

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report Nos. 50-277/91-17  
50-278/91-17

Docket Nos. 50-277  
50-278

License Nos. DPR-44 Category C  
DPR-56 C

Licensee: Philadelphia Electric Company  
Correspondence Control Desk  
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Facility Name: Peach Bottom Atomic Power Station, Units 2 and 3

Inspection At: Delta, Pennsylvania

Inspection Period: May 13 - 20, 1991

Inspector: David J. Chawaga 6-7-91  
D. Chawaga, Radiation Specialist Date  
Facilities Radiation Protection Section

Inspector: R. Lance 6-7-91  
R. Lance, Radiation Specialist Date  
Facilities Radiation Protection Section

Approved by: W. Pasciak 6-10-91  
W. Pasciak, Chief Date  
Facilities Radiation Protection Section

Inspection Summary: Inspection on May 13 - 20, 1991 (Combined  
NRC Inspection Report Nos. 50-277/91-17; 50-278/91-17)

Areas Inspected: The inspection was a routine, unannounced  
radiological controls inspection. Areas reviewed included TLD  
response to noble gas, corrective actions system, whole body  
counting and dosimetry, ALARA, training, preparations for  
implementation of the Plant Information Management System (PIMS),  
preparations for Hydrogen Water Chemistry Control, and  
organization and staffing.

Results: No violations were identified.

## DETAILS

### 1.0 Persons Contacted

#### 1.1 Philadelphia Electric Company

- D. Allen, Dosimetry Physicist
- \* E. Barnett, Senior Training Instructor
- J. Commiskey, Jr., Health Physicist
- \* D. DiCello, Health Physics Support Supervisor
- W. Downey, Radiological Engineering Supervisor
- \* D. Foss, Regulatory Group Leader
- \* N. Gazda, Services Training Supervisor
- K. Holsopple, Director, Corporate Radiation Protection
- \* R. Jones, Nuclear Quality Assurance
- \* R. Knieriem, Delmarva Power
- \* S. Lee, Engineer, Nuclear Quality Assurance Auditor
- \* D. LeQuia, Acting Superintendent of Maintenance Engineering
- \* G. McCarty, Staff Health Physicist
- \* H. McCrory, Corporate Radiation Protection Engineer
- \* R. Moore, Nuclear Quality Assurance Engineer
- D. Oltmans, Director, Nuclear Chemistry Branch
- \* J. Pratt, Nuclear Quality Assurance Manager
- \* M. Ryan, Acting Superintendent of Plant Services
- \* R. Smith, Regulatory Inspection Coordinator
- \* D. Wheeler, ISEG

#### 1.2 NRC Personnel

- M. Evans, Resident Inspector
- \* J. Lyash, Senior Resident Inspector
- L. Myers, Resident Inspector

\* Denotes attendance at the exit meeting.

### 2.0 Purpose

The purpose of this routine unannounced inspection was to assess the licensee's radiological controls program. Areas reviewed included TLD response to noble gas, corrective actions system, whole body counting and dosimetry, ALARA, training, preparations for implementation of the Plant Information Management System (PIMS), preparations for Hydrogen Water Chemistry Control, and organization and staffing.

### 3.0 TLD Response to Noble Gas Radiation Fields

During the 1991 Unit 2 refueling outage, leaks in the Unit 3 Offgas System allowed noble gas to be released to many areas of the plant. Personnel who transited these areas and then attempted to exit the Radiologically Controlled Area (RCA) frequently received distributed contamination alarms on the Personnel Contamination Monitor (PCM). Upon receipt of a PCM alarm, personnel were required to perform a whole body frisk using an RM-14 and pancake probe. These subsequent surveys typically indicated that all areas of the body were less than 100 counts per minute (cpm) above background and the individuals were clear to leave the RCA.

Radiation Protection issued a memo to plant personnel stating that personnel exposures due to noble gas were being adequately monitored. A subsequent licensee evaluation indicates that there has been no significant underestimate of worker exposure due to noble gas radiation during the refueling outage. This conclusion was based on measured noble gas concentrations and estimates of worker stay times. The licensee planned to further evaluate the adequacy of TLD response to noble gas radiation fields. In the interim, criteria are being developed to use worker stay time and grab samples to evaluate skin dose to personnel when noble gas levels exceed a predetermined concentration. No weakness was noted in the licensee's review of this concern.

### 4.0 Corrective Action System

A review of recently generated Radiological Occurrence Reports (RORs) by the inspector indicated that problems continue to exist in the area of procedural compliance and adherence to sound radiological work practices. Many of the events documented, when considered individually, were observed to be of little programmatic or safety significance. These lesser significant events, when viewed in the aggregate, provide valuable information essential to program improvement. The inspector found no indication that significant radiological events could have been overlooked by the ROR system. The licensee's ability to analyze the information collected by the ROR system and provide effective and comprehensive actions will be evaluated during future inspections.

### 5.0 Whole Body Counting and Dosimetry

Whole body counting records were reviewed during the course of this inspection. Whole body counting results were adequately evaluated and procedural compliance was observed in all cases reviewed. Licensee personnel informed the inspector that program improvement was planned in the area

of instrument control charting. Improvement will include better graphical representation of instrument performance trends.

The inspector reviewed personnel exposure records which included NRC Form 4's, bioassay results, and personnel exposure history requests to other facilities. The licensee had an effective system in place for tracking exposure history requests which have been sent to other utilities.

At the time of inspection, a temporary contract employee was filling the position of Dosimetry Physicist. The licensee was evaluating candidates for this position.

#### 6.0 ALARA Performance

The inspector reviewed ALARA performance during the Unit 2 refueling outage which was completed in April. Total dose to personnel during the outage was 369.8 Man-Rem. Most of this dose was TLD corrected at this time with the exception of the dose received in April. The total estimated exposure goal for the outage was 306 Man-Rem.

The difference between the estimated dose and the actual dose was attributed to variations in three work activities, the condenser retube job, work on Control Rod Drive (CRD) tube bundle clamps, and the Emergency Service Water (ESW) Modification.

Estimated exposure for the condenser retube job was 30 Man-Rem and estimated time for the job was 93,066 Man-Hours. The actual time for completion of the job was 176,730 Man-Hours and the resultant total exposure for the job was 67.081 Man-Rem.

Work on the CRD tube bundle clamps was not anticipated prior to the outage, and therefore the 27 Man-Rem received during this job was not accounted for in any exposure goal for 1991.

Estimated exposure for the ESW pipe replacement was 30 Man-Rem and actual exposure for the job was 48.5 Man-Rem. The difference is attributed to under-estimation of the original man-hour scope, increased man-power assigned to the modification, and 1990 non-outage work associated with the modification that was not completed prior to the outage.

Preliminary planning for the upcoming Unit 3 refueling outage had just begun. Maintenance Request Forms (MRFs) were being processed and a Unit 3 outage planning task force had been formed.

No preliminary outage schedule had been proposed at this time. ALARA personnel were attempting to have drywell shielding installation incorporated into the outage schedule early in the outage to achieve maximum benefit. This practice had much success at Philadelphia Electric Company's Limerick Nuclear Generating Station (LGS) and was seen as a LGS program improvement.

#### 7.0 Training

The inspector visited the new training building at the PBAPS Unit 1 site. The facility was a marked improvement over the previous training facility and appeared to be well utilized. The Health Physics laboratory was generally well supplied, and was considered a good resource for training and retraining HP technicians.

Systems training for HP technicians was reviewed. All technicians currently assigned to the station are subject to HP continuing training. During each training cycle, approximately every two months, one of nineteen different systems is taught to the technicians. Examples of systems which have been discussed in the past two years are Traversing In-Core Probes, Reactor Water Cleanup, Reactor Core Isolation Cooling, Emergency Core Cooling, Residual Heat Removal, Standby Liquid Control, Control Rod Drive Mechanisms/ Control Rod Drive Hydraulic System, and the Main Steam System. Emphasis is placed on system operation and radiological concerns associated with each system.

#### 8.0 Health Physics Database Implementation

The inspector reviewed the health physics module of the Plant Information Management System (PIMS) being prepared for implementation at the Peach Bottom Atomic Power Station (PBAPS) and Limerick Generating Stations (LGS). Each section of the module was reviewed in its entirety as it existed during the time of inspection. Implementation of this system will significantly increase the ability of each station to collect, control and analyze data. Technicians from both stations were actively involved in system design and assured that the needs of the "end user" were considered during development. Database implementation has assisted in achieving a greater degree of radiation protection program commonality between PBAPS and LGS. The inspector reviewed the licensee's system acceptance criteria and other quality assurance aspects of this project. No weaknesses were observed in planning for implementation of the system. Overall, efforts in this area were observed to be aggressive, well managed and worthwhile.

## 9.0 Preparation for Hydrogen Water Chemistry Implementation

The inspector reviewed plans and preparation for radiological controls associated with hydrogen addition to the Reactor Feedwater System. Hydrogen is being added to suppress the reactor water dissolved oxygen levels and reduce the electrochemical potential to levels which are expected to essentially eliminate Intergranular Stress Corrosion Cracking (IGSCC). As a result of this chemical control process, radiation fields attributable to the isotopes  $^{16}\text{N}$  will increase by a factor of three to six times the normal at-power levels. Potentially affected areas were being monitored to establish baseline radiation levels prior to hydrogen addition testing. The anticipated increase in radiation levels were being evaluated to determine the need for additional monitoring of personnel and for ALARA concerns. The inspector reviewed radiological control planning efforts for Hydrogen Addition and found no weaknesses in this area.

## 10.0 Organization and Staffing

Combined NRC Inspection Report No. 50-277/91-06 and 50-278/91-06 documented inspector concern regarding the responsibilities delegated to individuals in the Health Physics (HP) department during extended plant outages. Supervisors were not assigned the responsibility for projects or areas of the plant. This change in station practice caused some confusion during the 1991 Unit II refueling outage. Areas were, to a large extent, the responsibility of lead HP technicians. According to some HP technicians, minimal supervisory oversight and support was provided.

During the upcoming Unit 3 outage, the HP department plans to assign plant areas to HP supervisors who will have responsibility for the personnel working in that area. The inspector will review this subject during future outage inspections.

## 11.0 Exit Meeting

A meeting was held with licensee representatives at the end of this inspection on May 20, 1991. The purpose and scope of the inspection were reviewed and the findings of the inspection were discussed.