

PEACH BOTTOM ATOMIC POWER STATION

UNIT NOS. 2 AND 3

DOCKET NOS. 50-277 & 50-278

SEMI -ANNUAL EFFLUENT RELEASES REPORT

NO. 11

JANUARY 1, 1981 THROUGH JUNE 30, 1981

SUBMITTED TO

THE UNITED STATES NUCLEAR REGULATORY COMMISSION

PURSUANT TO

FACILITY OPERATING LICENSE NO. DPR-44 & 56

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PHILADELPHIA ELECTRIC COMPANY  
PEACH BOTTOM ATOMIC POWER STATION  
Unit Nos. 2 and 3  
Docket Nos. 50-277 & 50-278

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Preparation Directed By:

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Peach Bottom Atomic Power Station

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I. INTRODUCTION

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, 1981 through June 30, 1981. The notations E+ and E- are used to denote positive and negative exponents to the base 10.

TABLE A

## PEACH BOTTOM UNITS 2 &amp; 3 - LIQUID RADIOACTIVE RELEASE DATA 1981

	JAN	FEB	MARCH	APRIL	MAY	JUNE	TOTAL
Gross Activity ( $\beta, \gamma, \alpha$ ) Total Curies (Except Tritium & Noble Gas)	1.543E-03	1.626E-03	4.61E-03	2.718E-02	1.957E-02	2.992E-02	8.445E-02
Average $\mu$ Ci/ml Gross Activity (except Tritium at Point of Release)	8.083E-11	1.905E-10	3.699E-10	1.38E-09	2.65E-09	3.423E-09	1.110E-09
Total Curies of Tritium	5.92E+00	2.96E+00	3.15E+00	5.93E+00	3.70E+00	3.23E+00	2.489E+01
Average $\mu$ Ci/ml Tritium at Point of Release	3.101E-07	3.469E-07	2.526E-07	3.012E-07	5.022E-07	3.54E-07	3.271E-07
Total Curies, Alpha	$\leq 2.54E-06$	$\leq 1.15E-06$	$\leq 9.86E-07$	4.70E-06	$\leq 1.14E-06$	$\leq 1.55E-06$	$\leq 1.207E-05$
Average $\mu$ Ci/ml Alpha at Point of Release (1)	$\leq 1.331E-13$	$\leq 1.348E-13$	$\leq 7.907E-14$	2.387E-13	$\leq 1.304E-13$	$\leq 1.773E-13$	$\leq 1.586E-13$
Total Curies of Dissolved Noble Gases (5)	1.64E-01	2.86E-01	8.74E-02	6.40E-02	2.89E-03	$\emptyset$	6.043E-01
Average $\mu$ Ci/ml of Noble Gases at Point of Release	8.591E-09	3.352E-08	7.009E-09	3.250E-09	3.923E-10	$\emptyset$	7.941E-09
Maximum $\mu$ Ci/ml Released except Tritium - at Point of Release	2.375E-10	4.318E-10	1.255E-09	5.694E-08	6.926E-08	6.230E-08	6.926E-08
Total Volume of Waste: Gallons: Liters:	6.145E+05 2.326E+06	2.972E+05 1.125E+06	4.575E+05 1.732E+06	1.042E+06 3.945E+06	6.991E+05 2.646E+06	9.569E+05 3.622E+06	4.067E+06 1.540E+07
Total Volume of Dilution: Gallons: Liters:	5.043E+09 1.909E+10	2.255E+09 8.533E+09	3.294E+09 1.247E+10	5.201E+09 1.969E+10	1.946E+09 7.367E+09	2.364E+09 8.949E+09	2.010E+10 7.610E+10
(1) % of Tech. Spec. Curie Limit	2.315E-02	2.439E-02	6.920E-02	4.077E-01	2.9365E-01	4.485E-01	2.111E-01

(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 B

PEACH BOTTOM UNITS 2 &amp; 3 - ISOTOPIC ANALYSIS OF LIQUID RADIOACTIVE RELEASES (In Curies) (1)

1981

ISOTOPE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	CI TOTAL
Strontium 89	*	*	*	1.708E-04	*	*	1.708E-04
Strontium-90	*	*	*	3.770E-05	1.240E-05	*	5.010E-05
Cerium 134	*	3.029E-04	*	7.948E-03	6.493E-03	5.506E-03	2.025E-02
Cesium 137	1.152E-04	6.241E-04	1.173E-04	1.335E-02	8.681E-03	8.270E-03	3.116E-02
Iodine-131	1.262E-04	7.401E-05	6.235E-05	1.287E-03	1.320E-03	9.797E-05	2.968E-03
Cobalt-58	*	*	1.152E-05	4.384E-04	7.434E-05	3.602E-04	8.845E-04
Cobalt-60	2.261E-04	5.303E-04	7.720E-04	1.284E-02	4.729E-03	1.059E-02	2.929E-02
Zinc 65	1.685E-04	1.544E-03	6.404E-04	2.693E-02	1.283E-02	1.671E-02	5.882E-02
Manganese-54	*	*	*	5.923E-04	6.826E-05	8.833E-05	7.489E-04
Chromium 51	*	8.443E-04	*	6.783E-03	*	9.534E-04	8.581E-03
Lanthanum-140	*	4.079E-04	3.054E-04	1.975E-04	*	*	9.108E-04
Niobium-95	*	*	*	1.399E-05	2.00E-04	4.300E-05	2.570E-04
Sodium-24	*	3.453E-05	*	7.926E-03	*	1.020E-03	3.981E-03
Yttrium-91m	*	5.660E-05	*	*	*	*	5.660E-05
Xenon 135m	1.061E-03	1.244E-04	2.312E-04	*	*	*	1.417E-03
Iodine 133	*	*	1.653E-05	8.323E-05	*	*	9.976E-05
Strontium 92	*	*	*	2.201E-04	3.777E-04	7.243E-05	6.702E-04
Xenon 133m	2.199E-04	2.012E-04	*	7.534E-05	*	*	4.964E-04
Xenon-133	1.001E-01	3.892E-02	2.478E-02	9.992E-02	5.389E-03	7.390E-04	2.699E-01
Xenon-135	3.627E-02	1.649E-02	1.557E-02	2.165E-02	*	8.346E-04	9.082E-02
Phosphorus 32	3.265E-04	7.98E-05	5.993E-04	1.168E-03	*	6.013E-04	2.775E-03
Iron 55	*	*	7.816E-04	1.661E-03	*	*	2.443E-03
Nickel 63	*	7.00E-05	*	*	2.262E-04	1.098E-04	4.060E-04
Alpha	*	*	*	4.70E-06	*	*	4.700E-06
Tritium	5.92E+00	2.96E+00	3.15E+00	5.93E+00	3.70E+00	3.23E+00	2.489E+01
Xenon-131m	*	*	*	4.140E-04	*	*	4.140E-04
Silver-110m	*	*	*	4.103E-04	9.933E-04	6.718E-05	1.471E-03
TOTAL (Curies)	6.059E+00	3.02E+00	3.194E+00	6.129E+00	3.741E+00	3.276E+00	2.542E+01

\* Less than detectable activity.

1) Based on analysis done on each batch.

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

1981

	JAN	FEB	MARCH	APRIL	MAY	JUNE	TOTAL
Mixed Noble Gases Ci	1.724E+03	1.64E+03	1.436E+03	1.459E+03	2.00E+02	3.987E+02	6.382E+03
% of Tech. Spec. Limit (1)	5.051E-01	3.387E-01	2.778E-01	2.255E-01	1.828E-01	4.992E-01	(4) 3.382E-01
Iodine 131 Ci	2.315E-03	9.283E-04	3.188E-03	1.722E-03	6.246E-04	6.833E-04	9.461E-03
% of Tech. Spec. Limit (2)	1.295E-01	7.778E-02	1.743E-01	8.043E-02	6.160E-02	5.691E-02	(4) 9.675E-02
Particulates > 3 Day Half Life Ci	≤5.826E-04	≤4.939E-04	≤1.270E-03	1.392E-03	≤9.848E-05	≤2.893E-04	≤4.126E-03
Particulate Alpha Ci	6.53E-07	6.21E-07	≤7.17E-07	5.05E-07	9.95E-07	7.17E-07	≤1.262E-06
% of Tech. Spec. Limit (2)	≤9.363E-03	≤1.34E-02	≤1.104E-01	≤7.682E-02	≤9.815E-03	≤1.165E-02	(4) ≤2.315E-01
Tritium Ci (3)	3.461E+00	2.769E+00	2.769E+00	3.765E+00	3.012E+00	3.012E+00	1.679E+01
Max. Noble Gas Release Rate μ ci/sec	5.025E+03	1.24E+03	3.943E+03	1.401E+04	No Peaks	1.206E+04	(5) 1.401E+04
Date:	12/29/80	2/25/81	3/8/81	4/23/81		6/22/81	4/23/81
% of Tech. Spec. Limit for Maximum Noble Gas Release (1)	6.00E-01	6.60E-01	8.10E-01	2.85E+00	No Peaks	1.82E+02	(5) 1.82E+02
Maximum % of Tech. Spec. Limit (1)	1.02E+01	5.44E+00	8.68E+00	4.94E+00	No Peaks	1.82E+02	(5) 1.82E+02

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

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

TABLE D

PEACH BOTTOM UNITS 2 & 3 ISOTOPIC ANALYSIS OF GASEOUS RADIOACTIVE EFFLUENTS  
(In Curies) 1981

ISOTOPES	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	CUM. TOTAL
Krypton 87 (2)	*	1.10E+00	5.0E-01	5.53E+01	*	*	5.69E+01
Xenon 133a (2)	1.85E+01	1.87E+01	3.20E+01	5.70E+00	*	*	8.77E+01
Xenon 133b (2)	1.54E+01	3.20E+00	1.13E+01	2.20E+00	*	*	3.11E+01
Xenon 138 (2)	*	3.9E+00	1.10E+00	7.98E+01	*	*	8.81E+01
Krypton-85m (2)	1.00E+00	2.00E-01	2.90E+00	*	*	6.80E+00	1.07E+01
Xenon 133 (2)	1.549E+03	1.097E+03	1.279E+03	1.237E+03	3.2E+00	8.1E+01	5.249E+03
Xenon 135 (2)	7.11E+01	3.60E+01	9.56E+01	6.58E+01	*	1.17E+02	3.831E+02
Krypton 88 (2)	*	*	3.70E+00	*	*	1.8E+00	8.30E+00
Total	1.665E+01	1.16E+03	1.132E+03	1.176E+03	3.25E+00	2.10E+02	5.11E+03
Iodine 131	2.31E-03	9.28E-04	3.188E-03	1.722E-03	6.21E-04	6.81E-04	9.44E-03
Iodine 133 (1)	6.827E-02	5.172E-02	5.172E-02	1.518E-01	1.215E-01	1.215E-01	5.723E-01
Iodine-135 (1)	1.318E-02	3.179E-02	3.179E-02	1.737E-02	3.787E-02	3.787E-02	2.37E-01
Total	1.11E-01	9.02E-02	9.25E-02	2.009E-01	1.60E-01	1.60E-01	8.177E-01
Strontium 89	3.703E-04	2.811E-04	1.135E-04	7.93E-05	7.68E-05	1.73E-05	9.012E-04
Strontium 90	≤1.28E-05	≤1.21E-05	≤8.17E-06	≤4.1E-06	≤3.55E-06	≤4.45E-06	≤4.657E-05
Cesium 134	*	*	7.72E-05	1.718E-04	1.53E-05	2.20E-05	2.863E-04
Cesium-137	2.69E-06	1.69E-05	1.159E-04	2.106E-04	7.01E-05	5.31E-05	4.993E-04
Lanthanum-140	1.349E-04	1.739E-04	5.35E-05	2.58E-05	*	*	3.281E-04
Cobalt 58	*	*	*	2.60E-05	*	*	2.60E-05
Cobalt-60	*	*	3.842E-04	3.176E-04	*	9.345E-05	7.952E-04
Zinc 65	*	*	1.905E-04	5.321E-04	*	6.14E-05	1.087E-03
Yttrium 91m	1.009E-03	1.368E-03	1.528E-04	6.26E-05	*	3.80E-05	2.630E-03
Strontium 90	1.849E-04	1.836E-04	1.28E-05	2.13E-05	*	*	1.056E-04
Cesium-136	8.133E-03	1.509E-02	1.083E-01	1.751E-03	*	3.38E-03	2.975E-02
Barium-140	1.961E-04	1.801E-04	7.98E-05	3.39E-05	*	4.90E-06	4.948E-04
Niobium-95	*	*	*	5.0E-07	8.5E-07	*	1.35E-06
TOTAL	≤1.034E-02	≤1.725E-02	≤2.571E-03	3.275E-03	9.748E-05	3.713E-03	3.775E-02

\*Less than minimum detectable

- 1) Quarterly analysis used for monthly estimation  
 2) Based on weekly grab sample



TABLE E

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

1981

	JAN	FEB	MARCH	APRIL	MAY	JUNE	TOTAL
Number of shipments	25	23	25	28	36	24	161
Volume of waste (ft) <sup>3</sup>	4.152E+03	3.942E+03	4.167E+03	3.759E+03	1.369E+03	3.342E+03	2.073E+04
Activity, Curies	3.226E+02	6.997E+02	2.626E+02	3.559E+02	4.053E+02	4.961E+02	2.542E+03
Shipping dates (# of shipments)	2(1) 6(2) 7(1) 8(2) 9(2) 12(1) 13(1) 14(1) 15(1) 16(1) 19(1) 20(2) 21(1) 22(2) 23(1) 26(1) 27(1) 28(1) 29(1) 30(1)	2(1) 3(1) 4(1) 5(1) 6(1) 9(2) 10(1) 12(1) 13(1) 16(1) 17(2) 18(1) 19(1) 21(1) 23(1) 24(2) 25(2) 26(1) 27(1)	2(1) 3(1) 4(1) 5(1) 6(1) 9(1) 10(1) 12(2) 13(1) 16(1) 17(1) 18(2) 19(1) 20(1) 23(2) 24(2) 25(1) 26(1) 27(1) 30(1) 31(1)	1(2) 3(2) 6(1) 7(2) 8(1) 9(2) 10(1) 13(1) 14(1) 15(2) 16(1) 17(1) 20(1) 22(2) 23(1) 24(2) 27(1) 28(2) 29(1) 30(1)	1(1) 2(2) 4(1) 5(2) 6(1) 7(2) 9(2) 11(1) 12(2) 13(1) 14(2) 15(1) 16(2) 18(2) 19(2) 20(1) 21(2) 22(2) 23(1) 26(2) 27(1) 28(1) 29(2)	1(1) 2(1) 3(1) 4(1) 5(1) 8(2) 9(1) 10(1) 11(2) 12(1) 15(1) 16(2) 18(1) 22(1) 23(2) 24(1) 25(1) 26(1) 29(1) 30(1)	

Disposition - All waste shipped by Hittman Nuclear and Development Corporation in trucks to Chem. Nuclear Corporation, Barnwell, South Carolina.