

Maine Yankee

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February 28, 1994

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JRH-94-38

UNITED STATES NUCLEAR REGULATORY COMMISSION

Attention: Document Control Desk

Washington, DC 20555

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

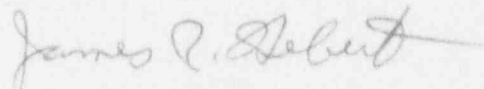
Subject: Semiannual Radioactive Effluent Release Report

Gentlemen:

Enclosed, in accordance with the requirements of Maine Yankee Technical Specification 5.9.1.6, is the Maine Yankee Semiannual Effluent Release Report for the period July to December 1993.

Please contact John Arnold if you have questions or comments.

Very truly yours,



James R. Hebert, Manager
Licensing & Engineering Support Department

JHA/jag

Enclosures

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MAINE YANKEE ATOMIC POWER COMPANY

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JULY - DECEMBER 1993

1.0 INTRODUCTION

Tables 1 and 2 summarize the quantity of radioactive gaseous and liquid effluents, respectively, for the third and fourth quarters of 1993. Table 3 summarizes the solid waste shipped off-site for burial or disposal during the last half of 1993. Table 4 contains supplementary information.

Appendices A through D indicate the status of reportable items per the requirements of ODCM sections 2.1.5, 2.2.6, 2.3.3, 2.3.4, 2.5 and Appendix C.

There were no changes to the ODCM during the last half of 1993.

TABLE 1A

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters, 1993
Gaseous Effluents - Summation of All Releases

	Unit	Quarter 3rd	Quarter 4th	Est. Total Error, %
A. Fission and Activation Gases				
1. Total release	Ci	3.60 E+01	1.37 E+00	2.50 E+01
2. Average release rate for period	uCi/sec	4.58 E+00	1.74 E-01	
3. Percent of regulatory limit	%	1.36 E-02	8.04 E-04	
B. Iodines				
1. Total Iodine-131	Ci	3.95 E-03	6.77 E-09	2.50 E+01
2. Average release rate for period	uCi/sec	5.02 E-04	8.61 E-10	
3. Percent of regulatory limit	%	2.20 E-03	3.78 E-09	
C. Particulates				
1. Particulates with T-1/2 > 8 days	Ci	1.60 E-03	2.73 E-05	2.50 E+01
2. Average release rate for period	uCi/sec	2.03 E-04	3.47 E-06	
3. Percent of regulatory limit	%	1.03 E-03	1.52 E-05	
4. Gross alpha radioactivity	Ci	1.42 E-07	2.10 E-07	
D. Tritium				
1. Total release	Ci	4.10 E+00	1.85 E+00	2.50 E+01
2. Average release rate for period	uCi/sec	5.21 E-01	2.35 E-01	
3. Percent of regulatory limit	%	4.70 E-03	2.12 E-03	

*N/D = Not Detected

TABLE 1B

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters, 1993
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*	4.05 E+00	5.48 E-01
Krypton-85m	Ci	7.43 E-04	3.36 E-03	4.71 E-07	N/D*
Krypton-87	Ci	1.30 E-03	5.35 E-03	N/D*	N/D*
Krypton-88	Ci	2.94 E-04	3.32 E-03	N/D*	N/D*
Xenon-133	Ci	2.09 E+00	6.17 E-01	2.83 E+01	5.91 E-03
Xenon-135	Ci	8.32 E-03	1.26 E-01	5.72 E-01	1.15 E-05
Xenon-135m	Ci	1.04 E-02	3.56 E-02	N/D*	N/D*
Xenon-138	Ci	4.34 E-03	1.70 E-02	N/D*	N/D*
Xenon-133m	Ci	4.82 E-05	8.63 E-05	2.28 E-02	N/D*
Argon-41	Ci	1.45 E-03	7.83 E-03	4.85 E-01	8.86 E-06
Xenon-131m	Ci	N/D*	N/D*	4.14 E-01	N/D*
Unidentified	Ci	N/D*	N/D*	N/D*	N/D*
Total for period	Ci	2.12 E+00	8.16 E-01	3.38 E+01	5.54 E-01
2. Iodines					
Iodine-131	Ci	3.92 E-04	N/D*	3.56 E-03	6.77 E-09
Iodine-133	Ci	8.99 E-05	5.01 E-06	9.10 E-04	N/D*
Iodine-135	Ci	N/D*	N/D*	9.13 E-09	1.82 E-08
Total for period	Ci	4.82 E-04	5.01 E-06	4.77 E-03	2.50 E-08
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	3.77 E-06	2.73 E-05	N/D*	N/D*
Barium-Lanthanum-140	Ci	N/D*	N/D*	N/D*	N/D*
Zinc-65	Ci	N/D*	N/D*	N/D*	N/D*
Cobalt-58	Ci	4.46 E-05	N/D*	3.81 E-04	N/D*
Cobalt-60	Ci	2.50 E-05	N/D*	4.12 E-04	N/D*
Others-Chromium-51	Ci	5.35 E-05	N/D*	6.72 E-04	N/D*
Nionium-95	Ci	2.95 E-06	N/D*	N/D*	N/D*

*N/D = Not Detected

TABLE 1C

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters 1993
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 1993.

TABLE 2A

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters, 1993
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	1.14 E-01	2.67 E-02	1.50 E+01
2. Average diluted concentration during period	uCi/ml	1.40 E-09	1.39 E-10	
3. Percent of applicable limit	%	1.09 E-02	2.26 E-03	
B. Tritium				
1. Total release	Ci	6.97 E+00	2.82 E+01	1.50 E+01
2. Average diluted concentration during period	uCi/ml	8.62 E-08	1.47 E-07	
3. Percent of applicable limit	%	8.62 E-03	1.47 E-02	
C. Dissolved and Entrained Gases				
1. Total release	Ci	1.12 E-02	5.75 E-03	1.50 E+01
2. Average diluted concentration during period	uCi/ml	1.39 E-10	3.00 E-11	
3. Percent of applicable limit	%	6.94 E-05	1.50 E-05	
D. Gross Alpha Radioactivity				
1. Total release	Ci	3.67 E-06	3.43 E-06	1.50 E+01
2. Average diluted concentration during period	uCi/ml	4.54 E-14	1.79 E-14	
E. Volume of waste released (prior to dilution)				
	liters	2.03 E+07	2.34 E+07	1.00 E+01
F. Volume of dilution water used during period				
	liters	8.09 E+10	1.92 E+11	1.00 E+01

*N/D = Not Detected

TABLE 2B

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Third and Fourth Quarters, 1993

Liquid Effluents

Nuclides Released	Unit	Continuous Mode		Batch Mode	
		Quarter 1st	Quarter 2nd	Quarter 1st	Quarter 2nd
Strontium-89	Ci	N/D*	N/D*	1.46 E-04	N/D*
Strontium-90	Ci	N/D*	N/D*	N/D*	N/D*
Cesium-134	Ci	7.68 E-05	N/D*	1.81 E-04	3.48 E-04
Cesium-137	Ci	1.88 E-04	1.18 E-06	1.13 E-03	2.28 E-03
Iodine-131	Ci	3.04 E-04	N/D*	5.73 E-05	1.20 E-04
Cobalt-58	Ci	N/D*	3.05 E-05	1.12 E-02	4.34 E-03
Cobalt-60	Ci	8.42 E-06	8.00 E-06	4.32 E-03	3.16 E-03
Iron-59	Ci	N/D*	N/D*	1.06 E-03	2.13 E-04
Zinc-65	Ci	N/D*	N/D*	1.42 E-05	N/D*
Manganese-54	Ci	N/D*	N/D*	4.59 E-05	3.04 E-05
Chromium-51	Ci	N/D*	N/D*	9.60 E-03	4.91 E-03
Zirconium-Niobium-95	Ci	N/D*	N/D*	3.39 E-04	5.62 E-04
Molybdenum-99	Ci	N/D*	N/D*	N/D*	N/D*
Technetium-99m	Ci	N/D*	N/D*	1.50 E-05	N/D*
Barium-Lanthanum-140	Ci	N/D*	N/D*	8.14 E-05	6.20 E-06
Cerium-141	Ci	N/D*	N/D*	1.05 E-05	5.22 E-06
Others- Iron-55	Ci	N/D*	N/D*	3.22 E-02	8.09 E-03
Iodine-133	Ci	1.70 E-04	N/D*	4.94 E-06	4.64 E-06
Antimony-122	Ci	N/D*	N/D*	1.30 E-04	N/D*
Antimony-124	Ci	N/D*	N/D*	2.04 E-02	5.22 E-04
Antimony-125	Ci	N/D*	N/D*	2.78 E-02	1.48 E-03
Silver-110m	Ci	N/D*	N/D*	2.32 E-03	4.84 E-04
Ruthenium-103	Ci	N/D*	N/D*	9.17 E-05	5.71 E-05
Tellurium-132	Ci	N/D*	N/D*	3.39 E-05	N/D*
Cerium-144	Ci	N/D*	N/D*	8.45 E-05	N/D*
Cobalt-57	Ci	N/D*	N/D*	5.37 E-06	2.80 E-06
Tin-113	Ci	N/D*	N/D*	3.09 E-05	N/D*
Rhodium-105	Ci	N/D*	N/D*	4.44 E-05	N/D*
Iodine-132	Ci	N/D*	N/D*	3.91 E-06	N/D*
Cesium-138	Ci	N/D*	N/D*	2.45 E-04	N/D*
Lanthanum-141	Ci	N/D*	N/D*	1.20 E-03	N/D*
Unidentified	Ci	N/D*	N/D*	N/D*	N/D*
Total for period (above)(1)	Ci	7.47 E-04	3.97 E-05	1.13 E-01	2.66 E-02
Xenon-133	Ci	N/D*	1.34 E-06	1.09 E-02	5.68 E-03
Xenon-135	Ci	N/D*	1.75 E-06	N/D*	7.30 E-05
Xenon-133m	Ci	N/D*	N/D*	3.08 E-04	N/D*
Krypton-87	Ci	N/D*	N/D*	8.67 E-06	N/D*

N/D* - Not Detected

TABLE 3

Maine Yankee Atomic Power Station
Effluent and Waste Disposal Semiannual Report
Second Half, 1993
Solid Waste and Irradiated Fuel Shipments

- A. Solid Waste Shipped Off-Site for Burial or Disposal (Not Irradiated Fuel)
None shipped.
- B. Irradiated Fuel Shipments (Disposition): None shipped.

TABLE 4

Supplemental Information

1. Regulatory Limits

Effluent 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 2
- 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: 62
2. Total time period for batch releases: 241 hours, 31 minutes
3. Maximum time period for a batch release: 25 hours, 18 minutes
4. Average time period for batch releases: 3 hours, 54 minutes
5. Minimum time period for a batch release: 40 minutes
6. Average stream flow during periods of release of effluents into a flowing stream: N/A
7. Maximum gross release concentration (uCi/ml): 1.46 E-06

b. Gaseous

1. Number of batch releases: 45
2. Total time period for batch releases: 1424 hours, 19 minutes
3. Maximum time period for a batch release: 332 hours, 9 minutes
4. Average time period for batch releases: 31 hours, 39 minutes
5. Minimum time period for a batch release: 16 minutes
6. Maximum gross release rate (uCi/sec): 1.44 E+03

5. Unplanned 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 utilized for 91 hours, 52 minutes during this reporting period, which is also the total time on-line purge was employed during 1993.

APPENDIX A

Radioactive Effluent Monitoring Instrumentation

Requirement: Radioactive effluent monitoring instrumentation channels are required to be operable in accordance with ODCM Sections 2.3.3 and 2.3.4. 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, ODCM Sections 2.3.3 and 2.3.4 requires an explanation for the delay in correcting the inoperability in the next Semiannual Effluent Release Report.

Response: The service water monitor was declared inoperative on July 26, 1993, when it was taken out of service for calibration. Subsequently, the plant was shutdown for refueling, with a loss of vacuum priming required to supply flow through the monitor. Vacuum priming was restored, and the monitor was returned to service on September 29, 1993.

APPENDIX B

Liquid Radwaste Treatment System

Requirement: With radioactive liquid waste being discharged without treatment with estimated doses in excess of the limits in ODCM Section 2.1.5, a report must be submitted to the Commission in the Semiannual Effluent Release Report for the period.

Response: The requirements of ODCM Section 2.1.5 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 ODCM Section 2.2.6, a report must be submitted to the Commission in the Semiannual Effluent Release Report for the period.

Response: The requirements of ODCM Section 2.2.6 were met during this period and, therefore, no report is required.

APPENDIX D

Lower Limit of Detection for Radiological Analyses

Requirement: ODCM Section 2.5 requires that when unusual circumstances result in LLD's higher than required, the reasons shall be documented in the Semiannual Radioactive Effluent Release Report.

Response: All samples were counted in such a manner as to satisfy the specified a priori lower limits of detection.

SEMIANNUAL REPORT CHECKLIST

1. Summary of the quantities of radioactive gaseous and liquid effluents by quarter (T.S. 5.9.1.6). _____
2. Summary of solid waste released by quarter (T.S. 5.9.1.6). _____
3. Description of unplanned releases (T.S. 5.9.1.6). _____
4. New locations for dose calculations and/or environmental monitoring identified by the land use census (T.S. 5.9.1.6). _____
5. Changes to the ODCM (T.S. 5.9.1.6). _____
6. Discharges made without processing through treatment/ filtration systems that exceeded 31 day dose limits (T.S. 3.16-C and 3.17-D). _____
7. Reason for the delay in correcting inoperable effluent monitoring instrumentation within 30 days (T.S. 3.28.A.1 and 3.28.B.1). _____
8. Reasons why specified LLDs were not met if exceptions exist (T.S. 4.13 - Table 4.13-1, note f and Table 4.13-2, note e).
 - a. Liquid releases _____
 - b. Gaseous releases _____
9. On-line containment purges, number and total hours. _____
10. Description of DOSEQ-I131 excursions above 1.0 uci/gm. (T.S. 5.9.1.3-B). _____

ATTACHMENT I

Changes to the Off-Site Calculation Manual

1. Yankee Nuclear Services Division (Bolton, Mass) (YNSD) (REG 309/92) provided a) new long-term average atmospheric/deposition factors for both elevated and ground level release conditions, b) new dispersion factors to incorporate the stack exit velocity and site-specific recirculation factors, c) revised dose factors to incorporate the new atmospheric dispersion factors.

Meteorological data were updated using the site-specific data for the period 1986 through 1990. Dilution factors were calculated using the latest version of the AEOLUS Program.

One page (71) was deleted on YNSD advice because the information is not necessary for ODCM calculations and may vary depending on the results of the Annual Land Use Census.

2. The revisions to 10CFR20 require the use of ECLs (Effluent Concentration Limits) rather than the old term "MPC". The ODCM revision changed MPC to ECL.
3. The Technical Support Department Manager was listed as the responsible manager since the REMP Program became the responsibility of Tech Support on 4/1/93.
4. The page summary was appropriately revised.