

PECO ENERGY

Gerald R. Rainey
Vice President
Peach Bottom Atomic Power Station

PECO Energy Company
RD 1, Box 208
Delta, PA 17314-9739
717 456 7014

February 25, 1994

Docket Nos. 50-277
50-278

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Subject: Semi-Annual Effluent Release Report No. 36
July 1, 1993 through December 31, 1993
Peach Bottom Atomic Power Station Unit Nos. 2 and 3

Gentlemen:

Enclosed are two copies of the Semi-Annual Effluent Release Report No. 36, July 1, 1993 through December 31, 1993 for Peach Bottom Atomic Power Station Unit Nos. 2 and 3.

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

Sincerely,

G. R. Rainey
Vice President

GRR:aa

enclosures

050071

cc: R. A. Burricelli, Public Service Electric & Gas
W. P. Dornsife, Commonwealth of Pennsylvania
W. L. Schmidt, USNRC Senior Resident Inspector
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

9403080139 931231
PDR ADDCK 05000277
R PDR

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

SEMI-ANNUAL EFFLUENT RELEASE REPORT

NO. 36

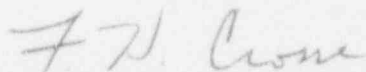
JULY 1, 1993 THROUGH DECEMBER 31, 1993

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

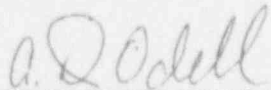
TABLE OF CONTENTS

SECTION	PAGE
I. Introduction	1
II. Tables	
1A. Gaseous Effluents - Summation of All Releases	2
1B. Gaseous Effluents for Release Point - Main Stack	3
1C. Gaseous Effluents for Release Point - Unit 2 and Unit 3 Roof Vents	5
2A. Liquid Effluents - Summation of All Releases	7
2B. Liquid Effluents	8
III. Classes of Solid Radioactive Waste Shipments	9
IV. Attachments	
A. Supplemental Information	10

Technical Concurrences: (for accuracy of information)



Radwaste Manager



Chemistry Manager

1. 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, 1993 through December 31, 1993. 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, iodine, and fission gas releases were determined for a 7-day period when an improperly secured main stack particulate and cartridge filter assembly resulted in diluted sample flow (PBAPS LER 2-93-15).

There were two unplanned releases of liquid radioactive material.

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (7/01/93 - 12/31/93)

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	5.25E3	2.08E3	18.8
2. Average release rate for period	$\mu\text{Ci}/\text{sec}$	6.67E2	2.65E2	18.8
3. Gamma Air Dose	Millirad	1.40E-1	6.63E-2	18.8
Percent of Technical Specification	%	1.40E0	6.63E-1	18.8
4. Beta Air Dose	Millirad	1.39E-1	6.10E-2	18.8
Percent of Technical Specification	%	6.95E-1	3.05E-1	18.8
B. Iodines				
1. Total iodine-131	Ci	3.06E-2	4.34E-3	22.9
2. Average release rate for period	$\mu\text{Ci}/\text{sec}$	3.89E-3	5.52E-4	22.9
3. Critical Organ dose	Millirem	1.19E-1	1.87E-2	22.9
Percent of Technical Specification	%	7.93E-1	1.25E-1	22.9
C. Particulates				
1. Particulates with half-lives greater than 8 days (includes Alpha and Strontium 89-90)	Ci	3.48E-3	2.24E-3	22.9
2. Average release rate for period	$\mu\text{Ci}/\text{sec}$	4.43E-4	2.85E-4	22.9
3. Average Gross Alpha Radioactivity	Ci	5.68E-6	2.26E-5	22.9
D. Tritium				
1. Total release	Ci	8.88E0	4.68E0	23.5
2. Average release rate for period	$\mu\text{Ci}/\text{sec}$	1.13E0	5.95E-1	23.5

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (7/01/93 - 12/31/93)

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	1.51E2	7.40E1	0	0
Krypton - 87	Ci	1.85E2	1.25E2	0	0
Krypton - 88	Ci	5.55E1	7.49E1	0	0
Xenon - 133	Ci	1.16E3	4.93E2	0	0
Xenon - 135	Ci	7.89E2	3.97E2	0	0
Xenon - 135M	Ci	7.26E2	1.51E2	0	0
Xenon - 138	Ci	7.45E2	2.87E2	0	0
Xenon - 133M	Ci	9.61E0	0	0	0
Unidentified	Ci	0	2.51E2	0	0
Total for Period	Ci	3.82E3	1.85E3	0	0
2. Iodines					
Iodine - 131	Ci	1.93E-2	2.24E-3	0	0
Iodine - 133	Ci	5.58E-2	9.48E-4	0	0
Iodine - 135	Ci	1.74E-2	0	0	0
Total for Period	Ci	9.25E-2	3.19E-2	0	0
3. Particulates					
Strontium - 89	Ci	1.35E-3	1.14E-3	0	0
Strontium - 90	Ci	1.63E-6	2.32E-6	0	0
Strontium - 91	Ci	5.71E-4	1.04E-3	0	0
Cesium - 134	Ci	0	1.47E-5	0	0
Cesium - 137	Ci	3.79E-5	3.26E-5	0	0
Cesium - 138	Ci	6.89E-2	2.53E-2	0	0
Barium - 139	Ci	4.22E-3	1.32E-2	0	0
Barium - 140	Ci	3.95E-4	8.44E-4	0	0
Lanthanum - 140	Ci	2.38E-4	6.31E-4	0	0
Cobalt - 57	Ci	0	0	0	0
Cobalt - 58	Ci	0	0	0	0

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (7/01/93 - 12/31/93)

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	5.57E-6	0	0
Zinc - 65	Ci	0	0	0	0
Yttrium - 91M	Ci	5.73E-3	6.05E-4	0	0
Iodine - 133	Ci	9.88E-5	7.18E-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
Iodine - 135	Ci	1.69E-5	0	0	0
Tellurium - 132	Ci	4.27E-6	0	0	0
Molybdenum - 99	Ci	9.94E-7	0	0	0
Technetium - 99m	Ci	1.51E-6	0	0	0
TOTAL FOR PERIOD	Ci	8.15E-2	4.28E-2	0	0

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (7/01/93 - 12/31/93)

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	2.64E1	0	0	0
Xenon - 135	Ci	4.74E1	0	0	0
Xenon - 135M	Ci	0	0	0	0
Xenon - 138	Ci	0	0	0	0
Unidentified	Ci	4.39E2	2.25E2	0	0
Total for Period	Ci	5.13E2	2.25E2	0	0
2. Iodines					
Iodine - 131	Ci	1.13E-2	2.10E-3	0	0
Iodine - 133	Ci	7.14E-2	1.18E-2	0	0
Iodine - 135	Ci	1.15E-1	2.50E-2	0	0
Total for Period	Ci	1.98E-1	3.89E-2	0	0
3. Particulates					
Strontium - 89	Ci	5.80E-4	1.39E-4	0	0
Strontium - 90	Ci	4.13E-6	3.07E-6	0	0
Strontium - 91	Ci	1.21E-3	9.41E-5	0	0
Cesium - 134	Ci	4.61E-5	0	0	0
Cesium - 137	Ci	1.86E-4	3.12E-5	0	0
Cesium - 138	Ci	4.09E-2	3.68E-3	0	0
Barium - 139	Ci	8.65E-3	1.98E-3	0	0
Barium - 140	Ci	4.96E-4	0	0	0
Lanthanum - 140	Ci	6.09E-4	9.39E-5	0	0
Cobalt - 57	Ci	0	0	0	0
Cobalt - 58	Ci	3.41E-6	0	0	0
Cobalt - 60	Ci	5.98E-5	0	0	0

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (7/01/93 - 12/31/93)

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	0	0	0	0
Yttrium - 91M	Ci	3.73E-3	6.53E-5	0	0
Iodine - 133	Ci	9.17E-4	3.64E-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
Cadmium - 109	Ci	1.02E-4	0	0	0
Technetium - 99m	Ci	1.74E-5	0	0	0
TOTAL FOR PERIOD	Ci	5.75E-2	6.45E-3	0	0

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (7/01/93 - 12/31/93)

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	2.61E-2	2.75E-2	22.9
2. Average diluted concentration during period	μCi/ml	5.99E-11	7.39E-11	22.9
3. Total Body Dose ADULT BODY	Millirem	3.10E-3	5.43E-3	22.9
Percent of Technical Specification	%	1.03E-1	1.81E-1	22.9
4. Maximally Exposed Organ Dose TEEN LIVER	Millirem	5.47E-3	9.72E-3	22.9
Percent of Technical Specification	%	5.47E-2	9.72E-2	22.9
B. Tritium				
1. Total release	Ci	1.88E0	3.37E-1	15.0
2. Average diluted concentration during period	μCi/ml	4.31E-9	9.06E-10	15.0
C. Dissolved and entrained gases				
1. Total release	Ci	9.67E-3	1.49E-4	22.9
2. Average diluted concentration during period	μCi/ml	2.22E-11	4.01E-13	22.9
D. Gross alpha radioactivity				
1. Total release	Ci	3.71E-5	6.24E-6	22.9
2. Average diluted concentration during period	μCi/ml	8.51E-14	1.68E-14	22.9
E. Volume of waste released (prior to dilution)	liters	9.61E5	1.73E5	12.7
F. Volume of dilution water used during period	liters	4.36E11	3.72E11	10.9

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (7/01/93 - 12/31/93)

Table 2B Page 1 of 1
Liquid Effluents

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 3	Quarter 4	Quarter 3	Quarter 4
Strontium - 89	Ci	9.18E-6	9.94E-6	1.08E-4	3.21E-6
Strontium - 90	Ci	5.33E-7	6.51E-7	3.08E-5	6.25E-7
Alpha	Ci	8.68E-7	9.93E-7	3.62E-5	5.25E-6
Tritium	Ci	4.51E-2	4.99E-2	1.83E0	2.87E-1
Phosphorus - 32	Ci	6.19E-6	6.25E-6	1.64E-4	1.95E-5
Iron - 55	Ci	3.51E-4	3.48E-4	5.53E-4	6.66E-5
Xenon - 131M	Ci	0	0	0	0
Xenon - 133	Ci	0	0	3.41E-3	4.01E-5
Xenon - 133M	Ci	0	0	0	0
Xenon - 135	Ci	0	0	6.22E-3	1.09E-4
Xenon - 135M	Ci	0	0	3.67E-5	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	3.33E-3	3.65E-3	2.72E-7	0
Cesium - 134	Ci	2.27E-4	2.57E-4	4.64E-6	3.38E-6
Cesium - 137	Ci	5.99E-4	6.53E-4	1.71E-5	1.20E-5
Cesium - 138	Ci	0	0	0	0
Zinc - 65	Ci	8.88E-3	9.75E-3	0	0
Sodium - 24	Ci	0	0	0	0
Cobalt - 58	Ci	9.18E-4	9.80E-4	0	0
Cobalt - 60	Ci	1.04E-2	1.12E-2	1.82E-5	2.82E-6
Chromium - 51	Ci	5.23E-4	5.07E-4	0	0
TOTAL FOR PERIOD (ABOVE)	Ci	7.03E-2	7.73E-2	1.84E0	2.87E-1

EFFLUENT & WASTE DISPOSAL SEMI-ANNUAL REPORT (07/01/93 - 12/31/93)

PEACH BOTTOM UNITS 2 & 3
 JULY 1, 1993 TO DECEMBER 31, 1993
 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
Class A						
19	Dewatered Resin	HIC/Type A Cask	202.1	3839.9	4.30E+02	Zn-65, Co-60, Cs-137, Cs-134, Cr-51
1	Dewatered Resin	HIC/Type A Cask	132.4	132.4	1.78E+01	Zn-65, Co-60, Cs-137, Mn-54, Cs-134
13	DAW	Metal Drum/STC, Metal Box/STC	variable	(*) 207.6	1.13E-01	Co-60, Zn-65, Fe-55, Cs-137, Mn-54
71	DAW	Metal Drum/STC, Metal Box/STC	variable	(**) 856.3	1.00E+00	Co-60, Zn-65, Fe-55, Cs-137, Mn-54
1	DAW	HIC/Type A Cask	38.3	114.9	3.37E+00	Co-60, Fe-55, Zn-65, Ni-63
1	DAW	HIC/Type A Cask	205.8	205.8	1.41E+00	Co-60, Cs-137, Zn-65, Fe-55, Mn-54
CLASS B						
8	Dewatered Resin	HIC/Type A Cask	202.1	1616.8	3.06E+02	Zn-65, Cs-137, Co-60, Cs-134, Fe-55
2	Dewatered Filters	HIC/Type A Cask	38.3	229.8	3.20E+01	Co-60, Fe-55, Zn-65, Ni-63
CLASS C						
3	Irradiated H'Ware	Steel Liner/ Type B Cask	57.8	173.4	6.03E+04	Fe-55, Co-60, Mn-54, Ni-63, Cr-51
TOTALS						
119				7376.9	6.11E+04	

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

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

- | | | | | |
|----|--------|------------------------------|-------------|---|
| 1. | ≤ 1500 | mRem/Yr
(inhalation path) | - any organ | - "instantaneous" limits
Tech. Spec. 3.8.C.1.b |
| 2. | ≤ 15 | mRem | - any organ | - quarterly dose limits
Tech. Spec. 3.8.C.3.a |
| 3. | ≤ 30 | mRem | - any organ | - yearly dose limits
Tech. Spec. 3.8.C.3.b |

C. Liquid Effluents

- | | | | | |
|----|--|--------------|-----------------------------|--|
| 1. | Concentration ≤ 10 CFR 20,
Appendix B, Table II, Col. 2 | | | - "instantaneous" limits
Tech. Spec. 3.8.B.1 |
| 2. | ≤ 3.0
≤ 10 | mRem
mRem | - total body
- any organ | - quarterly dose limits
Tech. Spec. 3.8.B.2.a |
| 3. | ≤ 6.0
≤ 20 | mRem
mRem | - total body
- any organ | - yearly dose limits
- 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 or the Canberra S95/Dual Host 3400 Counting System
 - Gas Marinelli -

B. Iodine:

The method used is the Nuclear Data 6700 Counting System or the Canberra S95/Dual Host 3400 Counting System
 - Charcoal Cartridge -

C. Particulates:

The method used is the Nuclear Data 6700 Counting System or the Canberra S95/Dual Host 3400 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:	15	7
Total time for batch releases (minutes):	3506	893
Maximum time period for batch release (minutes):	368	260
Average time period for batch release (minutes):	234	128
Minimum time period for batch release (minutes):	43	65
Dilution volume (liters):	1.37E10	2.28E9

B. Gaseous:

Not applicable

ATTACHMENT A (continued)

6. Abnormal Releases:

A. Liquid:

1. Event description - On 7/23/93 routine sampling of the high pressure service water (HPSW) effluent to the discharge canal detected low level radioactive contamination. Subsequent investigation determined that a trace amount of condensate stay full or primary coolant water was leaking past the Unit 2 'B' residual heat removal (RHR) heat exchanger floating head gasket into the 'B' loop of the HPSW system. The gasket was replaced and leak tested satisfactorily.

It was estimated that the contaminated water released $7.65E-3$ millirem total body dose to the discharge canal from 7/23/93 to 12/7/93. This dose contribution was well below the limits specified in Technical Specifications.

Analysis of Release - The representative sample obtained was analyzed for all the parameters of a radioactive effluent release. The results were then calculated based on the actual release conditions. The Dose contributions and Isotope quantities from this continuous release were added to this Semi-Annual Effluent Report for the applicable reporting period.

2. Event description - On 11/10/93 routine sampling of the high pressure service water (HPSW) effluent to the discharge canal detected low level radioactive contamination. Subsequent investigation determined that a trace amount of condensate stay full or primary coolant water was leaking past the Unit 2 'A' residual heat removal (RHR) heat exchanger floating head gasket into the 'A' loop of the HPSW system. The gasket was replaced and leak tested satisfactorily.

It was estimated that the contaminated water released $6.41E-4$ millirem total body dose to the discharge canal from 11/10/93 to 1/9/94. This dose contribution was well below the limits specified in Technical Specifications.

Analysis of Release - The representative sample obtained was analyzed for all the parameters of a radioactive effluent release. The results were then calculated based on the actual release conditions. The Dose contributions and Isotope quantities from this continuous release were added to this Semi-Annual Effluent Report for the applicable reporting period.

6. Abnormal Releases: (Continued)

B. Gaseous:

PBAPS LER 2-93-15

Event Description - While performing the weekly filter change on December 1, 1993 the Main Stack Particulate Filter and Charcoal Cartridge Assembly was found to be improperly secured, resulting in diluted sample flow. Accordingly, representative sampling of Main Stack particulate, iodine, and fission gas releases was not obtained for the 7-day period from November 24 through December 1, 1993.

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