

# PHILADELPHIA ELECTRIC COMPANY

## PEACH BOTTOM ATOMIC POWER STATION

R.D. 1, Box 208

Delta, Pennsylvania 17314



PEACH BOTTOM—THE POWER OF EXCELLENCE

(717) 456-7014

February 26, 1993

D. B. Miller, Jr.  
Vice President

Docket Nos.: 50-277  
50-278

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Mail Station P1-137  
Washington, DC 20555

Subject: Semi-annual Effluent Release Report No. 34  
July 1, 1992 through December 31, 1992  
Peach Bottom Atomic Power Station - Units No. 2 and No. 3

Gentlemen:

Enclosed are two (2) copies of the Semi-annual Effluent Release Report No. 34, July 1, 1992 through December 31, 1992 for Peach Bottom Atomic Power Station - Units No. 2 and No. 3.

This report is being submitted in compliance with 10 CFR 50.36a (a)(2) and the Technical Specifications of Operating Licenses DPP-44 and DPR-56, and to fulfill the requirements of Regulatory Guide 10.1.

Sincerely,

DBM:aus  
Enclosures

cc: R. A. Burricelli, Public Service Electric & Gas  
W. P. Dornisfe, Commonwealth of Pennsylvania  
J. J. Lyash, USNRC Senior Resident Inspector, PBAPS  
R. I. McLean, State of Maryland  
T. T. Martin, Administrator, Region I, USNRC  
H. C. Schwemm, Atlantic Electric  
C. D. Schaefer, Delmarva Power  
INPO Records Center

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PEACH BOTTOM ATOMIC POWER STATION  
Unit Numbers 2 and 3  
Docket Numbers 50-277 and 50-278

SEMI-ANNUAL EFFLUENT RELEASE REPORT

NO. 34

JULY 1, 1992 THROUGH DECEMBER 31, 1992

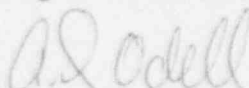
Submitted to  
The United States Nuclear Regulatory Commission  
Pursuant to  
Facility Operating Licenses DPR-44 and DPR-56

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Technical Concurrences: (for accuracy of information)

  
\_\_\_\_\_  
Senior Engineer - Radwaste

  
\_\_\_\_\_  
Senior Chemist

## I. INTRODUCTION

In accordance with the Unique Reporting Requirements of Technical Specification 6.9.2h (2) applicable during the reporting period, this report summarizes the Effluent Release Data for Peach Bottom Atomic Power Station Units 2 and 3 for the period July 1 through December 31, 1992. The notations E and E- are used to denote positive and negative exponents to the base 10, respectively.

The release of radioactive materials during the reporting period was within the Technical Specification limits. There were no changes made to the Off-Site Dose Calculation Manual (ODCM) during the reporting period.

Estimated particulate and iodine releases were determined for a 40 hour period when both Unit 2 Roof Vent sample pumps were out of service and alternate continuous particulate and iodine sampling was not established (PBAPS LER 2-92-22).

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (07/01/92 - 12/31/92)

Table 1A Page 1 of 1

Gaseous Effluents - Summation of All Releases

	Units	Quarter 3	Quarter 4	Est. Error Total %
A. Fission & activation gases				
1. Total release	Ci	3.15E3	1.67E3	18.8
2. Average release rate for period	$\mu\text{Ci/sec}$	4.01E2	1.99E2	18.8
3. Gamma Air Dose	Millirad	3.76E-2	3.22E-2	18.8
Percent of Technical Specification	%	3.76E-1	3.22E-1	18.8
4. Beta Air Dose	Millirad	3.69E-2	3.05E-2	18.8
Percent of Technical Specification	%	1.85E-1	1.53E-1	18.8
B. Iodines				
1. Total iodine-131	Ci	1.79E-2	3.43E-3	22.9
2. Average release rate for period	$\mu\text{Ci/sec}$	2.28E-3	4.09E-4	22.9
3. Critical Organ dose	Millirem	6.43E-2	1.72E-2	22.9
Percent of Technical Specification	%	4.29E-1	1.15E-1	22.9
C. Particulates				
1. Particulates with half-lives greater than 8 days (includes Alpha and Strontium 89-90)	Ci	6.30E-4	4.95E-4	22.9
2. Average release rate for period	$\mu\text{Ci/sec}$	8.01E-5	5.90E-5	22.9
3. Average Gross Alpha Radioactivity	Ci	5.16E-6	5.49E-6	22.9
D. Tritium				
1. Total release	Ci	1.30E1	6.82E0	23.5
2. Average release rate for period	$\mu\text{Ci/sec}$	1.65E0	8.13E-1	23.5

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (07/01/92 - 12/31/92)

Table 1B Page 1 of 2

Gaseous Effluents For Release Point - Main Stack

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
1. Fission gases					
Krypton – 85M	Ci	6.93E1	8.42E1	0	0
Krypton – 87	Ci	2.21E1	4.99E1	0	0
Krypton – 88	Ci	4.07E1	7.61E1	0	0
Xenon – 133	Ci	2.07E3	7.54E2	0	0
Xenon – 135	Ci	5.83E2	4.24E2	0	0
Xenon – 135M	Ci	1.95E2	5.47E1	0	0
Xenon – 138	Ci	1.16E1	4.46E1	0	0
Xenon – 133M	Ci	2.52E1	5.68E0	0	0
Xenon – 131M	Ci	0	2.44E-	0	0
Unidentified	Ci	0	0	0	0
Total for Period	Ci	3.02E3	1.52E3	0	0
2. Iodines					
Iodine – 131	Ci	1.36E–2	1.06E–3	0	0
Iodine – 133	Ci	5.43E–3	2.43E–2	0	0
Iodine – 135	Ci	7.41E–3	2.61E–2	0	0
Total for Period	Ci	2.64E–2	5.15E–2	0	0
3. Particulates					
Strontium – 89	Ci	3.21E–4	2.37E–4	0	0
Strontium – 90	Ci	8.70E–7	6.32E–7	0	0
Strontium – 91	Ci	4.45E–4	2.06E–4	0	0
Cesium – 134	Ci	0	0	0	0
Cesium – 137	Ci	9.69E–6	7.10E–6	0	0
Cesium – 138	Ci	3.07E–2	1.27E–2	0	0
Barium – 139	Ci	4.31E–3	2.24E–3	0	0
Barium – 140	Ci	1.35E–4	1.59E–4	0	0
Lanthanum – 140	Ci	8.09E–5	1.03E–4	0	0
Cobalt <sup>57</sup> – 57	Ci	0	0	0	0
Cobalt – 58	Ci	1.06E–6	0	0	0

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (07/01/92 - 12/31/92)

Table 1B Page 2 of 2

Gaseous Effluents For Release Point - Main Stack

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Cobalt - 60	Ci	0	2.75E-6	0	0
Zinc - 65	Ci	0	0	0	0
Yttrium - 91M	Ci	1.98E-3	2.11E-3	0	0
Iodine - 133	Ci	2.19E-5	5.73E-6	0	0
Copper - 64	Ci	0	0	0	0
Rubidium - 88	Ci	0	0	0	0
Manganese - 54	Ci	0	0	0	0
Strontium - 92	Ci	0	0	0	0
Te-132	Ci	7.87E-7	5.40E-7	0	0
Technetium - 99m	Ci	0	1.05E-6	0	0
Total for Period	Ci	3.80E-2	1.78E-2	0	0

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (07/01/92 - 12/31/92)

Table 1C Page 1 of 2

Gaseous Effluents For Release Point - Unit 2 & Unit 3 Roof Vents

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
1. Fission gases					
Krypton – 85M	Ci	0	0	0	0
Krypton – 87	Ci	0	0	0	0
Krypton – 88	Ci	0	0	0	0
Xenon – 133	Ci	2.62E0	7.67E0	0	0
Xenon – 135	Ci	1.33E0	3.86E1	0	0
Xenon – 135M	Ci	0	0	0	0
Xenon – 138	Ci	0	0	0	0
Unidentified	Ci	1.33E2	1.06E2	0	0
Total for Period	Ci	1.37E2	1.52E2	0	0
2. Iodines					
Iodine – 131	Ci	4.30E–3	2.37E–3	0	0
Iodine – 133	Ci	1.37E–2	4.76E–3	0	0
Iodine – 135	Ci	0	0	0	0
Total for Period	Ci	1.80E–2	7.13E–3	0	0
3. Particulates					
Strontium – 89	Ci	7.84E–5	7.72E–5	0	0
Strontium – 90	Ci	4.00E–6	5.54E–6	0	0
Strontium – 91	Ci	0	4.46E–5	0	0
Cesium – 134	Ci	0	0	0	0
Cesium – 137	Ci	1.57E–5	0	0	0
Cesium – 138	Ci	6.86E–3	6.83E–3	0	0
Barium – 139	Ci	1.92E–3	9.17E–4	0	0
Barium – 140	Ci	0	0	0	0
Lanthanum – 140	Ci	0	0	0	0
Cobalt – 57	Ci	0	0	0	0
Cobalt – 58	Ci	0	0	0	0
Cobalt – 60	Ci	0	0	0	0



EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (07/01/92 - 12/31/92)

Table 1C Page 2 of 2

Gaseous Effluents For Release Point - Unit 2 & Unit 3 Roof Vents

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Zinc - 65	Ci	5.96E-5	0	0	0
Yttrium - 91M	Ci	0	1.09E-4	0	0
Iodine - 133	Ci	6.61E-5	1.42E-4	0	0
Copper - 64	Ci	0	0	0	0
Rubidium - 88	Ci	0	0	0	0
Manganese - 54	Ci	0	0	0	0
Strontium - 92	Ci	0	0	0	0
Total for Period	Ci	9.00E-3	8.13E-3	0	0

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (07/01/92 - 12/31/92)

Table 2A Page 1 of 1

Liquid Effluents - Summation of All Releases

	Units	Quarter 3	Quarter 4	Est. Error Total %
A. Fission & activation products				
1. Total release (not including tritium, gases, alpha)	Ci	3.55E-3	1.50E-2	22.9
2. Average diluted concentration during period	μCi/ml	1.74E-10	4.87E-10	22.9
3. Total Body Dose	Millirem	7.53E-4	8.50E-3	22.9
Percent of Technical Specification	%	2.51E-2	2.83E-1	22.9
4. Maximally Exposed Organ Dose - 3rd Qtr. Child Bone - 4th Qtr. Adult Bone	Millirem	3.62E-3	2.77E-2	22.9
Percent of Technical Specification	%	3.62E-2	2.77E-1	22.9
B. Tritium				
1. Total release	Ci	4.11E0	5.78E0	15.0
2. Average diluted concentration during period	μCi/ml	2.01E-7	1.88E-7	15.0
C. Dissolved and entrained gases				
1. Total release	Ci	5.01E-3	3.93E-2	22.9
2. Average diluted concentration during period	μCi/ml	2.46E-10	1.28E-9	22.9
D. Gross alpha radioactivity				
1. Total release	Ci	6.47E-5	1.52E-4	22.9
2. Average diluted concentration during period	μCi/ml	3.17E-12	4.94E-12	22.9
E. Volume of waste released (prior to dilution)	liters	1.65E6	3.70E6	12.7
F. Volume of dilution water used during period	liters	2.04E10	3.08E10	10.9

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (07/01/92 - 12/31/92)

Table 2B Page 1 of 2  
Liquid Effluents

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Strontium - 89	Ci	0	0	9.60E-5	2.49E-4
Strontium - 90	Ci	0	0	7.72E-6	2.86E-3
Alpha	Ci	0	0	6.47E-5	1.52E-4
Tritium	Ci	0	0	4.11E 0	5.78E 0
Phosphorus - 32	Ci	0	0	2.07E-3	1.65E-3
Iron - 55	Ci	0	0	8.58E-4	1.48E-3
Xenon - 131M	Ci	0	0	0	0
Xenon - 133	Ci	0	0	2.36E-3	3.19E-2
Xenon - 133M	Ci	0	0	0	1.74E-4
Xenon - 135	Ci	0	0	2.65E-3	7.25E-3
Xenon - 135M	Ci	0	0	0	0
Krypton - 85M	Ci	0	0	0	0
Krypton - 87	Ci	0	0	0	0
Krypton - 88	Ci	0	0	0	0
Manganese - 54	Ci	0	0	1.50E-5	2.12E-4
Cesium - 134	Ci	0	0	9.44E-7	1.25E-5
Cesium - 137	Ci	0	0	5.05E-5	9.04E-5
Cesium - 138	Ci	0	0	0	0
Zinc - 65	Ci	0	0	0	3.14E-3
Sodium - 24	Ci	0	0	0	0
Cobalt - 58	Ci	0	0	0	5.32E-5
Cobalt - 60	Ci	0	0	3.53E-4	2.18E-3
Iodine - 131	Ci	0	0	1.65E-5	4.25E-6
Iodine - 133	Ci	0	0	0	5.88E-6
Iodine - 135	Ci	0	0	0	0
Molybdenum - 99	Ci	0	0	0	0
Barium - 140	Ci	0	0	0	0
Neptunium - 239	Ci	0	0	0	0
Chromium - 51	Ci	0	0	7.89E-5	2.52E-3

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (07/01/92 - 12/31/92)

Table 2B Page 2 of 2  
Liquid Effluents

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Yttrium - 91M	Ci	0	0	0	0
Strontium - 91	Ci	0	0	0	0
Antimony - 122	Ci	0	0	0	0
Tellurium - 132	Ci	0	0	0	0
Niobium - 95	Ci	0	0	0	4.18E-5
Lanthanum - 140	Ci	0	0	0	0
Cadmium - 109	Ci	0	0	0	0
Cesium - 136	Ci	0	0	0	0
Antimony - 124	Ci	0	0	0	0
Iron - 59	Ci	0	0	0	0
Tellurium - 129M	Ci	0	0	0	0
Tellurium - 131M	Ci	0	0	0	0
Zirconium - 95	Ci	0	0	0	0
Cerium - 141	Ci	0	0	0	0
Strontium - 92	Ci	0	0	0	3.87E-5
Silver - 110M	Ci	0	0	0	4.91E-4
Total for Period (above)	Ci	0	0	4.12E0	5.83E0

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (1/1/92 - 6/30/92)

PEACH BOTTOM UNITS 2 & 3  
JULY 1, 1992 TO DECEMBER 31, 1992  
CLASSES OF SOLID RADIOACTIVE WASTE SHIPMENTS

Total # of Shipments	Waste Description (source of waste)	Container/Type	Individual Volume (cubic ft.)	Total Volume (cubic ft.)	Total Curie	Principal Radionuclides
<b>Class A</b>						
21	Dewatered Resin	HIC/Type A Cask	202.1	4244.1	2.29E+02	Zn-65, Co-60, Cs-137 I-131, Cs-134
57	DAW	Metal Drum/STC Metal Box/STC	variable	(*) 2288.8	3.21E+00	Co-60, Zn-65, Fe-55, Cs-137, Mn-54
59	DAW	Metal Drum/STC Metal Box/STC	variable	(**) 1475.8	8.52E-01	Co-60, Zn-65, Fe-55, Cs-137, Mn-54
1	Solidified Liq.	Metal Drum/STC	variable	(***) 148.7	6.16E-05	Co-60, Zn-65, Fe-55, Cs-137, Mn-54
<b>Class B</b>						
4	Dewatered Resin	HIC/Type A Cask	202.1	808.4	1.61E+02	Zn-65, Co-60, Cs-137 Cs-134, Fe-55
1	Dewatered Resin	HIC/Type B Cask	132.4	132.4	6.57E+02	Zn-65, Co-60, Cr-51 Mn-54, Co-58
<b>Totals</b>						
143				9098.2	1.05E+03	

NOTES:

\* - Indicates actual total PECO radwaste shipped from Quadrex, after volume reduction, to the burial site.

\*\* - Indicates actual total PECO radwaste shipped from SEG, after volume reduction, to the burial site.

## ATTACHMENT A SUPPLEMENT INFORMATION

Facility: Peach Bottom Units 2 & 3

Licenses: DPR-44  
DPR-56

### 1. Regulatory Limits (Technical Specification Limits)

#### A. Noble Gases:

- |    |             |         |              |   |                           |
|----|-------------|---------|--------------|---|---------------------------|
| 1. | $\leq 500$  | mRem/Yr | - total body | - | *instantaneous* limits    |
|    | $\leq 3000$ | mRem/Yr | - skin       |   | Tech. Spec. 3.8.C.1.a     |
| 2. | $\leq 10$   | mRad    | - air gamma  | - | quarterly air dose limits |
|    | $\leq 20$   | mRad    | - air beta   |   | Tech. Spec. 3.8.C.2.a     |
| 3. | $\leq 20$   | mRad    | - air gamma  | - | yearly air dose limits    |
|    | $\leq 40$   | mRad    | - air beta   |   | Tech. Spec. 3.8.C.2.b     |

#### B. Iodines, Tritium, Particulates with Half Life > 8 days:

- |    |             |         |                                  |   |                        |
|----|-------------|---------|----------------------------------|---|------------------------|
| 1. | $\leq 1500$ | mRem/Yr | - any organ<br>(inhalation path) | - | *instantaneous* limits |
|    |             |         |                                  |   | Tech. Spec. 3.8.C.1.b  |
| 2. | $\leq 15$   | mRem    | - any organ                      | - | quarterly dose limits  |
|    |             |         |                                  |   | Tech. Spec. 3.8.C.3.a  |
| 3. | $\leq 30$   | mRem    | - any organ                      | - | yearly dose limits     |
|    |             |         |                                  |   | Tech. Spec. 3.8.C.3.b  |

#### C. Liquid Effluents

- |    |   |      |              |   |                        |
|----|---|------|--------------|---|------------------------|
| 1. | Concentration $\leq 10$ CFR 20,<br>Appendix B, Table II, Col. 2 |      |              | - | *instantaneous* limits |
|    |   |      |              |   | Tech. Spec. 3.8.B.1    |
| 2. | $\leq 3.0$  | mRem | - total body | - | quarterly dose limits  |
|    | $\leq 10$   | mRem | - any organ  |   | Tech. Spec. 3.8.B.2.a  |
| 3. | $\leq 6.0$  | mRem | - total body | - | yearly dose limits     |
|    | $\leq 20$   | mRem | - any organ  |   | Tech. Spec. 3.8.B.2.b  |

### 2. Maximum Permissible Concentrations:

MPCs are not used to calculate permissible release rates and concentrations for gaseous releases.

The MPCs specified in 10 CFR 20, Appendix B, Table II, Column 2, for identified nuclides are used to calculate permissible release rates and concentrations for liquid release per Peach Bottom Technical Specification 3.8.B.1.

# ATTACHMENT A (continued)

## 3. Average Energy:

Not Applicable

## 4. Measurements and Approximations of Total Radioactivity:

### A. Fission and Activation Gases:

The method used is the Nuclear Data 6700 Counting System  
– Gas Marinelli –

### B. Iodine:

The method used is the Nuclear Data 6700 Counting System  
– Charcoal Cartridge –

### C. Particulates:

The method used is the Nuclear Data 6700 Counting System  
– Air Particulate Sample, (47mm and 57mm filters) –

### D. Liquid Effluents:

The method used is the Nuclear Data 6700 Counting System and the Radwaste Liquid Discharge Pre–Release Method with a liter marinelli.

## 5. Batch Releases:

### A. Liquid:

	<u>QTR 3</u>	<u>QTR 4</u>
Number of batch releases:	28	60
Total time for batch releases (minutes):	5683	13267
Maximum time period for batch release (minutes):	300	300
Average time period for batch release (minutes):	203	221
Minimum time period for batch release (minutes):	30	13
Dilution flow (liters):	2.04E10	3.08E10

### B. Gaseous:

Not applicable.

## ATTACHMENT A (continued)

### 6. Abnormal Releases:

#### A. Liquid:

NONE

#### B. Gaseous:

PBAPS LER 2-92-22

Event Description – On September 21, 1992 the Unit 2 'A' Roof Vent sample pump was removed from service for preventive maintenance. At 1800 on October 21, 1992 a previously scheduled bus outage removed power from the Unit 2 'B' Roof Vent sample pump. Both Unit 2 Roof Vent sample pumps were therefore out of service until 0700 October 23, 1992 when the 'A' sample pump was returned to service. During the period that both sample pumps were out of service, grab samples were taken as required by Technical Specifications to monitor noble gases, but there were no particulate and iodine filters in service to provide the ability to quantitatively analyze particulate and iodine effluent releases.

Analysis of Release – Based on existing radiological controls and current and previous plant experience, it is believed that no abnormal particulate or iodine releases occurred. Release values during the unmonitored period were calculated by simply extending the before and after release rates into the unmonitored period.