

PHILADELPHIA ELECTRIC COMPANY  
PHILADELPHIA

PEACH BOTTOM ATOMIC POWER STATION  
UNITS 2 AND 3

SEMI-ANNUAL EFFLUENT RELEASES REPORT

NO. 7

JANUARY 1, 1979 THROUGH JUNE 30, 1979

SUBMITTED TO  
THE UNITED STATES NUCLEAR REGULATORY COMMISSION  
PURSUANT TO  
FACILITY OPERATING LICENSES NO. DPR-44 & DPR-56

POOR ORIGINAL

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PHILADELPHIA ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION  
UNITS 2 and 3  
DOCKET NOS. 50-277 & 50-278

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Preparation Directed by:  
W. T. Ullrich, Superintendent  
Peach Bottom Atomic Power Station

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I. INTRODUCTION

A. SEMI-ANNUAL EFFLUENT RELEASES REPORT

In accordance with the Unique Reporting Requirements of Technical Specification 6.9.3, this report summarizes the Effluent Release Data for Peach Bottom Atomic Power Station Units 2 and 3. This data covers the period January 1, 1979 through June 30, 1979. The notations E+ and E- are used to denote positive and negative exponents to the base 10.

B. REVISIONS TO PREVIOUS REPORTS

Table III-F from the July through December, 1976, Semi-Annual Effluent Report is attached as page 7. A typographical error in the Mixed Noble Gases value for July has been corrected.

Table B from the January through June, 1977 Semi-Annual Effluent Report is attached as page 8. A typographical error in the Total Iodine value for January has been corrected.

TABLE A

PEACH BOTTOM UNITS 2 &amp; 3 - LIQUID RADIOACTIVE RELEASE DATA 1979

	JAN	FEB	MARCH	APRIL	MAY	JUNE	TOTAL
Gross Activity ( $\beta\delta$ ) (4) Total Curies Except Tritium & Noble Gases	1.60E-01	8.92E-02	3.91E-01	1.06E+00	1.56E+00	5.20E+00	8.46E+00
Average $\mu$ Ci/ml Gross Activity (except Tritium at Point of Release)	7.29E-09	7.49E-09	2.77E-08	2.60E-08	4.06E-08	1.54E-07	(2) 5.25E-08
Total Curies of Tritium	2.92E+00	2.19E+00	1.77E+00	4.62E+00	4.33E+00	4.01E+00	1.98E+01
Average $\mu$ Ci/ml Tritium at Point of Release	1.33E-07	1.84E-07	1.25E-07	1.13E-07	1.13E-07	1.18E-07	(2) 1.23E-07
Total Curies, Alpha	$\leq 9.20E-07$	$\leq 3.27E-07$	$\leq 5.54E-07$	$\leq 2.26E-06$	$\leq 1.19E-06$	$\leq 1.68E-06$	$\leq 6.93E-06$
Average $\mu$ Ci/ml Alpha at Point of Release	$\leq 4.20E-14$	$\leq 2.75E-14$	$\leq 3.93E-14$	$\leq 5.54E-14$	$\leq 3.10E-14$	$\leq 4.96E-14$	(2) $\leq 4.30E-14$
Total Curies of Dissolved Noble Gases (5)	1.42E+00	3.00E-01	1.30E-01	3.95E-02	5.48E-02	1.96E-01	2.14E+00
Average $\mu$ Ci/ml of Noble Gases at Point of Release	6.48E-08	2.52E-08	9.22E-09	9.68E-10	1.43E-09	5.78E-09	(2) 1.33E-08
Maximum $\mu$ Ci/ml Released except Tritium - at Point of Release	4.68E-08	1.20E-07	1.68E-07	8.83E-08	1.16E-07	6.12E-07	(3) 6.12E-07
Total Volume Gallons: of Waste: Liters:	7.21E+05 2.73E+06	4.39E+05 1.66E+06	3.83E+05 1.45E+06	6.74E+05 2.55E+06	6.62E+05 2.50E+06	8.04E+05 3.04E+06	3.68E+06 1.39E+07
Total Volume Gallons: of Dilution: Liters:	5.79E+09 2.19E+10	3.15E+09 1.19E+10	3.74E+09 1.41E+10	1.08E+10 4.08E+10	1.02E+10 3.84E+10	8.96E+09 3.39E+10	4.27E+10 1.61E+11
(1) % of Tech. Spec. Curie Limit	2.4%	1.3%	5.9%	15.9%	23.4%	78.0%	(2) 21.2%

(1) Based on Tech Spec. 3.8.B.2 on a per month basis

(2) Average for 6 month period

(3) Maximum for 6 month period

(4) Based on a Strontium - 90 counting efficiency

(5) Based on a monthly analysis

TABLE 8

PEACH BOTTOM UNITS 2 &amp; 3 - ISOTOPIC ANALYSIS OF LIQUID RADIOACTIVE RELEASES (in Curies) (2) 1979

ISOTOPE	JAN	FEB	MARCH	APRIL	MAY	JUNE	GI TOTAL
Strontium-89	4.72E-04	1.23E-04	1.86E-04	7.70E-04	3.45E-03	2.61E-03	7.61E-03
Strontium-90	4.94E-05	5.35E-05	2.28E-05	8.42E-05	2.53E-04	4.02E-04	5.65E-04
Cesium-134	1.09E-02	2.48E-02	1.15E-01	7.57E-01	2.79E-01	5.79E-01	1.77E+00
Cesium-137	1.40E-02	7.18E-02	1.32E-01	3.01E-01	3.47E-01	6.54E-01	1.48E+00
Iodine-131	3.59E-02	4.55E-03	1.71E-01	6.12E-02	2.15E-01	1.83E-01	6.71E-01
Cobalt-58	*	9.0E-05	2.73E-04	2.64E-04	9.82E-03	1.44E-03	1.19E-02
Cobalt-60	1.79E-03	8.54E-04	4.29E-03	1.51E-02	3.52E-02	8.0E-03	6.52E-02
Zinc-65	5.30E-03	4.61E-03	1.28E-02	3.20E-02	7.09E-02	3.18E-02	1.57E-01
Manganese-54	2.61E-03	*	*	*	7.38E-04	*	3.35E-03
Chromium-51	*	1.60E-04	*	*	*	*	1.60E-04
Strontium-91	*	*	*	*	2.26E-03	*	2.26E-03
Molybdenum-99	*	*	1.60E-04	*	*	*	1.60E-04
Barium-140	*	*	*	*	3.63E-04	*	3.63E-04
Lanthanum-140	*	2.40E-04	4.60E-05	*	8.30E-05	2.50E-04	6.19E-04
Sodium-24	6.36E-02	1.26E-03	9.50E-02	3.74E-01	6.52E-01	3.94E+00	5.13E+00
Neptunium-239	*	*	*	*	4.86E-03	*	4.86E-03
Iodine-132	6.02E-04	*	*	*	1.60E-03	*	2.20E-03
Iodine-133	1.55E-02	*	2.94E-02	8.16E-02	8.16E-02	4.59E-02	2.54E-01
Iodine-135	7.57E-03	*	2.81E-03	1.03E-02	2.70E-02	*	4.77E-02
Strontium-92	1.89E-04	*	*	*	7.05E-04	*	8.94E-04
Technetium-99m	1.70E-03	*	1.27E-03	1.08E-02	1.40E-02	1.72E-02	4.50E-02
Tellurium-132	1.93E-04	*	*	9.70E-05	1.52E-04	*	4.42E-04
Yttrium-91m	5.24E-04	*	2.10E-05	*	5.45E-03	*	6.00E-03
Antimony-122	6.19E-04	2.04E-03	1.37E-02	2.91E-02	2.72E-02	3.36E-02	1.06E-01
Niobium-95	8.0E-06	*	*	*	*	*	8.0E-06
Cadmium-109	*	*	5.48E-02	1.65E-02	*	*	7.13E-02
Xenon-131m	*	*	*	*	*	9.46E-02	9.46E-02
Xenon-133	7.04E-01	1.70E-01	3.10E-02	*	9.88E-03	9.43E-02	1.01E+00
Xenon-135	5.67E-01	1.30E-01	9.89E-02	3.96E-02	4.48E-02	7.14E-03	8.87E-01
Krypton-85m	5.28E-02	*	*	*	*	*	5.28E-02
Krypton-87	2.98E-02	*	*	*	*	*	2.98E-02
Krypton-88	8.51E-02	*	*	*	*	*	8.51E-02
Nickel-63	(1)	(1)	(1)	(1)	(1)	1.75E-04	1.75E-04
Phosphorus-32	*	1.93E-04	6.22E-04	*	4.57E-02	8.57E-04	4.84E-02
Iron-55	7.27E-02	3.52E-02	2.69E-02	7.59E-03	*	*	1.42E-01
Total Curies	21.67E+00	44.06E-01	7.91E-01	1.74E+00	1.88E+00	5.69E+00	11.22E+01

\*Less than detectable activity

(1) Not measured; analysis begun in June

(2) Based on analysis done on each batch released

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TABLE C  
PEACH BOTTOM UNITS 2 AND 3  
GASEOUS RADIOACTIVE RELEASE DATA 1979

	JAN	FEB	MARCH	APRIL	MAY	JUNE	TOTAL
Mixed Noble Gases Ci	7.76E+03	6.99E+03	1.13E+04	2.06E+04	2.47E+04	2.92E+04	1.01E+05
% of Tech. Spec. Limit (1)	1.85	2.37	2.66	2.16	2.11	2.45	(4) 2.27
Iodine 131 Ci	3.05E-02	8.53E-03	4.23E-02	1.10E-02	6.13E-03	3.93E-02	1.38E-01
% of Tech. Spec. Limit (2)	2.46	0.862	3.90	0.893	0.500	3.14	(4) 1.96
Particulates > 8 Day Half Life Ci	$\leq 5.42E-04$	$\leq 2.59E-04$	$\leq 5.77E-04$	$\leq 1.05E-03$	$\leq 2.25E-04$	$\leq 2.09E-03$	$\leq 4.74E-03$
Particulate Alpha Ci	$\leq 1.35E-06$	$\leq 9.72E-07$	$\leq 9.07E-07$	$\leq 1.08E-06$	$\leq 6.48E-07$	$\leq 6.91E-07$	$\leq 5.65E-06$
% of Tech. Spec. Limit (2)	$\leq 4.44E-02$	$\leq 2.64E-02$	$\leq 5.88E-02$	$\leq 8.60E-02$	$\leq 2.29E-02$	$\leq 2.16E-01$	(4) $\leq 7.58E-02$
Tritium Ci (3)	2.64E+00	2.11E+00	2.11E+00	3.85E+00	3.08E+00	3.08E+00	1.68E+01
Max. Noble Gas Release Rate $\mu$ ci/sec	230,000	9,500	125,000	26,100	500,000	851,000	(5) 851,000
Date:	1/6/79	2/23/79	3/17/79	4/10/79	6/2/79	6/21/79	6/21/79
% of Tech. Spec. Limit for Maximum Noble Gas Release (1)	12.2	16.2	38.3	3.08	90.1	116.0	(5) 116.0
Maximum % of Tech. Spec. Limit (1)	273.0	76.4	289.0	57.1	90.1	116.0	(5) 289.0

- (1) Basis: Tech. Spec. 3.8.C.1 on a monthly basis  
 (2) Basis: Tech. Spec. 3.8.C.2 on a monthly basis  
 (3) Quarterly analysis used for monthly estimation

- (4) Average for 6 month period  
 (5) Maximum for 6 month period

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TABLE D

PEACH BOTTOM UNITS 2 &amp; 3 - ISOTOPIC ANALYSIS OF GASEOUS RADIOACTIVE EFFLUENTS (in Curies) 1979

ISOTOPE	JAN	FEB	MARCH	APRIL	MAY	JUNE	CI TOTAL
Krypton-85m	5.61E+00	1.19E+01	2.78E+01	1.90E+01	9.12E+00	2.22E+01	9.56E+01
Xenon-133	3.57E+03	6.17E+03	4.03E+03	9.28E+03	4.96E+03	1.97E+03	3.00E+04
Xenon-135	3.39E+02	6.43E+02	8.72E+02	1.06E+03	5.93E+02	7.56E+02	4.26E+03
Krypton-88	1.54E+00	2.41E+00	9.03E+00	5.48E+00	*	5.96E+00	2.44E+01
Total	3.92E+03	6.83E+03	4.94E+03	1.04E+04	5.56E+03	2.75E+03	3.44E+04
Iodine-131	3.05E-02	8.53E-03	4.23E-02	1.10E-02	6.13E-03	3.93E-02	1.36E-01
Iodine-133 (1)	6.23E-03	2.06E-03	2.06E-03	1.95E-02	1.56E-02	1.56E-02	6.11E-02
Iodine-135 (1)	4.13E-02	3.30E-02	3.30E-02	4.28E-02	3.43E-02	3.43E-02	2.19E-01
Total	7.80E-02	4.36E-02	7.74E-02	7.33E-02	5.60E-02	8.92E-02	4.18E-01
Strontium-89	3.10E-05	9.77E-05	1.03E-04	1.14E-04	1.64E-04	1.41E-04	6.51E-04
Strontium-90	8.68E-06	8.21E-06	4.76E-06	2.09E-05	8.48E-06	8.53E-06	5.36E-05
Cesium-134	7.56E-05	*	2.56E-04	1.90E-04	2.28E-04	3.72E-04	1.12E-03
Cesium-137	1.25E-04	7.07E-05	2.12E-04	9.97E-05	*	3.75E-04	8.82E-04
Chromium-51	*	*	*	*	*	6.74E-04	6.74E-04
Cobalt-58	*	*	*	*	*	*	*
Cobalt-60	3.10E-04	1.43E-04	*	*	1.77E-05	4.35E-05	5.14E-04
Zinc-65	*	*	*	3.03E-04	*	3.81E-04	6.84E-04
Yttrium-91m	2.45E-06	1.57E-04	*	2.66E-04	6.12E-04	8.61E-05	1.12E-03
Strontium-91	*	*	*	*	*	*	*
Zirconium-95	*	*	*	*	*	*	*
Technetium-99m	*	*	*	*	*	8.85E-04	8.85E-04
Sodium-24	*	*	*	4.29E-05	5.95E-05	1.31E-03	1.41E-03
Cesium-138	5.45E-03	1.89E-03	8.20E-03	1.05E-02	5.49E-03	1.74E-02	4.89E-02
Barium-140	*	*	*	*	*	*	*
Silver-110m	*	*	*	*	*	*	*
Rubidium-88	*	*	*	*	*	*	*
Total	6.00E-03	2.37E-03	8.78E-03	5.15E-02	6.58E-03	2.17E-02	5.69E-02

\* Less than minimum detectable

(1) Quarterly analysis used for monthly estimation

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TABLE E

PEACH BOTTOM UNITS 2 &amp; 3 - SOLID RADIOACTIVE WASTE SHIPMENT 1979

	JAN	FEB	MARCH	APRIL	MAY	JUNE	TOTAL
Number of shipments	18	21	32	24	30	24	149
Volume of waste (ft) <sup>3</sup>	2.15E+03	5.04E+03	5.22E+03	7.14E+03	1.70E+04	5.38E+03	4.19E+04
Activity, Curies	2.64E+02	3.38E+02	5.56E+02	5.54E+02	2.97E+02	8.40E+02	2.85E+03
Shipping dates (# of shipments)	3(2)A	1(2)A	1(1)A	2(1)A	1(2)A	1(2)A	
	5(2)A	5(2)A	2(1)A	3(1)A	2(1)A	2(1)A	
A -Disposition- waste	9(2)A	7(2)A	5(2)A	4(1)A	3(1)A	4(1)A	
shipped by Hittman Nuclear	11(1)A	8(1)C	6(1)A	4(1)B	4(1)A	4(1)B	
and Development Corp.	15(2)A	9(2)A	7(1)A	5(1)A	7(1)A	5(1)A	
in trucks to the Chem.	17(2)A	13(2)A	7(1)C	6(1)A	8(1)A	6(2)A	
Nuclear System Inc.,	19(1)A	15(2)A	8(2)A	9(1)A	8(1)B	7(2)A	
Barnwell, South Carolina	23(2)A	21(2)A	9(2)A	10(1)A	9(1)A	11(1)A	
	25(2)A	22(1)A	10(1)A	11(1)A	10(1)A	13(1)A	
B -Disposition- waste shipped	30(2)A	23(2)A	12(1)A	12(2)A	11(2)A	14(1)A	
by Chem. Nuclear System		27(1)A	13(2)A	16(1)A	15(1)A	15(1)A	
Inc. in trucks to Chem.		28(2)A	14(2)A	17(1)A	16(1)A	18(1)A	
Nuclear System Inc.,			15(1)A	18(2)A	16(1)B	19(1)A	
Barnwell, South Carolina			16(2)A	19(2)A	17(1)A	20(3)A	
			19(1)A	19(1)B	18(2)A	25(1)A	
C -Disposition - waste			20(1)A	20(1)A	21(1)A	26(1)A	
shipped by Hittman			21(2)A	23(1)A	22(1)A	27(1)A	
Nuclear and Development			22(1)A	24(1)A	22(2)B	28(1)A	
Corp. in trucks to Nuclear			23(2)A	25(1)A	23(1)A	29(1)A	
Engineering Company, Inc.,			26(1)A	27(2)A	24(1)A		
Beatty, Nevada			28(1)A		25(2)A		
			29(1)A		25(2)B		
			30(2)A		29(1)A		
					31(1)A		

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TABLE III-F

PEACH BOTTOM UNITS 2 AND 3  
GASEOUS RADIOACTIVE RELEASE DATA  
1976

	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
Mixed Noble Gases Ci	9.81E+03	9.74E+03	1.90E+04	1.26E+04	7.80E+03	1.04E+04	6.94E+04
% of Tech. Spec. Limit (1)	1.51E+00	3.01E+00	2.84E+00	1.34E+00	7.48E-01	8.78E-01	1.72E+00
Iodine 131 Ci	7.77E-02	9.93E-02	1.38E-01	4.10E-02	1.85E-02	1.64E-02	3.91E-01
% of Tech. Spec. Limit (2)	1.67E+01	3.24E+01	3.80E+01	1.24E+01	3.84E+00	3.92E+00	1.81E+01
Particulates > 8 Day Half Life Alpha Ci (6)	1.68E-03 <6.92E-08	1.18E-02 <8.98E-07	9.73E-03 <1.17E-06	4.20E-03 <2.94E-06	1.52E-03 <2.20E-07	2.52E-03 <1.16E-09	3.15E-02 <5.30E-06
% of Tech. Spec. Limit (2)	4.79E-01	5.00E+00	2.84E+00	1.50E+00	4.41E-01	1.59E+00	1.94E+00
Tritium Ci (3)	1.20E+00	1.03E+00	1.28E+00	2.12E+00	1.91E+00	2.16E+00	9.70E+00
Max. Noble Gas Release Rate $\mu$ Ci/sec Date:	1.00E+05 7-11-76	3.75E+04 8-18-76	7.5E+04 9-19-76	1.80E+04 10-8-76	5.8E+04 11-15-76	3.05E+03 12-18-76	1.00E+05 7-11-76
% of Tech. Spec. Limit for Maximum Noble Gas Release (1)	3.06E+01	1.32E+01	2.40E+01	5.94E+00	1.81E+01	1.56E+00	3.06E+01
Maximum % of Tech. Spec. Limit (1)	3.06E+01	3.00E+02	7.09E+01	3.18E+01	2.9E+01	1.42E+01	3.00E+02

- (1) Basis: Tech. Spec. 3.8.C.1  
(2) Basis: Tech. Spec. 3.8.C.2  
(3) Quarterly

- (4) Average for 6 month period.  
(5) Maximum for 6 month period.  
(6) Determined by ratio method.

Revised 8/79 - Mixed Noble Gases value for July corrected

Table B

PEACH BOTTOM UNITS 2 &amp; 3 - ISOTOPIC ANALYSIS OF GASEOUS RADIOACTIVE EFFLUENTS (in Curies) 1977

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	TOTAL
Krypton - 85m	*	*	*	1.27E+00	1.09E+00	*	2.36E+00
Krypton - 87	*	*	1.71E+00	*	*	*	1.71E+00
Xenon - 133	2.53E+03	3.18E+03	1.04E+04	1.00E+04	3.69E+03	3.18E+03	3.30E+04
Xenon - 135	2.07E+02	1.05E+02	9.37E+01	1.73E+02	2.14E+02	1.44E+02	9.37E+02
Total (Ci)	2.74E+03	3.29E+03	1.05E+04	1.02E+04	3.91E+03	3.32E+03	3.39E+04
Iodine - 131	1.17E-02	6.09E-03	1.10E-02	2.99E-02	2.84E-02	1.11E-02	9.82E-02
Iodine - 133	6.77E-02	6.77E-02	8.46E-02	7.74E-02	7.74E-02	9.68E-02	4.72E-01
Iodine - 135	3.98E-02	3.98E-02	4.98E-02	3.51E-02	3.51E-02	4.38E-02	2.43E-01
Total	1.19E-01	1.14E-01	1.45E-01	1.42E-01	1.41E-01	1.52E-01	8.13E-01
Strontium - 89	3.52E-05	6.60E-05	1.40E-04	1.63E-04	5.80E-05	6.83E-05	5.31E-04
Strontium - 90	4.23E-06	3.57E-06	4.81E-06	7.37E-06	3.99E-06	1.30E-05	3.70E-05
Cesium - 134	3.16E-04	2.62E-04	2.52E-04	8.08E-04	3.51E-04	6.26E-04	2.62E-03
Cesium - 137	4.64E-04	3.59E-04	3.22E-04	9.58E-04	4.45E-04	7.87E-04	3.34E-03
Strontium - 91	*	*	1.50E-04	*	*	*	1.50E-04
Cobalt - 58	*	*	*	*	*	4.57E-05	4.57E-05
Cobalt - 60	3.81E-04	1.95E-04	5.66E-04	6.92E-04	3.60E-04	4.42E-04	2.64E-03
Zinc - 65	1.02E-03	4.14E-04	6.03E-04	7.31E-04	7.95E-04	1.12E-03	4.68E-03
Arsenic - 76	*	*	1.20E-03	*	*	*	1.20E-03
Chromium - 51	*	*	*	1.10E-03	2.95E-04	*	1.40E-03
Zirconium - 95	*	*	*	1.90E-04	3.46E-05	*	2.25E-04
Molybdenum - 99	2.81E-05	1.15E-04	7.45E-05	5.47E-04	*	*	7.65E-04
Sodium - 24	2.10E-04	5.68E-04	7.08E-05	*	*	*	8.49E-04
Cesium - 138	6.40E-06	*	*	*	*	2.17E-05	2.81E-05
Rubidium - 88	*	*	*	*	*	2.84E-05	2.84E-05
Total (Ci)	2.46E-03	1.98E-03	3.38E-03	5.20E-03	2.34E-03	3.15E-03	1.85E-02

\* Less than minimum detectable

Revised 2/78 - Total value of Noble Gas Totals corrected  
 Revised 8/79 - Total Iodine value for January corrected.

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