

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-277/90-23
50-278/90-23

Docket Nos. 50-277
50-278

License Nos. DPR 44
DPR 56

Licensee: Philadelphia Electric Company
P.O. Box 7520
Philadelphia, Pennsylvania 19101

Facility Name: Peach Bottom Units 2&3

Inspection At: Delta, Pennsylvania

Inspection Conducted: 12/17/90 - 12/21/90

Inspectors: H. Kaplan 4/25/91
H. Kaplan, Sr. Reactor Engineer,
Materials & Processes Section, EB, DRS
date

J. Medoff 1/25/91
J. Medoff, Reactor Engineer,
Materials & Processes Section, EB, DRS
date

Approved by: E. H. Gray 1/28/91
E. H. Gray, Chief, Materials and
Processes Section, EB, DRS
date

Inspection Summary: Inspection on December 17 - December 21, 1990.
(Report Nos. 50-277/90-23 and 50-278/90-23).

Areas Inspected: A routine, unannounced inspection was conducted of the licensee's water chemistry control program for Units 2 & 3. In addition, a review of the licensee's second ten year interval inservice inspection program was conducted for Units 2 & 3.

Results: No violations or deviations were identified during this inspection.

DETAILS

1.0 People Contacted

Philadelphia Electric Co.

- *D. Mowery, Supervisory Chemist
- *A. Odell, Senior Chemist
- *D. LeQuia, Superintendent of Plant Services
- *D. Oltmans, Director of Nuclear Chemistry
- *T. Geyer, Systems Engineering Supervisor
- *D. Wheeler, ISEG
- *J. Stanley, Service Maintenance Engineer
- *R. Smith, Regulatory Inspection Con.
- *D. McGarrigan, Superintendent of Quality Control
- *J. Cotton, Superintendent of Operations
- *G. DePasquale, NQA Auditor
- *A. Fulvio, Regulatory Engineer

Atlantic Electric Co.

- *H. Abendroth

United States Nuclear Regulatory Commission

- *J. Lyash, Senior Resident Inspector
- R. Urban, Resident Inspector
- L. Myers, Resident Inspector

* Denotes those attending the exit meeting.

2.0 References/Requirements

- BWR Owners Group/EPRI BWR Water Chemistry Guidelines, NP-3589-SR-LD, Special Report, April 1985.
- Technical Specifications, Peach Bottom Units 1 and 2, Chapters 3.4 and 4.4, Coolant Chemistry/Surveillance Tests, Chapters 3.6 and 4.6, Standby Liquid Control/Surveillance Tests, and Chapter 6.5.2, Nuclear Review Board.
- Peach Bottom Atomic Power Site FSAR, Chapter 10.16, Makeup Water Treatment System.

- Philadelphia Electric Co. Document NA-11C001, Nuclear Group Administrative Procedure Chemistry Control Program.
- Philadelphia Electric Co. Document CH-1, Chemistry Organization and Administrative Policy.
- Philadelphia Electric Co. Document CH-10, Chemistry Goals.
- Inservice Inspection (ISI) Program Second Ten Year Interval

3.0 Water Chemistry Control Program (Module 84570)

3.1 Scope

The water chemistry control program was reviewed as part of this inspection. Although water sampling methods and chemical analysis methods were observed during the inspection, no verification of water chemistry data was performed. Peach Bottom Units 2 & 3 were both operating at >90% power during the time of the inspection.

3.2 Findings

Philadelphia Electric Company (PECo) uses two documents as the main guidelines for water chemistry related action levels at the Peach Bottom Atomic Power Station (PBAPS):

- 1) PECo Document CH-10, Chemistry Goals.
- 2) PECo Document NA-11C001, Nuclear Group Administrative Procedure Chemistry Control Program.

These documents have limits on chemical impurities which are at least as stringent as those set in the licensee's Technical Specifications and FSAR for Reactor Coolant Chemistry.

Key systems which are specified for daily monitoring in CH-10 are:

- 1) The Reactor Water Cleanup System (including Influent and Demineralizer Effluent sampling locations).
- 2) The Condensate System (including Condensate Feedwater Pump, Condensate Demineralizer, and Condensate Storage Tank sampling locations).
- 3) Feedwater System (including sampling locations at the Feedwater Sinks).
- 4) Rad Waste System.

It should be noted that Reactor Cleanup Water is used as a measure of Reactor Coolant Water purity since the system drains directly from the reactor vessel bottom head. Water samples from the Condensate Storage Tank and from the Condensate Filter Demineralizer Outlet Header are used as a measure of Control Rod Drive Water purity since they are the sources of the water to the Control Rod Drive Mechanisms.

Critical parameters for inorganic water chemistry monitoring include conductivity, dissolved oxygen concentration, pH, temperature, silica concentration, sulfate concentration, and Cl concentration. Additional inorganic parameter limits have been set for Reactor Cleanup Water Influent (i.e., Zn, Fe, Cu, Na, sulfate, nitrate and nitrite concentrations) and for Feedwater (i.e., Cu, Cr, Fe, and Ni concentrations).

A walkdown of continuous conductivity monitors was performed for the Feedwater and Reactor Cleanup Water systems of Units 2 & 3. The walkdown for Unit 2 was performed with a member of chemistry supervision. Flow cells and Martek indicators for Unit 2 showed that the Reactor Cleanup Water Influent and A & B Demineralizer Effluent conductivities of 0.068μ and $0.052 \mu\text{mhos}$ were within the respective $0.3 \mu\text{mhos}$ and $0.1 \mu\text{mhos}$ limits (as set in CH-10) for operating condition 1. The conductivities of $0.060 \mu\text{mhos}$ and $0.054 \mu\text{mhos}$ for Unit 2 A & B Feedwater were also within the limit of $0.065 \mu\text{mhos}$ as set by CH-10.

The walkdown for Unit 3 was performed by the Senior Chemical Technician and included a walkdown of water samples from the Feedwater Sinks and Reactor Cleanup Water Influent & Demineralizer Effluent locations, and of subsequent laboratory analyses. The Unit 3 A & B Feedwater conductivities of $0.058 \mu\text{mhos}$ were within operating limits. The Unit 3 A & B dissolved oxygen concentration of 20.0 ppb was also within the limiting range for operating condition 1 (i.e., $10 - 200 \text{ ppb}$). The Unit 3 Reactor Cleanup Water Influent conductivity of $0.303 \mu\text{mhos}$ was within operating limits. The Unit 3 Reactor Cleanup Water Influent pH of 7.63, dissolved oxygen concentration of 12.4 ppb , temperature of 22 C were all within the limiting ranges (i.e., $5.6 - 8.6$, $< 50 \text{ ppb}$, and $20 - 30 \text{ C}$ respectively).

The Unit 3 Reactor Cleanup Water Demineralizer Effluent B conductivity of 0.77 μ mhos was within the limiting range; the Reactor Water Cleanup Demineralizer Effluent A conductivity of 0.110 was over the CH-10 limit (i.e., $<0.1 \mu$ mhos). Chemistry supervision was informed of the discrepancy, and a Chemistry Recommendation was filled out for the out of limit conductivity. These actions were in accordance with criteria set for CH-10 action level 500 parameters. Laboratory analysis of Unit 3 Reactor Water Cleanup Influent and Effluents A & B chloride, sulfate, nitrate, and nitrite concentrations were all within CH-10 limits for operating condition 1.

Data Input Forms are filled out as the official logs of water system chemistries. All Input Data Forms contain appropriate spaces for the logging of sample dates and times. A review was made of the Data Input Reports for the week 12/08/90 -12/14/90. Although the reports indicated the licensee had good control over water chemistry, it was noticed that the licensee had failed to fill in appropriate sampling times for the daily logging of the Rad Waste Floor Collector Tank and for the each use loggings of the Rad Waste Floor Drain Filter Demineralizer Effluent, the Rad Waste Floor Drain Deep Bed Effluent, the Rad Waste Collector Filter Demineralizer Effluent, and the Rad Waste Collector Deep Bed Effluent. These omissions were considered to be a lack of attentiveness to detail in document control.

Logging of chemistry data is covered by PBAPS document CH-1, Chemistry Organization and Administrative Policy, which states in Sect. 8.11.2 that "Sample Analysis Records shall be maintained in the Chemistry Labs or the chemistry office" Review of the documents by chemistry supervision failed to pick up the omissions, a point which will be discussed later. The omissions were pointed out to licensee management who indicated that the times should have been logged, but who felt that the logging of the exact sampling times were not significantly important to safety during operation of the plant. The logging times, however, are entered into the computer data base at the end of each shift. It was noted that sampling times were properly entered into the November, Standby Liquid Control Tank Boron Analyses which is a safety related system.

Yearly reports are generated at the Peach Bottom Atomic Power Station to give an overall assessment of the yearly fluctuations of critical water chemistry parameters. Yearly reports for Units 2 & 3 include:

- 1) The Chemistry Performance Index (Ref. ADO X4832).
- 2) Reactor Water Conductivity (Ref. ADO X4827).
- 3) Feedwater Dissolved Oxygen (Ref. ADO X4827).
- 4) Demin Avg Run Time (Ref. ADO X4827).
- 5) Radioactive Liquid Effluents (Ref. ADO X4827).

- 6) Radioactive Gaseous Effluents (Ref. ADO X4827).
- 7) Radioactive Iodine (Ref. ADO X4827).
- 8) Auxiliary Cooling Water % Of Time Out-Of-Specification (Ref. ADO X4827).
- 9) National Pollutant Discharge Elimination System Limits (Ref. ADO X4827).

Review of the yearly reports indicated that the licensee had good control of water chemistry for Units 2 & 3 for 1990.

Quality assurance of the PBAPS chemistry program is accomplished by:

- 1) Initial review of chemistry performance and documentation by chemistry management.
- 2) NQA audits of the chemistry control program.

NQA audits of the chemistry control program are either performed horizontally (meaning that a whole system is being audited for all parameters and controls), or vertically (meaning that a few parameters or controls are being monitored for a number of systems).

The Quality Assurance Department (NQA) was informed of the omission of logging sampling times in the 12/08/90 - 12/14/90 Data Input Reports. Since Chemistry Department supervision failed to notice the omissions during review of the documents, NQA was asked if the omissions were noted in one of their audits. NQA stated they had not yet had the opportunity to review the appropriate documents; however, review of a September 1990 vertical audit of Feedwater metals revealed that a transposition of copper ion data during mathematical calculation had resulted in an unexpected copper ion result. This was considered to be another example of lack of attention to detail in document control.

3.2 Conclusions

The technicians and other chemistry personnel showed that the licensee has good control of water chemistry at PBAPS, and exhibited good techniques during performance of their duties. The omission of the sampling times in the Data Input Reports was considered to be of a weakness in the chemistry control program. The licensee stated at the exit meeting that they would address and correct this weakness.

No violations or deviations were identified during this inspection.

4.0 ISI (Module 73753)

4.1 Scope

The inspector reviewed the ISI documentation covering the licensee's second ten year interval inservice inspection program for Units 2 & 3. The second interval for Unit 2 covered the period between April 1, 1987 through April 26, 1989. The second interval for Unit 3 covered the period between March 31, 1987 through November 11, 1989.

4.2 Findings

The second ten year program was reviewed by the inspector and found to meet the requirements of the 1980 Edition of ASME Section XI with addenda through winter 1981. The program was found to be detailed in every respect, with weld identifications, specific weld requirements, and relief requests clearly defined. As demonstrated to the inspector, the ISI program was controlled and checked by a computer program (ISIC). With the exception of the cracking found in the two Unit 3 Reactor Vessel Shroud Access Hole Cover Welds, the inspector's review of the summary results disclosed no significant indications in either Unit 2 or Unit 3. The cracked covers were subsequently removed and replaced with new bolted, secured covers. The inspector randomly selected the Reactor Vessel Weld MF in the bottom head of Unit 2 for specific review. The data sheets for weld MF were found to be complete with no recordable indications reported after employing 0 degree, 45 degree, and 60 degree ultrasonic tests.

4.3 Conclusions

The inspector's review of the ISI program revealed no deficiencies or deviations. The licensee reported no significant indications except for the indications in the Unit 3 Reactor Vessel Shroud Access Hole Cover Welds.

5.0 Entrance and Exit Meetings (Module 30703)

The licensee's management was informed of the scope and purpose of the inspection at the entrance meeting which took place at the beginning of the inspection. The findings of the inspection were presented to and discussed with the licensee's management at the exit meeting which took place after the conclusion of the inspection on December 21, 1990.

At no time during the inspection was written material provided to the licensee by the inspector. The licensee did not indicate that confidential or proprietary information was involved during the inspection.