

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-277/78-33
50-278/78-36
Docket No. 50-277
50-278
License No. DPR-44 Priority - Category C
DPR-56
Licensee: Philadelphia Electric Company
2301 Market Street
Philadelphia, Pennsylvania 19101

Facility Name: Peach Bottom Atomic Power Station, Units 2 and 3

Inspection at: Delta, Pennsylvania

Inspection conducted: December 18-20, 1978

Inspectors: J. J. Kottan, Radiation Specialist
D. M. Gloski, Co-op

1/4/79
date signed

date signed

Approved by: J. P. Stohr
J. P. Stohr, Chief, Environmental and
Special Projects Section, FF&MS Branch

date signed
1/5/79
date signed

Inspection Summary:

Inspection on December 18-20, 1978 (Report No. 50-277/78-33; 50-278/78-36)
Areas Inspected: Routine, unannounced inspection of the licensee's chemical and radiochemical measurements program using NRC-I Mobile Radiological Measurements Laboratory and laboratory assistance provided by DOE Radiological and Environmental Services Laboratory. Areas reviewed included: program for quality control of analytical measurements; audit results; performance on radiological analyses of split actual effluent samples; and, effluent control records and procedures. The inspection involved 22 inspector-hours onsite by one NRC regional based inspector.

Results: Of the four areas inspected, no items of noncompliance were identified.

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DETAILS

1. Persons Contacted

Principal Licensee Employees

- *W. Ullrich, Station Superintendent
- R. Fleishman, Assistant Superintendent
- *J. Davenport, Engineer, QA
- *R. Costagliola, General Supervisor, QA
- *C. Endriss, Engineer, QA
- *H. Watson, Chemist
- E. Ott, Site QA Auditor

The inspector also interviewed other licensee employees including members of the chemistry and health physics staffs.

* denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Infraction (50-277/78-39-01, 50-278/76-29-01): Iodine and Particulate Surveillance. The licensee has completed installation of flow gauges on the Unit 2 and Unit 3 plant vent stack sampling systems to control the flow through the iodine and particulate sampling system. This item is closed.

(Closed) Infraction (50-277/77-37-01, 50-278/77-37-01): Failure to Follow Chemical and Radiological Procedures. The inspector reviewed the licensee procedures identified in this item of noncompliance (specifically procedures HPO/CO-18, HPO/CO-19, HPO/CO-29, HPA-2, and HPA-21) and noted the licensee had modified these procedures to reflect current operating practices. This action is in accordance with the action in the licensee's letter dated January 6, 1978, to NRC:I. This item is closed.

(Closed) Infraction (50-277/77-37-02, 50-278/77-37-02): Chemistry Quality Control. The inspector noted the licensee has written and implemented quality control procedures for the periodic calibration and check of laboratory instruments used in the analysis of reactor coolant for safety related parameters. The inspector also noted that the licensee was complying with a procedure issued by the Electric Production Department Chemical Laboratory for the control

of reagents against deterioration. These reagents are used in performance of safety related analyses on reactor coolant and are supplied to the Peach Bottom Atomic Power Station by the Electric Production Department Chemical Laboratory. This item is closed.

3. Laboratory QC Program

The inspector reviewed the licensee's program for the quality control of analytical measurements. The inspector noted that the licensee's RT series procedures cover quality control for both reactor coolant chemistry analyses and radiological analyses of effluent samples. The licensee's effluent radiological analysis program consists of monthly sample splits with an outside laboratory for analyses required by his Technical Specifications. In addition, the licensee has analyzed unknown samples submitted by an outside laboratory. Also, the operating procedures for the various counting instruments specify daily background and source checks. The inspector discussed laboratory QC with the licensee. The inspector noted the licensee has no regulatory requirements in the area of laboratory QC, and, therefore, had no further questions in this area. No items of noncompliance were identified.

4. Audit Results

The inspector determined that the licensee's effluent monitoring and chemistry program were on the site QA audit list. The inspector reviewed Audit No. 78-3 HPC, dated January 31, 1978. The inspector had no further questions in this area. No items of noncompliance were identified.

5. Confirmatory Measurements

During the inspection, actual liquid and gaseous effluent samples were split between the licensee and NRC:I for the purpose of inter-comparison. The effluent samples were analyzed by the licensee using his normal methods and equipment, and the NRC using the NRC:I Mobile Radiological Measurements Laboratory. Joint analyses of actual effluent samples determine the licensee's capability to measure radioactivity in effluent samples.

In addition, a liquid effluent sample was sent to the NRC reference laboratory, Department of Energy, Radiological and Environmental Services Laboratory (RESL), for analyses requiring wet chemistry. The analyses to be performed on the sample are: Sr-89, Sr-90, gross alpha, gross beta and tritium. These results will be compared with the licensee's results when received at a later date, and will be documented in a subsequent inspection report.

The results of the sample measurements compared, indicated that all of the measurements were in agreement, or possible agreement, under the criteria used for comparing results. (See Attachment 1) The results of the comparison are listed in Table I.

6. Records and Procedures

The inspector reviewed the following records and procedures:

- a. Airborne effluent analysis data (September, 1978 to December, 1978)
- b. Counter Calibration and Check Records (January, 1978 to December, 1978)
- c. Laboratory QC Sample Analyses (June, 1978 to December, 1978)
- d. The following procedures:
 - (1) CA-9.2 Determination of Chloride - Silver Nitrate Turbidimeter Method
 - (2) CA-65 Calibration of Hach Turbidimeters
 - (3) HPA-21 General Counting Room Calibration Procedures
 - (4) HPA-2 Operation of NMC Internal Gas Flow Proportional Counter
 - (5) HPA-63D Calibration of Ventillation Systems Radiation Monitors
 - (6) HPO/CO-18, Processing Liquid Radioactive Waste
 - (7) HPO/CO-19, Preparation of Radwaste Samples and Analysis
 - (8) HPO/CO-20, Preparation of the Monthly Radwaste Release Composite Sample
 - (9) HPO/CO-29, Sampling of Gaseous Release for Tritium in Water Vapor

- (10) HPO/CO-33, Quality Control of Effluent Analysis Program
- (11) HPA-1, General Counting Room Operating Procedures
- (12) RT 7.1, Periodic Calibration Check of Chemical Laboratory Analytical Instruments
- (13) RT 7.21, Counting Room Quality Assurance Program - Cross Check Analysis Program
- (14) ST 7.6.1.F, Analysis of Plant Roof Vent and Main Stack Particulate Filters and Iodine Cartridges for Compliance with Total Halogen and Particulate Release Rates
- (15) ST 7.6.1.J Determination of Total Noble Gas Release Rate and Maximum Percent of Technical Specification Limits

7. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on December 20, 1978. The inspector summarized the purpose and scope of the inspection and the inspection findings.

The licensee agreed to perform the analyses listed in Paragraph 5 and report the results to the NRC.

TABLE 1

PEACH BOTTOM VERIFICATION TEST RESULTS

<u>SAMPLE</u>	<u>ISOTOPE</u>	<u>NRC VALUE</u>	<u>LICENSEE VALUE</u>	<u>COMPARISON</u>
Reactor Water 1025 12/19/78	Cr-51	1.07 ± 0.07E-2	6.50 ± 0.05E-3	Agreement
	I-131	5.72 ± 0.72E-4	4.72 ± 0.56E-4	Agreement
	I-132	8.78 ± 0.27E-3	8.29 ± 0.12E-3	Agreement
	I-133	5.39 ± 0.11E-3	4.62 ± 0.06E-3	Agreement
	I-134	2.76 ± 0.12E-2	2.45 ± 0.03E-2	Agreement
	Sr-91	4.30 ± 0.32E-3	4.12 ± 0.25E-3	Agreement
	Na-24	2.67 ± 0.03E-2	2.59 ± 0.07E-2	Agreement

RESULTS IN MICROCURIES PER MILLILITER

TABLE 1

PEACH BOTTOM VERIFICATION TEST RESULTS

<u>SAMPLE</u>	<u>ISOTOPE</u>	<u>NRC VALUE</u>	<u>LICENSEE VALUE</u>	<u>COMPARISON</u>
<u>RESULTS IN MICROCURIES PER MILLILITER</u>				
FDST 1600 12/18/78	I-131	3.93 ± 0.35E-6	2.65 ± 0.40E-6	Agreement
	Cs-137	8.31 ± 0.50E-6	8.15 ± 0.60E-6	Agreement
	Cs-134	5.05 ± 0.66E-6	5.77 ± 0.54E-6	Agreement
	Na-24	3.44 ± 0.10E-5	3.88 ± 0.14E-5	Agreement

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PEACH BOTTOM VERIFICATION TEST RESULTS

<u>SAMPLE</u>	<u>ISOTOPE</u>	<u>NRC VALUE</u>	<u>LICENSEE VALUE</u>	<u>COMPARISON</u>
<u>RESULTS IN TOTAL MICROCURIES</u>				
Particulate Filter 0950 12/19/78	I-131	3.13 ± 0.24E-4	4.96 ± 0.72E-4	Agreement
	I-133	8.11 ± 0.41E-4	1.12 ± 0.10E-3	Possible Agreement
	Na-24	2.74 ± 0.10E-3	3.43 ± 0.25E-3	Agreement
<u>RESULTS IN MICROCURIES PER SECOND</u>				
3B Roof Vent Charcoal Cartridge 0920 12/18/78	I-131	8.83 ± 0.59E-4	9.33 ± 0.05E-4	Agreement
<u>RESULTS IN TOTAL MICROCURIES</u>				
	I-133	1.20 ± 0.12E-3	1.21 ± 0.10E-3	Agreement

TABLE 1

PEACH BOTTOM VERIFICATION TEST RESULTS

<u>SAMPLE</u>	<u>ISOTOPE</u>	<u>NRC VALUE</u>	<u>RESULTS IN MICROCURIES PER MILLILITER</u>		<u>COMPARISON</u>
			<u>LICENSEE VALUE</u>		
Off Gas #1 1000 12/19/78	Kr-85m	1.81 ± 0.10E-3	2.73 ± 0.04E-3		Possible Agreement
	Kr-87	4.21 ± 0.08E-3	4.05 ± 0.09E-3		Agreement
	Kr-88	4.57 ± 0.07E-3	4.02 ± 0.08E-3		Agreement
	Xe-133	2.72 ± 0.04E-3	4.18 ± 0.09E-3		Possible Agreement
	Xe-135	9.03 ± 0.09E-3	9.15 ± 0.06E-3		Agreement
	Kr-85m	1.84 ± 0.02E-3	2.36 ± 0.04E-3		Possible Agreement
Off Gas #2 1019 12/19/78	Kr-87	3.85 ± 0.08E-3	3.47 ± 0.07E-3		Agreement
	Kr-88	4.07 ± 0.07E-3	3.94 ± 0.07E-3		Agreement
	Xe-133	2.88 ± 0.04E-3	4.09 ± 0.08E-3		Possible Agreement
	Xe-135	9.27 ± 0.09E-3	1.01 ± 0.01E-2		Agreement

Attachment 1

Criteria for Comparing Analytical Measurements

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgement limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated uncertainty. As that ratio, referred to in this program as "Resolution", increases the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement must be considered acceptable as the resolution decreases.

<u>Resolution</u>	<u>Agreement</u>	<u>LICENSEE VALUE</u>	
		<u>RATIO= NRC REFERENCE VALUE</u>	
		<u>Possible Agreement A</u>	<u>Possible Agreement B</u>
<3	0.4 - 2.5	0.3 - 3.0	No Comparison
4 - 7	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0
8 - 15	0.6 - 1.66	0.5 - 2.0	0.4 - 2.5
16 - 50	0.75 - 1.33	0.6 - 1.66	0.5 - 2.0
51 - 200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.66
>200	0.85 - 1.18	0.80 - 1.25	0.75 - 1.33

"A" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is greater than 250 Kev.

Plutonium analyses of liquid samples.

Iodine on absorbers

"B" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is less than 250 Kev.

⁸⁹Sr and ⁹⁰Sr Determinations.

Gross Beta where samples are counted on the same date using the same reference nuclide.