

Attachment 1  
2003 Annual Radioactive Effluent Releases Report for TMI  
5928-04-20104

**Summary of Radioactive Liquid and Gaseous Effluents  
Released from TMI during 2003**

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

UNITS	2003 1ST QUARTER	2003 2ND QUARTER	2003 3RD QUARTER	2003 4TH QUARTER	EST. TOTAL ERROR %
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**A. FISSION AND ACTIVATION GASES**

1. TOTAL RELEASE	Ci	1.33E-02	4.93E-02	9.76E-02	3.03E+01	25%
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	1.70E-03	6.27E-03	1.23E-02	3.81E+00	
3. PERCENT OF TECH SPEC LIMIT	%	*	*	*	*	

**B. IODINES**

1. TOTAL IODINE I-131	Ci	5.79E-08	1.39E-07	2.40E-07	4.70E-06	25%
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	7.45E-09	1.77E-08	3.02E-08	5.91E-07	
3. PERCENT OF TECH SPEC LIMIT	%	*	*	*	*	

**C. PARTICULATES**

1. PARTICULATES WITH HALF-LIVES > 8 DAYS	Ci	<LLD	<LLD	<LLD	4.18E-05	25%
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	NA	NA	NA	5.26E-06	
3. PERCENT OF TECH SPEC LIMIT	%	*	*	*	*	
4. GROSS ALPHA RADIOACTIVITY	Ci	<LLD	<LLD	<LLD	<LLD	

**D. TRITIUM**

1. TOTAL RELEASE	Ci	2.04E+01	2.45E+01	3.59E+01	4.40E+01	25%
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	2.62E+00	3.12E+00	4.51E+00	5.54E+00	
3. PERCENT OF TECH SPEC LIMIT	%	*	*	*	*	

\* % ODCM LIMITS: LISTED ON DOSE SUMMARY TABLE

TABLE 1C  
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2003)  
GASEOUS EFFLUENTS - GROUND LEVEL RELEASES  
TMI-1

NUCLIDES RELEASED	UNIT	CONTINUOUS		BATCH		CONTINUOUS		BATCH	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4

1. FISSION GASES

AR 41	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	2.69E-02	3.26E-02
KR 85M	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
KR 85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	2.35E+00
KR 87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
KR 88	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
XE131M	Ci	<LLD	<LLD	<LLD	9.11E-04	<LLD	<LLD	9.44E-04	1.72E-01
XE 133	Ci	<LLD	<LLD	1.30E-02	4.84E-02	<LLD	<LLD	6.78E-02	2.76E+01
XE133M	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	3.86E-02
XE 135M	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
XE 135	Ci	<LLD	<LLD	2.58E-04	<LLD	5.84E-04	3.65E-04	1.38E-03	8.95E-02
XE 138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
TOTAL FOR PERIOD	Ci	NA	NA	1.33E-02	4.93E-02	5.84E-04	3.65E-04	9.70E-02	3.03E+01

2. IODINES

I 131	Ci	4.60E-08	1.39E-07	1.19E-08	<LLD	9.47E-08	4.30E-06	1.45E-07	4.04E-07
I 133	Ci	2.00E-07	9.59E-07	2.82E-08	<LLD	5.50E-07	5.12E-07	3.31E-07	4.77E-07
I 135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
TOTAL FOR PERIOD	Ci	2.46E-07	1.10E-06	4.01E-08	<LLD	6.45E-07	4.81E-06	4.76E-07	8.81E-07

3. PARTICULATES

CO 58	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	4.17E-05	<LLD	1.07E-07
TOTAL FOR PERIOD	Ci	NA	NA	NA	NA	NA	4.17E-05	NA	1.07E-07

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

UNITS	2003 1ST QUARTER	2003 2ND QUARTER	2003 3RD QUARTER	2003 4TH QUARTER	EST. TOTAL ERROR %
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A. FISSION AND ACTIVATION PRODUCTS

1. TOTAL RELEASES (NOT INCLUDING TRITIUM, GASES, ALPHA)	Ci	1.57E-04	6.29E-04	1.32E-04	1.09E-03	25%
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ml	2.17E-11	1.15E-10	2.02E-11	1.35E-10	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	*	*	

B. TRITIUM

1. TOTAL RELEASE	Ci	2.53E+01	1.60E+02	5.23E+02	2.21E+01	25%
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ml	3.48E-06	2.92E-05	8.02E-05	2.73E-06	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	*	*	

C. DISSOLVED AND ENTRAINED GASES

1. TOTAL RELEASE	Ci	<LLD	<LLD	3.12E-04	<LLD	25%
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ml	NA	NA	4.78E-11	NA	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	*	*	

D. GROSS ALPHA ACTIVITY

1. TOTAL RELEASE	Ci	<LLD	<LLD	<LLD	<LLD	25%
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E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)	liters	8.10E+06	9.13E+06	1.22E+07	2.04E+07	10%
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F. VOLUME OF DILUTION WATER USED	liters	7.25E+09	5.46E+09	6.52E+09	8.07E+09	10%
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\* % ODCM LIMITS: LISTED ON DOSE SUMMARY TABLE

**TABLE 2B**  
**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2003)**  
**LIQUID EFFLUENTS**  
**TMI-1**

NUCLIDES RELEASED	UNIT	CONTINUOUS		BATCH		CONTINUOUS		BATCH	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
CR 51	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
MN 54	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
FE 59	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
CO 58	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	3.14E-05
CO 60	Ci	<LLD	<LLD	<LLD	4.40E-06	<LLD	<LLD	1.35E-06	<LLD
ZN 65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
SR 89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
SR 90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	3.91E-06
ZR 95	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NB 95	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
MO 99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
TC 99M	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I 131	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
CS 134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
CS 137	Ci	1.52E-04	<LLD	5.38E-06	2.75E-05	6.20E-05	1.04E-03	6.85E-05	1.40E-05
BA 140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
LA 140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
CE 141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
FE 55	Ci	<LLD	<LLD	<LLD	5.97E-04	<LLD	<LLD	<LLD	<LLD
TOTAL FOR PERIOD	Ci	1.52E-04	0.00E+00	5.38E-06	6.29E-04	6.20E-05	1.04E-03	6.99E-05	4.93E-05
XE 133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	3.04E-04	<LLD
XE 135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	7.60E-06	<LLD

# SUPPLEMENTAL INFORMATION

FACILITY: TMI UNIT 1 LICENSE: DPR 50-289

## 1. REGULATORY LIMITS --- 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 --- TEN TIMES 10 CFR 20, APPENDIX B TABLE 2

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 BETA = 2.33E-01 MeV  
E-BAR GAMMA = 2.77E-01 MeV  
E-BAR BETA AND GAMMA = 5.10E-01 MeV

## 4. MEASUREMENTS AND APPROXIMATIONS OF TOTAL RADIOACTIVITY

PROVIDE THE METHODS USED TO MEASURE OR APPROXIMATE THE TOTAL RADIOACTIVITY IN EFFLUENTS AND THE METHODS USED TO DETERMINE RADIONUCLIDE COMPOSITION:

- A. FISSION AND ACTIVATION GASES: HPGE SPECTROMETRY, LIQUID SCINTILLATION
- B. IODINES: HPGE SPECTROMETRY
- C. PARTICULATES: HPGE SPECTROMETRY, GAS FLOW PROPORTIONAL, BETA SPECTROMETRY
- D. LIQUID EFFLUENTS: HPGE SPECTROMETRY, LIQUID SCINTILLATION

## 5. BATCH RELEASES

PROVIDE THE FOLLOWING INFORMATION RELATING TO BATCH RELEASES OF RADIOACTIVITY MATERIALS IN LIQUID AND GASEOUS EFFLUENTS.

A. LIQUID (ALL TIMES IN MINUTES)	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
1. NUMBER OF BATCH RELEASES:	2	23	40	8
2. TOTAL TIME PERIOD FOR BATCH RELEASES:	530	6098	13104	2140
3. MAXIMUM TIME PERIOD FOR A BATCH RELEASE:	270	325	690	300
4. AVERAGE TIME PERIOD FOR BATCH RELEASES:	265	265	327	267
5. MINIMUM TIME PERIOD FOR A BATCH RELEASE:	260	235	186	250
6. AVERAGE STREAM FLOW DURING PERIODS OF RELEASE OF EFFLUENT INTO A FLOWING STREAM: (CFM)	4.33E+06	3.61E+06	2.26E+06	3.85E+06

B. GASEOUS (ALL TIMES IN MINUTES)				
1. NUMBER OF BATCH RELEASES:	5	7	5	15
2. TOTAL TIME PERIOD FOR BATCH RELEASES:	3121	5241	3265	70915
3. MAXIMUM TIME PERIOD FOR A BATCH RELEASE:	790	780	900	47675
4. AVERAGE TIME PERIOD FOR BATCH RELEASES:	624	748	653	4727
5. MINIMUM TIME PERIOD FOR A BATCH RELEASE:	7	720	110	1

## 6. ABNORMAL RELEASES

### A. LIQUID

1. NUMBER OF RELEASES:	-0-	-0-	-0-	-0-
2. TOTAL ACTIVITY RELEASED: (CURIES)	N/A	N/A	N/A	N/A

### B. GASEOUS

1. NUMBER OF RELEASES:	-0-	-0-	-0-	-0-
2. TOTAL ACTIVITY RELEASED: (CURIES)	N/A	N/A	N/A	N/A

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

UNITS	2003 1ST QUARTER	2003 2ND QUARTER	2003 3RD QUARTER	2003 4TH QUARTER	EST. TOTAL ERROR %
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**A. FISSION AND ACTIVATION GASES**

1. TOTAL RELEASE	Ci	<LLD	<LLD	<LLD	<LLD	25%
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	NA	NA	NA	NA	
3. PERCENT OF TECH SPEC LIMIT	%	*	*	*	*	

**B. IODINES**

NOT APPLICABLE FOR TMI-2

**C. PARTICULATES**

1. PARTICULATES WITH HALF-LIVES > 8 DAYS	Ci	1.22E-06	<LLD	<LLD	<LLD	25%
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	1.57E-07	NA	NA	NA	
3. PERCENT OF TECH SPEC LIMIT	%	*	*	*	*	
4. GROSS ALPHA RADIOACTIVITY	Ci	<LLD	<LLD	<LLD	<LLD	

**D. TRITIUM**

1. TOTAL RELEASE	Ci	1.96E-01	5.98E-01	1.55E+00	3.12E-01	25%
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	2.52E-02	7.61E-02	1.95E-01	3.93E-02	
3. PERCENT OF TECH SPEC LIMIT	%	*	*	*	*	

# BATCH RELEASES		0	0	0	0	
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\* % ODCM LIMITS: LISTED ON DOSE SUMMARY TABLE

TABLE 1C  
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2003)  
GASEOUS EFFLUENTS - GROUND LEVEL RELEASES  
TMI-2

NUCLIDES RELEASED	UNIT	CONTINUOUS		BATCH		CONTINUOUS		BATCH	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4

1. FISSION GASES

AR 41	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
KR 85M	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
KR 85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
KR 87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
KR 88	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
XE131M	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
XE 133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
XE133M	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
XE 135M	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
XE 135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
XE 138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
TOTAL FOR PERIOD	Ci	NA	NA	NA	NA	NA	NA	NA	NA

2. IODINES

NOT APPLICABLE TO TMI-2

3. PARTICULATES

CS 137	Ci	1.22E-06	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
TOTAL FOR PERIOD	Ci	1.22E-06	NA	NA	NA	NA	NA	NA	NA



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

	UNITS	2003 1ST QUARTER	2003 2ND QUARTER	2003 3RD QUARTER	2003 4TH QUARTER	EST. TOTAL ERROR %
A. FISSION AND ACTIVATION PRODUCTS						
1. TOTAL RELEASES (NOT INCLUDING TRITIUM, GASES, ALPHA)	Ci	4.92E-06	1.31E-05	6.07E-06	2.93E-06	25%
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ml	1.26E-09	3.44E-09	1.30E-09	5.22E-10	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	*	*	
B. TRITIUM						
1. TOTAL RELEASE	Ci	<LLD	2.80E-04	1.58E-04	2.90E-05	25%
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ml	NA	7.34E-08	3.38E-08	5.17E-09	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	*	*	
C. DISSOLVED AND ENTRAINED GASES						
1. TOTAL RELEASE	Ci	<LLD	<LLD	<LLD	<LLD	25%
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ml	NA	NA	NA	NA	
3. PERCENT OF APPLICABLE LIMIT	%	*	*	*	*	
D. GROSS ALPHA ACTIVITY						
1. TOTAL RELEASE	Ci	<LLD	<LLD	<LLD	<LLD	25%
E. VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)						
	liters	2.48E+05	1.00E+04	1.52E+05	7.41E+03	10%
F. VOLUME OF DILUTION WATER USED						
	liters	3.65E+06	3.80E+06	4.53E+06	5.60E+06	10%
# BATCH RELEASES		2	5	5	3	

\* % ODCM LIMITS: LISTED ON DOSE SUMMARY TABLE

**TABLE 2B**  
**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2003)**  
**LIQUID EFFLUENTS**  
**TMI-2**

		CONTINUOUS		BATCH		CONTINUOUS		BATCH	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
CO 60	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
ZN 65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
SR 90	Ci	<LLD	<LLD	<LLD	1.15E-06	<LLD	<LLD	<LLD	<LLD
SB 125	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
NB 95	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
CS 134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
CS 137	Ci	<LLD	<LLD	4.92E-06	1.19E-05	<LLD	<LLD	6.07E-06	2.93E-06
H3	Ci	<LLD	<LLD	<LLD	2.80E-04	<LLD	<LLD	1.58E-04	2.90E-05
TOTAL FOR PERIOD	Ci	NA	NA	4.92E-06	2.93E-04	NA	NA	1.64E-04	3.19E-05

Attachment 2  
2003 Annual Radioactive Effluent Releases Report for TMI  
5928-04-20104

**Solid Waste Shipped Offsite during 2003**

TMI-1 TABLE 3  
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT  
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. Solid waste shipped off-site for burial or disposal (not irradiated fuel)			
1. Type of waste	UNIT	12 month period	EST. Total Error %
a. Spent resins, filter sludges, Evaporator bottoms, etc.	m <sup>3</sup> Ci	6.1 m3 65.4 Ci	25%
b. Dry compressible waste, contaminated equipment, etc.	m <sup>3</sup> Ci	41.7 m3 .01 Ci	25%
c. Irradiated components, control rods, etc.	m <sup>3</sup> Ci	92.0 m3 3.44 Ci	25%
d. Other (describe) : Mixed Waste	m <sup>3</sup> Ci	N/A	N/A
2. Estimate of major nuclide composition (by type of waste)			
a. Cs137	53.9%		
Cs134	29.3%		
Ni63	9.12%		
Fe55	5.52%		
b. Co58	46.4%		
Cs137	39.3%		
Ni63	9.47%		
Sr90	2.44%		
c. Ni63	37.2%		
Co58	31.1%		
Fe55	14.3%		
Co60	7.41%		
d. N/A			
3. Solid Waste Disposition Number of Shipments	Mode of Transportation		Destination
See attached for this information			
B. Irradiated Fuel Shipments (Disposition)			
	None		
Number of Shipments			
N/A	Mode Transport	Destination	

## WASTE SHIPPED AS FOLLOWS

### A.1.a

One (1) – Steel Liner @ 215 ft3 each – Dewatered Resin

### A.1.b

One(1) – Steel Cargo Container @ 1280 ft3 each- noncompacted DAW

Two(2) –Steel boxes @ 96 ft3 each – noncompacted DAW

### A-1-c

One (1) – Steel Box @ 3250 ft3- Irradiated Component- Reactor Vessel Closure Head

### A.3.a

One Shipment	Hittman Transport/Cask	Studsvik- Erwin,TN
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### A.3.b

One Shipment	Hittman Transport/Flatbed	Duratek-Oak Ridge,TN
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### A.3.c

One Shipment	R&R Trucking/Flatbed	Race,LLC- Memphis,TN
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NOTE- All Shipments were TYPE-A LSA-II

No Shipment originated from TMI-2 during 2003

TMI-2 TABLE 3 EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT SOLID WASTE AND IRRADIATED FUEL SHIPMENTS			
A. Solid waste shipped off-site for burial or disposal (not irradiated fuel)			
1. Type of waste	UNIT	12 month period	EST. Total Error %
c. Spent resins, filter sludges, Evaporator bottoms, etc.	m <sup>3</sup> Ci	N/A	N/A
d. Dry compressible waste, contaminated equipment, etc.	m <sup>3</sup> Ci	N/A	N/A
d. Irradiated components, control rods, etc.	m <sup>3</sup> Ci	N/A	N/A
d. Other (describe) : Mixed Waste	m <sup>3</sup> Ci	N/A	N/A
2. Estimate of major nuclide composition (by type of waste)			
a. Cs137	N/A		
Cs134			
Ni63			
Fe55			
b. Co58	N/A		
Cs137			
Ni63			
Sr90			
c. Ni63	N/A		
Co58			
Fe55			
Co60			
d. N/A	N/A		
3. Solid Waste Disposition			
Number of Shipments	Mode of Transportation		Destination
No Shipment during this period			
B. Irradiated Fuel Shipments (Disposition)			
	None		
Number of Shipments''			
N/A	Mode Transport	Destination	

Attachment 3  
2003 Annual Radioactive Effluent Releases Report for TMI  
5928-04-20104

### **Summary of Unplanned Releases from the TMI Site During 2003**

There were no unplanned releases to unrestricted areas from either the TMI-1 or TMI-2 site during 2003.

**Changes to the Process Control Program and the  
Offsite Dose Calculation Manual during 2003,  
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 no changes to the Process Control Program (PCP) for TMI-1 during 2003.

**2. Changes to the Offsite Dose Calculation Manual during 2003**

The Offsite Dose Calculation Manual (ODCM) was modified once during 2003. These changes did not reduce the accuracy or reliability of dose calculations or setpoint determinations. The level of effluent controls required by 10 CFR 20.1301, 40 CFR 190, 10 CFR 50.36a, and Appendix I to 10 CFR 50 was not reduced and the accuracy or reliability of effluent, dose or setpoint calculations was not adversely impacted for the reasons stated below.

Revision 24 of the ODCM was issued on July 1, 2003. Revision 24 made the following changes to the ODCM:

- Changed the definition of the Member of the Public to the current 10CFR20 definition. Pg. 18
- Added Occupational Dose definition. Definition was needed to support the revised Member of the Public definition. Pg. 18
- Part I, On Table 2.1-2, Radioactive Gaseous Process and Effluent Monitoring Instrumentation, changed the nomenclature description of FR-148 to FR-148A, FR-148B. As there are 2 different flow sensor devices, this is more accurate. Pg. 24
- Changed the Basis of Part I, section 2.2.2.1, Gaseous Effluent Dose Rates. The basis section changed to reflect that the basis of the setpoint is as allowed by technical specifications and not based on effluent tables in 10CFR20. Also changed the 1500 mrem/yr basis reference from NuReg 0133 to NuReg 1301. Pg. 34
- Part I, Table 3.2-1, Radioactive Liquid Waste Sampling and Analysis Program. Section A.2 Continuous Release, changed a weekly composite sample for Dissolved and Entrained Gases to a Monthly Grab Sample. This change puts the sampling for liquid entrained gasses back to the basis of the requirement as stated in NuReg-1301, Table



4.11-1, page 39. Sampling of these systems on the composite made it difficult to meet the LLD requirements due to the short decay half lives of the radionuclides involved. Performing a grab sample will remove the long decay of the radionuclides prior to analysis. Pg. 50

- Part I, Table 3.2-2, Radioactive Gaseous Waste Sampling and Analysis Program, added note i to section I. The note already existed but needed to be placed in the table for clarification. Pg. 56
- Part II, Table 2.1-2, Radioactive Gaseous Process and Effluent Monitoring Instrumentation. Replace first sentence in Note 3 to so that the Soiled Exhaust is added to obtain 2AH-FR-5907 Point 6 when manually calculated. This point does add the Soiled Exhaust for its value when all detectors are operational. The system identifier for each point was added for the other exhaust flows for clarity. Pg. 67
- Part II, Section 2.2.2.1 Bases section. Changed the dose rate criteria to a child from an infant for inhalation pathway and to NUREG-1301 for a basis. This basis is stated on page 75 of NuReg – 1301. Pg. 72
- Part III, Section 2.1 Liquid Effluent – 10CFR50 appendix I, removed the symbol  $\sum_j$  from the calculation, equation 2.1. This symbol was placed in the equation to show the individual organs are summed to obtain the whole body dose. In practice the summation is performed within the  $AW_{ij}$  and  $AF_{ij}$  factors which are made for organs or total body. Hence the summation over j is not needed mathematically nor performed in the effluent software. Pg 97.

**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 2003 land use census, no changes to the radiological environmental monitoring program or the dose model are required.

Attachment 5  
2003 Annual Radioactive Effluent Releases Report for TMI  
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**Instrumentation not returned to Operable status within 30 days during 2003**

There was no 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 during 2003.

Attachment 6  
2003 Annual Radioactive Effluent Releases Report for TMI  
5928-04-20104

**Annual Summary of Hourly Meteorological Data for 2003**

3 MILE ISLAND DATA 1/03-12/03

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED  
BY ATMOSPHERIC STABILITY CLASS  
WIND: 100 FT.  
DELTA T: (150-33FT)

LAPSE RATE: LE -1.9 DEG C/100M  
CLASS A

WIND SPEED GROUPS (MPH)

	0.0-0.5		0.6-3.5		3.6-7.5		7.6-12.5		12.6-18.5		18.6-24.5		GE 24.6		SUM PERCENT	
DIRECTION	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT		
N	0	0.0	2	0.0	14	0.2	3	0.0	4	0.0	0	0.0	0	0.0	23	0.3
NNE	0	0.0	2	0.0	11	0.1	0	0.0	0	0.0	0	0.0	0	0.0	13	0.2
NE	0	0.0	1	0.0	10	0.1	1	0.0	1	0.0	0	0.0	0	0.0	13	0.2
ENE	0	0.0	1	0.0	10	0.1	5	0.1	3	0.0	0	0.0	0	0.0	19	0.2
E	0	0.0	5	0.1	14	0.2	13	0.2	2	0.0	0	0.0	0	0.0	34	0.4
ESE	0	0.0	4	0.0	12	0.1	19	0.2	3	0.0	0	0.0	0	0.0	38	0.5
SE	0	0.0	2	0.0	10	0.1	6	0.1	0	0.0	0	0.0	0	0.0	18	0.2
SSE	0	0.0	2	0.0	9	0.1	1	0.0	0	0.0	0	0.0	0	0.0	12	0.1
S	1	0.0	0	0.0	12	0.1	5	0.1	0	0.0	0	0.0	0	0.0	18	0.2
SSW	0	0.0	5	0.1	46	0.6	24	0.3	0	0.0	0	0.0	0	0.0	75	0.9
SW	0	0.0	13	0.2	32	0.4	10	0.1	1	0.0	0	0.0	0	0.0	56	0.7
WSW	0	0.0	8	0.1	7	0.1	5	0.1	0	0.0	0	0.0	0	0.0	20	0.2
W	0	0.0	3	0.0	12	0.1	5	0.1	3	0.0	0	0.0	0	0.0	23	0.3
WNW	0	0.0	15	0.2	36	0.4	13	0.2	5	0.1	0	0.0	0	0.0	69	0.9
NW	0	0.0	36	0.4	48	0.6	19	0.2	18	0.2	1	0.0	1	0.0	123	1.5
NNW	0	0.0	29	0.4	47	0.6	3	0.0	1	0.0	0	0.0	0	0.0	80	1.0
	1	0.0	128	1.6	330	4.1	132	1.6	41	0.5	1	0.0	1	0.0	634	7.9

MEAN WIND SPEED: 6.4

MISSING: 0

3 MILE ISLAND DATA 1/03-12/03

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED  
BY ATMOSPHERIC STABILITY CLASS  
WIND: 100 FT.  
DELTA T: (150-33FT)

LAPSE RATE: -1.8 TO -1.7 DEG C/100M  
CLASS B

WIND SPEED GROUPS (MPH)

	0.0-0.5		0.6-3.5		3.6-7.5		7.6-12.5		12.6-18.5		18.6-24.5		GE 24.6		SUM PERCENT	
DIRECTION	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT		
N	0	0.0	4	0.0	8	0.1	2	0.0	0	0.0	0	0.0	0	0.0	14	0.2
NNE	0	0.0	2	0.0	3	0.0	0	0.0	0	0.0	0	0.0	0	0.0	5	0.1
NE	0	0.0	1	0.0	3	0.0	1	0.0	0	0.0	0	0.0	0	0.0	5	0.1
ENE	0	0.0	3	0.0	7	0.1	6	0.1	1	0.0	0	0.0	0	0.0	17	0.2
E	0	0.0	2	0.0	16	0.2	23	0.3	1	0.0	0	0.0	0	0.0	42	0.5
ESE	0	0.0	2	0.0	12	0.1	8	0.1	4	0.0	0	0.0	0	0.0	26	0.3
SE	0	0.0	3	0.0	9	0.1	5	0.1	2	0.0	0	0.0	0	0.0	19	0.2
SSE	2	0.0	4	0.0	9	0.1	3	0.0	0	0.0	0	0.0	0	0.0	18	0.2
S	0	0.0	6	0.1	11	0.1	9	0.1	3	0.0	0	0.0	0	0.0	29	0.4
SSW	0	0.0	5	0.1	18	0.2	16	0.2	2	0.0	0	0.0	0	0.0	41	0.5
SW	0	0.0	10	0.1	8	0.1	7	0.1	0	0.0	0	0.0	0	0.0	25	0.3
WSW	0	0.0	7	0.1	7	0.1	5	0.1	0	0.0	0	0.0	0	0.0	19	0.2
W	0	0.0	5	0.1	14	0.2	14	0.2	2	0.0	1	0.0	0	0.0	36	0.4
WNW	0	0.0	3	0.0	17	0.2	12	0.1	6	0.1	2	0.0	0	0.0	40	0.5
NW	0	0.0	7	0.1	24	0.3	23	0.3	19	0.2	1	0.0	0	0.0	74	0.9
NNW	0	0.0	4	0.0	9	0.1	11	0.1	3	0.0	1	0.0	0	0.0	28	0.3
	2	0.0	68	0.8	175	2.2	145	1.8	43	0.5	5	0.1	0	0.0	438	5.4

MEAN WIND SPEED: 7.5  
MISSING: 7

3 MILE ISLAND DATA 1/03-12/03

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED  
BY ATMOSPHERIC STABILITY CLASS  
WIND: 100 FT.  
DELTA T: (150-33FT)

LAPSE RATE: -1.6 TO -1.5 DEG C/100M  
CLASS C

WIND SPEED GROUPS (MPH)

	0.0-0.5		0.6-3.5		3.6-7.5		7.6-12.5		12.6-18.5		18.6-24.5		GE 24.6		SUM PERCENT	
DIRECTION	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT		
N	0	0.0	1	0.0	3	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	0.0
NNE	0	0.0	3	0.0	3	0.0	1	0.0	0	0.0	0	0.0	0	0.0	7	0.1
NE	0	0.0	1	0.0	7	0.1	0	0.0	0	0.0	0	0.0	0	0.0	8	0.1
ENE	0	0.0	2	0.0	6	0.1	6	0.1	0	0.0	1	0.0	0	0.0	15	0.2
E	0	0.0	1	0.0	23	0.3	6	0.1	2	0.0	0	0.0	0	0.0	32	0.4
ESE	0	0.0	3	0.0	13	0.2	7	0.1	1	0.0	0	0.0	0	0.0	24	0.3
SE	0	0.0	3	0.0	4	0.0	3	0.0	0	0.0	0	0.0	1	0.0	11	0.1
SSE	0	0.0	0	0.0	3	0.0	6	0.1	0	0.0	0	0.0	0	0.0	9	0.1
S	0	0.0	5	0.1	4	0.0	7	0.1	0	0.0	0	0.0	0	0.0	16	0.2
SSW	0	0.0	1	0.0	11	0.1	11	0.1	0	0.0	0	0.0	0	0.0	23	0.3
SW	0	0.0	2	0.0	8	0.1	2	0.0	0	0.0	0	0.0	0	0.0	12	0.1
WSW	0	0.0	2	0.0	6	0.1	3	0.0	1	0.0	0	0.0	0	0.0	12	0.1
W	0	0.0	5	0.1	5	0.1	10	0.1	5	0.1	0	0.0	2	0.0	27	0.3
WNW	0	0.0	6	0.1	14	0.2	9	0.1	11	0.1	3	0.0	0	0.0	43	0.5
NW	0	0.0	3	0.0	15	0.2	13	0.2	24	0.3	2	0.0	0	0.0	57	0.7
NNW	0	0.0	7	0.1	5	0.1	6	0.1	1	0.0	0	0.0	0	0.0	19	0.2
	0	0.0	45	0.6	130	1.6	90	1.1	45	0.6	6	0.1	3	0.0	319	4.0

MEAN WIND SPEED: 8.1  
MISSING: 2

3 MILE ISLAND DATA 1/03-12/03

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED  
BY ATMOSPHERIC STABILITY CLASS  
WIND: 100 FT.  
DELTA T: (150-33FT)

LAPSE RATE: -1.4 TO -0.5 DEG C/100M  
CLASS D

WIND SPEED GROUPS (MPH)																
0.0-0.5		0.6-3.5		3.6-7.5		7.6-12.5		12.6-18.5		18.6-24.5		GE 24.6		SUM PERCENT		
DIRECTION	SUM PERCENT	SUM PERCENT	SUM PERCENT	SUM PERCENT	SUM PERCENT	SUM PERCENT	SUM PERCENT	SUM PERCENT	SUM PERCENT	SUM PERCENT	SUM PERCENT	SUM PERCENT	SUM PERCENT			
N	0	0.0	27	0.3	67	0.8	16	0.2	1	0.0	0	0.0	0	0.0	111	1.4
NNE	0	0.0	24	0.3	50	0.6	11	0.1	0	0.0	0	0.0	0	0.0	85	1.1
NE	0	0.0	36	0.4	105	1.3	36	0.4	0	0.0	0	0.0	0	0.0	177	2.2
ENE	0	0.0	34	0.4	129	1.6	30	0.4	1	0.0	1	0.0	0	0.0	195	2.4
E	0	0.0	49	0.6	116	1.4	88	1.1	6	0.1	1	0.0	0	0.0	260	3.2
ESE	0	0.0	27	0.3	95	1.2	98	1.2	19	0.2	0	0.0	0	0.0	239	3.0
SE	0	0.0	38	0.5	77	1.0	45	0.6	6	0.1	0	0.0	0	0.0	166	2.1
SSE	0	0.0	16	0.2	50	0.6	22	0.3	3	0.0	1	0.0	0	0.0	92	1.1
S	0	0.0	21	0.3	64	0.8	46	0.6	6	0.1	0	0.0	0	0.0	137	1.7
SSW	0	0.0	28	0.3	83	1.0	30	0.4	8	0.1	0	0.0	0	0.0	149	1.8
SW	0	0.0	42	0.5	47	0.6	20	0.2	1	0.0	0	0.0	0	0.0	110	1.4
WSW	0	0.0	35	0.4	59	0.7	25	0.3	3	0.0	0	0.0	0	0.0	122	1.5
W	0	0.0	32	0.4	96	1.2	115	1.4	48	0.6	8	0.1	3	0.0	302	3.7
WNW	0	0.0	49	0.6	83	1.0	163	2.0	135	1.7	52	0.6	4	0.0	486	6.0
NW	0	0.0	42	0.5	116	1.4	145	1.8	128	1.6	28	0.3	3	0.0	462	5.7
NNW	0	0.0	63	0.8	68	0.8	36	0.4	18	0.2	3	0.0	0	0.0	188	2.3
	0	0.0	563	7.0	1305	16.2	926	11.5	383	4.7	94	1.2	10	0.1	3281	40.6

MEAN WIND SPEED: 7.8  
MISSING: 31

3 MILE ISLAND DATA 1/03-12/03

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED  
BY ATMOSPHERIC STABILITY CLASS  
WIND: 100 FT.  
DELTA T: (150-33FT)

LAPSE RATE: -0.4 TO 1.5 DEG C/100M  
CLASS E

WIND SPEED GROUPS (MPH)																
	0.0-0.5		0.6-3.5		3.6-7.5		7.6-12.5		12.6-18.5		18.6-24.5		GE 24.6		SUM PERCENT	
DIRECTION	SUM PERCENT		SUM PERCENT		SUM PERCENT		SUM PERCENT		SUM PERCENT		SUM PERCENT		SUM PERCENT			
N	1	0.0	51	0.6	67	0.8	2	0.0	0	0.0	0	0.0	0	0.0	121	1.5
NNE	0	0.0	32	0.4	57	0.7	3	0.0	0	0.0	0	0.0	0	0.0	92	1.1
NE	0	0.0	36	0.4	45	0.6	3	0.0	0	0.0	0	0.0	0	0.0	84	1.0
ENE	0	0.0	41	0.5	44	0.5	4	0.0	0	0.0	0	0.0	0	0.0	89	1.1
E	0	0.0	49	0.6	49	0.6	6	0.1	0	0.0	0	0.0	0	0.0	104	1.3
ESE	0	0.0	56	0.7	56	0.7	25	0.3	2	0.0	0	0.0	0	0.0	139	1.7
SE	0	0.0	37	0.5	34	0.4	3	0.0	0	0.0	2	0.0	1	0.0	77	1.0
SSE	0	0.0	26	0.3	29	0.4	3	0.0	0	0.0	0	0.0	0	0.0	58	0.7
S	0	0.0	43	0.5	52	0.6	10	0.1	1	0.0	0	0.0	0	0.0	106	1.3
SSW	0	0.0	39	0.5	84	1.0	30	0.4	1	0.0	0	0.0	0	0.0	154	1.9
SW	0	0.0	63	0.8	87	1.1	14	0.2	0	0.0	0	0.0	0	0.0	164	2.0
WSW	0	0.0	64	0.8	74	0.9	9	0.1	0	0.0	2	0.0	0	0.0	149	1.8
W	0	0.0	59	0.7	85	1.1	54	0.7	9	0.1	1	0.0	0	0.0	208	2.6
WNW	0	0.0	61	0.8	95	1.2	71	0.9	29	0.4	6	0.1	0	0.0	262	3.2
NW	0	0.0	65	0.8	79	1.0	47	0.6	28	0.3	0	0.0	0	0.0	219	2.7
NNW	0	0.0	68	0.8	78	1.0	9	0.1	4	0.0	0	0.0	0	0.0	159	2.0
	1	0.0	790	9.8	1015	12.6	293	3.6	74	0.9	11	0.1	1	0.0	2185	27.1

MEAN WIND SPEED: 5.2  
MISSING: 23



3 MILE ISLAND DATA 1/03-12/03

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED  
BY ATMOSPHERIC STABILITY CLASS  
WIND: 100 FT.  
DELTA T: (150-33FT)

LAPSE RATE: 1.6 TO 4.0 DEG C/100M  
CLASS F

WIND SPEED GROUPS (MPH)

	0.0-0.5		0.6-3.5		3.6-7.5		7.6-12.5		12.6-18.5		18.6-24.5		GE 24.6		SUM PERCENT	
DIRECTION	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT		
N	0	0.0	11	0.1	6	0.1	0	0.0	0	0.0	0	0.0	0	0.0	17	0.2
NNE	0	0.0	18	0.2	9	0.1	0	0.0	0	0.0	0	0.0	0	0.0	27	0.3
NE	0	0.0	11	0.1	6	0.1	0	0.0	0	0.0	0	0.0	0	0.0	17	0.2
ENE	0	0.0	21	0.3	8	0.1	0	0.0	0	0.0	0	0.0	0	0.0	29	0.4
E	0	0.0	37	0.5	16	0.2	0	0.0	0	0.0	0	0.0	0	0.0	53	0.7
ESE	0	0.0	35	0.4	10	0.1	0	0.0	0	0.0	0	0.0	0	0.0	45	0.6
SE	0	0.0	46	0.6	3	0.0	0	0.0	1	0.0	1	0.0	1	0.0	52	0.6
SSE	0	0.0	35	0.4	5	0.1	0	0.0	0	0.0	0	0.0	0	0.0	40	0.5
S	0	0.0	44	0.5	14	0.2	1	0.0	0	0.0	0	0.0	0	0.0	59	0.7
SSW	1	0.0	37	0.5	27	0.3	0	0.0	0	0.0	0	0.0	0	0.0	65	0.8
SW	0	0.0	54	0.7	13	0.2	0	0.0	0	0.0	0	0.0	0	0.0	67	0.8
WSW	0	0.0	43	0.5	17	0.2	1	0.0	0	0.0	0	0.0	0	0.0	61	0.8
W	0	0.0	46	0.6	20	0.2	0	0.0	0	0.0	0	0.0	0	0.0	66	0.8
WNW	0	0.0	49	0.6	9	0.1	1	0.0	0	0.0	0	0.0	0	0.0	59	0.7
NW	0	0.0	55	0.7	19	0.2	3	0.0	0	0.0	0	0.0	0	0.0	77	1.0
NNW	0	0.0	49	0.6	37	0.5	2	0.0	0	0.0	0	0.0	0	0.0	88	1.1
	1	0.0	591	7.3	219	2.7	8	0.1	1	0.0	1	0.0	1	0.0	822	10.2

MEAN WIND SPEED: 3.0  
MISSING: 2

3 MILE ISLAND DATA 1/03-12/03

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED  
BY ATMOSPHERIC STABILITY CLASS  
WIND: 100 FT.  
DELTA T: (150-33FT)

LAPSE RATE: GT 4.0 DEG C/100M  
CLASS G

WIND SPEED GROUPS (MPH)

	0.0-0.5		0.6-3.5		3.6-7.5		7.6-12.5		12.6-18.5		18.6-24.5		GE 24.6		SUM PERCENT	
DIRECTION	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT		
N	0	0.0	16	0.2	4	0.0	0	0.0	0	0.0	0	0.0	0	0.0	20	0.2
NNE	0	0.0	10	0.1	2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	12	0.1
NE	0	0.0	7	0.1	2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	9	0.1
ENE	0	0.0	13	0.2	3	0.0	0	0.0	0	0.0	0	0.0	0	0.0	16	0.2
E	0	0.0	12	0.1	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	13	0.2
ESE	0	0.0	27	0.3	2	0.0	0	0.0	0	0.0	0	0.0	0	0.0	29	0.4
SE	0	0.0	23	0.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	23	0.3
SSE	0	0.0	28	0.3	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0	29	0.4
S	0	0.0	28	0.3	7	0.1	1	0.0	0	0.0	0	0.0	0	0.0	36	0.4
SSW	0	0.0	27	0.3	8	0.1	0	0.0	0	0.0	0	0.0	0	0.0	35	0.4
SW	0	0.0	24	0.3	8	0.1	0	0.0	0	0.0	0	0.0	0	0.0	32	0.4
WSW	0	0.0	10	0.1	8	0.1	0	0.0	0	0.0	0	0.0	0	0.0	18	0.2
W	0	0.0	29	0.4	11	0.1	2	0.0	0	0.0	0	0.0	0	0.0	42	0.5
WNW	0	0.0	16	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	16	0.2
NW	0	0.0	25	0.3	13	0.2	2	0.0	0	0.0	0	0.0	0	0.0	40	0.5
NNW	0	0.0	14	0.2	12	0.1	0	0.0	0	0.0	0	0.0	0	0.0	26	0.3
	0	0.0	309	3.8	82	1.0	5	0.1	0	0.0	0	0.0	0	0.0	396	4.9

MEAN WIND SPEED: 2.8  
MISSING: 0

3 MILE ISLAND DATA 1/03-12/03

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED  
BY ATMOSPHERIC STABILITY CLASS  
WIND: 100 FT.  
DELTA T: (150-33FT)

ALL STABILITY CLASSES

WIND SPEED GROUPS (MPH)

	0.0-0.5		0.6-3.5		3.6-7.5		7.6-12.5		12.6-18.5		18.6-24.5		GE 24.6		SUM PERCENT	
DIRECTION	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT	SUM	PERCENT		
N	1	0.0	112	1.4	169	2.1	23	0.3	5	0.1	0	0.0	0	0.0	310	3.8
NNE	0	0.0	91	1.1	135	1.7	15	0.2	0	0.0	0	0.0	0	0.0	241	3.0
NE	0	0.0	93	1.2	178	2.2	41	0.5	1	0.0	0	0.0	0	0.0	313	3.9
ENE	0	0.0	115	1.4	207	2.6	51	0.6	5	0.1	2	0.0	0	0.0	380	4.7
E	0	0.0	155	1.9	235	2.9	136	1.7	11	0.1	1	0.0	0	0.0	538	6.7
ESE	0	0.0	154	1.9	200	2.5	157	1.9	29	0.4	0	0.0	0	0.0	540	6.7
SE	0	0.0	152	1.9	137	1.7	62	0.8	9	0.1	3	0.0	3	0.0	366	4.5
SSE	2	0.0	111	1.4	106	1.3	35	0.4	3	0.0	1	0.0	0	0.0	258	3.2
S	1	0.0	147	1.8	164	2.0	79	1.0	10	0.1	0	0.0	0	0.0	401	5.0
SSW	1	0.0	142	1.8	277	3.4	111	1.4	11	0.1	0	0.0	0	0.0	542	6.7
SW	0	0.0	208	2.6	203	2.5	53	0.7	2	0.0	0	0.0	0	0.0	466	5.8
WSW	0	0.0	169	2.1	178	2.2	48	0.6	4	0.0	2	0.0	0	0.0	401	5.0
W	0	0.0	179	2.2	243	3.0	200	2.5	67	0.8	10	0.1	5	0.1	704	8.7
WNW	0	0.0	199	2.5	254	3.1	269	3.3	186	2.3	63	0.8	4	0.0	975	12.1
NW	0	0.0	233	2.9	314	3.9	252	3.1	217	2.7	32	0.4	4	0.0	1052	13.0
NNW	0	0.0	234	2.9	256	3.2	67	0.8	27	0.3	4	0.0	0	0.0	588	7.3
	5	0.1	2494	30.9	3256	40.3	1599	19.8	587	7.3	118	1.5	16	0.2	8075	100.0

MISSING HOURS: 685

MEAN WIND SPEED: 6.2

3 MILE ISLAND DATA 1/03-12/03

JOINT DISTRIBUTION OF WIND DIRECTION AND SPEED  
BY ATMOSPHERIC STABILITY CLASS  
WIND: 100 FT.  
DELTA T: (150-33FT)

DIRECTION VS SPEED ONLY

		WIND SPEED GROUPS (MPH)															
		0.0-0.5		0.6-3.5		3.6-7.5		7.6-12.5		12.6-18.5		18.6-24.5		GE 24.6		SUM PERCENT	
DIRECTION		SUM PERCENT		SUM PERCENT		SUM PERCENT		SUM PERCENT		SUM PERCENT		SUM PERCENT		SUM PERCENT			
N	1	0.0	112	1.4	169	2.1	23	0.3	5	0.1	0	0.0	0	0.0	310	3.8	
NNE	0	0.0	91	1.1	135	1.7	15	0.2	0	0.0	0	0.0	0	0.0	241	3.0	
NE	0	0.0	93	1.2	178	2.2	41	0.5	1	0.0	0	0.0	0	0.0	313	3.9	
ENE	0	0.0	115	1.4	207	2.6	51	0.6	5	0.1	2	0.0	0	0.0	380	4.7	
E	0	0.0	155	1.9	235	2.9	136	1.7	11	0.1	1	0.0	0	0.0	538	6.7	
ESE	0	0.0	154	1.9	200	2.5	157	1.9	29	0.4	0	0.0	0	0.0	540	6.7	
SE	0	0.0	152	1.9	137	1.7	62	0.8	9	0.1	3	0.0	3	0.0	366	4.5	
SSE	2	0.0	111	1.4	106	1.3	35	0.4	3	0.0	1	0.0	0	0.0	258	3.2	
S	1	0.0	147	1.8	164	2.0	79	1.0	10	0.1	0	0.0	0	0.0	401	5.0	
SSW	1	0.0	142	1.8	277	3.4	111	1.4	11	0.1	0	0.0	0	0.0	542	6.7	
SW	0	0.0	208	2.6	203	2.5	53	0.7	2	0.0	0	0.0	0	0.0	466	5.8	
WSW	0	0.0	169	2.1	178	2.2	48	0.6	4	0.0	2	0.0	0	0.0	401	5.0	
W	0	0.0	179	2.2	243	3.0	200	2.5	67	0.8	10	0.1	5	0.1	704	8.7	
WNW	0	0.0	199	2.5	254	3.1	269	3.3	186	2.3	63	0.8	4	0.0	975	12.1	
NW	0	0.0	233	2.9	314	3.9	252	3.1	217	2.7	32	0.4	4	0.0	1052	13.0	
NNW	0	0.0	234	2.9	256	3.2	67	0.8	27	0.3	4	0.0	0	0.0	588	7.3	
		5	0.1	2494	30.9	3256	40.3	1599	19.8	587	7.3	118	1.5	16	0.2	8075	100.0

MISSING HOURS: 685

MEAN WIND SPEED: 6.2

## **Assessment of Radiation Doses Due to Radioactive Liquid and Gaseous Effluents Released from TMI during 2003**

### **TMI-1**

The attached table presents the maximum hypothetical doses to an individual and the general population resulting from 2003 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 and standing on the shoreline influenced by TMI-1 effluents. The latter 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), 2) consumed fish residing in the vicinity of the TMI-1 liquid discharge outfall and 3) occupied an area of shoreline influenced by the TMI-1 liquid discharge.

For 2003, the calculated maximum whole body (or total body) dose from TMI-1 liquid effluents was  $4.02\text{E-}2$  mrem to an adult (line 1). The maximum organ dose was  $5.43\text{E-}2$  mrem to the liver of an adult (line 2).

#### **B. Gaseous (Individual)**

There were six 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, (5) meat, and (6) standing on contaminated ground. Real-time meteorology was used in all dose calculations for gaseous effluents.

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 are considered to be the maximum doses that would have occurred at or beyond the site boundary. The table presents the distance in meters to the location in the affected sector (compass point) where the theoretical maximum plume exposures occurred. The calculated maximum plume exposures were  $5.94\text{E-}4$  mrad and  $2.29\text{E-}3$  mrad for gamma and beta, respectively.

The maximum organ dose due to the release of iodines, particulates and tritium from TMI-1 in 2003 was  $1.10\text{E-}2$  mrem to the thyroid of a child residing 1450 meters from the site in the E sector (line 5). This dose again reflects the maximum exposed organ for the appropriate age group.

For 2003, 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, 2003 through December 31, 2003

Effluent	Applicable Organ	Estimated Dose (mrem)	Age Group	Location		% of ODCM Dose Limit		ODCM Dose Limit (mrem)	
				Dist (m)	Dir (to)	Quarter	Annual	Quarter	Annual
(1) Liquid (2) Liquid	Total Body Liver	4.02E-2 5.43E-2	Adult Adult	Receptor 1 Receptor 1		2.68E+0 1.09E+0	1.34E+0 5.43E-1	1.5 5	3 10
(3) Noble Gas (4) Noble Gas	Air Dose (gamma-mrad) Air Dose (beta-mrad)	5.94E-4 2.29E-3	--- ---	1000 1000	E E	1.19E-2 2.29E-2	5.94E-3 1.14E-2	5 10	10 20
(5) Iodine, Tritium & Particulates	Thyroid	1.10E-2	Child	1450	E	1.47E-1	7.33E-2	7.5	15

## TMI-2

The attached table presents the maximum hypothetical doses to an individual and the general population resulting from 2003 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 and standing on the shoreline influenced by TMI-2 effluents. The latter 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), 2) consumed fish residing in the vicinity of the TMI-2 liquid discharge outfall and 3) occupied an area of shoreline influenced by the TMI-2 liquid discharge.

For 2003, the calculated maximum whole body (or total body) dose from TMI-2 liquid effluents was  $6.33\text{E-}4$  mrem to an adult (line 1). The maximum organ dose was  $9.87\text{E-}4$  mrem to the liver of a teen (line 2).

### B. Gaseous (Individual)

There were six 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, (5) meat, and (6) standing on contaminated ground. Real-time meteorology was used in all dose calculations for gaseous effluents.

Since there were no noble gases released from TMI-2 during 2003, 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 2003 was  $1.12\text{E-}4$  mrem to the liver, total body, thyroid, kidney, lung and GI tract of a child residing 2150 meters from the site in the NNE sector (line 5).

For 2003, 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, 2003 through December 31, 2003

Effluent	Applicable Organ	Estimated Dose (mrem)	Age Group	Location		% of ODCM Dose Limit		ODCM Dose Limit (mrem)	
				Dist (m)	Dir (to)	Quarter	Annual	Quarter	Annual
(1) Liquid (2) Liquid	Total Body Bone	6.33E-4 9.87E-4	Adult Teen	Receptor 1 Receptor 1		4.22E-2 1.97E-2	2.11E-2 9.87E-3	1.5 5	3 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	1.12E-4	Child	2150	NNE	1.49E-3	7.47E-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 2003**

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 following are the assumptions made in this assessment:

1. A member of the public stays in the owner controlled area for 3000 hours. The 3000 hours is based upon the State Police or National Guard personnel who are periodically stationed at the site at the directive of the Governor. This time selected is conservative, as it is higher than full time employment with consideration for substantial overtime.
2. The highest dose individual is standing next to a radiologically controlled area for 10 hours, where the dose rate is 0.6 mR/hr. In areas where the dose rate is greater than 0.6 mR/hr, the area would be posted as a TLD or RWP required area. This is a conservative assumption, as any person would normally be moving around the island during their visit and would not spend it next to a restricted area posting. This calculation would also bound all personnel that visited the site or spent time in areas of lower dose rate for longer periods of time. The members of longest times on the site were the National Guard or State Police. They normally spent their time at the north gate or along the perimeter of the island with the exception for breaks/snack/lunch in the cafeteria.
3. Direct radiation to the north gate is best represented by the environmental TLD located at the North Bridge
4. Liquid effluents are not a pathway to the individual on site.
5. The estimated airborne dose is based on the annual dose to the boundary for year 2003. To correct for any period of time within the boundary, a 10% factor was used or 300 hours would be spent with the maximum dispersion factor and the average discharge rate for the year.
6. Highest dispersion factor for gaseous effluents to personnel outside restricted area is  $4.99\text{e-}5 \text{ sec/m}^3$ . This is the value used in FSAR section 2.5.4.2.1 Containment release to Yard intake for a 4 day to 30 day period. This intake is very close to the

protected area and is very close to where the Reactor Building (Containment) would release. This is calculated in the FSAR for postulated accident conditions and is a very conservative dispersion factor to be used for this calculation. This would be very conservative as the members of the public spend most of their time along the site boundary fence line and rarely near the protected area boundary.

The maximum total body dose to an individual is 10.8 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 2003 resulted in maximum individual doses (regardless of age group) of 0.025 mrem to the thyroid and 0.067 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 TLD, and subtracting from it, the lowest quarterly environmental TLD exposure rate.

Based on the maximum exposure rate of 6.7 mR/standard month, a person residing at the fence-line for 67 hours (shoreline exposure from Reg. Guide 1.109) received an exposure of 0.61 mR. Based on the lowest exposure rate of 4.5 mR/standard month and converting it by the same method yielded a background exposure of 0.41 mR. Therefore, the net exposure from direct radiation from TMINS was 0.20 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 0.23 mrem to the thyroid and 0.27 mrem to any other organ. Both doses were well below the limits specified in 40 CFR 190.

Attachment 10  
2003 Annual Radioactive Effluent Releases Report for TMI  
5928-04-20104

**Deviation from the ODCM Sampling and Analysis Regime during 2003**

There were no deviations from the effluent sampling and analysis regime specified in the TMI Offsite Dose Calculation Manual during 2003.

Enclosure 1  
2003 Annual Radioactive Effluent Releases Report for TMI  
5928-04-20104

**TMI Offsite Dose Calculation Manual, Revision 24  
6610-PLN-4200.01**

**(Revision 24 was issued on  
July 1, 2003)**