1	0	0	23
WSW	2	3	0	0	0	0	5
W	0	0	0	0	0	0	0
WNW	5	11	0	0	0	0	16
NW	10	11	1	0	0	0	22
NNW	8	8	3	0	1	0	20
Variable	0	0	0	0	0	0	0
Total	26	63	44	3	1	0	137

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Three Mile Island Alpha
Period of Record: **July - September 2014**
Stability Class - **Moderately Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	0	2	0	0	0	0	2
NNE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	3	0	0	0	0	3
E	0	5	1	0	0	0	6
ESE	0	1	5	0	0	0	6
SE	0	2	2	1	0	0	5
SSE	0	2	1	0	0	0	3
S	0	1	1	0	0	0	2
SSW	0	4	3	1	0	0	8
SW	1	6	6	1	0	0	14
WSW	0	1	2	0	0	0	3
W	2	0	0	0	0	0	2
WNW	3	3	1	0	0	0	7
NW	6	5	1	0	0	0	12
NNW	4	7	3	0	4	0	18
Variable	0	0	0	0	0	0	0
Total	16	43	26	3	4	0	92

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
Period of Record: **July - September 2014**
Stability Class - **Slightly Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	0	2	3	0	0	0	5
NNE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	4	1	0	0	0	5
ESE	0	6	3	0	0	0	9
SE	0	3	2	0	0	0	5
SSE	0	1	0	0	0	0	1
S	0	2	2	0	0	0	4
SSW	0	4	3	2	0	0	9
SW	1	7	3	0	0	0	11
WSW	0	3	1	0	0	0	4
W	3	0	0	0	0	0	3
WNW	2	6	2	0	0	0	10
NW	2	10	8	1	0	0	21
NNW	7	5	8	2	1	0	23
Variable	0	0	0	0	0	0	0
Total	15	54	36	5	1	0	111

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Three Mile Island Alpha
Period of Record: **July - September 2014**
Stability Class - **Neutral** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	9	18	22	2	1	0	52
NNE	9	4	0	0	0	0	13
NE	11	9	0	0	0	0	20
ENE	10	15	1	0	0	0	26
E	6	26	13	0	0	0	45
ESE	9	28	20	0	0	0	57
SE	3	20	17	3	0	0	43
SSE	4	28	5	0	0	0	37
S	6	31	9	1	0	0	47
SSW	10	37	21	4	0	0	72
SW	16	41	10	1	0	0	68
WSW	9	21	5	0	0	0	35
W	19	18	5	5	0	0	47
WNW	19	25	20	6	0	0	70
NW	19	39	45	19	1	0	123
NNW	14	34	41	23	3	1	116
Variable	1	0	0	0	0	0	1
Total	174	394	234	64	5	1	872

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
Period of Record: July - September 2014
Stability Class - **Slightly Stable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	22	52	9	0	0	0	83
NNE	17	10	1	0	1	0	29
NE	8	4	1	0	0	0	13
ENE	14	18	0	0	0	0	32
E	32	13	4	0	0	0	49
ESE	29	15	4	0	0	0	48
SE	23	13	4	0	0	0	40
SSE	13	8	1	0	0	0	22
S	10	18	0	0	0	0	28
SSW	10	28	7	0	0	0	45
SW	19	24	8	0	0	0	51
WSW	24	16	0	0	0	0	40
W	30	33	6	0	0	0	69
WNW	18	25	12	0	0	0	55
NW	13	18	4	1	0	0	36
NNW	13	29	8	0	0	0	50
Variable	1	0	0	0	0	0	1
Total	296	324	69	1	1	0	691

Hours of calm in this stability class: 8
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Three Mile Island Alpha
Period of Record: July - September 2014
Stability Class - **Moderately Stable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	3	6	0	0	0	0	9
NNE	3	1	0	0	0	0	4
NE	1	1	0	0	0	0	2
ENE	6	3	0	0	0	0	9
E	16	5	0	0	0	0	21
ESE	14	0	0	0	0	0	14
SE	13	2	0	0	0	0	15
SSE	5	0	0	0	0	0	5
S	10	0	0	0	0	0	10
SSW	8	1	0	0	0	0	9
SW	19	1	0	0	0	0	20
WSW	36	0	0	0	0	0	36
W	29	5	0	0	0	0	34
WNW	19	1	0	0	0	0	20
NW	16	3	0	0	0	0	19
NNW	15	6	0	0	0	0	21
Variable	3	0	0	0	0	0	3
Total	216	35	0	0	0	0	251

Hours of calm in this stability class: 19
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
 Period of Record: **July - September 2014**
 Stability Class - **Extremely Stable** - 145Ft-31Ft Delta-T (F)
 Winds Measured at 98 Feet
 Wind Speed (in mph)

<u>Wind Direction</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8 - 12</u>	<u>13 - 18</u>	<u>19 - 24</u>	<u>> 24</u>	<u>Total</u>
N	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	3	2	0	0	0	0	5
ESE	1	0	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	1	1	0	0	0	0	2
SW	1	0	0	0	0	0	1
WSW	2	0	0	0	0	0	2
W	4	0	0	0	0	0	4
WNW	0	0	0	0	0	0	0
NW	1	0	0	0	0	0	1
NNW	2	1	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	16	5	0	0	0	0	21

Hours of calm in this stability class: 2
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
Period of Record: **October - December 2014**
Stability Class - **Extremely Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

<u>Wind Direction</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8 - 12</u>	<u>13 - 18</u>	<u>19 - 24</u>	<u>> 24</u>	<u>Total</u>
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	3	0	0	3
SSW	0	0	3	0	0	0	3
SW	0	2	3	0	0	0	5
WSW	1	0	0	0	0	0	1
W	0	0	1	0	0	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	1	2	7	3	0	0	13

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Three Mile Island Alpha
Period of Record: **October - December 2014**
Stability Class - **Moderately Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

<u>Wind Direction</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8 - 12</u>	<u>13 - 18</u>	<u>19 - 24</u>	<u>> 24</u>	<u>Total</u>
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	2	1	0	0	0	3
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	0	1
SSW	0	1	4	0	0	0	5
SW	0	0	1	2	0	0	3
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	3	7	2	0	0	12

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
Period of Record: **October - December 2014**
Stability Class - **Slightly Unstable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	2	0	0	0	2
SE	0	0	1	1	0	0	2
SSE	1	0	1	0	0	0	2
S	0	1	2	0	0	0	3
SSW	0	2	2	0	0	0	4
SW	0	0	0	1	0	0	1
WSW	0	0	1	0	0	0	1
W	0	1	1	0	0	0	2
WNW	1	0	0	0	0	0	1
NW	1	0	0	1	0	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	3	4	10	3	0	0	20

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Three Mile Island Alpha
Period of Record: **October - December 2014**
Stability Class - **Neutral** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	3	17	19	7	0	0	46
NNE	4	9	0	0	0	0	13
NE	2	16	0	0	0	0	18
ENE	10	12	2	0	0	0	24
E	8	30	2	0	0	0	40
ESE	12	22	18	0	0	0	52
SE	12	12	12	1	0	0	37
SSE	6	8	13	1	0	0	28
S	3	10	8	0	1	0	22
SSW	2	19	20	3	1	0	45
SW	6	11	10	1	0	0	28
WSW	5	14	9	7	0	0	35
W	5	25	46	41	4	0	121
WNW	4	26	102	46	0	0	178
NW	8	28	66	80	27	2	211
NNW	7	28	26	11	35	13	120
Variable	1	0	0	0	0	0	1
Total	98	287	353	198	68	15	1019

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
Period of Record: **October - December 2014**
Stability Class - **Slightly Stable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	13	29	11	0	0	0	53
NNE	10	16	0	0	0	0	26
NE	13	10	0	0	0	0	23
ENE	11	14	1	0	0	0	26
E	17	11	1	0	0	0	29
ESE	7	12	8	1	0	0	28
SE	9	9	14	1	0	0	33
SSE	11	12	6	2	0	0	31
S	9	17	8	3	0	0	37
SSW	12	28	9	4	1	0	54
SW	15	23	10	0	0	0	48
WSW	27	33	9	1	0	0	70
W	18	54	12	0	0	0	84
WNW	20	37	34	11	0	0	102
NW	17	17	26	21	3	0	84
NNW	22	39	19	13	12	1	106
Variable	5	0	0	0	0	0	5
Total	236	361	168	57	16	1	839

Hours of calm in this stability class: 8
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Three Mile Island Alpha
Period of Record: **October - December 2014**
Stability Class - **Moderately Stable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

Wind Direction	1 - 3	4 - 7	8 - 12	13 - 18	19 - 24	> 24	Total
N	12	7	0	0	0	0	19
NNE	3	0	0	0	0	0	3
NE	4	2	0	0	0	0	6
ENE	2	2	0	0	0	0	4
E	6	2	0	0	0	0	8
ESE	6	2	0	0	0	0	8
SE	9	0	0	0	0	0	9
SSE	8	2	0	0	0	0	10
S	6	5	0	0	0	0	11
SSW	12	2	1	0	0	0	15
SW	9	12	0	0	0	0	21
WSW	6	8	0	0	0	0	14
W	8	6	0	0	0	0	14
WNW	6	8	0	1	0	0	15
NW	9	5	0	1	0	0	15
NNW	5	10	0	0	0	0	15
Variable	1	0	0	0	0	0	1
Total	112	73	1	2	0	0	188

Hours of calm in this stability class: 10
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

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Three Mile Island Alpha
Period of Record: **October - December 2014**
Stability Class - **Extremely Stable** - 145Ft-31Ft Delta-T (F)
Winds Measured at 98 Feet
Wind Speed (in mph)

<u>Wind Direction</u>	<u>1 - 3</u>	<u>4 - 7</u>	<u>8 - 12</u>	<u>13 - 18</u>	<u>19 - 24</u>	<u>> 24</u>	<u>Total</u>
N	0	1	0	0	0	0	1
NNE	3	0	0	0	0	0	3
NE	1	0	0	0	0	0	1
ENE	4	0	0	0	0	0	4
E	6	0	0	0	0	0	6
ESE	8	1	0	0	0	0	9
SE	6	0	0	0	0	0	6
SSE	9	1	0	0	0	0	10
S	6	1	1	0	0	0	8
SSW	7	2	0	0	0	0	9
SW	9	6	0	0	0	0	15
WSW	6	0	0	0	0	0	6
W	4	1	0	0	0	0	5
WNW	1	0	0	0	0	0	1
NW	2	0	0	0	0	0	2
NNW	1	1	0	0	0	0	2
Variable	5	0	0	0	0	0	5
Total	78	14	1	0	0	0	93

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Assessment of Radiation Doses Due to Radioactive Liquid and Gaseous Effluents Released from TMI During 2014

TMI-1

The attached table presents the maximum hypothetical doses to an individual and the general population resulting from 2014 TMI-1 releases of gaseous and liquid effluents. Provided below is a brief explanation of the table.

A. Liquid (Individual)

Calculations were performed on the four age groups and seven organs recommended in Regulatory Guide 1.109. The pathways considered for TMI-1 were the consumption of drinking water and fish. These two pathways are considered to be the primary recreational activities associated with the Susquehanna River in the vicinity of TMI. The "critical receptor" or Receptor 1 was that individual who 1) consumed Susquehanna River water from the nearest downstream drinking water supplier (Wrightsville Water Supply) and 2) consumed fish residing in the vicinity of the TMI-1 liquid discharge.

For 2014 the calculated maximum whole body (or total body) dose from TMI-1 liquid effluents was $4.57\text{E-}3$ mrem to an adult (line 1). The maximum organ dose was $4.63\text{E-}3$ mrem to the liver of an adult (line 2).

B. Gaseous (Individual)

There were five major pathways considered in the dose calculations for TMI-1 gaseous effluents. These were: (1) plume exposure (2) inhalation, consumption of; (3) cow milk, (4) vegetables and fruits and (5) meat.

Lines 3 and 4 present the maximum plume exposure at or beyond the site boundary. The notation of "air dose" is interpreted to mean that these doses are not to an individual, but is considered to be the maximum doses that would have occurred at or beyond the site boundary. The calculated maximum plume exposures were $1.95\text{E-}4$ mrad and $7.14\text{E-}5$ mrad for gamma and beta, respectively.

The maximum organ dose due to the release of iodines, particulates and tritium from TMI-1 in 2014 was $1.10\text{E-}1$ mrem to the bone of a child. This dose again reflects the maximum exposed organ for the appropriate age group (line 5).

For 2014, TMI-1 liquid and gaseous effluents resulted in maximum hypothetical doses that were a small fraction of the quarterly and yearly ODCM dose limits.

TMI-1 SUMMARY OF MAXIMUM INDIVIDUAL DOSES FOR TMI-1 FROM January 1, 2014 through December 31, 2014							
Effluent	Applicable Organ	Estimated Dose (mrem)	Age Group	% of ODCM Dose Limit		ODCM Dose Limit (mrem)	
				Quarter	Annual	Quarter	Annual
(1) Liquid	Total Body	4.57E-3	Adult	3.05E-1	1.52E-1	1.5	3
(2) Liquid	Liver	4.63E-3	Adult	9.26E-2	4.63E-2	5	10
(3) Noble Gas	Air Dose (gamma-mrad)	1.95E-4	-	3.90E-3	1.95E-3	5	10
(4) Noble Gas	Air Dose (beta-mrad)	7.14E-5	-	7.14E-4	3.57E-4	10	20
(5) Iodine, Tritium & Particulates	Bone	1.10E-1	Child	1.47E0	7.33E-1	7.5	15

TMI-2

The attached table presents the maximum hypothetical doses to an individual and the general population resulting from 2014 TMI-2 releases of gaseous and liquid effluents. Provided below is a brief explanation of the table.

A. Liquid (Individual)

Calculations were performed on the four age groups and seven organs recommended in Regulatory Guide 1.109. The pathways considered for TMI-2 were the consumption of drinking water and fish. These two pathways are considered to be the primary recreational activities associated with the Susquehanna River in the vicinity of TMI. The "critical receptor" or Receptor 1 was that individual who 1) consumed Susquehanna River water from the nearest downstream drinking water supplier (Wrightsville Water Supply) and 2) consumed fish residing in the vicinity of the TMI-2 liquid discharge.

For 2014 the calculated maximum whole body (or total body) dose from TMI-2 liquid effluents was $3.87\text{E-}4$ mrem to an adult (line 1). The maximum organ dose was $6.15\text{E-}4$ mrem to the liver of a teen (line 2).

B. Gaseous (Individual)

There were five major pathways considered in the dose calculations for TMI-2 gaseous effluents. These were: (1) plume exposure (2) inhalation, consumption of; (3) cow milk, (4) vegetables and fruits and (5) meat.

Since there were no noble gases released from TMI-2 during 2014, the gamma and beta air doses (lines 3 and 4, respectively) were zero.

The maximum organ dose due to the release of particulates and tritium from TMI-2 in 2014 was $5.63\text{E-}5$ mrem to the liver, total body, thyroid, kidney, lung, and GI tract of a child (line 5).

For 2014, TMI-2 liquid and gaseous effluents resulted in maximum hypothetical doses that were a small fraction of the quarterly and yearly ODCM dose limits.

TMI-2 SUMMARY OF MAXIMUM INDIVIDUAL DOSES FOR TMI-2 FROM January 1, 2014 through December 31, 2014							
Effluent	Applicable Organ	Estimated Dose (mrem)	Age Group	% of ODCM Dose Limit		ODCM Dose Limit (mrem)	
				Quarter	Annual	Quarter	Annual
(1) Liquid	Total Body	3.87E-4	Adult	2.58E-2	1.29E-2	1.5	3
(2) Liquid	Liver	6.15E-4	Teen	1.23E-2	6.15E-3	5	10
(3) Noble Gas	Air Dose (gamma-mrad)	0	-	0	0	5	10
(4) Noble Gas	Air Dose (beta-mrad)	0	-	0	0	10	20
(5) Tritium & Particulate	Liver, Total Body, Thyroid, Kidney, Lung & GI Tract	5.63E-5	Child	7.51E-4	3.75E-4	7.5	15

Assessment of Radiation Doses from Liquid and Gaseous Effluents Releases to Members of the Public within the TMI Site Boundaries During 2014

The Offsite Dose Calculation Manual requires an assessment of the radiation doses from radioactive liquid and gaseous effluents to members of the public due to their activities inside the site boundary during the reporting period. The estimated dose to a member of the public at or within the TMI Site Boundary was 1.14 mrem for 2014.

The following are the assumptions made in this assessment:

Access to the TMI Owner Controlled Area is limited to only those persons who have business related activities that support the operation of the facility. Therefore, based on the definition of a 'member of the public' in NUREG-1301, there is no credible scenario for this individual to receive non-occupational dose inside the TMI Owner Controlled Area. The scenario selected will be recreational use of the Susquehanna River and shoreline next to the Owner Controlled Area fence. Based on the two definitions of Site Boundary in the ODCM, this scenario is AT the Site Boundary for liquid releases but INSIDE the Site Boundary for gaseous releases.

A member of the public stays next to the owner controlled area for 67 hours. The 67 hours is based upon Reg. Guide 1.109 shoreline recreation period given in Table E-5. This is a table of recommended values to be used for the maximum exposed individual in lieu of site-specific data. Three Mile Island is co-located with other islands in the Lake Frederick area of the Susquehanna River. This area is used recreationally for boating and fishing over the summer months. The application of the 67 hours of recreational use from Reg. Guide 1.109 is appropriate.

The highest dose from liquid releases is characterized by release L20140708-075-B. This release was from the WECST B Radwaste Release Tank. The total body dose from release L20140708-075-B was 3.11E-4 mrem.

The highest dose from a single airborne release is characterized by release G20140211-009-C. This release was from TMI's Auxiliary and Fuel Handling Buildings ventilation system. The release contained airborne tritium from spent fuel pool evaporation. This release occurred over 180 hours. The entire dose from this release will be applied to the 67 hour recreational use period. The application of the total dose from this release to 67 hours is conservative. The maximum individual dose from release G20140211-009-C was 3.35E-3 mrem to the bone of a child.

The highest fenceline direct radiation result (assumed to be equal to dose) will be added to the dose from the highest liquid and gaseous releases to yield the hypothetical maximum dose to a member of the public within the site boundaries.

The highest fenceline direct radiation result for 2014 was from Station F1-2 and was 37.4 mrem per quarter. The net direct radiation dose, obtained by subtracting the results from a control station dosimeter from the indicator results, was not used. This again is conservative.

Calculations:

$$37.4 \text{ mrem/qtr} * 1/91.5 \text{ d/qtr} * 1/24 \text{ hr/day} * 67 \text{ hr} = 1.14 \text{ mrem}$$

The dose from liquid release L20140708-075-B was 0.000311 mrem.

The dose from gas release G20140211-009-C was 0.00335 mrem.

Total Dose Calculation

$$1.14 \text{ mrem} + 0.000311 \text{ mrem} + 0.00335 \text{ mrem} = 1.14 \text{ mrem}$$

Assessment of Radiation Dose to Most Likely Exposed Real Individual per 40 CFR 190

Dose calculations were performed to demonstrate compliance with 40 CFR 190 (ODCM Part IV Section 2.10). Gaseous and liquid effluents released from TMI-1 and TMI-2 in 2014 resulted in maximum individual doses (regardless of age group) of 0.068 mrem to the thyroid and 0.21 mrem to any other organ including the whole (total) body. The direct radiation component was determined using the highest quarterly fence-line exposure rate as measured by an environmental dosimeter, and subtracting from it, the lowest quarterly environmental dosimeter exposure rate.

Based on the maximum exposure rate of 37.4 mR/quarter, a person residing at the fence-line for 67 hours (shoreline exposure from Reg. Guide 1.109) received an exposure of 1.14 mR. Based on the lowest exposure rate of 16.2 mR/quarter and converting it by the same method yielded a background exposure of 0.49 mR. Therefore, the net exposure from direct radiation from TMINS was 0.65 mR. Combining the direct radiation exposure (assumed to be equal to dose) with the maximum organ doses from liquid and gaseous releases, the maximum potential (total) doses were 0.69 mrem to the thyroid and 0.77 mrem to any other organ. Both doses were well below the limits specified in 40 CFR 190.

Deviations from the ODCM Sampling and Analysis Regime During 2014

The Turbine Building Integrator (SD-FQ-301) sends a signal to the Turbine Building Compositor (SD-CE-253) to collect a flow proportional sample. In 2012, engineering identified that the integrator does not work at low flows. An Engineering Change Request (ECR) 14-00015 has been completed to upgrade the integrator but determined that industrial cooler blowdown will need to be re-routed. A second ECR 14-00552 has been completed for this mechanical work. ECR 14-00015 was installed in April 2015, and ECR 14-00552 is scheduled to be installed during 2015. The only known low flow source is from a non-radioactive system – industrial cooler blowdown. Weekly compensatory sampling to confirm no radioisotopes are present in the industrial coolers will continue until the blowdown is re-routed.

Major Changes to Radioactive Waste Treatment Systems

The following information is for inclusion in the TMI-1/2 Radiological Effluents Report pursuant to Tech Spec Amendment 284.

Licensee initiated safety related changes to the radioactive waste system (liquid, gaseous and solid):

1. Shall be reported to the Commission in the Annual Report for the period in which the evaluation was reviewed. The discussion of each change shall contain:
 - a. A summary of the evaluation that led to the determination that the change could be made in accordance with 10CFR 50.59;

The processing of liquid radwaste materials is unchanged except as noted for the concentrated waste storage capabilities. The Hittman Building radwaste processing activities remain unchanged whether the waste is transferred from the CWST storage prior to being abandoned, from an RBAT, or directly from an Evaporator.

Below is the summary of conclusion for the Activity's 50.59 Review:

Screening Question 1 was answered "Yes" due to the elimination of the design function to store concentrated waste. Storage of concentrated waste is identified as a component function attributed to the CWSTs which have been abandoned in accordance with change document ECR 14-00245. Questions 2 through 5 have been answered "No" for the Screening. Therefore, a 50.59 Evaluation was required. The 50.59 Evaluation has all Questions answered "No" so this activity was completed without prior NRC approval.

- b. Sufficient detailed information to totally support the reason for the change without benefit of additional or supplemental information;

The processing of liquid radwaste materials is unchanged except as noted for the concentrated waste storage capabilities. The Hittman Building radwaste processing activities remain unchanged whether the waste is transferred from the CWST storage prior to being abandoned, from an RBAT, or directly from an Evaporator.

Below is the problem statement from change document ECR 14-00245:

The Miscellaneous Waste Evaporator WDL-Z-1B concentrates liquid radioactive waste. When waste concentration operations are complete, the Liquid Radioactive Waste (WDL) System was designed to pump the bottoms from the Waste Feed Tank WDL-T-13B, i.e., "Bottoms" to its Concentrated Liquid Waste Storage and Forwarding for Disposal (CWDL) Subsystem where it was previously stored and eventually pumped to the waste disposal liners in the Hittman Building.

Due to station desire and conditions of the concentrated waste storage tanks, concentrated waste transfer pumps and associated piping, ECR 14-00245 physically abandoned the CWDL Subsystem, i.e., CWSTs, pumps, heat trace, valves, instrument air connections and steam heating.

ECR 14-00245 re-established a flow path within the existing piping configuration to allow pumping the Miscellaneous Waste Evaporator Bottoms directly to the waste disposal liner located in the Hittman Building.

ECR 14-00245 also established a new flow path with new piping configured to allow pumping the Reclaimed Boric Acid Tanks (RBAT), WDL-T-7A(B), directly to the waste disposal liner located in the Hittman Building.

- c. A detailed description of the equipment, components and processes involved and the interfaces with other plant systems;
- The processing of liquid radwaste materials is unchanged except as noted for the concentrated waste storage capabilities. The Hittman Building radwaste processing activities remain unchanged whether the waste is transferred from the CWST storage prior to being abandoned, from an RBAT, or directly from and Evaporator.
 - Two isolation valves and a check valve have been added to ensure water inventory cross-contamination does not occur during normal system operations. This new line enables transport of reclaimed boric acid tank (RBAT) inventory to the Hittman Building when needed. RBAT inventory was previously transferred to the CWSTs enroute to the Hittman Building. The ultimate destination in the Hittman Building remains unchanged.

The scope the change included:

- Physical abandonment of the CWSTs; Concentrated Radwaste Pumps, WDL-P-12A(B); associated valves, piping, instrumentation, heat tracing and Auxiliary Steam System supply for the CWSTs. The abandonment included cutting and capping piping to and from the abandoned portion of the system as necessary.
 - Physical abandonment of Instrument Air (IA) tubing/piping and isolation valves to the air operated diaphragm valves mention above.
 - Re-purpose air-operated diaphragm valves WDL-V-418 and WDL-V-256 to accommodate the transfer of liquid radioactive waste from the Miscellaneous Waste Evaporator Bottoms directly to a waste disposal liner in the Hittman Building.
 - Installation of a new flow path from the discharge of the Boric Acid Recycle Pumps, WDL-P-13A(B), to a portion of the existing flow path between air-operated valves WDL-V-256 and WDL-V-418. The new flow path allows transferring of reclaimed boric acid to a liner for disposal as needed.
 - Removal and installation of heat trace as required.
 - Changes to the Radioactive Waste Disposal Plant display.
- d. An evaluation of the change which shows the predicted releases of radioactive materials in liquid and gaseous effluents and/or quantity of solid waste that differ from those previously predicted in the license application and amendments thereto;

The processing of liquid radwaste materials is unchanged except as noted for the concentrated waste storage capabilities. The Hittman Building radwaste processing activities remain unchanged whether the waste is transferred from the CWST storage prior to being abandoned, from an RBAT or directly from an Evaporator.

As stated in the 50.59 Screening Form:

GDC 69 "Protection Against Radioactivity Release from Spent Fuel and Waste Storage" is unaffected as the method for processing liquid and radwaste through the Hittman Building is unchanged as evaluated per SE-115302-052 "Shipment of Misc. Waste Evaporator Concentrates". GDC 70 "Control of Releases of Radioactivity to the Environment" continue to be satisfied CWSTs and WDL-P-12A/B pumps abandoned.

- e. An evaluation of the change which shows the expected maximum exposures to individuals in the unrestricted area and to the general population that differ from those previously estimated in the license application and amendments thereto;

The processing of liquid radwaste materials is unchanged except as noted for the concentrated waste storage capabilities. The Hittman Building radwaste processing activities remain unchanged whether the waste is transferred from the CWST storage prior to being abandoned, from an RBAT, or directly from an Evaporator. Offsite dose projections did not change as a result of this radwaste system modification.

- f. A comparison of the predicted releases of radioactive materials, in liquid and gaseous effluents and in solid waste, to the actual releases for the period prior to when the changes are to be made;

The processing of liquid radwaste materials is unchanged except as noted for the concentrated waste storage capabilities. The Hittman Building radwaste processing activities remain unchanged whether the waste is transferred from the CWST storage prior to being abandoned, from an RBAT, or directly from an Evaporator. No change to predicted releases of radioactive materials, in liquid and gaseous effluents and in solid waste as a result of design change 14-00245.

- g. An estimate of the exposure to plant operating personnel as a result of the change; and ECR 14-00245 facilitated removal of associated components to reduce radiation and contamination sources remaining in the vicinity, and is intended to reduce long-term personnel dose.
- h. Documentation of the fact that the change was reviewed and approved.

The 50.59 Evaluation Form was reviewed (09/2014) and approved (10/2014). ECR 14-00245 was reviewed (10/2014) and approved (10/2014).