

MAINE YANKEE ATOMIC POWER COMPANY

SEMIANNUAL EFFLUENT RELEASE REPORT

July - December, 1987

1.0 INTRODUCTION

Tables 1 through 4 list the recorded radioactive liquid and gaseous effluents and solid waste for the second six months of the year, with data summarized on a quarterly basis.

Appendices A through E indicate the status of reportable items per the requirements of Technical Specifications 3.16.C, 3.17.D, 3.28.A, 3.28.B, 4.8.A, 4.13 and 5.9.1.6.

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TABLE 1A

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters, 1987
Gaseous Effluents - Summation of All Releases

<u>Unit</u>	<u>Quarter</u> <u>3rd</u>	<u>Quarter</u> <u>4th</u>	<u>Est. Total</u> <u>Error, %</u>
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A. Fission and Activation Gases

1. Total release	Ci	2.34 E-02	1.26 E-02	2.50 E+01
2. Average release rate for period	uCi/sec	2.98 E-03	1.63 E-03	
3. Percent of regulatory limit	%	8.96 E-06	4.89 E-06	

B. Iodines

1. Total Iodine-131	Ci	2.37 E-05	4.61 E-08	2.50 E+01
2. Average release rate for period	uCi/sec	3.01 E-06	5.86 E-09	
3. Percent of regulatory limit	%	2.64 E-05	5.14 E-08	

C. Particulates

1. Particulates with T-1/2 8 days	Ci	5.87 E-06	1.49 E-06	2.50 E+01
2. Average release rate for period	uCi/sec	7.46 E-07	1.89 E-07	
3. Percent of regulatory limit	%	3.62 E-06	1.24 E-07	
4. Gross alpha radioactivity	Ci	1.07 E-08	1.01 E-08	

D. Tritium

1. Total release	Ci	5.47 E-01	1.06 E+00	2.50 E+01
2. Average release rate for period	uCi/sec	6.96 E-02	1.35 E-01	
3. Percent of regulatory limit	%	3.05 E-04	5.91 E-04	

TABLE 1B

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters, 1987
Gaseous Effluents - Elevated Release

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 3rd	Quarter 4th	Quarter 3rd	Quarter 4th
1. Fission Gases					
Krypton-85	Ci	N/D*	N/D*	N/D*	N/D*
Krypton-85m	Ci	N/D*	N/D*	N/D*	N/D*
Krypton-87	Ci	N/D*	N/D*	N/D*	N/D*
Krypton-88	Ci	N/D*	N/D*	N/D*	N/D*
Xenon-133	Ci	N/D*	N/D*	2.34 E-02	1.25 E-02
Xenon-135	Ci	N/D*	N/D*	N/D*	8.99 E-05
Xenon-135m	Ci	N/D*	N/D*	N/D*	N/D*
Xenon-138	Ci	N/D*	N/D*	N/D*	N/D*
Xenon-133m	Ci	N/D*	N/D*	N/D*	N/D*
Argon-41	Ci	N/D*	N/D*	N/D*	N/D*
Xenon-131m	Ci	N/D*	N/D*	N/D*	N/D*
Unidentified	Ci	N/D*	N/D*	N/D*	N/D*
Total for period	Ci	N/D*	N/D*	2.34 E-02	1.26 E-02
2. Iodines					
Iodine-131	Ci	2.37 E-05	N/D*	1.74 E-10	4.61 E-08
Iodine-133	Ci	1.66 E-04	N/D*	3.86 E-10	1.04 E-07
Iodine-135	Ci	N/D*	N/D*	N/D*	N/D*
Total for period	Ci	1.90 E-04	N/D*	5.60 E-10	1.50 E-07
3. Particulates					
Strontium-89	Ci	N/D*	N/D*	N/D*	N/D*
Strontium-90	Ci	N/D*	N/D*	N/D*	N/D*
Cesium-134	Ci	N/D*	N/D*	N/D*	N/D*
Cesium-137	Ci	2.20 E-06	4.97 E-07	N/D*	N/D*
Barium-Lanthanum-140	Ci	N/D*	N/D*	N/D*	N/D*
Ruthenium-103	Ci	N/D*	N/D*	N/D*	N/D*
Cobalt-58	Ci	N/D*	N/D*	N/D*	N/D*
Cobalt-60	Ci	1.03 E-06	8.99 E-07	N/D*	N/D*
Cadmium-109	Ci	N/D*	N/D*	N/D*	8.56 E-08
Others					

*N/D - Not Detected

TABLE 1C

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters 1987
Gaseous Effluents - Ground Level Releases

There were no routine measured ground level continuous or batch mode gaseous releases during the third and fourth quarters of 1987.

TABLE 2A

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters, 1987
Liquid Effluents - Summation of All Releases

	Unit	Quarter 3rd	Quarter 4th	Est. Total Error, %
A. Fission and Activation Products				
1. Total release (not including tritium, gases, alpha)	Ci	1.19 E-01	7.16 E-02	1.50 E+01
2. Average diluted concentration during period	uCi/ml	9.30 E-10	3.46 E-10	
3. Percent of applicable limit	%	2.48 E-03	1.97 E-03	
B. Tritium				
1. Total release	Ci	1.42 E+01	6.53 E+01	1.50 E+01
2. Average diluted concentration during period	uCi/ml	1.11 E-07	3.15 E-07	
3. Percent of applicable limit	%	3.72 E-03	1.05 E-02	
C. Dissolved and Entrained Gases				
1. Total release	Ci	5.71 E-03	1.33 E-02	1.50 E+01
2. Average diluted concentration during period	uCi/ml	4.46 E-11	6.43 E-11	
3. Percent of applicable limit	%	2.23 E-05	3.21 E-05	
D. Gross Alpha Radioactivity				
1. Total release	Ci	8.77 E-06	6.98 E-06	1.50 E+01
2. Average diluted concentration during period	uCi/ml	6.85 E-14	3.37 E-14	
E. Volume of waste released (prior to dilution)				
	liters	1.86 E+07	7.91 E+06	1.00 E+01
F. Volume of dilution water used during period				
	liters	1.28 E+11	2.07 E+11	1.00 E+01

TABLE 2B

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters, 1987

Liquid Effluents

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 3rd	Quarter 4th	Quarter 3rd	Quarter 4th
Strontium-89	Ci	N/D*	N/D*	N/D*	1.69 E-03
Strontium-90	Ci	2.81 E-03	N/D*	6.39 E-05	2.06 E-05
Cesium-134	Ci	N/D*	N/D*	6.16 E-04	1.11 E-03
Cesium-137	Ci	N/D*	N/D*	3.80 E-03	4.72 E-03
Iodine-131	Ci	N/D*	N/D*	2.48 E-04	5.87 E-04
Cobalt-58	Ci	N/D*	N/D*	9.81 E-03	3.95 E-03
Cobalt-60	Ci	N/D*	N/D*	1.55 E-02	9.78 E-03
Iron-59	Ci	N/D*	N/D*	N/D*	N/D*
Zinc-65	Ci	N/D*	N/D*	N/D*	N/D*
Manganese-54	Ci	N/D*	N/D*	1.28 E-04	N/D*
Chromium-51	Ci	N/D*	N/D*	1.08 E-03	6.30 E-04
Zirconium-Niobium-95	Ci	N/D*	N/D*	1.49 E-03	6.24 E-05
Molybdenum-99	Ci	N/D*	N/D*	3.34 E-05	7.77 E-05
Technetium-99m	Ci	N/D*	N/D*	6.43 E-05	2.07 E-05
Barium-Lanthanum-140	Ci	N/D*	N/D*	N/D*	8.63 E-04
Cerium-141	Ci	N/D*	N/D*	N/D*	N/D*
Others Iron-55	Ci	N/D*		4.90 E-02	3.85 E-02
Silver-110m	Ci	N/D*		5.80 E-03	6.78 E-03
Cobalt-57/25	Ci	N/D*	N/D*	N/D*	1.72 E-05
Antimony-124	Ci	N/D*	N/D*	1.16 E-02	2.79 E-04
Antimony-125	Ci	N/D*	N/D*	1.62 E-02	1.52 E-03
Iodine-132	Ci	N/D*	N/D*	N/D*	2.07 E-05
Iodine-133	Ci	N/D*	N/D*	3.53 E-04	3.51 E-04
Iodine-135	Ci	N/D*	N/D*	N/D*	1.97 E-04
Tin-113	Ci	N/D*	N/D*	1.91 E-04	3.02 E-05
Rhuthenium-103	Ci	N/D*	N/D*	9.89 E-05	1.78 E-05
Cerium-139	Ci	N/D*	N/D*	N/D*	3.54 E-05
Neptunium-239	Ci	N/D*	N/D*	N/D*	4.27 E-05
Strontium-91	Ci	N/D*	N/D*	N/D*	8.10 E-05
Yttrium-91m	Ci	N/D*	N/D*	N/D*	8.52 E-05
Yttrium-92	Ci	N/D*	N/D*	N/D*	1.07 E-04
Unidentified	Ci	N/D*	N/D*	N/D*	N/D*
Total for period (above)(1)	Ci	2.81 E-03	0.00 E-01	1.16 E-01	7.16 E-02
Xenon-133	Ci	N/D*	N/D*	5.08 E-03	1.23 E-02
Xenon-135	Ci	N/D*	N/D*	6.25 E-04	9.91 E-04
Xenon-135M	Ci	N/D*	N/D*	N/D*	5.21 E-05

N/D* - Not Detected

(1) - Total for period does not include unidentified in this summation but is included in Table 2A, Item A1.

TABLE 3

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters, 1987
Solid Waste and Irradiated Fuel Shipments

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

	Unit	6-Month Period	Est. Total Error, %
1. Type of Waste			
a. Spent resins, filter sludges, evaporator bottoms, etc. - LSA container**,+++	m ³	4.48	± 10
	Ci	4.90	
b. Dry compressible waste, contaminated equipment, etc. - LSA container+,++	m ³	-0-	
	Ci	-0-	
c. Irradiated components, control rods, etc.	m ³	-0-	
	Ci	-0-	
d.	m ³		
	Ci		
e.	m ³		
	Ci		

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

a. Co-134	15%	plus or minus 10%
Cs-137	56%	plus or minus 10%
Fe-55	10%	plus or minus 10%
Ni-63	5%	plus or minus 10%
H-3	10%	plus or minus 10%
b.		-0-

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	Trucking over Highway	Chem-Nuclear, Barnwell, S.C.

B. Irradiated Fuel Shipments (Disposition)

+ Container volume equal to 55 gallons (drums).

++ Container volume equal to 110 ft³ (boxes).+++ Container volume equal to 170 ft³ (liners) (HIC)

* Solid waste is Class A, as defined in 10CFR61.55.

* Solid waste is Class B, as defined in 10CFR61.55

* Solid waste is Class C, as defined in 10CFR61.55

** Solidification agent is cement.

*** Excluding nuclides with half-lives less than 12.8 days.

8510L-DS

4.48 m ³ ,	4.90 Ci
0 m ³ ,	0 Ci
0 m ³ ,	0 Ci

TABLE 4

Supplemental Information

1. Regulatory Limits

Maximum Permissible Concentration

- | | |
|---|--|
| a. Fission and activation gases: | 10CFR20; Appendix B, Table 2, Column 1 |
| b. Iodines: | 10CFR20; Appendix B, Table 2, Column 1 |
| c. Particulates, (with half
lives greater than 8 days) | 10CFR20; Appendix B, Table 2, Column 1 |
| d. Liquid effluents: | 10CFR20; Appendix B, Table 2, Column 1 |
| e. Total noble gas concentration | 2E-04 uCi/ml |

2. Average Energy - Not Applicable

3. Measurements and Approximations of Radioactivity

a. Fission and Activation Cases

Continuous Discharge - Vent stack samples are analyzed monthly. Activity levels determined are assumed constant for the surveillance interval. The continuous vent stack monitor reading is used as a basis for increasing periodic sample frequency.

Batch Discharges - Direct measurements of the waste gas hold-up drums are taken prior to discharge. Containment vents and purges are analyzed by direct measurement of the containment atmosphere at periodic intervals during discharge.

b. Iodines

Primary vent stack iodine totals are taken from a minimum of weekly measurements of an in-line charcoal filter.

c. Particulates

Primary vent stack particulate totals are taken from a minimum of weekly measurements of an in-line particulate filter.

d. Liquid Effluents

Samples of secondary systems' liquid effluents are analyzed weekly for gross beta-gamma, alpha, tritium, dissolved gases, and gamma emitting isotopes.

Each batch release is analyzed for gross beta-gamma, alpha, tritium, dissolved gases, and gamma emitting isotopes prior to discharge.

Composite samples are made of secondary and primary system liquid effluents for a quarterly analysis of Strontium-90 and Strontium-89. Primary system liquid effluents are also analyzed quarterly for Iron-55.

TABLE 4
(Continued)

4. Batch Releases

a. Liquids

1. Number of batch releases: 87
2. Total time period for batch releases: 445 hours, 27 minutes
3. Maximum time period for a batch release: 59 hours, 0 minutes
4. Average time period for batch releases: 5 hours, 7 minutes
5. Minimum time period for a batch release: 19 minutes
6. Average steam flow during periods of release of effluents into a flowing stream: N/A
7. Maximum gross release concentration (uCi/ml): 1.16 E-06

b. Gaseous

1. Number of batch releases: 16
2. Total time period for batch releases: 21 hours, 51 minutes
3. Maximum time period for a batch release: 6 hours, 53 minutes
4. Average time period for batch releases: 1 hour, 22 minutes
5. Minimum time period for a batch release: 1 minute
6. Maximum gross release rate (uCi/sec): 2.63 E+01

5. Abnormal Releases

a. Liquid

There were no abnormal liquid releases during the reporting period.

b. Gaseous

There were no abnormal gaseous releases during the reporting period.

6. On-Line Containment Purge

On-line containment purge was not employed during the reporting period. Total on-line purge time for 1987 was 107 hours and 27 minutes.

APPENDIX A

Radioactive Liquid Effluent Monitoring Instrumentation

Requirement: Radioactive liquid effluent monitoring instrumentation channels are required to be operable in accordance with Technical Specification 3.28.A. With less than the minimum number of channels operable and reasonable efforts to return the instrument(s) to operable status within 30 days being unsuccessful, Technical Specification 3.28.A requires an explanation for the delay in correcting the inoperability in the next Semiannual Effluent Release Report.

Response: During this reporting period, two effluent monitors were inoperable in excess of 30 days when required to be operable.

- As reported previously, the air ejector monitor was continued as inoperable following replacement with a different, moisture resistant detector until a primary calibration was performed. This was accomplished and the monitor was returned to service on September 10, 1987.
- Similarly, the original tube failed during calibration of the primary vent stack gas monitor on July 1, 1987. Again, a component substitution was required, and the monitor was considered inoperable until a primary calibration was completed on August 20, 1987.

APPENDIX B

Liquid Radwaste Treatment System

Requirement: With radioactive liquid waste being discharged without treatment with estimated doses in excess of the limits in Technical Specification 3.17.C.1, a report must be submitted to the Commission in the Semiannual Effluent Release Report for the period.

Response: The requirements of Technical Specification 3.17.C.1 were met during this period and, therefore, no report is required.

APPENDIX C

Gaseous Radwaste Treatment System

Requirement: With radioactive gaseous waste being discharged without treatment with doses in excess of the limits in Technical Specifications 3.18.D.1, a report must be submitted to the Commission in the Semiannual Effluent Release Report for the period.

Response: The requirements of Technical Specification 3.18.D.1 were met during this period and, therefore, no report is required.

APPENDIX D

Lower Limit of Detection for Radiological Analyses

Requirement: Technical Specification 4.13 requires that when unusual circumstances result in LLDs higher than required, the reasons shall be documented in the Semiannual Radioactive Effluent Release Report.

Response: Analyses were performed in such a manner that the stated LLD's were achievable under routine conditions. On several occasions, with liquid samples, however, the presence of detected higher energy isotopes caused a compton background elevation. This interference was sufficient to make the specified LLD's in those liquid samples unattainable. On all occasions, the specified LLD's were attained on the gaseous samples.

APPENDIX E

Reactor Coolant System Activity

Requirements:

Technical Specification 5.9.1.3.B requires that a report, covering the results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.2, be submitted annually for the previous calendar year.

The report shall include (1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded; (2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit. Each result to include date and time of sampling and the radioiodine concentrations; (3) Clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded; (4) Graph of the iodine-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above the steady state level; and (5) the time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

Response:

Primary coolant activity did not exceed the limits of Specification 3.2 during the reporting period and, therefore, no report is required.

Maine Yankee

RELIABLE ELECTRICITY FOR MAINE SINCE 1972

EDISON DRIVE • AUGUSTA, MAINE 04330 • (207) 623-3521

February 29, 1988
MN-88-23

GDW-88-50

Region I
United States Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, Pennsylvania 19406

Attention: Mr. William T. Russell, Regional Administrator

References: (a) License No. DPR-36 (Docket No. 50-309)

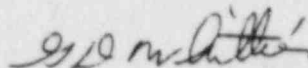
Subject: Semiannual Effluent Release Report

Gentlemen:

Enclosed is the Maine Yankee Semiannual Effluent Release Report. The report includes the annual reactor coolant system activity report. There were no changes to the Off-Site Dose Calculation Manual. These reports are submitted in accordance with Technical Specifications 5.9.1.6 and 5.9.1.3B. This report covers the period from July 1, 1987 to December 31, 1987.

Very truly yours,

MAINE YANKEE ATOMIC POWER COMPANY



G. D. Whittier, Manager
Nuclear Engineering and Licensing

GDW/bjp

Enclosure

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