

EXECUTIVE SUMMARY

Three Mile Island Nuclear Station Unit 2
Effluent and Offsite Dose Report
for the Period of April 1, 1987 to June 30, 1987

This report summarizes the radioactive liquid and gaseous releases (effluents) from Three Mile Island Unit 2 and the calculated maximum hypothetical radiation exposure to the public resulting from these releases. This report covers the period of operation from April 1 to June 30, 1987.

Radiological releases from the plant are measured by installed plant monitors sampling the plant stack for gaseous releases and liquid monitors for discharges to the Susquehanna River. These monitors provide a means for accurate determination of the type and quantities of radioactive materials being released to the environment.

Calculations of the maximum hypothetical dose to an individual and the total population around Three Mile Island due to radioactive releases from the plant are made utilizing environmental conditions that existed at the time of the release. Susquehanna River flow data are used to calculate the maximum hypothetical doses to an individual and the population downstream of TMI due to liquid releases. Actual or "real-time" meteorological data from an onsite tower is used to determine the doses resulting from gaseous releases from the plant. The use of real-time meteorological information permits the determination of both the direction in which the release traveled and the dispersion of radioactive material in the environment.

Utilizing gaseous effluent data and real-time meteorology the maximum hypothetical dose to any individual and to the total population within 50 miles of the plant is calculated. Similarly, Susquehanna River flow and liquid effluent data are used to calculate a maximum hypothetical dose to an individual and a population dose from liquid effluents for any shoreline exposure down to the Chesapeake Bay. Exposure to the public from consumption of water and fish withdrawn from the Susquehanna River downstream of the plant is also calculated.

Dose calculations for liquid and gaseous effluents are performed using a mathematical model which is based on the methods defined by the U.S. Nuclear Regulatory Commission.

The maximum hypothetical doses are conservative overestimates of the actual offsite doses which are likely to occur. For example, the dose does not take into consideration the removal of radioactive material from the river water by precipitation of insoluble salts, absorption onto river sediment, biological removal, or removal during processing by water companies prior to distribution and consumption.

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Liquid discharges made during the reporting period April 1 to June 30, 1987 consisted of 0.0004 curies of tritium, 0.00002 curies of strontium-90 and unidentified beta activity, 0.0000001 curies of cesium-134, and 0.00001 curies of cesium-137. Unidentified beta activity is treated as strontium-90 for the purpose of dose calculations. These release rates and quantities are consistent with results of previous quarters. The quantities of each radionuclide released are actually up to 1 million times smaller than the normally existing environmental quantities that flowed past the plant during the same time period.

During the reporting period April 1 to June 30 of 1987, the maximum hypothetical calculated whole body dose to an individual due to liquid effluents from Three Mile Island Unit 2 was about 0.0002 millirem. The maximum hypothetical calculated dose to any organ of an individual was 0.0005 millirem to the bone.

Airborne discharges made during this same time period consisted of 15 curies of tritium, 0.000000003 curies of gross alpha activity, and 0.0000003 curies of unidentified beta activity. Unidentified beta activity is, as with liquid effluents, conservatively assumed to be entirely strontium-90. These release rates and quantities are also consistent with the results from previous reporting periods. The maximum hypothetical dose to an individual due to gaseous effluents was about 0.003 millirem to the total body.

The maximum hypothetical whole body dose received by any individual from effluents from the Three Mile Island Nuclear Station Unit 2 for the latest reporting period is 8000 times lower than the dose the average individual in the Three Mile Island area receives from natural background during the same time period. Natural background averages about 25 millirem whole body per quarter in the Three Mile Island area. In addition, average equivalent dose from natural radon is about 90 millirem per quarter.

The doses which could be received by the maximum hypothetical individual are at most 0.02 percent of the guides established by the Nuclear Regulatory Commission.

EFFLUENT SUMMARY
THREE MILE ISLAND UNIT 2 LIQUID AND GASEOUS EFFLUENTS
(Summary of All Releases)

TYPE EFFLUENT	APRIL	MAY	JUNE	TOTAL 2ND QUARTER
I. Liquid Effluent:				
A. Fission and activation products (not including H-3, gases & alpha)				
1. Total Release (Ci) (Note 2)	9.21E-6	5.25E-6	1.41E-5	2.86E-5
2. Concentration (µCi/cc)(Note 2)	2.72E-12	1.63E-12	2.99E-12	2.53E-12
B. Tritium				
1. Total release (Ci)	1.81E-6	5.07E-5	3.05E-4	3.58E-4
2. Concentration (µCi/cc)	5.36E-13	1.58E-11	6.48E-11	3.17E-11
C. Dissolved and entrained gases				
1. Total release (Ci)	N/A	N/A	N/A	N/A
2. Concentration (µCi/cc)	N/A	N/A	N/A	N/A
D. Gross alpha radioactivity				
1. Total release (Ci) (Note 2)	<LLD	<LLD	<LLD	<LLD
E. Volume of waste released prior to dilution (liters) (Note 1)	2.57E4	2.51E4	4.68E4	9.76E4
F. Volume of dilution water (flow to river in liters from MPDES Report)	3.38E9	3.21E9	4.71E9	1.13E10
G. Number of batch releases:	12	10	16	38

- The concentration of radioactive material other than dissolved or entrained noble gases in liquid effluent released to the unrestricted area shall not exceed the values specified in 10CFR 20, Appendix B, Table II.

- Present liquid effluent release limits are 10% of the concentration values specified in 10CFR 20, Appendix B, Table II.

- Liquid effluent releases are also limited to 10CFR 50, Appendix I, not to exceed a dose of 3 mrem total body and 10 mrem to any organ per year.

Note 1) Includes only those releases which were found to contain radioisotopic concentration >LLD from the Industrial Waste Stream..

Note 2) These activities are to be verified by composite sampling.

EFFLUENT SUMMARY
THREE MILE ISLAND UNIT 2 LIQUID AND GASEOUS EFFLUENTS
(Summary of All Releases)

TYPE EFFLUENT	APRIL	MAY	JUNE	TOTAL 2ND QUARTER
II. Gaseous Effluent				
A. Fission & activation gases				
1. Total release (Ci)	<LLD N/A	<LLD N/A	<LLD N/A	<LLD N/A
B. Iodine-131 released (Ci):	<LLD	<LLD	<LLD	<LLD
C. Particulates with half-lives >8 days:				
1. Total releases (not including alpha)(Ci)	2.66E-7	2.27E-8	2.79E-6	3.08E-6
2. Release rate (μ Ci/sec)	1.03E-7	8.48E-9	1.08E-6	3.92E-7
3. Gross alpha radio- activity (Ci)	1.55E-9	<LLD	1.93E-9	3.48E-9
D. Tritium				
1. Total release (Ci)	8.38E0	4.39E0	1.83E0	1.46E1
2. Release rate (μ Ci/sec)	3.23E0	1.64E0	7.06E-1	1.86E0
E. Seconds in period reported	2.5920E6	2.6784E6	2.5920E6	7.8624E6
F. Number of batch releases	0	0	0	0

- The concentration of radioactive material in gaseous effluents released to the unrestricted area shall not exceed the values specified in 10CFR 20, Appendix B, Table II.
- 10CFR 50 dose to individual for: a) 10 mRad/yr, gamma radiation; b) 20 mRad/yr, beta radiation; and c) 15 mrem/yr to any organ.

1987 UNIT 2 LIQUID RADIONUCLIDE RELEASES BY ISOTOPE (Ct)

RADIONUCLIDE	APRIL	MAY	JUNE	2ND QUARTER 1987
Fission and activation products (not including alpha, H-3 & gases)	<LLD	<LLD	<LLD	<LLD
Ag-110m	<LLD	<LLD	<LLD	<LLD
Ce-144	<LLD	<LLD	<LLD	<LLD
Co-58	<LLD	<LLD	<LLD	<LLD
Co-60	<LLD	<LLD	<LLD	<LLD
Cs-134	<LLD	<LLD	1.14E-7	1.14E-7
Cs-137	3.52E-6	9.03E-7	5.22E-6	9.64E-6
I-131	<LLD	<LLD	<LLD	<LLD
Sr-90*	5.69E-6	4.35E-6	8.80E-6	1.88E-5
TOTAL	9.21E-6	5.25E-6	1.41E-5	2.86E-5
H-3	1.81E-6	5.07E-5	3.05E-4	3.58E-4

*The values reported include Sr-90 activity and any activity not specifically identified. Thus, the reported Sr-90 value represents a conservative estimate (i.e. overestimate) and contains activity from other beta-gamma emitters which were not positively identified during conduct of analytical procedures.

1986 UNIT 2 GASEOUS RADIONUCLIDE RELEASES BY ISOTOPE (Ci)

RADIONUCLIDE	APRIL	MAY	JUNE	2ND QUARTER 1987
<u>Fission and activation gases</u>				
Kr-85	<LLD	<LLD	<LLD	<LLD
Total				
<u>Particulates (half lives >8 days)</u>				
Unidentified beta/gamma	2.66E-7	2.27E-8	2.79E-6	3.08E-6
Cs-137	<LLD	<LLD	<LLD	<LLD
Cs-134	<LLD	<LLD	<LLD	<LLD
Gross alpha	1.55E-9	<LLD	1.93E-9	3.48E-9
TOTAL (including alpha)	2.68E-7	2.27E-8	2.79E-6	3.08E-6
TOTAL (minus alpha)	2.66E-7	2.27E-8	2.79E-6	3.08E-6
Tritium (³ H)	8.38E0	4.39E0	1.83E0	1.46E1

UNIT 2
Second Quarter Dose Report

SUMMARY OF MAXIMUM INDIVIDUAL DOSES FOR UNIT 2 FROM
April 1, 1987 through June 30, 1987

Effluent	Applicable Organ	Estimated Dose (mrem)	Age Group	Location Dist (m) (toward)	% of Applicable Limit		Limits (mrem)	
					Quarterly	Annual	Quarterly	Annual
(1) Liquid	Total Bone	2.2E-4	Adult Adult	Receptor 1 Receptor 1	---	7.2E-3	---	3.0
(2) Liquid		5.2E-4			---	5.2E-3	---	10.0
(3) Noble Gas	Air Dose (gamma-mrad) Air Dose (beta-mrad)	0	---	---	---	0	---	10.0
(4) Noble Gas		0			---	0	---	20.0
(5) Noble Gas	Total Body Skin	0	---	---	---	0	---	5.0
(6) Noble Gas		0			---	0	---	15.0
(7) Iodine & Particulates	Total Body	2.7E-3	Child	500 W	---	0.018	---	15.0

SUMMARY OF MAXIMUM POPULATION DOSES FOR UNIT 2 FROM
April 1, 1987 through June 30, 1987

Effluent	Applicable Organ	Estimated Population Dose (person-rem)
(8) Liquid	Total Body	3.6E-3
(9) Liquid	Bone	0.014
(10) Gaseous	Total Body	0.11
(11) Gaseous	GI, Liver, Kidney, Thyroid, Lung	0.11

INTERPRETATION OF DOSE SUMMARY TABLE

The Dose Summary Table presents the maximum hypothetical doses to an individual and the general population resulting from the release of gaseous and liquid effluents from TMI-2 during the second quarter reporting period of 1987.

A. Liquid (Individual)

The first two lines present the maximum hypothetical dose to an individual. Presented are the whole body and critical organ doses. Calculations are performed on the four age groups and eight organs recommended in Regulatory Guide 1.109. The pathways considered for TMI are drinking water, consumption of fish, and standing on the shoreline influenced by TMI effluents. The latter two pathways are considered to be the primary recreational activities associated with the Susquehanna River in the vicinity of TMI. The "receptor" would be that individual who consumes water from the Susquehanna River and fish residing in the plant discharge, while occupying an area of shoreline influenced by the plant discharge.

After calculating the doses to all age groups for all eight organs resulting from the three pathways described above, the Dose Summary Table presents the maximum whole body dose and affected age group along with the organ and associated age group that received the largest dose.

For the second quarter of 1987 the calculated maximum whole body dose received by anyone would have been $2.2\text{E-}4$ mrem to an adult. Similarly, the maximum organ dose would have been $5.2\text{E-}4$ mrem to the bone of an adult.

B. Gaseous (Individual)

There are seven major pathways considered in the dose calculations for gaseous effluents. These are: (1) plume, (2) inhalation, consumption of (3) cow milk, (4) goat milk, (5) vegetables, (6) meat, and (7) standing on contaminated ground.

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 dose that would have occurred at or beyond the site boundary. The Dose Summary Table presents the distance in meters to the location in the affected sector (compass point) where the theoretical maximum plume exposure occurred. It should be noted that real-time meteorology was used in all dose calculations for gaseous effluents.

Direct noble gas plume dose to the maximum individual is shown on lines 5 and 6. For the second quarter of 1987 there were no releases of noble gases from Unit 2. The doses reported on lines 3, 4, 5 and 6 are therefore zero.

The Iodines and Particulates section described in line 7 represents the maximum exposed organ due to iodine and particulates. This does not include any plume exposure which is separated out by lines 5 and 6. The doses presented in this section again reflect the maximum exposed organ for the appropriate age group.

The second quarter 1987 iodines and particulates would have resulted in a maximum dose of $2.7\text{E-}3$ mrem to the total body of a child residing 500 meters from the site in the W sector. No other organ of any age group would have received a greater dose.

C. Liquid and Gaseous (Population)

Lines 8 - 11 present the person-rem doses resulting from the liquid and gaseous effluents. These doses are summed over all pathways and the affected populations. Liquid person-rem is based upon the population encompassed within the region from the TMI outfall extending down to the Chesapeake Bay. The person-rem for gaseous effluents are based upon the 1980 population and consider the population out to a distance of 50 miles around TMI. Population doses are summed over all distances and sectors to give an aggregate dose.

Based upon the calculations performed for the second quarter, liquid effluents resulted in a whole body population dose of $3.6\text{E-}3$ person-rem. The maximum critical organ population dose to the bone was $1.4\text{E-}2$ person-rem. Gaseous effluents resulted in a whole body population dose of $1.1\text{E-}1$ person-rem. Maximum organ population dose to the lung, GI, thyroid, liver, and kidney was also $1.1\text{E-}1$ person-rem.

EFFLUENT AND WASTE DISPOSAL SEMI ANNUAL REPORT
January 1, 1987 to June 30, 1987
SUPPLEMENTAL INFORMATION

FACILITY TMI Unit-2 (including EPICOR II) LICENSEE DPR-73-320

1. Regulatory Limits

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

2. Maximum Permissible Concentrations

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

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

3. Average Energy

Provide the average energy (\bar{E}) of the radionuclide mixture in releases of fission and activation gases, if applicable 0.253 Mev (Kr-85)

4. Measurements and Approximations of Total Radioactivity

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

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

5. Batch Releases

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

A. Liquid	1987	1987
	1st Quarter	2nd Quarter
1. Number of batch releases:	25	38
2. Total time period for batch release:	N/A	N/A
3. Maximum time period for a batch release:	N/A	N/A
4. Average time period for batch releases:	N/A	N/A
5. Minimum time period for a batch release:	N/A	N/A
6. Average stream flow during periods of release of effluent into flowing stream:	N/A	N/A

N/A - Not Applicable

5. Batch Releases (cont.)

	1987 1st Quarter	1987 2nd Quarter
B. Gaseous		
1. Number of batch releases:	0	0
2. Total time period for batch releases:	N/A	N/A
3. Maximum time period for a batch release:	N/A	N/A
4. Average time period for batch release:	N/A	N/A
5. Minimum time period for a batch release:	N/A	N/A

6. Abnormal Releases

A. Liquid

1. Number of releases:	None	None
2. Total activity released:	N/A	N/A

B. Gaseous

1. Number of releases:	None	None
2. Total activity released:	N/A	N/A

TABLE 1A
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
GASEOUS EFFLUENTS-SUMMATION OF ALL RELEASES

	UNIT	1st QUARTER 1987	2nd QUARTER 1987	EST. TOTAL ERROR, %
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A. Fission & activation gases

1. Total release	Ci	<LLD	<LLD	Tech. Spec. Limit = 7.20E+3 μ Ci/sec for Kr-85
2. Average release rate for period	μ Ci/sec.	N/A	N/A	
3. Percent of Tech Spec limit	%	N/A	N/A	

B. Iodines

1. Total Iodine-131	Ci	<LLD	<LLD	Tech. Spec. Limit = 2.40E-2 μ Ci/sec
2. Average release rate for period	μ Ci/sec.	N/A	N/A	
3. Percent of Tech Spec limit	%	N/A	N/A	

C. Particulates

1. Particulates with half-lives > 8 Days	Ci	5.42E-5	3.08E-6	Tech. Spec. Limit = 2.40E-2 μ Ci/sec
2. Average release rate for period	μ Ci/sec.	6.97E-6	3.92E-7	
3. Percent of Tech Spec limit	%	2.90E-2	1.63E-3	
4. Gross alpha radioactivity	Ci	1.81E-9	3.48E-9	

D. Tritium

1. Total release	Ci	1.07E1	1.46E1	Tech. Spec. Limit = 4.80E+3 μ Ci/sec for H-3
2. Average release rate for period	μ Ci/sec.	1.38E0	1.86E0	
3. Percent of Tech Spec limit	%	2.88E-2	3.88E-2	

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

Nuclides Released	UNIT	Continuous Mode		Batch Mode	
		1987 1st QUARTER	1987 2nd QUARTER	1987 1st QUARTER	1987 2nd QUARTER

1. Fission gases

krypton-85	Ci	<LLD	<LLD	<LLD	<LLD
krypton-85m	Ci	<LLD	<LLD	<LLD	<LLD
krypton-87	Ci	<LLD	<LLD	<LLD	<LLD
krypton-88	Ci	<LLD	<LLD	<LLD	<LLD
xenon-133	Ci	<LLD	<LLD	<LLD	<LLD
xenon-135	Ci	<LLD	<LLD	<LLD	<LLD
xenon-135m	Ci	<LLD	<LLD	<LLD	<LLD
xenon-138	Ci	<LLD	<LLD	<LLD	<LLD
Others (specify)	Ci	<LLD	<LLD	<LLD	<LLD
	Ci				
	Ci				
	Ci				
	Ci				
Unidentified	Ci	<LLD	<LLD	<LLD	<LLD
Total for period	Ci	N/A	N/A	N/A	N/A

2. Iodines

iodine-131	Ci	<LLD	<LLD	N/A	N/A
iodine-133	Ci	<LLD	<LLD	N/A	N/A
iodine-135	Ci	<LLD	<LLD	N/A	N/A
Total for period	Ci	N/A	N/A	N/A	N/A

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

Nuclides Released	UNIT	Continuous Mode		Batch Mode	
		1987 1st QUARTER	1987 2nd QUARTER	1987 1st QUARTER	1987 2nd QUARTER

3. Particulates

strontium-89	Ci	<LLD	<LLD	N/A	N/A
strontium-90	Ci	<LLD	<LLD	N/A	N/A
cesium-134	Ci	<LLD	<LLD	N/A	N/A
cesium-137	Ci	8.11E-6	<LLD	N/A	N/A
barium-lanthanum-140	Ci	<LLD	<LLD	N/A	N/A
Others (specify)					
Unidentified	Ci	4.61E-5	3.08E-6	N/A	N/A

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

	UNIT	1987 1st QUARTER	1987 2nd QUARTER	EST. TOTAL ERROR %
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A. Fission and activation products

1. Total releases (not including tritium, gases, alpha)	Ci	3.45E-5	2.86E-5	± 60%
2. Average diluted concentration during period	µCi/ml	2.93E-12	2.53E-12	Based on 2E-5 µCi/ml (CS-137)
3. Percent of applicable limit	%	1.47E-5	1.27E-5	

B. Tritium

1. Total release	Ci	3.69E-6	3.58E-4	± 60%
2. Average diluted concentration during period	µCi/ml	3.13E-13	3.17E-11	Based on 3E-3 µCi/ml (H-3)
3. Percent of applicable limit	%	1.04E-8	1.06E-6	

C. Dissolved and entrained gases

1. Total release	Ci	<LLD	<LLD	± 60%
2. Average diluted concentration during period	µCi/ml	N/A	N/A	
3. Percent of applicable limit	%	N/A	N/A	

D. Gross alpha radioactivity

1. Total release	Ci	Note (1)	Note (1)	± 60%
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E. Volume of waste released (prior to dilution)	liters	1.14E5	9.76E4	± 25%
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F. Volume of dilution water used during period	liters	1.18E10	1.13E10	± 10%
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Includes only those releases mentioned in Note (1) which were found to contain radioisotope concentration >LLD.

Note (1) There were no liquid releases from the radwaste system during the first half of 1987 since this system is flanged off from the discharge lines. However, low concentrations of radionuclides have been occasionally found in the industrial waste stream and are appropriately included in Item A2.

Note (2) Refer to Table 5 for Typical LLD values.

Note (3) The values reported include Sr-90 activity and any activity not specifically identified. Thus, the reported Sr-90 value represents a conservative estimate (i.e. overestimate) and contains activity from other beta-gamma emitters which were not positively identified during conduct of analytical procedures.

TABLE 2B
EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
LIQUID EFFLUENTS

Nuclides Released	UNIT	Continuous Mode		Batch Mode	
		1987 1st QUARTER	1987 2nd QUARTER	1987 1st QUARTER	1987 2nd QUARTER
strontium-89	C1	See Note(2) page 6	See Note(2) page 6	<LLD	<LLD
strontium-90 Note(3), Pg. 6	C1			2.57E-5	1.88E-5
cesium-134	C1			<LLD	1.14E-7
cesium-137	C1			8.75E-6	9.64E-6
iodine-131	C1			<LLD	<LLD
cobalt-58	C1			<LLD	<LLD
cobalt-60	C1			<LLD	<LLD
iron-59	C1			<LLD	<LLD
zinc-65	C1			<LLD	<LLD
manganese-54	C1			<LLD	<LLD
chromium-51	C1			<LLD	<LLD
zirconium-niobium-95	C1			<LLD	<LLD
molybdenum-99	C1			<LLD	<LLD
technetium-99m	C1			<LLD	<LLD
barium-lanthanum-140	C1			<LLD	<LLD
cerium-141	C1			<LLD	<LLD
Other (specify)	C1			<LLD	<LLD
	C1				
	C1				
	C1				
	C1				
	C1				
Unidentified	C1			<LLD	<LLD
Total for period	C1			3.45E-5	2.86E-5
xenon-133	C1			<LLD	<LLD
xenon-135	C1			<LLD	<LLD

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

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

1. Type of waste	UNIT	6 month period	EST. TOTAL ERROR %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	38.71m ³ 25.477 Ci	5%
b. Dry compressible waste, contaminated equipment, etc.	m ³ Ci	N/A	N/A
c. Irradiated components, control rods, etc.	m ³ Ci	N/A	N/A
d. Other (describe)	m ³ Ci	N/A	N/A

2. Estimate of major nuclide composition (bv type of waste)		
a. Sb125	29.954%	
Cs137	26.184%	
Sr90	17.753%	
Tel25m	7.007%	
b.		
c.		
d.		

3. Solid Waste Disposition		
Number of Shipments	Mode of Transportation	Destination
4 Shipments	Tractor-Cask(NuPac 14/190m)	Hanford - Richland, WA
3 Shipments	Tractor-Cask(Hn-100Series 3)	Hanford - Richland, WA
2 Shipments	Tractor-Cask(HN-100Series 2)	Hanford - Richland, WA
1 Shipment	Tractor-Flatbed	Hanford - Richland, WA

B. Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination
N/A		

Unit 2 LSA January 1, 1987 through June 30, 1987

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

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

1. Type of waste	UNIT	6 month period	EST. TOTAL ERROR %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	N/A	N/A
b. Dry compressible waste, contaminated equipment, etc.	m ³ Ci	299.53 m ³ 3.901 Ci	5%
c. Irradiated components, control rods, etc.	m ³ Ci	N/A	N/A
d. Other (describe)	m ³ Ci	N/A	N/A

2. Estimate of major nuclide composition (by type of waste)		
a. N/A	%	
	%	
	%	
	%	
	%	
b. Cs137	41.733%	
Sr90	34.025%	
Pm147	7.682%	
Cs134	3.548%	
Ru106	2.847%	
c. N/A	%	
	%	
	%	
	%	
	%	
	%	
d. N/A	%	
	%	
	%	
	%	
	%	

3. Solid Waste Disposition		
Number of Shipments	Mode of Transportation	Destination
6 Shipments	Tractor - Closed Van	Hanford - Richland, WA
7 Shipments	Tractor - Flatbed	Hanford - Richland, WA
2 Shipments	Tractor - Cask (Hn-100 Series J)	Hanford - Richland, WA
1 Shipment	Tractor - Cask (NuPack 14/190m)	Hanford - Richland, WA

B. Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination
N/A		

TABLE 3A
EFFLUENT AND WASTE DISPOSAL SEMI-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	6 month period	EST. TOTAL ERROR %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	N/A	N/A
b. Dry compressible waste, contaminated equipment, etc.	m ³ Ci	5.66 m ³ 3.326 Ci	5%
c. Irradiated components, control rods, etc.	m ³ Ci	N/A	N/A
d. Other (describe)	m ³ Ci	N/A	N/A

2. Estimate of major nuclide composition (by type of waste)		
a. N/A		
b. Sr90	65.42%	
Cs137	16.765%	
Pm147	7.149%	
Ru106	2.605%	
Pu241	2.105%	
c. N/A		
d. N/A		

3. Solid Waste Disposition		
Number of Shipments	Mode of Transportation	Destination
3 Shipments	Tractor - Cask(HN-100 Series 3)	Hanford - Richland, WA
1 Shipment	Tractor - Cask(HN-100 Series 2)	Hanford - Richland, WA

B. Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination
N/A		

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

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

1. Type of waste	UNIT	6 month period	EST. TOTAL ERROR %
a. Spent resins, filter sludges, evaporator bottoms, etc.	m ³ Ci	N/A	N/A
b. Dry compressible waste, contaminated equipment, etc.	m ³ Ci	N/A	N/A
c. Irradiated components, control rods, etc.	m ³ Ci	N/A	N/A
d. Other (describe)	m ³ Ci	N/A	N/A

2. Estimate of major nuclide composition (by type of waste)		
a. N/A	0/0	
	0/0	
	0/0	
	0/0	
	0/0	
b. N/A	0/0	
	0/0	
	0/0	
	0/0	
	0/0	
	0/0	
c. N/A	0/0	
	0/0	
	0/0	
	0/0	
	0/0	
d. N/A	0/0	
	0/0	
	0/0	
	0/0	
	0/0	

3. Solid Waste Disposition Number of Shipments	Mode of Transportation	Destination
N/A		

B. Irradiated Fuel Shipments (Disposition)

Number of Shipments	Mode of Transportation	Destination
7 Shipments	125B Rail Cask	INEL - Scoville, Idaho

TABLE 1

TYPICAL LIQUID EFFLUENT LLD (Lower Limit of Detection) VALUES

ASSUMPTIONS: Sample volume = 1 liter = 1000 cc
 Sample counting time = 1000 sec
 Sample counted with a 25% Ge(Li) for Gamma Emitters

<u>ISOTOPE</u>		<u>μCi/cc LLD</u>	<u>NOTES</u>
Gross Alpha	α	4E-9	Counted with proportional counter
Gross Beta	β	7E-8	Counted with proportional counter
Tritium	H-3	4E-6	Counted with liquid scintillation counter
Krypton-85	Kr-85	1E-4	
Xenon-131m	Xe-131m	2E-5	
Xenon-133	Xe-133	1E-6	
Xenon-135	Xe-135	3E-7	
Chromium-51	Cr-51	3E-6	
Manganese-54	Mn-54	4E-7	
Cobalt-58	Co-58	4E-7	
Iron-59	Fe-59	9E-7	
Cobalt-60	Co-60	6E-7	
Zinc-65	Zn-65	1E-6	
Zirconium-95	Zr-95	7E-7	
Niobium-95	Nb-95	4E-7	
Molybdenum-99	Mo-99	3E-7	
Technetium-99m	Tc-99m	3E-7	
Silver-110m	Ag-110m	6E-7	
Antimony-125	Sb-125	9E-7	
Cesium-134	Cs-134	5E-7	
Cesium-136	Cs-136	4E-7	
Cesium-137	Cs-137	5E-7	
Barium-140	Ba-140	1E-6	
Lanthanum-140	La-140	7E-7	
Cerium-141	Ce-141	5E-7	
Cerium-144	Ce-144	3E-6	
Iodine-131	I-131	3E-7	
Iodine-133	I-133	4E-7	
Phosphorus-32	P-32	1E-6	These LLD values for liquid sample analyses of gross alpha, P-32, Fe-55, Sr-89, and Sr-90 are the same as Unit 1 which are offsite vendor LLD values.
Iron-55	Fe-55	5E-8	
Strontium-89	Sr-89	5E-8	
Strontium-90	Sr-90	5E-8	
Gross Alpha		1E-7	

TABLE 2

TYPICAL GASEOUS EFFLUENT LLD (Lower Limit of Detection) VALUES

ASSUMPTIONS:	Sample volume (Marinelli)	1640cc
	Sample volume (Particulate & Charcoal Filters)	5.7E8cc
	Sampling Rate	2 cfm or 5.66E4cc/min
	Sampling Time	1 week or 1E4 min
	Sample volume (tritium bubbled thru water)	7.56E5cc
	Sampling Rate	75cc/min
	Sampling Time	1E4 min
	Sample Counting Time: a & H-3 = 20min;	= 10min; = 1000sec
	Sample Counters:	emitters 25% Ge(Li)
		or Proportional Counter
	H-3	Liquid Scintillation Counter

<u>ISOTOPE</u>		<u>Ci/cc LLD</u>	<u>NOTES</u>
Gross Alpha	α	1E-15	Particulate Filter Paper
Gross Beta	β	1E-14	"
Tritium	H-3	1E-10	Air bubbled thru water by a fritted disc or Fisher Milligan gas washer
Krypton-85	Kr-85	5E-6	Marinelli
Krypton-85m	Kr-85m	2E-8	"
Krypton-87	Kr-87	6E-8	"
Krypton-88	Kr-88	5E-8	"
Xenon-133	Xe-133	4E-8	"
Xenon-133m	Xe-133m	1E-7	"
Xenon-135	Xe-135	2E-8	"
Xenon-135m	Xe-135m	3E-7	"
Xenon-138	Xe-138	3E-7	"
Iodine-131	I-131	2E-8	"
Iodine-133	I-133	3E-8	"
Iodine-135	I-135	2E-7	"
Iodine-131	I-131	3E-14	Charcoal Filter
Iodine-133	I-133	4E-14	"
Iodine-135	I-135	3E-13	"
Manganese-54	Mn-54	3E-14	Particulate filter Paper
Iron-59	Fe-59	8E-14	"
Cobalt-58	Co-58	3E-14	"
Cobalt-60	Co-60	5E-14	"
Zinc-65	Zn-65	9E-14	"
Strontium-89	Sr-89	2E-14	"
Strontium-90	Sr-90	2E-14	"
Molybdenum-99	Mo-99	2E-14	"
Ruthenium-103	Ru-103	2E-14	"
Silver-110m	Ag-110m	3E-14	"
Cesium-134	Cs-134	4E-14	"
Cesium-137	Cs-137	3E-14	"
Cerium-141	Ce-141	3E-14	"
Cerium-144	Ce-144	9E-14	"

THREE MILE ISLAND
JOINT FREQUENCY TABLES
FIRST QUARTER 1987

ATTACHMENT 6
Page 1 of 8
4410-87-L-0132

SITE: THREE MILE ISLD.

08/14/87 12:10

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87010101-87033124
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED:SP100A DIRECTION:DI100A LAPSE:DT150A

WIND SPEED(MPH)							
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	7	8	10	10	4	0	39
NNE	3	2	5	2	0	0	12
NE	0	0	0	0	0	0	0
ENE	0	2	0	0	0	0	2
E	3	3	0	0	0	0	6
ESE	2	7	0	0	0	0	9
SE	5	9	0	0	0	0	14
SSE	4	2	0	0	0	0	6
S	2	3	1	0	0	0	6
SSW	4	8	4	0	0	0	16
SW	6	5	1	0	0	0	12
WSW	7	1	0	0	0	0	8
W	3	2	4	5	3	0	17
WNW	3	8	16	3	0	0	30
NW	8	15	20	8	0	0	51
NNW	11	26	25	20	3	0	85
TOTAL	68	101	86	48	10	0	313

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 95
HOURS OF MISSING DATA: 18

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87010101-87033124
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED:SP100A DIRECTION:DI100A LAPSE:DT150A

WIND SPEED(MPH)							
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	0	2	3	8	2	0	15
NNE	0	0	0	0	0	0	0
NE	0	2	0	0	0	0	2
ENE	0	1	0	0	0	0	1
E	3	1	1	0	0	0	5
ESE	1	3	0	0	0	0	4
SE	1	3	1	0	0	0	5
SSE	1	3	1	1	0	0	6
S	1	0	1	0	0	0	2
SSW	0	2	2	1	0	0	5
SW	3	1	0	0	0	0	4
WSW	0	0	0	0	0	0	0
W	1	1	3	6	2	0	13
WNW	1	3	4	8	0	0	16
NW	1	0	10	7	2	0	20
NNW	3	0	8	6	4	2	23
TOTAL	16	22	34	37	10	2	121

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 20
HOURS OF MISSING DATA: 18

THREE MILE ISLAND
JOINT FREQUENCY TABLES
FIRST QUARTER 1987

ATTACHMENT 6
Page 2 of 6
4410-87-L-0132

SITE: THREE MILE ISLD.

08/14/87 12:14

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87010101-87033124
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:SP100A DIRECTION:DI100A LAPSE:DT150A

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	1	0	1	0	0	2
NNE	0	0	0	1	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	2	0	0	0	0	2
ESE	1	1	0	0	0	0	2
SE	0	2	1	0	0	0	3
SSE	0	0	0	0	0	0	0
S	0	1	0	0	0	0	1
SSW	0	1	0	0	0	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	1	1	1	1	1	0	5
WNW	0	1	1	3	0	0	5
NW	0	1	1	5	2	0	9
NNW	0	1	3	3	1	2	10
TOTAL	2	13	7	14	4	2	42

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 5
HOURS OF MISSING DATA: 18

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87010101-87033124
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:SP100A DIRECTION:DI100A LAPSE:DT150A

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	2	15	12	10	2	0	41
NNE	7	11	2	1	0	0	21
NE	5	16	5	0	0	0	26
ENE	4	13	0	1	0	0	18
E	7	17	1	0	0	0	25
ESE	2	12	12	6	0	0	32
SE	11	21	14	3	0	0	49
SSE	4	5	6	3	0	0	18
S	5	6	10	1	0	0	22
SSW	2	1	4	0	0	0	7
SW	2	4	0	0	0	0	6
WSW	4	2	3	0	0	0	9
W	1	6	14	15	1	0	37
WNW	0	6	24	57	11	1	99
NW	3	16	34	33	19	1	106
NNW	0	16	27	17	10	8	78
TOTAL	59	167	168	147	43	10	594

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 92
HOURS OF MISSING DATA: 18

THREE MILE ISLAND
JOINT FREQUENCY TABLES
FIRST QUARTER 1987

ATTACHMENT 6
Page 3 of 8
4410-87-L-013-

SITE: THREE MILE ISLD.

08/14/87 12:18

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87010101-87033124
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:SP100A DIRECTION:DI100A LAPSE:DT150A

WIND SPEED(MPH)							
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	4	52	22	3	1	0	82
NNE	9	14	5	0	0	0	28
NE	7	5	0	0	0	0	12
ENE	6	9	0	0	0	0	15
E	7	12	4	0	0	0	23
ESE	2	13	3	1	0	0	19
SE	5	24	3	0	0	0	32
SSE	3	7	1	2	0	0	13
S	3	10	6	2	0	0	21
SSW	8	12	0	1	0	0	21
SW	9	15	9	0	0	0	33
WSW	7	18	5	0	0	0	30
W	4	25	17	3	0	0	49
WNW	7	16	37	13	0	0	73
NW	7	15	46	29	10	1	108
NNW	13	30	25	18	2	0	88
TOTAL	101	277	183	72	13	1	647

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 125
HOURS OF MISSING DATA: 18

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87010101-87033124
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:SP100A DIRECTION:DI100A LAPSE:DT150A

WIND SPEED(MPH)							
WIND DIRECTION	1-3	4-7	8-12	13-18	19-24	>24	TOTAL
N	6	18	2	0	0	0	26
NNE	1	2	0	0	0	0	3
NE	3	1	0	0	0	0	4
ENE	5	2	0	0	0	0	7
E	5	4	0	0	0	0	9
ESE	6	4	0	0	0	0	10
SE	9	4	0	0	0	0	13
SSE	9	8	0	0	0	0	17
S	11	0	0	0	0	0	11
SSW	7	7	0	0	0	0	14
SW	5	1	0	0	0	0	6
WSW	9	7	0	0	0	0	16
W	2	5	3	0	0	0	10
WNW	3	2	2	0	0	0	7
NW	6	5	0	0	0	0	11
NNW	4	23	13	2	0	0	42
TOTAL	91	93	20	2	0	0	206

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 85
HOURS OF MISSING DATA: 18

THREE MILE ISLAND
JOINT FREQUENCY TABLES
FIRST QUARTER 1987

ATTACHMENT 6
Page 4 of 4
4410-87-L-0132

SITE: THREE MILE ISLD.

08/14/87 12:21

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 87010101-87033124

STABILITY CLASS: G DT/DZ

ELEVATION: SPEED:SP100A DIRECTION:DI100A LAPSE:DT150A

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	3	5	1	0	0	0	9
NNE	1	1	0	0	0	0	2
NE	3	0	0	0	0	0	3
ENE	3	0	0	0	0	0	3
E	4	1	0	0	0	0	5
ESE	6	1	0	0	0	0	7
SE	13	2	0	0	0	0	15
SSE	22	1	0	0	0	0	23
S	26	1	0	0	0	0	27
SSW	20	15	0	0	0	0	35
SW	13	4	0	0	0	0	17
WSW	8	8	0	0	0	0	16
W	11	4	0	0	0	0	15
WNW	7	1	0	0	0	0	8
NW	6	7	1	0	0	0	14
NNW	6	13	1	0	0	0	20
TOTAL	152	64	3	0	0	0	219

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 94

HOURS OF MISSING DATA: 18

HOURS AT EACH WIND SPEED AND DIRECTION

PERIOD OF RECORD = 87010101-87033124

STABILITY CLASS: ALL DT/DZ

ELEVATION: SPEED:SP100A DIRECTION:DI100A LAPSE:DT150A

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	22	101	50	32	9	0	214
NNE	21	30	12	4	0	0	67
NE	18	24	5	0	0	0	47
ENE	18	28	0	1	0	0	47
E	29	40	6	0	0	0	75
ESE	20	41	15	7	0	0	83
SE	44	65	19	3	0	0	131
SSE	43	26	8	6	0	0	83
S	48	21	18	3	0	0	90
SSW	41	46	10	2	0	0	99
SW	38	30	10	0	0	0	78
WSW	35	36	8	0	0	0	79
W	23	44	42	30	7	0	146
WNW	21	37	84	84	11	1	238
NW	31	59	112	82	33	2	319
NNW	37	109	102	66	20	12	346
TOTAL	489	737	501	320	80	15	2142

PERIODS OF CALM(HOURS): 0

VARIABLE DIRECTION 516

HOURS OF MISSING DATA: 18

THREE MILE ISLAND
JOINT FREQUENCY TABLES
SECOND QUARTER 1987

ATTACHMENT 6
Page 5 of 8
4410-87-L-0132

SITE: THREE MILE ISLD.

07/29/87 13:37

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87040101-87063024
STABILITY CLASS: A DT/DZ
ELEVATION: SPEED: SP100B DIRECTION: DI100B LAPSE: DT150B

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	3	10	5	1	0	0	19
NNE	2	3	2	0	0	0	7
NE	1	9	6	1	0	0	17
ENE	0	8	8	0	0	0	16
E	2	4	6	5	1	0	18
ESE	1	4	17	3	0	0	25
SE	1	5	7	0	0	0	13
SSE	0	1	1	3	0	0	5
S	3	2	0	1	0	0	6
SSW	0	13	10	7	0	0	30
SW	2	11	6	2	0	0	21
WSW	6	4	1	0	0	0	11
W	5	10	8	0	0	0	23
WNW	5	15	16	1	0	0	37
NW	7	28	24	7	0	0	66
NNW	7	23	29	3	0	0	62
TOTAL	45	150	146	34	1	0	376

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 88
HOURS OF MISSING DATA: 8

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87040101-87063024
STABILITY CLASS: B DT/DZ
ELEVATION: SPEED: SP100B DIRECTION: DI100B LAPSE: DT150B

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	1	1	1	1	0	0	4
NNE	0	3	0	0	0	0	3
NE	0	5	0	0	0	0	5
ENE	0	2	2	0	0	0	4
E	1	2	8	9	1	0	21
ESE	1	2	7	1	1	0	12
SE	0	3	4	1	0	0	8
SSE	1	3	1	1	0	0	6
S	1	1	3	0	0	0	5
SSW	1	3	5	1	0	0	10
SW	0	11	1	1	1	0	14
WSW	2	1	1	0	0	0	4
W	2	5	4	0	0	0	11
WNW	5	1	8	3	0	0	17
NW	3	4	8	4	2	0	21
NNW	4	3	3	3	0	0	13
TOTAL	22	50	56	25	5	0	158

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 43
HOURS OF MISSING DATA: 8

THREE MILE ISLAND
JOINT FREQUENCY TABLES
SECOND QUARTER 1987

ATTACHMENT 6
Page 6 of 8
4410-87-L-0132

SITE: THREE MILE ISLD.

07/29/87 13:37

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87040101-87063024
STABILITY CLASS: C DT/DZ
ELEVATION: SPEED:SP100B DIRECTION:DI100B LAPSE:DT150B

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	0	4	2	0	0	0	6
NNE	0	1	1	0	0	0	2
NE	1	3	1	0	0	0	5
ENE	0	2	0	0	0	0	2
E	0	1	5	2	0	0	8
ESE	0	0	5	1	0	0	6
SE	0	2	2	1	0	0	5
SSE	1	0	0	1	0	0	2
S	0	4	0	1	0	0	5
SSW	0	1	5	0	0	0	6
SW	1	2	2	0	0	0	5
WSW	0	0	2	0	0	0	2
W	2	1	3	0	0	0	6
WNW	1	3	8	3	0	0	15
NW	1	1	4	2	0	0	8
NNW	0	2	4	4	0	0	10
TOTAL	7	27	44	15	0	0	93

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 10
HOURS OF MISSING DATA: 8

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87040101-87063024
STABILITY CLASS: D DT/DZ
ELEVATION: SPEED:SP100B DIRECTION:DI100B LAPSE:DT150B

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	7	14	11	1	0	0	33
NNE	3	11	13	0	0	0	27
NE	6	19	11	0	0	0	36
ENE	5	21	13	2	0	0	41
E	7	23	29	3	0	0	62
ESE	6	42	56	5	0	0	109
SE	4	24	22	3	1	0	54
SSE	4	10	3	1	0	0	18
S	1	5	6	0	0	0	12
SSW	1	21	24	4	0	0	50
SW	9	16	12	0	1	1	39
WSW	14	10	1	1	0	0	26
W	7	13	15	2	0	0	37
WNW	8	14	11	8	1	0	42
NW	5	15	8	15	3	0	46
NNW	4	8	9	2	0	0	23
TOTAL	91	266	244	47	6	1	655

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 142
HOURS OF MISSING DATA: 8

THREE MILE ISLAND
JOINT FREQUENCY TABLES
SECOND QUARTER 1987

ATTACHMENT 6
Page 7 of 8
4410-87-L-0132

SITE: THREE MILE ISLD.

07/29/87 13:41

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87040101-87063024
STABILITY CLASS: E DT/DZ
ELEVATION: SPEED:SP100B DIRECTION:DI100B LAPSE:DT150B

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	9	29	13	0	0	0	51
NNE	7	20	3	0	0	0	30
NE	9	23	1	0	0	0	33
ENE	10	16	4	0	0	0	30
E	16	21	5	0	0	0	42
ESE	8	12	1	0	0	0	21
SE	4	6	2	0	0	0	12
SSE	4	3	0	0	0	0	7
S	7	8	5	0	0	0	20
SSW	10	32	24	4	0	0	70
SW	14	43	6	1	0	0	64
WSW	10	28	2	0	0	0	40
W	10	19	8	0	0	0	37
WNW	8	23	13	3	1	0	48
NW	7	15	12	7	0	0	41
NNW	6	24	6	1	0	0	37
TOTAL	139	322	105	16	1	0	583

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 196
HOURS OF MISSING DATA: 8

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87040101-87063024
STABILITY CLASS: F DT/DZ
ELEVATION: SPEED:SP100B DIRECTION:DI100B LAPSE:DT150B

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	2	3	1	0	0	0	6
NNE	2	1	0	0	0	0	3
NE	2	1	0	0	0	0	3
ENE	4	5	0	0	0	0	9
E	7	8	0	0	0	0	15
ESE	9	3	1	0	0	0	13
SE	6	1	0	0	0	0	7
SSE	11	4	0	0	0	0	15
S	8	3	0	0	0	0	11
SSW	6	7	2	0	0	0	15
SW	15	8	0	0	0	0	23
WSW	16	6	0	0	0	0	22
W	12	12	0	0	0	0	24
WNW	10	3	0	0	0	0	13
NW	5	10	2	0	0	0	17
NNW	7	9	1	0	0	0	17
TOTAL	122	84	7	0	0	0	213

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 109
HOURS OF MISSING DATA: 8

THREE MILE ISLAND
JOINT FREQUENCY TABLES
SECOND QUARTER 1987

ATTACHMENT 6
Page 8 of 8
4410-87-L-0132

SITE: THREE MILE ISLD.

07/29/87 13:47

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87040101-87063024
STABILITY CLASS: G DT/DZ
ELEVATION: SPEED: SP100B DIRECTION: DI100B LAPSE: DT150B

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	5	1	0	0	0	0	6
NNE	2	0	0	0	0	0	2
NE	0	1	0	0	0	0	1
ENE	2	2	0	0	0	0	4
E	3	4	1	0	0	0	8
ESE	2	0	0	0	0	0	2
SE	6	0	0	0	0	0	6
SSE	2	0	0	0	0	0	2
S	7	1	0	0	0	0	8
SSW	12	2	0	0	0	0	14
SW	7	0	0	0	0	0	7
WSW	6	1	0	0	0	0	7
W	8	3	0	0	0	0	11
WNW	6	2	0	0	0	0	8
NW	7	0	0	0	0	0	7
NNW	2	3	0	0	0	0	5
TOTAL	77	20	1	0	0	0	98

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 65
HOURS OF MISSING DATA: 8

HOURS AT EACH WIND SPEED AND DIRECTION
PERIOD OF RECORD = 87040101-87063024
STABILITY CLASS: ALL DT/DZ
ELEVATION: SPEED: SP100B DIRECTION: DI100B LAPSE: DT150B

WIND DIRECTION	WIND SPEED(MPH)						TOTAL
	1-3	4-7	8-12	13-18	19-24	>24	
N	27	62	33	3	0	0	125
NNE	16	39	19	0	0	0	74
NE	19	61	19	1	0	0	100
ENE	21	56	27	2	0	0	106
E	36	63	54	19	2	0	174
ESE	27	63	87	10	1	0	188
SE	21	41	37	5	1	0	105
SSE	23	21	5	6	0	0	55
S	27	24	14	2	0	0	67
SSW	30	79	70	16	0	0	195
SW	48	91	27	4	2	1	173
WSW	54	50	7	1	0	0	112
W	46	63	38	2	0	0	149
WNW	43	61	56	18	2	0	180
NW	35	73	58	35	5	0	206
NNW	30	72	52	13	0	0	167
TOTAL	503	919	603	137	13	1	2176

PERIODS OF CALM(HOURS): 0
VARIABLE DIRECTION 653
HOURS OF MISSING DATA: 8



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4410-87-L-0132
Document ID 0080P

August 28, 1987

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Dear Sirs:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Quarterly Dose Assessment Report - Second Quarter 1987;
Semi-Annual Radioactive Effluent Release Report

Per the requirements of Section 5.6.1.C of Appendix B to the Recovery Technical Specifications, the quarterly report of radiological releases and estimated doses is submitted. Attachment 1 is an executive summary of TMI-2 effluents and doses reported in Attachments 2 and 3. Attachment 2 presents a summary of releases listing estimates of total activity and the time rate of release of each nuclide. Attachment 3 is the Dose Summary Table which provides a summary of the maximum hypothetical and/or real doses to individuals and the general population resulting from TMI-2 activities. Attachment 4 is an interpretation of the Dose Summary Table. Doses were extracted from calculational models and represent the bounding dose for all cases. The reporting period includes April 1, 1987, through June 30, 1987.

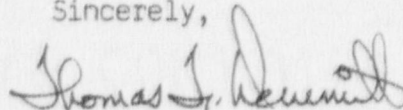
Also enclosed as Attachment 5, in accordance with the requirements of 10 CFR 50.36a(a)(2), is the Radioactive Effluent Release Report for TMI-2. Table 1B, "Effluent and Waste Disposal Semi-Annual Report, Gaseous Effluent-Elevated Releases," is not included as release paths at TMI-2 do not meet Regulatory Guide 1.109 definition of an elevated release. Attachment 6 presents the Joint Frequency Tables for TMI-2. These effluent reports cover the period January 1, 1987, through June 30, 1987.

1-248
11

August 28, 1987
4410-87-L-0132

Dose summaries and effluent releases for the previous quarter of the 1987 calendar year were submitted via GPU Nuclear letter 4410-87-L-0087.

Sincerely,



for F. R. Standerfer
Director, TMI-2

FRS/DHW/eml

Attachments

cc: Regional Administrator, Region 1 - W. T. Russell
Director, TMI-2 Cleanup Project Directorate - Dr. W. D. Travers