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

SEMI-ANNUAL EFFLUENT RELEASE REPORT

NO. 35

JANUARY 1, 1993 THROUGH JUNE 30, 1993

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)

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Radwaste Manger

A. D. Odell

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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 January 1, 1993 through June 30, 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.

The Off-Site Dose Calculation Manual (ODCM) was under revision during the reporting period. This revision was approved and issued on July 1, 1993. Revisions made were:

1. The addition of a stored feed component to the dose factor equation of Section VIII, Note 2 and the consequent correction of the dose factor values listed in Table IV.C.1.

2. A change in the wording of Section III.A to allow for the possible use of revised 10CFR20, Appendix B, Table II, Column 2 values for the liquid radwaste release flow rate determination.

3. Changes in Section VII to reflect the current Radiological Environmental Monitoring Program, correct typographical errors, and provide updated site maps.

4. Upgrade of the system diagrams.

5. Updated XE-138 decay corrected dose factors in Table IV.A.1 resulting from the use of a more accurate value for the half life of XE-138.

6. Clarification of the liquid radwaste activity monitor setpoint methodology.

7. A change in the skin dose rate equation of Section IV.A.1.a to reflect a more accurate specification of limiting nuclides.

A copy of the revised ODCM is attached to this report.

The station Process Control Program (PCP) was revised on 12-28-92. Issuance of this revised PCP was made during the first half of 1993. The revision was driven by the Philadelphia Electric Company effort to make certain procedures common between their nuclear stations at Peach Bottom and Limerick. No changes were made to the basic content of the PCP. A copy of the revised RW-C-100 Solid Radwaste System Process Control Program (PCP) is attached to this report.

There was one unplanned release of liquid radioactive material.

Table 1A Page 1 of 1
Gaseous Effluents - Summation of All Releases

	UNITS	QUARTER 1	QUARTER 2	EST. ERROR TOTAL %
A. Fission & activation gases				
1. Total release	Ci	1.77E3	2.01E3	18.8
2. Average release rate for period	μCi/sec	2.25E2	2.56E2	18.8
3. Gamma Air Dose	Millirad	5.89E-2	6.73E-2	18.8
Percent of Technical Specification	%	5.89E-1	6.73E-1	18.8
4. Beta Air Dose	Millirad	4.64E-2	5.85E-2	18.8
Percent of Technical Specification	%	2.32E-1	2.93E-1	18.8
B. Iodines				
1. Total iodine-131	Ci	3.53E-3	9.50E-3	22.9
2. Average release rate for period	μCi/sec	4.49E-4	1.21E-3	22.9
3. Critical Organ dose	Millirem	1.60E-2	4.89E-2	22.9
Percent of Technical Specification	%	1.07E-1	3.26E-1	22.9
C. Particulates				
1. Particulates with half-lives greater than 8 days (includes Alpha and Strontium 89-90)	Ci	7.70E-4	1.72E-3	22.9
2. Average release rate for period	μCi/sec	9.79E-5	2.19E-4	22.9
3. Average Gross Alpha Radioactivity	Ci	3.91E-6	3.47E-6	22.9
D. Tritium				
1. Total release	Ci	5.00E0	4.24E0	23.5
2. Average release rate for period	μCi/sec	6.36E-1	5.39E-1	23.5

Table 1B Page 1 of 2
Gaseous Effluents for Release Point - Main Stack

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
1. Fission gases					
Krypton - 85M	Ci	7.00E1	6.04E1	0	0
Krypton - 87	Ci	4.20E1	1.29E2	0	0
Krypton - 88	Ci	9.57E1	1.09E2	0	0
Xenon - 133	Ci	1.10E3	6.24E2	0	0
Xenon - 135	Ci	1.50E2	2.15E2	0	0
Xenon - 135M	Ci	2.19E1	1.57E2	0	0
Xenon - 138	Ci	6.00E1	3.79E2	0	0
Argon - 41 (Activation Gas)	Ci	7.42E0	0	0	0
Unidentified	Ci	0	0	0	0
Total for Period	Ci	1.55E3	1.67E3	0	0
2. Iodines					
Iodine - 131	Ci	1.63E-3	2.56E-3	0	0
Iodine - 133	Ci	5.86E-3	5.19E-3	0	0
Iodine - 135	Ci	6.80E-3	6.99E-3	0	0
Total for Period	Ci	1.43E-2	1.47E-2	0	0
3. Particulates					
Strontium - 89	Ci	3.73E-4	8.14E-4	0	0
Strontium - 90	Ci	3.85E-7	1.21E-6	0	0
Strontium - 91	Ci	3.17E-4	4.32E-4	0	0
Cesium - 134	Ci	0	0	0	0
Cesium - 137	Ci	1.40E-6	1.48E-5	0	0
Cesium - 138	Ci	1.57E-2	2.81E-2	0	0
Barium - 139	Ci	2.68E-3	3.96E-3	0	0
Barium - 140	Ci	2.13E-4	3.80E-4	0	0
Lanthanum - 140	Ci	1.45E-4	2.40E-4	0	0
Cobalt - 57	Ci	0	0	0	0
Cobalt - 58	Ci	0	0	0	0

Table 1B Page 2 of 2
Gaseous Effluents For Release Point - Main Stack

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
Cobalt - 60	Ci	0	0	0	0
Zinc - 65	Ci	4.30E-6	0	0	0
Yttrium - 91M	Ci	3.14E-3	4.88E-3	0	0
Iodine - 133	Ci	0	2.90E-5	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
	Ci				
	Ci				
Total for Period	Ci	2.26E-2	3.89E-2	0	0

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 1	Quarter 2	Quarter 1	Quarter 2
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	0	0	0	0
Xenon - 135	Ci	0	1.05E2	0	0
Xenon - 135M	Ci	0	0	0	0
Xenon - 138	Ci	0	0	0	0
Unidentified	Ci	2.17E2	2.28E2	0	0
Total for Period	Ci	2.17E2	3.33E2	0	0
2. Iodines					
Iodine - 131	Ci	1.90E-3	6.94E-3	0	0
Iodine - 133	Ci	4.98E-3	2.27E-2	0	0
Iodine - 135	Ci	0	2.41E-2	0	0
Total for Period	Ci	6.88E-3	5.37E-2	0	0
3. Particulates					
Strontium - 89	Ci	1.15E-4	3.87E-4	0	0
Strontium - 90	Ci	5.20E-6	3.28E-6	0	0
Strontium - 91	Ci	0	9.18E-5	0	0
Cesium - 134	Ci	0	0	0	0
Cesium - 137	Ci	0	0	0	0
Cesium - 138	Ci	1.06E-2	2.17E-2	0	0
Barium - 139	Ci	1.36E-3	4.07E-3	0	0
Barium - 140	Ci	0	1.15E-4	0	0
Lanthanum - 140	Ci	0	1.29E-4	0	0
Cobalt - 57	Ci	0	0	0	0
Cobalt - 58	Ci	0	0	0	0
Cobalt - 60	Ci	0	0	0	0

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 1	Quarter 2	Quarter 1	Quarter 2
Zinc - 65	Ci	0	0	0	0
Yttrium - 91M	Ci	0	1.63E-3	0	0
Iodine - 133	Ci	1.58E-4	4.56E-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
Ce-144	Ci	5.38E-5	0	0	0
Mo-99	Ci	1.14E-5	2.72E-5	0	0
Tc-99m	Ci	1.50E-5	3.28E-5	0	0
Total for Period	Ci	1.23E-2	2.86E-2	0	0

Table 2A Page 1 of 1
Liquid Effluents - Summation of All Releases

	Units	Quarter 1	Quarter 2	Est. Error Total %
A. Fission & activation products				
1. Total release (not including tritium, gases, alpha)	Ci	2.83E-3	1.55E-4	22.9
2. Average diluted concentration during period	μCi/ml	7.31E-11	9.81E-11	22.9
3. Total Body Dose ADULT BODY	Millirem	7.64E-4	6.70E-5	22.9
Percent of Technical Specification	%	2.55E-2	2.23E-3	22.9
4. Maximally Exposed Organ Dose CHILD BONE	Millirem	2.42E-3	1.32E-4	22.9
Percent of Technical Specification	%	2.42E-2	1.32E-3	22.9
B. Tritium				
1. Total release	Ci	4.74E0	2.48E-1	15.0
2. Average diluted concentration during period	μCi/ml	1.22E-7	1.57E-7	15.0
C. Dissolved and entrained gases				
1. Total release	Ci	1.33E-2	5.86E-4	22.9
2. Average diluted concentration during period	μCi/ml	3.44E-10	3.71E-10	22.9
D. Gross alpha radioactivity				
1. Total release	Ci	1.31E-4	7.58E-6	22.9
2. Average diluted concentration during period	μCi/ml	3.39E-12	4.80E-12	22.9
E. Volume of waste released (prior to dilution)	liters	3.10E6	1.44E5	12.7
F. Volume of dilution water used during period	liters	3.87E10	1.58E9	10.9

Table 2B Page 1 of 2
Liquid Effluents

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
Strontium - 89	Ci	0	0	6.07E-5	3.08E-6
Strontium - 90	Ci	0	0	2.17E-5	1.17E-6
Alpha	Ci	0	0	1.31E-4	7.58E-6
Tritium	Ci	0	0	4.74E0	2.48E-1
Phosphorus - 32	Ci	0	0	8.23E-4	2.41E-5
Iron - 55	Ci	0	0	1.24E-3	1.03E-4
Xenon - 131M	Ci	0	0	0	0
Xenon - 133	Ci	0	0	4.21E-3	1.51E-4
Xenon - 133M	Ci	0	0	2.57E-5	0
Xenon - 135	Ci	0	0	8.98E-3	4.35E-4
Xenon - 135M	Ci	0	0	8.80E-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	0	0	2.94E-7	0
Cesium - 134	Ci	0	0	2.87E-5	2.99E-6
Cesium - 137	Ci	0	0	6.18E-5	2.11E-5
Cesium - 138	Ci	0	0	0	0
Zinc - 65	Ci	0	0	1.12E-4	0
Sodium - 24	Ci	0	0	0	0
Cobalt - 58	Ci	0	0	1.88E-7	0
Cobalt - 60	Ci	0	0	1.42E-4	0
Iodine - 131	Ci	0	0	3.82E-6	0
Iodine - 133	Ci	0	0	0	0
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	3.20E-4	0

Table 2B Page 2 of 2
Liquid Effluents

Nuclides Released	Units	Continuous Mode		Batch Mode	
		Quarter 1	Quarter 2	Quarter 1	Quarter 2
Yttrium - 91M	Ci	0	0	6.50E-6	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	0
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
Silver - 110m	Ci	0	0	1.12E-5	0
	Ci				
Total for Period (above)	Ci	0	0	4.76E0	2.49E-1

PEACH BOTTOM UNITS 2 & 3
JANUARY 1, 1993 TO JUNE 30, 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						
25	Dewatered Resin	HIC/Type A Cask	202.1	5052.5	2.64E+02	Zn-65, Co-60, Cs-137, Fe-55, I-131
28	DAW	Metal Drum/STC, Metal Box/STC	variable	(*) 1147.9	4.88E-01	Co-60, Zn-65, Fe-55, Cs-137, Mn-54
35	DAW	Metal Drum/STC, Metal Box/STC	variable	(**) 697.8	5.22E-01	Co-60, Zn-65, Fe-55, Cs-137, Mn-54
1	Dewatered Resin/ Sand Blast Grit	HIC/Type A Cask	202.1	202.1	1.72E+00	Zn-65, Co-60, Mn-54, Cs-137, Ni-63
1	Filters / DAW	HIC/Type A Cask	205.8	205.8	304E+00	Co-60, Cs-137, Fe-55, Zn-65, Mn-54
1	Irradiated H'Ware	Steel Liner/ Type B Cask	53.0	53.0	2.69E+01	Co-60, Sb-125, Fe-55, Ni-63, C-14
CLASS B						
3	Dewatered Resin	HIC/Type A Cask	202.1	606.3	3.89E+01	Cs-137, Zn-65, Co-60, Cs-134, I-131
1	Dewatered Resin	HIC/Type B Cask	132.4	132.4	8.95E+02	Zn-65, Cr-51, Co-60, Mn-54, Cs-137
1	Dewatered Resin/ Sand Blast Grit	HIC/Type A Cask	202.1	202.1	1.24E+02	Zn-65, Co-60, Cs-137, Cs-134, Ni-63
1	Irradiated H'Ware	Steel Liner/ Type B Cask	53.0	53.0	5.24E+01	Co-60, Fe-55, Ni-63, Sb-125, Ni-59
CLASS C						
1	Irradiated H'Ware	Steel Liner/ Type B Cask	22.4	22.4	6.03E+03	Co-60, Fe-55, Ni-63, Ni-59, C-14
TOTALS 98				8375.3	7.44E+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.	≤500	mRem/Yr	- total body	-	"instantaneous" limits
	≤3000	mRem/Yr	- skin		Tech. Spec. 3.8.C.1.a
2.	≤10	mRad	- air gamma	-	quarterly air dose limits
	≤20	mRad	- air beta		Tech. Spec. 3.8.C.2.a
3.	≤20	mRad	- air gamma	-	yearly air dose limits
	≤40	mRad	- air beta		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	mRem	- total body	-	quarterly dose limits
	≤10	mRem	- any organ		Tech. Spec. 3.8.B.2.a
3.	≤6.0	mRem	- total body	-	yearly dose limits
	≤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 10CFR20, 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.

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:

	QTR 1	QTR 2
Number of batch releases:	48	3
Total time for batch releases (minutes):	11379	577
Maximum time period for batch release (minutes):	320	257
Average time period for batch release (minutes):	237	192
Minimum time period for batch release (minutes):	55	65
Dilution volume (liters):	2.75E10	1.58E9

B. Gaseous:

Not applicable

6. Abnormal Releases:

A. Liquid:

Event description - On 3/22/93 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 3 'D' 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 approximately 880 liters of contaminated water was released to the discharge canal. The sample results indicated the activity released 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 were added to this Semi-Annual Effluent Report for the applicable reporting period, but the duration and dilution volume of this release was not included in the batch release summary of Attachment A.

B. Gaseous:

None