Exelon Generation.

April 30, 2018

TMI-18-025

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

THREE MILE ISLAND NUCLEAR STATION UNIT 1 AND UNIT 2
RENEWED OPERATING LICENSE NO. DPR-50 AND POSSESSION ONLY
LICENSE NO. DPR 73
DOCKET NOS. 50-289 AND 50-320

SUBJECT: COMBINED 2017 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

The 2017 Annual Radioactive Effluent Release Reports required by TMI-1 Technical Specification 6.9.4.1, TMI-2 Technical Specifications 6.8.1.2, and 6.12, and the Off-Site Dose Calculation Manual Part 4, Section 2.1, is enclosed.

Attachment 1 contains a summary of the quantities of radioactive liquid and gaseous effluents released from the site as outlined in Reg. Guide 1.21, Rev. 1, with data summarized on a quarterly basis following the format of Appendix B thereof.

Attachment 2 contains information for each type of solid waste shipped offsite during the report period including the container volume, total curie quantity, principal radionuclides and type of waste.

Attachment 3 includes a summary of unplanned releases from the site to unrestricted areas of radioactive materials in gaseous and liquid effluents made during the reporting period.

Attachment 4 describes any changes made during 2017 to the Process Control Program (PCP) documents or to the Offsite Dose Calculation Manual (ODCM) and a listing of new locations for dose calculations and/or environmental monitoring identified by the land use census pursuant to Part 3, Section 8.2, of the ODCM.

Attachment 5 reports all instrumentation 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.

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Attachment 6 is quarterly summaries of hourly meteorological data collected for 2017 in the form of joint frequency distribution of wind speed, wind direction and atmospheric stability.

Attachment 7 is an assessment of the radiation doses due to the radioactive liquid and gaseous effluents released from the respective unit during 2017.

Attachment 8 is an assessment of the radiation doses from the radioactive liquid and gaseous effluents to members of the public due to their activities inside the site boundary during 2017.

Attachment 9 is an assessment of the radiation doses to the most likely exposed real individual from reactor releases and other nearby uranium fuel cycle sources including doses from primary effluent pathways and direct radiation for 2017.

Attachment 10 is a summation of deviations from the sampling and analysis regime specified in the ODCM for TMI-1 and TMI-2.

Attachment 11 is a summary of Major Changes to Radioactive Waste Treatment Systems IAW FSAR Section 11.2.6.

Enclosure 1 is a copy of the "TMI Offsite Dose Calculation Manual (ODCM)", CY-TM-170-300, Revision 5, which was approved during 2017 and issued on December 8, 2017. There was one revision made to the ODCM during 2017.

Enclosure 2 is a copy of the TMI Process Control Program, RW-AA-100 Revision 12, which was issued on September 30, 2017.

Please contact Dani Brookhart at 717-948-8017 if you have any questions concerning this report.

Respectfully,

Joseph A. Dullinger
Plant Manager (acting), Three Mile Island Unit 1
Exelon Generation Co., LLC

JAD/DLB/dam

Attachments/Enclosures

cc: Regional Administrator, NRC Region I
NRC Senior Resident Inspector – Three Mile Island Nuclear Station, Unit 1
NRC Project Manager, NRR – Three Mile Island Nuclear Station, Unit 1
NRC Project Manager, NRR – Three Mile Island Nuclear Station, Unit 2
R. R. Janati, Commonwealth of Pennsylvania
S. L. Martin, PA Department of Environmental Protection, Bureau of Radiation Protection
GPU Nuclear Cognizant Officer

Summary of Radioactive Liquid and Gaseous Effluents Released from TMI during 2017

TABLE 1A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2017
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	5.31E-01	1.98E-01	1.13E+01	7.06E+01	25%
2. Avg release rate for period	µCi/S	6.83E-02	2.52E-02	1.42E+00	8.88E-02	
3. Percent of applicable limit	%	*	*	*	*	
B. IODINES						
1. Total Iodine 1131	Ci	<LLD	<LLD	2.68E-05	5.37E-05	25%
2. Avg Release Rate for Period	µCi/S	N/A	N/A	3.37E-06	6.75E-06	
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	2.04E+01	1.69E+01	2.58E+01	3.68E+01	15%
2. Avg Release Rate for Period	µCi/S	2.62E+00	2.15E+00	3.25E+00	4.63E+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	µCi/S	*	*	*	*	
F. CARBON 14						
1. Total Release	Ci	2.23E+00	2.18E+00	1.47E+00	2.47E+00	**
2. Avg release rate for period	µCi/S	2.86E-01	2.77E-01	1.85E-01	3.11E-01	
3. Percent of applicable limit	µCi/S	*	*	*	*	

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
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	1.38E-03	<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	3.78E-03	<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	5.16E-03	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

Tritium	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H3	Ci	3.40E-05	<LLD	4.04E-03	<LLD

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

TABLE 1B
(CONTINUED)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2017
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	1.89E-06	1.16E-07
I-132	Ci	<LLD	<LLD	<LLD	<LLD
I-133	Ci	<LLD	<LLD	6.51E-07	<LLD
Total	Ci	N/A	N/A	2.54E-06	1.16E-07

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	2.75E-04	1.49E-02	3.76E+00	6.45E-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 2017
GASEOUS EFFLUENTS – MIXED MODE RELEASES – BATCH MODE

Fission And Activation Gasses	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Ar-41	Ci	<LLD	3.45E-03	1.55E-00	1.36E-02
Kr-85	Ci	4.93E-01	1.77E-01	2.04E-01	1.27E-01
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	5.80E-03	1.19E-03	1.94E-03	5.17E-03
Xe-133	Ci	3.17E-02	1.57E-03	9.29E-00	5.60E-01
Xe-133m	Ci	<LLD	<LLD	3.98E-02	3.68E-05
Xe-135	Ci	<LLD	<LLD	1.67E-01	7.43E-06
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	5.31E-01	1.98E-01	1.21E+01	7.06E-01

Radioiodines	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
I-131	Ci	<LLD	<LLD	4.08E-06	4.88E-01
I-132	Ci	<LLD	<LLD	<LLD	<LLD
I-133	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	4.08E-06	4.88E-01

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	8.48E-04	2.26E-02	9.40E+00	6.54E-01

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

TABLE 1D (CONTINUED)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2017
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	2.02E-05	4.74E-06
I-132	Ci	<LLD	<LLD	<LLD	<LLD
I-133	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	N/A	N/A	2.02E-05	4.74E-06

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	2.04E+01	1.69E+01	1.26E+01	3.61E+01

Carbon 14	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
C-14	Ci	2.23E+00	2.18E+00	1.47E+00	2.47E+00

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

TABLE 2A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2017
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	5.05E-05	6.70E-05	1.36E-04	2.19E-04	25%
2. Avg diluted concentration during period	µCi/ml	7.79E-12	1.10E-11	1.97E-11	3.26E-11	
3. Percent of applicable limit	%	*	*	*	*	
B. Tritium						
1. Total Release	Ci	1.33E+02	7.45E+01	7.95E+01	5.29E+01	25%
2. Avg diluted concentration during period	µCi/ml	2.05E-05	1.23E-05	1.15E-05	7.88E-06	1.30E-05
3. Percent of applicable limit	%	*	*	*	*	
C. Dissolved and Entrained Gases						
1. Total Release	Ci	2.17E-05	1.42E-05	2.40E-05	<LLD	15%
2. Avg diluted concentration during period	µCi/ml	3.34E-12	2.33E-12	3.47E-12	0.00E+00	2.28E-12
3. Period of applicable limit	%	*	*	*	*	
D. Gross Alpha Activity						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	25%
E. VOLUME OF WASTE RELEASE (PRIOR TO DILUTION	LITERS	9.44E+07	9.79E+07	1.04E+08	1.07E+08	10%
F. VOLUME OF DILUTION WATER USED	LITERS	6.49E+09	6.08E+09	6.91E+09	6.71E+09	10%

TABLE 2B
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2017
LIQUID EFFLUENTS - BATCH MODE
TMI-1

Fission and Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H-3	Ci	1.33E+02	7.45E+01	7.94E+01	5.28E+01
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD
Fe-55	Ci	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	8.90E-07	<LLD	<LLD	3.09e-06
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	2.47E-05	5.42E-06	7.23E-05	5.42E-05
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	1.34E-06
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	2.50E-05	6.16E-05	6.38E-05	1.60E-04
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	1.33E+02	7.45E+01	7.94E+01	5.28E+01

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	2.17E-05	1.42E-05	2.40E-05	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD
Total	Ci	2.17E-05	1.42E-05	2.40E-05	N/A

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

TABLE 2B (CONTINUED)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2017
LIQUID EFFLUENTS - CONTINUOUS MODE
TMI-1

Fission and Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H-3	Ci	1.31E-02	1.02E-02	3.41E-02	2.87E-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	1.31E-02	1.02E-02	3.41E-02	2.87E-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
2017 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 N/A

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	39	13	37	43
2. Total time period for batch releases (min)	10500	4090	13000	12600
3. Maximum time period for a batch release (min)	760	695	970	860
4. Average time period for a batch release (min)	268	314	352	292
5. Minimum time period for a batch release (min)	203	205	195	1
6. Average stream flow during periods of release of effluent into a flowing stream (cfm)	3.29E+06	3.21E+06	1.66E+06	1.36E+06
B. GASEOUS				
1. Number of batch releases	7	7	22	13
2. Total time period for batch releases (min)	4690	4580	32100	10100
3. Maximum time period for a batch release (min)	818	793	10100	1560
4. Average time period for a batch release (min)	670	655	1460	776
5. Minimum time period for a batch release (min)	33	6	1	8

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)	2.72E-03	2.75E-03	2.78E-03	2.78E-03
B. GASEOUS				
1. Number of releases	0	0	1	0
2. Total activity released (curies)	0	0	9.19E-03	0

TABLE 1A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2017
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	1.16E-01	1.08E-02	3.14E-02	1.49E-02	25%
2. Avg release rate for period	µCi/S	1.50E-02	1.38E-03	3.95E-03	1.87E-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 2017
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

Tritium	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H3	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 2017
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	1.16E-01	1.08E-02	3.14E-02	1.49E-02

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

TABLE 2A
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2017
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	1.26E-06	4.92E-06	4.90E-06	1.57E-06	25%
2. Avg diluted concentration during period	µCi/ml	1.65E-09	2.52E-11	3.41E-10	6.94E-12	
3. Percent of applicable limit	%	*	*	*	*	
B. TRITIUM						
1. Total Release	Ci	<LLD	6.64E-06	2.73E-06	<LLD	25%
2. Avg diluted concentration during period	µCi/ml	N/A	1.46E-10	3.00E-11	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	1.21E+03	2.57E+05	1.99E+04	2.05E+05	10%
F. VOLUME OF DILUTION WATER USED	LITERS	7.62E+05	1.95E+08	1.44E+07	2.26E+08	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 2017
LIQUID EFFLUENTS - BATCH MODE
TMI-2

Fission and Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
H-3	Ci	<LLD	<LLD	<LLD	<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	1.26E-06	4.92E-06	4.90E-06	1.57E-06
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	1.26E-06	4.92E-06	4.90E-06	1.57E-06

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 2B(CONTINUED)
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2017
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 2017

2017 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.	9.22E+01	3.40E+02	01/01/17-12/31/17	+/- 25%
b. Dry compressible waste, contaminated equip, etc.	3.94E+02	3.55E-01	01/01/17-12/31/17	+/- 25%
c. Irradiated components, control rods, etc.	2.79E-02	4.13E-01	01/01/17-12/31/17	+/- 25%
d. Other (describe)	0.00E+00	0.00E+00	01/01/17-12/31/17	+/- 25%

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

	Major Nuclide Composition	%
a.	Co-60	55.00%
	Ni-63	23.91%
b.	Co-60	39.99%
	Ni-63	21.59%
	Cs-137	17.96%
c	Co-60	63.69%
	Fe-55	18.03%
d.	None	

2017 Annual Radioactive Effluent Release Report
Solid Waste and Irradiated Fuel Shipments
TMI-1

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
28	Hittman Transport Services	Energy Solutions LLC 1560 Bear Creek Rd
1	LandStar Ranger Inc.	Energy Solutions 1560 Bear Creek Rd
3	Hittman Transport Services	Energy Solution Clive Disposal Site, Utah
1	Hittman Transport Services	Waste Control Specialists LLC Andrews Texas

B. Irradiated Fuel Shipments (disposition)

Number of Shipments	Mode of Transportation	Destination
None	None	None

C. Changes to the Process Control Program

RW-AA-100: PROCESS CONTROL PROGRAM FOR RADIOACTIVE WASTES was revised 9/30/17 to remove references to Fort Calhoun and add references to Fitzpatrick. No functional change for TMI.

2017 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	01/01/17-12/31/17	+/- 25%
b. Dry compressible waste, contaminated equip, etc.	0.00E+00	0.00E+00	01/01/17-12/31/17	+/- 25%
c. Irradiated components, control rods, etc.	0.00E+00	0.00E+00	01/01/17-12/31/17	+/- 25%
d. Other (describe) radwaste system sump excess water from rain intrusion	2.65E+01	2.02E+00	01/01/17-12/31/17	+/- 25%

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

	Major Nuclide Composition	%
a.	None	
b.	None	
c.	None	
d.	Cs-137	85.97%
	Sr-90	13.09%

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
2	Hittman Transport Services	Energy Solutions LLC 1560 Bear Creek Rd.

B. Irradiated Fuel Shipments (disposition)

Number of Shipments	Mode of Transportation	Destination
None	None	None

Summary of Unplanned Releases from the TMI Site During 2017

There were no unplanned releases from TMI-2 in 2017. 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 2B.

The abnormal liquid releases are monthly releases to account for the tritium in groundwater released into the river. There was one unplanned gaseous release for TMI-1, captured in IR 04049166. This release occurred when both containment doors were open at the same time, for less than one minute.

CHANGES TO THE PROCESS CONTROL PROGRAM AND THE OFFSITE DOSE CALCULATION MANUAL DURING 2017 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 were minor changes to the TMI Process Control Program, RW-AA-100 Rev. 12 issued on 9/30/17, did not make a change to TMI's PCP.

2. Changes to the Offsite Dose Calculation Manual

There was one change to the Offsite Dose Calculation Manual approved in 2017. The procedure change is attached in Enclosure 1.

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 2017 Land Use Census, no changes were required to the Radiological Environmental Monitoring Program. The Land Use Census identified minor changes to the closest resident in Sectors A (N), and B (NNE). The satellite imagery indicated that the residents in these sectors are closer to the plant than previously reported.

Other minor changes occurred with gardens in Sectors L(SW) and N(W). A new garden in Sector L was identified farther than the plant that is closer to the 500 sq. ft. requirement than the current garden in that sector. The home in Sector N is under new ownership, but there is still a garden at that residence.

Instrumentation Not Returned to Operable Status Within 30 Days During 2017

There were no instruments 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 2017.

Annual Summary of Hourly Meteorological Data for

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 2017 was 99.9 percent. The data is presented by quarter.

Three Mile Island Alpha
Period of Record: **January - March 2017**
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	3	0	0	0	0	3
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	1	0	2	0	0	0	3
SE	0	1	0	0	0	0	1
SSE	0	1	1	0	0	0	2
S	0	1	0	1	0	0	2
SSW	0	0	7	2	0	0	9
SW	0	0	0	2	0	0	2
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	3	2	0	0	0	0	5
NNW	0	5	0	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	4	14	10	5	2	0	34

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

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Three Mile Island Alpha
Period of Record: **January - March 2017**
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	1	0	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	2	2	0	0	0	4
SE	0	2	0	0	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	3	1	0	0	0	4
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	1	1	0	0	2
WNW	0	0	0	2	1	0	3
NW	0	0	0	2	0	0	2
NNW	0	0	1	0	1	1	3
Variable	0	0	0	0	0	0	0
Total	1	7	5	5	2	1	21

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 2017**
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	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	0	0	0	0	0	0
ESE	0	2	0	1	0	0	3
SE	0	3	0	0	0	0	3
SSE	0	2	0	0	0	0	2
S	0	1	2	1	0	0	4
SSW	0	0	1	0	0	0	1
SW	0	1	0	0	0	0	1
WSW	0	0	0	0	0	0	0
W	0	2	3	0	0	0	5
WNW	0	1	0	1	3	0	5
NW	0	1	1	4	3	3	9
NNW	0	0	1	0	4	3	8
Variable	0	0	0	0	0	0	0
Total	0	13	9	7	10	3	42

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

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Three Mile Island Alpha
Period of Record: **January - March 2017**
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	11	29	11	0	0	54
NNE	2	12	2	0	0	0	16
NE	4	12	6	0	0	0	22
ENE	7	14	12	1	0	0	34
E	18	6	23	12	0	0	59
ESE	4	19	40	9	0	0	72
SE	6	18	4	0	0	0	28
SSE	5	13	5	0	0	0	23
S	3	14	13	2	0	0	32
SSW	4	12	12	1	0	0	29
SW	3	16	9	2	1	0	31
WSW	2	12	10	9	5	0	38
W	1	22	55	47	11	2	138
WNW	3	13	67	109	44	2	238
NW	3	12	50	58	50	6	179
NNW	4	20	27	17	5	0	73
Variable	0	0	0	0	0	0	0
Total	72	226	364	278	116	10	1066

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 2017**
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	24	38	6	6	0	0	74
NNE	13	20	1	0	0	0	34
NE	20	13	4	0	0	0	37
ENE	10	14	1	0	0	0	25
E	13	18	5	1	0	0	37
ESE	7	15	1	0	0	0	23
SE	6	6	0	0	0	0	12
SSE	5	13	2	0	0	0	20
S	4	27	9	6	0	0	46
SSW	10	12	28	8	0	0	58
SW	8	10	16	5	0	0	39
WSW	10	14	4	6	0	0	34
W	9	20	14	5	3	0	51
WNW	16	17	19	3	3	2	60
NW	15	15	38	19	0	0	87
NNW	28	30	12	10	1	0	81
Variable	0	0	0	0	0	0	0
Total	198	282	160	69	7	2	718

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: 0

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Three Mile Island Alpha
Period of Record: **January - March 2017**
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	11	5	0	0	0	0	16
NNE	3	3	0	0	0	0	6
NE	7	2	0	0	0	0	9
ENE	4	3	0	0	0	0	7
E	8	6	0	0	0	0	14
ESE	8	2	0	0	0	0	10
SE	9	1	0	0	0	0	10
SSE	8	5	0	0	0	0	13
S	12	6	0	0	0	0	18
SSW	2	8	2	1	0	0	13
SW	7	6	1	0	0	0	14
WSW	6	3	1	0	0	0	10
W	1	4	3	0	0	0	8
WNW	8	2	1	0	0	0	11
NW	5	3	2	1	0	0	11
NNW	7	4	6	1	0	0	18
Variable	0	0	0	0	0	0	0
Total	106	63	16	3	0	0	188

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: 0

Three Mile Island Alpha
Period of Record: **January - March 2017**
Stability Class - **Extremely 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	1	1	0	0	0	5
NNE	6	2	0	0	0	0	8
NE	3	0	0	0	0	0	3
ENE	5	0	0	0	0	0	5
E	5	0	0	0	0	0	5
ESE	8	1	0	0	0	0	9
SE	4	0	0	0	0	0	4
SSE	5	2	0	0	0	0	7
S	2	2	0	0	0	0	4
SSW	2	2	0	0	0	0	4
SW	2	3	0	0	0	0	5
WSW	5	1	0	0	0	0	6
W	1	3	0	0	0	0	4
WNW	2	3	1	0	0	0	6
NW	1	2	0	0	0	0	3
NNW	4	4	0	0	0	0	8
Variable	0	0	0	0	0	0	0
Total	58	26	2	0	0	0	86

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: **April - June 2017**
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	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	1	1	0	0	0	2
SE	0	1	6	5	0	0	12
SSE	0	0	1	0	0	0	1
S	0	0	6	0	0	0	6
SSW	0	1	10	1	1	0	13
SW	2	1	2	0	0	0	5
WSW	2	0	1	0	0	0	3
W	0	4	0	0	0	0	4
WNW	0	4	0	0	0	0	4
NW	1	5	1	0	0	0	7
NNW	1	4	0	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	6	23	28	6	1	0	64

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: 4

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Three Mile Island Alpha
Period of Record: **April - June 2017**
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	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	2	0	0	0	0	2
E	0	2	0	0	0	0	2
ESE	0	5	4	0	0	0	9
SE	0	1	3	1	0	0	5
SSE	0	1	0	0	0	0	1
S	0	1	2	2	0	0	5
SSW	0	3	3	0	2	0	8
SW	0	2	1	0	0	0	3
WSW	0	0	1	0	0	0	1
W	1	1	3	0	0	0	5
WNW	0	0	0	0	0	0	0
NW	2	4	3	0	0	0	9
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	3	24	21	3	2	0	53

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: 4

Three Mile Island Alpha
Period of Record: **April - June 2017**
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	0	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	2	0	0	0	0	2
ENE	0	2	0	0	0	0	2
E	0	1	0	0	0	0	1
ESE	0	1	4	0	0	0	5
SE	0	3	8	1	0	0	12
SSE	0	0	0	0	0	0	0
S	1	2	1	1	1	0	6
SSW	0	0	2	1	0	0	3
SW	0	2	1	0	0	0	3
WSW	0	0	7	1	2	0	10
W	0	3	4	0	0	0	7
WNW	1	1	3	0	0	0	5
NW	0	3	4	0	0	0	7
NNW	1	4	3	0	0	0	8
Variable	0	0	0	0	0	0	0
Total	3	26	37	4	3	0	73

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: 4

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Three Mile Island Alpha
Period of Record: **April - June 2017**
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	8	19	15	0	0	0	42
NNE	5	21	2	0	0	0	28
NE	12	14	12	0	0	0	38
ENE	9	36	9	0	0	0	54
E	5	56	38	4	0	0	103
ESE	3	38	72	15	0	0	128
SE	6	26	39	8	0	0	79
SSE	4	14	10	0	0	0	28
S	6	22	19	7	0	0	54
SSW	9	34	28	7	1	0	79
SW	4	27	30	4	0	0	65
WSW	6	13	26	2	1	0	48
W	5	16	45	23	0	0	89
WNW	10	10	45	23	8	0	96
NW	17	17	49	45	1	0	129
NNW	11	26	13	7	0	0	57
Variable	0	0	0	0	0	0	0
Total	120	389	452	145	11	0	1117

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: 4

Three Mile Island Alpha
Period of Record: **April - June 2017**
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	10	20	7	0	0	0	37
NNE	4	17	0	0	0	0	21
NE	8	6	0	0	0	0	14
ENE	7	13	1	0	0	0	21
E	17	12	1	0	0	0	30
ESE	8	10	3	0	0	0	21
SE	5	3	7	2	0	0	17
SSE	5	5	0	0	0	0	10
S	7	18	9	1	0	0	35
SSW	6	25	24	5	1	0	61
SW	16	22	16	1	0	0	55
WSW	22	20	10	5	3	0	60
W	17	30	9	2	2	0	60
WNW	14	19	16	6	3	0	58
NW	20	15	23	8	1	0	67
NNW	10	20	7	4	0	0	41
Variable	0	0	0	0	0	0	0
Total	176	255	133	34	10	0	608

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: 4

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Three Mile Island Alpha
Period of Record: **April - June 2017**
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	2	0	0	0	0	5
NNE	2	0	0	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	4	3	0	0	0	0	7
E	5	3	0	0	0	0	8
ESE	11	0	0	0	0	0	11
SE	3	0	0	0	0	0	3
SSE	11	1	0	0	0	0	12
S	8	1	0	0	0	0	9
SSW	10	6	0	0	0	0	16
SW	16	4	0	0	0	0	20
WSW	13	4	0	0	0	0	17
W	10	4	0	0	0	0	14
WNW	6	4	0	0	0	0	10
NW	8	4	0	0	0	0	12
NNW	5	1	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	115	37	0	0	0	0	152

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: 4

Three Mile Island Alpha
Period of Record: **April - June 2017**
Stability Class - **Extremely 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	2	0	0	0	0	0	2
NNE	4	0	0	0	0	0	4
NE	2	0	0	0	0	0	2
ENE	4	0	0	0	0	0	4
E	3	1	0	0	0	0	4
ESE	5	1	0	0	0	0	6
SE	8	0	0	0	0	0	8
SSE	11	0	0	0	0	0	11
S	4	1	1	0	0	0	6
SSW	10	1	1	0	0	0	12
SW	7	1	0	0	0	0	8
WSW	5	3	0	0	0	0	8
W	10	8	0	0	0	0	18
WNW	7	0	0	0	0	0	7
NW	6	0	1	0	0	0	7
NNW	4	0	0	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	92	16	3	0	0	0	111

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: 4

Three Mile Island Alpha
Period of Record: **July - September 2017**
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	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	5	0	0	0	7
SE	0	0	2	0	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	4	0	0	0	4
SW	0	2	1	0	0	0	3
WSW	0	2	0	0	0	0	2
W	0	0	0	0	0	0	0
WNW	5	1	0	0	0	0	6
NW	3	5	2	0	0	0	10
NNW	3	5	0	1	0	0	9
Variable	0	0	0	0	0	0	0
Total	11	17	14	1	0	0	43

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: 4

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Three Mile Island Alpha
Period of Record: **July - September 2017**
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	3	0	0	0	0	3
NNE	0	1	1	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	8	0	0	0	0	8
ESE	0	5	3	0	0	0	8
SE	0	1	2	0	0	0	3
SSE	0	1	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	0	4	3	1	0	0	8
SW	0	3	2	0	0	0	5
WSW	1	1	0	0	0	0	2
W	2	1	0	0	0	0	3
WNW	4	3	0	0	0	0	7
NW	5	9	1	0	0	0	15
NNW	2	2	0	2	2	0	8
Variable	0	0	0	0	0	0	0
Total	14	43	12	3	1	0	74

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: 4

Three Mile Island Alpha
Period of Record: **July - September 2017**
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	1	3	0	0	0	4
NNE	0	0	1	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	3	0	0	0	0	3
E	0	2	0	0	0	0	2
ESE	1	2	2	0	0	0	5
SE	0	0	1	0	0	0	1
SSE	0	1	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	0	3	4	0	0	0	7
SW	3	8	1	0	0	0	12
WSW	0	0	0	0	0	0	0
W	1	2	0	0	0	0	3
WNW	7	4	0	0	0	0	11
NW	3	5	2	0	0	0	10
NNW	1	6	4	1	6	0	18
Variable	0	0	0	0	0	0	0
Total	16	37	18	1	6	0	78

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: 4

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Three Mile Island Alpha
Period of Record: **July - September 2017**
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	16	26	16	5	0	0	63
NNE	13	11	1	0	0	0	25
NE	14	16	0	0	0	0	30
ENE	5	33	1	0	0	0	39
E	18	35	8	0	0	0	61
ESE	7	14	16	0	0	0	37
SE	7	17	3	0	0	0	27
SSE	2	20	2	0	0	0	24
S	4	15	3	0	0	0	22
SSW	8	19	12	1	0	0	40
SW	7	28	20	0	0	0	55
WSW	8	28	22	0	0	0	58
W	14	21	14	0	0	0	49
WNW	21	35	28	4	0	0	88
NW	24	38	60	4	0	0	126
NNW	27	35	47	11	3	0	123
Variable	0	0	0	0	0	0	0
Total	195	391	253	25	3	0	867

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: 4

Three Mile Island Alpha
Period of Record: **July - September 2017**
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	23	66	13	2	0	0	104
NNE	12	18	2	0	0	0	32
NE	17	11	0	0	0	0	28
ENE	17	11	0	0	0	0	28
E	19	22	0	0	0	0	41
ESE	21	14	1	0	0	0	36
SE	13	2	0	0	0	0	15
SSE	17	4	0	0	0	0	21
S	10	13	1	0	0	0	24
SSW	12	22	5	0	0	0	39
SW	21	24	6	0	0	0	51
WSW	29	32	4	0	0	0	65
W	44	39	5	0	0	0	88
WNW	25	30	4	0	0	0	59
NW	19	24	6	1	0	0	50
NNW	20	60	15	1	0	0	96
Variable	0	0	0	0	0	0	0
Total	319	392	62	4	0	0	777

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: 4

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Three Mile Island Alpha
Period of Record: **July - September 2017**
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	18	8	0	0	0	0	26
NNE	9	1	0	0	0	0	10
NE	4	1	1	0	0	0	6
ENE	5	4	0	0	0	0	9
E	19	8	0	0	0	0	27
ESE	24	4	0	0	0	0	28
SE	9	0	0	0	0	0	9
SSE	6	0	0	0	0	0	6
S	8	3	0	0	0	0	11
SSW	21	4	0	0	0	0	25
SW	26	4	0	0	0	0	30
WSW	33	2	0	0	0	0	35
W	39	1	0	0	0	0	40
WNW	24	0	1	0	0	0	25
NW	18	0	0	0	0	0	18
NNW	18	8	1	0	0	0	27
Variable	0	0	0	0	0	0	0
Total	281	48	3	0	0	0	332

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: 4

Three Mile Island Alpha
Period of Record: **July - September 2017**
Stability Class - **Extremely 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	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	2	0	0	0	0	0	2
SE	1	0	0	0	0	0	1
SSE	0	0	0	0	0	0	0
S	3	0	0	0	0	0	3
SSW	2	0	0	0	0	0	2
SW	6	0	0	0	0	0	6
WSW	3	0	0	0	0	0	3
W	3	0	0	0	0	0	3
WNW	0	0	0	0	0	0	0
NW	3	0	0	0	0	0	3
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	24	0	0	0	0	0	24

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: 4

Three Mile Island Alpha
Period of Record: **October - December 2017**
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	0	0	0	0	0
ESE	0	1	0	0	0	0	1
SE	0	1	0	0	0	0	1
SSE	0	1	0	0	0	0	1
S	1	0	1	0	0	0	2
SSW	0	1	3	2	0	0	6
SW	1	1	0	0	0	0	2
WSW	1	0	0	0	0	0	1
W	3	0	0	0	0	0	3
WNW	1	0	0	0	0	0	1
NW	2	5	0	0	0	0	7
NNW	1	2	1	0	1	0	5
Variable	0	0	0	0	0	0	0
Total	10	13	5	2	1	0	31

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 2017**
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	1	0	0	0	0	1
E	0	1	0	0	0	0	1
ESE	0	1	0	0	0	0	1
SE	0	1	0	0	0	0	1
SSE	0	1	0	0	0	0	1
S	0	1	1	1	0	0	3
SSW	0	5	3	0	0	0	8
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	1	1	0	0	0	0	2
NW	2	0	1	0	1	0	4
NNW	0	0	0	1	2	0	3
Variable	0	0	0	0	0	0	0
Total	3	14	5	2	3	0	27

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 2017**
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	1	0	0	0	0	1
SE	0	4	0	0	0	0	4
SSE	0	3	1	0	0	0	4
S	0	2	1	0	0	0	3
SSW	0	1	2	0	0	0	3
SW	0	4	0	2	0	0	6
WSW	0	0	0	0	0	0	0
W	1	0	1	2	0	0	4
WNW	0	0	1	0	0	0	1
NW	0	1	3	1	1	0	6
NNW	4	3	1	2	4	0	14
Variable	0	0	0	0	0	0	0
Total	5	19	10	7	5	0	46

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 2017**
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	11	30	10	1	0	0	52
NNE	10	8	0	0	0	0	18
NE	8	4	0	0	0	0	12
ENE	10	10	3	0	0	0	23
E	8	23	10	0	0	0	41
ESE	2	24	23	0	0	0	49
SE	5	19	13	5	0	0	42
SSE	4	21	7	0	0	0	32
S	7	11	22	1	0	0	41
SSW	4	36	21	0	0	0	61
SW	3	17	18	3	0	0	41
WSW	5	16	8	1	0	0	30
W	3	26	40	25	4	0	98
WNW	11	20	46	41	19	1	138
NW	19	12	65	62	21	1	180
NNW	23	29	37	10	2	0	101
Variable	0	0	0	0	0	0	0
Total	133	306	323	149	46	2	959

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 2017**
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	25	27	6	4	0	0	62
NNE	17	7	0	0	0	0	24
NE	16	4	0	0	0	0	20
ENE	21	11	0	0	0	0	32
E	10	11	1	0	0	0	22
ESE	19	11	8	0	0	0	38
SE	13	11	11	3	0	0	38
SSE	9	16	4	1	0	0	30
S	11	18	6	0	1	0	36
SSW	11	20	14	2	1	0	48
SW	11	33	28	1	0	0	73
WSW	19	21	4	1	1	0	46
W	16	23	11	1	1	0	52
WNW	17	5	15	4	0	0	41
NW	23	14	19	15	1	0	72
NNW	23	25	10	5	0	0	63
Variable	0	0	0	0	0	0	0
Total	261	257	137	37	5	0	697

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 2017**
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	17	3	0	0	0	0	20
NNE	10	2	0	0	0	0	12
NE	5	0	0	0	0	0	5
ENE	4	0	0	0	0	0	4
E	9	2	0	0	0	0	11
ESE	17	2	0	0	0	0	19
SE	15	1	0	0	0	0	16
SSE	21	1	0	0	0	0	22
S	16	1	0	0	0	0	17
SSW	19	6	1	0	0	0	26
SW	17	7	2	0	0	0	26
WSW	25	9	0	0	0	0	34
W	16	4	1	0	0	0	21
WNW	12	1	0	0	0	0	13
NW	19	1	1	0	0	0	21
NNW	14	5	0	0	0	0	19
Variable	0	0	0	0	0	0	0
Total	236	45	5	0	0	0	286

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

Three Mile Island Alpha
Period of Record: **October - December 2017**
Stability Class - **Extremely 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	3	0	0	0	0	6
NNE	0	1	0	0	0	0	1
NE	3	0	0	0	0	0	3
ENE	3	0	0	0	0	0	3
E	2	0	0	0	0	0	2
ESE	9	0	0	0	0	0	9
SE	14	1	0	0	0	0	15
SSE	14	0	0	0	0	0	14
S	14	3	0	0	0	0	17
SSW	9	5	1	0	0	0	15
SW	7	4	0	0	0	0	11
WSW	12	2	0	0	0	0	14
W	3	4	0	0	0	0	7
WNW	6	3	0	0	0	0	9
NW	10	2	0	0	0	0	12
NNW	4	3	0	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	113	31	1	0	0	0	145

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

Assessment of Radiation Doses Due to Radioactive Liquid and Gaseous Effluents Released from TMI During 2017

TMI-1

The attached table presents the maximum hypothetical doses to an individual and the general population resulting from 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 the calculated maximum whole body (or total body) dose from TMI-1 liquid effluents was 1.94E-2 mrem to an adult (line 1). The maximum organ dose was 2.42E-2 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 7.23E-4 mrad and 7.04E-4 mrad for gamma and beta, respectively.

The maximum organ dose due to the release of iodines, particulates and tritium from TMI-1 in was 4.08E-1 mrem to the bone of a child. This dose again reflects the maximum exposed organ for the appropriate age group (line 5).

For 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, 2017 through December 31, 2017

Effluent	Applicable Organ	Estimated Dose (mrem)	Age Group	% of ODCM Dose Limit		ODCM Dose Limit (mrem)	
				Quarter	Annual	Quarter	Annual
(1) Liquid	Total Body	1.94E-2	Adult	1.29E0	6.47E-1	1.5	3
(2) Liquid	Liver	2.42E-2	Adult	4.84E-1	2.42E-1	5	10
(3) Noble Gas	Air Dose (gamma-mrad)	7.23E-4	-	1.45E-2	7.23E-3	5	10
(4) Noble Gas	Air Dose (beta-mrad)	7.04E-4	-	7.04E-3	3.52E-4	10	20
(5) Iodine, Tritium & Particulates	Bone	4.08E-1	Child	5.44E0	2.72E0	7.5	15

TMI-2

The attached table presents the maximum hypothetical doses to an individual and the general population resulting from 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 the calculated maximum whole body (or total body) dose from TMI-2 liquid effluents was 3.17E-4 mrem to an adult (line 1). The maximum organ dose was 5.04E-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, 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 was 3.38E-5 mrem to the liver, total body, thyroid, kidney, lung, and GI tract of a child (line 5).

For 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, through December 31, 2017

Effluent	Applicable Organ	Estimated Dose (mrem)	Age Group	% of ODCM Dose Limit		ODCM Dose Limit (mrem)	
				Quarter	Annual	Quarter	Annual
(1) Liquid	Total Body	3.17E-4	Adult	2.11E-2	1.06E-2	1.5	3
(2) Liquid	Liver	5.04E-4	Teen	1.01E-2	5.04E-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	3.38E-5	Child	4.51E-4	2.25E-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 2017

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 0.79 mrem for 2017.

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 L20171017-388-B. This release was from the Industrial Waste Filter Sump. The total body dose from release L20171017-388-B was 4.10E-3 mrem.

The highest dose from a single airborne release is characterized by release G20170313-146-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 203 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 G20170313-146-C was 1.39E-2 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 2017 was from Station N1-3 and was 36.9 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:

36.9 mrem/qtr * 1/91.5 d/qtr * 1/24 hr/day * 67 hr = 1.13 mrem

The dose from liquid release L20171017-388-B was 0.00410 mrem.

The dose from gas release G20170313-146-C was 0.0139 mrem.

Total Dose Calculation

1.13 mrem + 0.00410 mrem + 0.0139 mrem = 1.15 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 2017 resulted in maximum individual doses (regardless of age group) of 0.12 mrem to the thyroid and 0.43 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 36.9 mR/quarter, a person residing at the fence-line for 67 hours (shoreline exposure from Reg. Guide 1.109) received an exposure of 1.13 mR. Based on the lowest exposure rate of 15.4 mR/quarter and converting it by the same method yielded a background exposure of 0.47 mR. Therefore, the net exposure from direct radiation from TMINS was 0.66 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 0.78 mrem to the thyroid and 1.09 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 2017

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.

UFSAR Section 11.2.6 requires reporting of Major changes to Radioactive Waste Treatment Systems. Major changes are interpreted to mean changes that would alter how the system functions or changes that would affect operational exposures, offsite dose rates or integrated doses. There were no major changes to the liquid, gaseous, or solid radioactive waste treatment systems at TMI-1 during the year of 2017.