2880089940

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

SEMI-ANNUAL EFFLUENT RELEASES REPORT

NO. 25

JANUARY 1, 1988 THROUGH JUNE 30, 1988

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

PHILADELPHIA ELECTRIC COMPANY

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Preparation Directed By:
D. M. Smith, Vice President
Peach Bottom Atomic Power Station

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Technical Concurrences: (for accuracy of information)

J. R. McFadden for EAF 8/25/88
Director-Radiation Protection Date

Walter Kropp 25 Aug 88
Director-Radwaste Date

SEMI-ANNUAL EFFLUENT RELEASE REPORT
JANUARY 1, TO JUNE 30, 1988

I. INTRODUCTION

In accordance with the Unique Reporting Requirements of Technical Specification 6.9.2.h(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 through June 30, 1988. The notations E and E- are used to denote positive and negative exponents to the base 10.

The release of radioactive materials during the reporting period was within the Technical Specification limits. There were changes made to the Offsite Dose Calculation Manual (ODCM) during the reporting period. A copy of the Offsite Calculation Manual is attached to this report.

There were no known unplanned releases of liquid radioactive material.

A special report discussing the inoperability of the Main Stack Sample Flow Monitor is included in the ATTACHMENT B section of this report.

Iodine was not present from either the roof vents or main stack in section labeled Gaseous Effluents (Table 1A). Therefore, the Critical Organ Dose for iodines in mRem was zero. In accordance with the current revision of the Offsite Dose Calculation Manual (ODCM) attached to this report, the Critical Organ Dose was calculated using the particulates with half-lives greater than 8 days. These calculations are incorporated into the ATTACHMENT B section of the report.

In section labeled Liquid Effluents (Table 2B) the Phosphorus-32 reported value is less than the lower limit of detection. The half-life of Phosphorus-32 has been exceeded by a factor of eight half-lives, therefore, Phosphorus-32 is reported as zero for this reporting period. In general, any isotope with half-lives greater than eight shall be reported as zero.

TABLE 1A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1988A)

GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit 2&3	Quarter 1	Quarter 2	Est. Total Error, %
A. Fission & activation gases				
1. Total release	Ci	3.02 E2	2.93 E2	54.0 E0
2. Average release rate for period	uCi/sec	3.84 E1	3.46 E1	
3. Gamma Air Dose	Millirad	3.53 E-2	4.44 E-2	
Percent of Tech. Spec.	%	3.53 E-1	4.44 E-1	
4. Beta Air Dose	Millirad	1.77 E-2	1.96 E-2	
Percent of Tech. Spec.	%	8.85 E-2	9.80 E-1	
B. Iodines				
1. Total iodine-131	Ci	0	0	61.0 E0
2. Average release rate for period	uCi/sec	0	0	
3. Critical Organ Dose	Millirem	5.11 E-6	3.57 E-5	
Percent of Tech. Spec.	%	3.41 E-5	2.38 E-4	
C. Particulates				
1. Particulates with half-lives greater than 8 days (includes Alpha and Strontium 89-90)	Ci	2.65 E-4	3.31 E-4	61.0 E0
2. Average release rat period	uCi/sec	4.11 E-5	3.91 E-5	
3. Gross Alpha Radioact	Ci	2.50 E-5	4.11 E-5	
D. Tritium				
1. Total release	Ci	3.41 E0	1.87 E0	94.0 E0
2. Average release rate for period	uCi/sec	4.34 E-1	2.21 E-1	

TABLE 1B

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1988A)

GASEOUS EFFLUENTS FOR RELEASE POINT: MAIN STACK

		CONTINUOUS MODE		BATCH MODE	
Nuclides Released	Unit 2 & 3	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	0	0	0
Xenon-135M	Ci	0	0	0	0
Xenon-138	Ci	0	0	0	0
Unidentified	Ci	2.47 E2	2.22 E2	0	0
Total for period	Ci	2.47 E2	2.22 E2	0	0
2. Iodines					
Iodine-131	Ci	0	0	0	0
Iodine-133	Ci	0	0	0	0
Iodine-135	Ci	0	0	0	0
Total for period	Ci	0	0	0	0
3. Particulates					
Strontium-89	Ci	4.90 E-7	3.30 E-7	0	0
Strontium-90	Ci	2.60 E-7	8.50 E-7	0	0
Strontium-91	Ci	0	0	0	0
Cesium-134	Ci	0	0	0	0

TABLE 1B (Continued)

Nuclides Released	Unit 2 & 3	CONTINUOUS MODE Quarter 1	CONTINUOUS MODE Quarter 2	BATCH MODE Quarter 1	BATCH MODE Quarter 2
Cesium-137	Ci	0	0	0	0
Cesium-138	Ci	0	0	0	0
Barium-139	Ci	0	0	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
Zinc-65	Ci	0	0	0	0
Yttrium-91M	Ci	0	0	0	0
Iodine-133	Ci	0	0	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
Totals	Ci	7.50 E-7	1.21 E-6	0	0

TABLE 1C

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1988A)

GASEOUS EFFLUENTS FOR RELEASE POINT: U/2 & U/3 Roof Vents

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		CONTINUOUS MODE		BATCH MODE	
Nuclides Released	Unit 2&3	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	0	0	0
Xenon-135M	Ci	0	0	0	0
Xenon-138	Ci	0	0	0	0
Xenon-133M	Ci	0	0	0	0
Unidentified	Ci	5.50 E1	7.09 E1	0	0
Total for period	Ci	5.50 E1	7.09 E1	0	0
2. Iodines					
Iodine-131	Ci	0	0	0	0
Iodine-133	Ci	0	0	0	0
Iodine-135	Ci	0	0	0	0
Total for period	Ci	0	0	0	0
3. Particulates					
Strontium-89	Ci	1.65 E-5	3.05 E-5	0	0
Strontium-90	Ci	8.95 E-6	1.50 E-5	0	0
Strontium-91	Ci	0	0	0	0
Cesium-134	Ci	0	0	0	0
Cesium-137	Ci	0	0	0	0

TABLE 1C (Continued)

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Nuclides Released	Unit 2&3	CONTINUOUS MODE Quarter 1	CONTINUOUS MODE Quarter 2	BATCH MODE Quarter 1	BATCH MODE Quarter 2
Cesium-138	Ci	0	0	0	0
Barium-139	Ci	0	0	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	1.11 E-4	9.13 E-5	0	0
Zinc-65	Ci	1.03 E-4	1.62 E-4	0	0
Yttrium-91M	Ci	0	0	0	0
Iodine-133	Ci	0	0	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
Totals	Ci	2.39 E-4	2.89 E-4	0	0

TABLE 2A

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1988A)

LIQUID EFFLUENTS - SUMMATION OF ALL RELEASES

	Unit 2&3	Quarter 1	Quarter 2	Est.Total Error, %
A. Fission & activation gases				
1. Total release (not including tritium, gases, alpha)	Ci	9.49 E-2	7.69 E-2	32.0 E0
2. Average diluted concentration during period	uCi/ml	6.04 E-9	5.34 E-9	
3. Whole Body Dose	Millirem	4.50 E-1	5.47 E-1	
Percent of Technical Specification	%	15.0 E0	18.2 E0	
4. Bone Dose	Millirem	3.64 E-1	4.57 E-1	
Percent of Technical Specification	%	3.64 E0	4.57 E0	
B. Tritium				
1. Total release	Ci	4.40 E0	2.43 E0	39.0 E0
2. Average diluted concentration during period	uCi/ml	2.81 E-7	1.69 E-7	
C. Dissolved and entrained gases				
1. Total release	Ci	0	0	42.0 E0
2. Average diluted concentration during period	uCi/ml	0	0	
D. Gross alpha radioactivity				
1. Total release	Ci	1.14 E-4	1.06 E-4	39.0 E0
2. Average diluted concentration during period	uCi/ml	7.26 E-12	7.36 E-12	
E. Volume of waste released (prior to dilution)	liters	4.98 E6	4.61 E6	32.0 E0
F. Volume of dilution water used during period	liters	1.57 E10	1.44 E10	30.0 E0

EFFLUENT AND WASTE DISPOSAL SEMIANNUAL REPORT (1988A)

LIQUID EFFLUENTS

Nuclides Released	Unit 2&3	CONTINUOUS MODE Quarter 1	CONTINUOUS MODE Quarter 2	BATCH MODE Quarter 1	BATCH MODE Quarter 2
Strontium-89	Ci	0	0	1.87 E-4	8.35 E-5
Strontium-90	Ci	0	0	4.80 E-4	3.99 E-5
Alpha	Ci	0	0	1.14 E-4	1.07 E-4
Tritium	Ci	0	0	4.40 E0	2.43 E0
Phosphorus-32	Ci	0	0	0	0
Iron-55	Ci	0	0	1.33 E-2	2.55 E-3
Xenon-131M	Ci	0	0	0	0
Xenon-133	Ci	0	0	0	0
Xenon-133M	Ci	0	0	0	0
Xenon-135	Ci	0	0	0	0
Xenon-138	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
Xenon-135M	Ci	0	0	0	0
Manganese-54	Ci	0	0	1.69 E-5	0
Celsium-134	Ci	0	0	1.76 E-2	1.99 E-2
Cesium-137	Ci	0	0	2.73 E-2	3.73 E-2
Cesium-138	Ci	0	0	0	0
Zinc-65	Ci	0	0	2.11 E-2	8.94 E-3
Sodium-24	Ci	0	0	0	0
Cobalt-58	Ci	0	0	0	0
Cobalt-60	Ci	0	0	1.43 E-2	8.09 E-3
Iodine-131	Ci	0	0	0	0
Iodine-133	Ci	0	0	0	0
Molybdenum-99	Ci	0	0	0	0

TABLE 2B (Continued)

Nuclides Released	Unit 2&3	CONTINUOUS MODE Quarter 1	CONTINUOUS MODE Quarter 2	BATCH MODE Quarter 1	BATCH MODE Quarter 2
Iodine-135	Ci	0	0	0	0
Barium-140	Ci	0	0	0	0
Neptunium-239	Ci	0	0	0	0
Chromium-51	Ci	0	0	0	0
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	0
Lanthanum-140	Ci	0	0	0	0
Cadmium-109	Ci	0	0	0	0
Cesium-136	Ci	0	0	0	0
Silver-110M	Ci	0	0	8.53 E-5	8.51 E-5
Cesium-144	Ci	0	0	0	0
Antimony-124	Ci	0	0	0	0
Iron-59	Ci	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
Total for Period (above)	Ci	0	0	4.495 E0	2.507 E0

PEACH BOTTOM UNITS 2 & 3
JANUARY 1 TO JUNE 30, 1988
CLASSES OF SOLID RADIOACTIVE WASTE SHIPMENTS

Total # of Shipments	Waste Description (Source of Waste)	Container/Type	Individual Volume (cubic feet)	Total Volume (cubic feet)	Total Curie	Principal Radionuclides
CLASS A						
20	Dewatered Resin	HIC/ Type A Cask	174.3 120.3 83.4	2963.1 240.6 83.4	231.5665	Fe-55, Co-60, Zn-65, Cs-134, Cs-137
16	DAW	Metal Drum/ STC	7.5 11.3	6045.0 113.0	63.3197	Fe-55, Co-60, Zn-65 Cs-134, Cs-137
1	DAW	Poly Drum/ STC	38.3	76.6	.9037	Fe-55, Co-60, Zn-65 Cs-134, Cs-137
39	DAW	B-25 Box/ STC	96.0	5157.2	4.7414	Fe-55, Co-60, Zn-65, Cs-134, Cs-137
1	Filters	HIC/ Type A Cask	170.8	170.8	17.6857	Fe-55, Co-60, Zn-65, Cs-134, Cs-137
1	Dewatered Resin/ DAW	HIC,STC/ Type A Cask	7.5	105.0	5.8574	Fe-55, Co-60, Zn-65 Cs-134, Cs-137
CLASS B						
7	Dewatered Resin	HIC/ Type A Cask	174.3	1220.1	176.6622	Fe-55, Co-60, Zn-65 Cs-134, Cs-137
1	DAW	HIC/ Type A Cask	120.3	120.3	0.8271	Fe-55, Co-60, Zn-65 Cs-134, Cs-137
1	Dewatered Resin	HIC/ Type B Cask	120.3	120.3	158.9576	Fe-55, Co-60, Zn-65 Cs-134, Cs-137
CLASS C						
1	Filters, DAW	HIC/ Type B Cask	120.3	120.3	16.9322	Fe-55, Co-60, Zn-65 Cs-134, Cs-137
TOTALS						
88				16535.7	678.4535	

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

ATTACHMENT A
SUPPLEMENTAL 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 ≤ 3000 mRem/Yr - skin	- "instantaneous" limits per Tech. Spec. 3.8.C.1.a
2.	≤ 10 mRad - gamma air ≤ 20 mRad - beta air	- quarterly air dose limits per Tech. Spec. 3.8.C.2.a
3.	≤ 20 mRad - gamma air ≤ 40 mRad - beta air	- yearly air dose limits per Tech. Spec. 3.8.C.2.b

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

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

C. Liquid Effluents:

1.	Concentration ≤ 10 CFR 20, Appendix B, Table II, Col. 2	- "instantaneous" limits per Tech. Spec. 3.8.B.1
2.	≤ 3.0 mRem - total body ≤ 10 mRem - any organ	- quarterly dose limits per Tech. Spec. 3.8.B.2.a
3.	≤ 6.0 mRem - total body ≤ 20 mRem - any organ	- yearly dose limits per 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 releases 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 6600/6700 Counting System - Gas Marinelli

B. Iodine

The method used in the Nuclear Data 6600/6700 Counting System - Charcoal Cartridge

C. Particulate:

The method used is the Nuclear Data 6600/6700 Counting System - Air Particulate Sample, 47 mm filter

D. Liquid Effluents:

The method used is the Nuclear Data 6600/6700 Counting System and the Radwaste Liquid Discharge Pre-Release Method with a liter bottle.

5. Batch Releases

A. Liquid

	Q1	Q2
# of Batch Releases:	66	69
Total Time for batch releases, minutes	18396	16871
Maximum time period for a batch release, minutes	340	340
Average time period for batch release, minutes	279	245
Minimum time period for a batch release, minutes	38	23
Dilution flow (Liters)	1.57 E10	1.44 E10

B Gaseous: N/A

6. Abnormal Releases

A. Liquid: See Attachment B

B. Gaseous: None

ATTACHMENT B

SUMMARY OF UNPLANNED RELEASES

1. Inoperable Main Stack Sample Flow Monitor

On February 9, 1988, the Main Stack sample flow rate monitor (FT-7341) could not be calibrated during a surveillance test, thus the monitor was determined to be inoperable. Technical Specification 4.8.C.4.e requires that if inoperable radiation monitors cannot be corrected within 30 days, an explanation of why the inoperability was not corrected will be reported in the next Semi-annual Radioactive Effluent Releases Report A replacement monitor was ordered; however, the manufacturer could not supply the same model. In addition, the manufacturer could not deliver a replacement until late May, 1988. On March 18, 1988, a calibration check was successfully performed on a redundant in-line Flow Indicating Transmitter (FIT-6509), which is being used to temporarily perform the same function as FT-7341. Meanwhile a site modification is currently being designed to install the new monitor. This modification is expected to be installed by October 10, 1988.

2. Calculations For Critical Organ Dose Using Particulates With Half-Lives Greater Than 8 Days

The following doses were calculated using particulates identified during the first and second quarter reporting period of 1988;

PARTICULATE	CRITICAL ORGAN DOSE, LIVER, (MREM) Quarter 1	Quarter 2
Sr-89	6.40 E-8	1.18 E-7
Sr-90	2.97 E-6	5.03 E-6
Co-60	1.03 E-8	8.50 E-8
Zn-65	2.07 E-6	3.05 E-5
Total	5.11 E-6	3.57 E-5

The percentage of Technical Specification for the Critical Organ (liver) for the first quarter is 3.41 E-5, second quarter is 2.38 E-4.