

MAINE. YANKEE ATOMIC POWER COMPANY

EFFLUENT AND WASTE DISPOSAL

SEMI-ANNUAL REPORT

JANUARY - JUNE 1979

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EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT

JANUARY - JUNE 1979

FACILITY: MAINE YANKEE ATOMIC POWER COMPANY

LICENSEE: MAINE YANKEE ATOMIC
POWER COMPANY

1. Regulatory Limits

- | | |
|--------------------------------------|-----------------------------|
| a. Fission and activation gases: | 10 CFR 20; Paragraph 20.106 |
| b. Iodines: | " " " |
| c. Particulates, half lives >8 days: | " " " |
| d. Liquid effluents: | " " " |

2. Masimum Permissible Concentrations

- | | |
|-------------------------------------|-----------------------------------|
| a. Fission and actuation gases: | 10 CFR 20; App. B. Table 2 Col. 1 |
| b. Iodines: | " " " |
| c. Particulates, half lives >8 days | " " " |
| d. Liquid effluents: | " " " |

3. Average Energy - Not Applicable

4. Measurements and Approximations of Radioactivity

a. Fission and activation gases:

Continuous discharge - Vent stack samples are analyzed monthly and the levels of activities determined are assumed to hold for the period between samples. The continuous vent stack monitor reading is used as a basis for increasing periodic sample frequency. Air ejector is sampled monthly and on any increase in continuous air ejector monitor reading.

Batch discharges - Direct measurement of waste gas hold up drums are made before discharge. Containment vents and purges are analyzed by direct measurement of the containment atmosphere at periodic intervals during the discharge.

b. Continuous monitoring of primary vent stack iodines are made by weekly measurements of an in-line charcoal filter.

Batch discharges - Direct measurement of waste gas hold up drums before discharge.

c. Particulates - Continuous monitoring of primary vent stack is made by weekly measurement of an in-line particulate filter.

Batch discharges - Direct measurement of waste gas hold up drums before discharge.

d. Liquid Effluents

Weekly sample of secondary systems liquid effluents for gross Beta-gamma, alpha, tritium, dissolved gases and gamma emitting isotopes each batch release.

Composite samples are made of secondary and primary systems liquid effluents for a quarterly analysis of strontium 90 and 89.

5. Bath Release

a. Liquid

1. Number of releases:	82
2. Total time for batch releases:	466 hrs. 19 min.
3. Maximum time for batch releases:	16 hrs. 15 min.
4. Average time for batch releases:	5 hrs. 46 min.
5. Minimum time for batch releases:	12 min.
6. Average stream flow during periods of release of effluent into a flowing stream:	--
7. Maximum gross release rate (uci/ml)	2.20E-08

b. Gaseous

1. Number of batch releases	25
2. Total time period for batch releases:	1,664 hrs. 24 min.
3. Maximum time period for a batch release:	553 hrs. 30 min.
4. Average time period for a batch release:	66 hrs. 34 min.
5. Minimum time for a batch release:	1 hr. 50 min.
6. Maximum gross release rate (uci/sec)	1.92E4 uci/sec

6. Abnormal Releases

a. Liquid

1. None

b. Gaseous

1. One abnormal release on 3/15/79 (LER #79-008-03L and LER #79-009/03T)
Total curies of noble gases released equaled 126.5 Ci.

The following table is not attached since there was no applicable release during the reporting period. Total curies of radioactive iodines equaled 0.045 Ci.

Table 1C Gaseous Effluents, Ground-Level Releases.

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT - 1979

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit	Quarter 1st	Quarter 2nd	Est. Total Error, %
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A. Fission & activation gases

1. Total release	Ci	6.49E+02	1.63E+01	
2. Average release rate for period	$\mu\text{Ci}/\text{sec}$	8.25E+01	2.07E+00	
3. Percent of technical specification limit	%	7.4E-01	3.9E-01	

B. Iodines

1. Total iodine-131	Ci	4.39E-02	7.84E-03	
2. Average release rate for period	$\mu\text{Ci}/\text{sec}$	5.58E-03	9.97E-04	
3. Percent of technical specification limit	%	2.02E-01	2.59E-02	

C. Particulates

1. Particulates with half-lives > 8 days	Ci	2.96E-04	3.20E-05	
2. Average release rate for period	$\mu\text{Ci}/\text{sec}$	3.76E-05	4.07E-06	
3. Percent of technical specification limit	%	1.05E-05	1.00E-06	
4. Gross alpha radioactivity	Ci	4.74E-06	2.34E-07	

D. Tritium

1. Total release	Ci	5.05E-01	7.53E-01	
2. Average release rate for period	$\mu\text{Ci}/\text{sec}$	6.42E-02	9.58E-02	
3. Percent of technical specification limit	%	8.32E-04	1.24E-03	

TABLE 1B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT

GASEOUS EFFLUENTS - ELEVATED RELEASE

CONTINUOUS MODE

BATCH MODE

Nuclides Released	Unit	1st Quarter 1979	2nd Quarter 1979	1st Quarter 1979	2nd Quarter 1979
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1. Fission gases

krypton-85	Ci	< 8.0E-05	< 8.0E-05	8.12E00	1.78E00
krypton-85m	Ci	< 1.0E-07	< 1.0E-07	< 1.0E-07	< 1.0E-07
krypton-87	Ci	< 3.0E-07	< 3.0E-07	< 3.0E-07	< 3.0E-07
krypton-88	Ci	< 3.5E-07	< 3.5E-07	< 3.5E-07	< 3.5E-07
xenon-133	Ci	< 3.5E-07	< 3.5E-07	6.16E+02	1.45E+01
xenon-135	Ci	< 7.0E-07	< 7.0E-07	1.46E+01	< 7.0E-07
xenon-135m	Ci	< 5.0E-07	< 5.0E-07	< 5.0E-07	< 5.0E-07
xenon-138	Ci	< 1.7E-07	< 1.7E-07	< 1.7E-07	< 1.7E-07
Others (specify)	Ci				
Xe-131m	Ci	< 1.0E-06	< 1.0E-06	1.06E+01	3.11E-02
	Ci				
unidentified	Ci	0.00E-00	0.00E-00	0.00E-00	2.20E-01
Total for period	Ci	Note-4	Note-4	6.49E+02	1.63E+01

2. Iodines

iodine-131	Ci	4.39E-02	7.84E-03	< 1E-05	< 1E-05
iodine-133	Ci	6.89E-02	1.60E-05	< 1E-05	< 1E-05
iodine-135	Ci	6.34E-03	< 2.0E-12	< 1E-04	< 1E-04
Total for period	Ci	1.19E-01	7.86E-03	Note - 4	Note - 4

3. Particulates

strontium-89	Ci	< 1.1E-15	< 1.1E-15	Note - 3	Note - 3
strontium-90	Ci	6.39E-08	1.65E-08	Note - 3	Note - 3
cesium-134	Ci	< 3.0E-14	< 3.0E-14	< 1E-04	< 1E-04
cesium-137	Ci	6.97E-07	7.20E-7	< 1E-04	< 1E-04
barium-lanthanum-140	Ci	< 1.0E-13	< 1.0E-13	< 1E-04	< 1E-04
Others (specify)	Ci				
Co-58	Ci	5.33E-05	< 2.0E-14	< 1E-04	< 1E-04
Mo-99	Ci	6.51E-06	< 4.0E-14	< 1E-04	< 1E-04
unidentified	Ci	0E-00	0E-00	0E-00	0E-00

- Note: 1. Less than (<) values are minimum detectable activities in uci/cc
 2. Iodine and particulates collected on continuous mode filter include batch mode releases.
 3. Batch mode strontium is collected on continuous mode filters.
 4. No detectable activity.

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT 1979

LIQUID EFFLUENTS--SUMMATION OF ALL RELEASES

	UNIT	1ST QUARTER	2ND QUARTER	EST. TOTAL ERROR %
A. FISSION AND ACTIVATION PRODUCTS *				
1. TOTAL RELEASE	CI	2.39E-02	3.02E-02	5.61E-01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	UCI/ML	1.38E-10	3.49E-10	
3. % APPLICABLE LIMIT	%	3.95E-02	1.64E-02	
B. TRITIUM				
1. TOTAL RELEASE	CI	9.59E+01	3.34E+01	2.11E-01
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	UCI/ML	5.53E-07	3.85E-07	
3. % APPLICABLE LIMIT	%	1.84E-02	1.28E-02	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	CI	4.85E-02	2.32E-03	1.09E-00
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	UCI/ML	2.34E-10	2.68E-11	
3. % APPLICABLE LIMIT	%	1.17E-04	1.34E-05	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	CI	<5.00E-10	<5.00E-09	0.00E-01
1E. VOLUME OF WASTE	LITERS	1.74E+07	1.15E+07	1.00E+01
1F. VOLUME OF DILUTION	LITERS	1.73E+11	8.66E+10	1.00E+01

* TOTAL RELEASE INCLUDING TRITIUM, GASES, AND AND ALPHA.

TABLE 2B

EFFLUENT AND WASTE DISPOSAL SEMI-ANNUAL REPORT 1979
LIQUID EFFLUENTS

NUCLIDES RELEASED	UNIT	CONTINUOUS MODE		BATCH MODE	
		QUARTER-1	QUARTER-2	QUARTER-1	QUARTER-2
SR-89	CI	<1.00E-09	<1.00E-09	<1.00E-08	<1.00E-08
SR-90	CI	<1.00E-09	<1.00E-09	<1.00E-08	<1.00E-08
CS-134	CI	<5.00E-08	<5.00E-08	<5.00E-07	2.15E-03
CS-137	CI	<6.00E-08	<6.00E-08	6.06E-04	1.09E-02
I-131	CI	<1.00E-08	<1.00E-08	2.05E-02	3.99E-03
CO-58	CI	<5.00E-08	<5.00E-08	2.27E-03	1.22E-02
CO-60	CI	<6.00E-08	2.42E-05	3.10E-04	6.77E-04
FE-59	CI	<1.00E-07	<1.00E-07	<1.00E-06	<1.00E-06
ZN-65	CI	<9.00E-08	<9.00E-08	<9.00E-07	<9.00E-07
MN-54	CI	<5.00E-08	<5.00E-08	1.39E-04	2.13E-04
CR-51	CI	<3.00E-07	<3.00E-07	<3.00E-06	6.27E-05
ZR-95	CI	<8.00E-08	<8.00E-08	<8.00E-07	<8.00E-07
MO-99	CI	<4.00E-08	<4.00E-08	<4.00E-07	<4.00E-07
TC-99M	CI	<4.00E-08	<4.00E-08	<4.00E-07	<4.00E-07
BA-140	CI	<2.00E-07	<2.00E-07	<2.00E-06	<2.00E-06
CE-141	CI	<4.00E-07	<4.00E-07	<4.00E-07	<4.00E-07
OTHER I-133	CI	<4.00E-07	<4.00E-07	1.42E-05	<4.00E-06
	CI	<0.00E-01	<0.00E-01	<0.00E-01	<0.00E-01
	CI	<0.00E-01	<0.00E-01	<0.00E-01	<0.00E-01
	CI	<0.00E-01	<0.00E-01	<0.00E-01	<0.00E-01
	CI	<0.00E-01	<0.00E-01	<0.00E-01	<0.00E-01
UNIDENTIFIED	CI	2.92E-05	4.71E-05	0.00E-01	0.00E-01
TOTAL FOR PERIOD	CI	2.92E-05	7.13E-05	2.39E-02	3.02E-02
XE-133	CI	<1.00E-07	<1.00E-07	4.05E-02	2.32E-03
XE-135	CI	<6.00E-06	<6.00E-06	1.09E-05	<6.00E-05

NOTE: ACTIVITIES OF ZR-95 AND BA-140 INCLUDE CONTRIBUTIONS OF DAUGHTERS.
NOTE: LESS THAN (<) VALUES ARE MINIMUM DETECTABLE ACTIVITIES IN UCI/CC.

RELEASE OF WASTE GAS STORAGE DRUMS BEFORE 60-DAY HOLDUP PERIOD

Technical Specification 3.17B3 requires a special effluent report should the average holdup time of waste gas drums be less than 60 days.

The following drums had a holdup time of less than 60 days during normal operations in the first half of 1979.

<u>Release No.</u>	<u>Decay Drum</u>	<u>Date Isolated</u>	<u>Date Released</u>	<u>Holdup Time</u>	<u>Cu.Ft.</u>
377	E	2-7-79	3-14-79	39	1,071
378	D	2-7-79	3-14-79	39	1,023
401	C	5-27-79	6-15-79	18	845

The average holdup time for the first half of 1979, of all batch releases during normal operations, was 33 days.

The two releases on 3/14/79 were scheduled to make certain decay drum space was available for a 3/15/79 shutdown. The drums contained low levels of noble gas.

The release on 6/15/79 was a discharge of low level noble gas from shutdown activities.

TABLE 3

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT
SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE 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	1.93E+01 2.68E+00	3.0E+01
b. Dry compressible waste, contaminated equip, etc.	m ³ Ci	5.07E+01 3.83E-01	3.0E+01
c. Irradiated components, control rods, etc.	m ³ Ci		
d. Other (describe)	m ³ Ci		

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

a.	Cs-137	%	4.5E+01
	Cs-134	%	2.8E+01
	Co-60, Co-58	%	2.7E+01
		%	
		%	
b.	Cs-137	%	4.0E+01
	Co-60	%	3.0E+01
	Cs-134, Co-58	%	3.0E+01
		%	
		%	
c.		%	
		%	
		%	
d.		%	
		%	
		%	

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
4	Truck	Chem Nuclear Barnwell, S.C.

B. IRRADIATED FUEL SHIPMENTS (Disposition)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
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