U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-277/90-21
50-278/90-21

Docket Nos. 50-277
50-278

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

Licensee: Philadelphia Electric Company
Correspondence Control Desk
P.O. Box 195
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Facility Name: Peach Bottom Atomic Power Station, Units 2 and 3

Inspection At: Delta, Pennsylvania

Inspection Period: October 29 - November 2, 1990

Inspector: RLNimitz for 11/26/90
D. Chawaga, Radiation Specialist Date
Facilities Radiation Protection Section

Inspector: J Noggle 11/26/90
J. Noggle, Radiation Specialist Date
Facilities Radiation Protection Section

Approved by: W. Pasciak 11/26/90
W. Pasciak, Chief Date
Facilities Radiation Protection Section

Inspection Summary: Inspection on October 29 - November 2, 1990 (Combined NRC Inspection Report Nos. 50-277/90-21; 50-278/90-21)

Areas Inspected: The inspection was a routine, unannounced radiological controls inspection. Areas reviewed were organization and staffing, radiation survey instrument calibration, dosimeter placement, spent fuel pool diving efforts, posting and barricading, and High Radiation Area access controls.

Results: One non-cited violation was identified. (Details Section 6)

DETAILS

1.0 Persons Contacted

1.1 Philadelphia Electric Company

* D. Foss, Regulatory Group Leader
* D. LeQuia, Superintendent of Plant Services
* R. Leddy, Senior Health Physicist
* G. McCarty, Staff Health Physicist
* D. Miller, Jr., Vice President, PBAPS
* R. Smith, Regulatory Inspection Coordinator
* M. Moore, Nuclear Quality Assurance Engineer
* R. Knieriem, Delmarva Power
* J. Wilson, Superintendent of Maintenance

W. Downey, Supervisor of Radiological Engineering

1.2 NRC Personnel

* J. Lyash, Senior Resident Inspector

L. Myers, Resident Inspector
R. Urban, Resident Inspector

1.3 Others

* S. Maingi, PA Bureau of Radiation Protection

* Denotes attendance at the exit meeting.

2.0 Purpose

The purpose of this inspection was to perform a routine, unannounced inspection of the licensee's radiological controls program.

3.0 Organization and Staffing

The Staff Health Physicist position (assistant to the Radiation Protection Manager), which was vacant during the last inspection period, has been filled by the former Health Physics Technical Support Supervisor (HPTSS). The HPTSS position remained vacant during this inspection period. With the exception of this one vacancy the professional level Health Physics Organization is fully staffed. The station has appointed an Instrument Physicist to the health physics staff. Licensee personnel anticipate improvements in the quality of the instrument

program as a result of this recent appointment.

No violations were identified.

4.0 Radiation Survey Instruments

The inspector evaluated the licensee's program for instrument calibration and generally found it to be satisfactory. However, the inspector observed some areas where program improvements could be realized. These areas included calibration procedure consistency, inventory control and traceability to test equipment used for instrument repairs.

Portable survey instruments are calibrated on a 6 month schedule using Cesium-137. The calibration process is traceable to the National Institute of Standards and Technology (NIST) through the use of "condenser R chambers" as primary transfer instruments. Records indicate that the calibration process is being performed in accordance with program requirements. Calibrations were current on all survey instruments inspected at the issue point and in the field.

The inspector selected 5 ion chambers, 2 "hotdog" GM detectors and 2 extendable GM detectors and compared the relative response of each of these instruments at locations within the plant. The ion chamber and "hotdog" GM detector instruments displayed similar response characteristics in the field. A maximum of 13 percent increased response was observed in the "hotdog" GM detectors when compared to the average ion chamber response. According to the calibration data sheet, TL-12-00519-1, proper calibration of the extendable GM detectors requires response to within ± 20 percent of predetermined calibration values. However, elsewhere in procedure TL-12-00519, the acceptance criteria for calibration is stated to be ± 15 percent.

Further inconsistencies exist in station procedure A-104 which indicates that HP instruments are to respond to within 10 percent of the known values to be considered calibrated. Extendable GM detectors were observed to have passed calibration with as much as 14 percent error. Field testing indicated that the extendable GM detectors generally displayed higher readings than the ion chamber instruments and that no significant safety issue existed. One extendable GM detector read approximately 1.6 times the average ion chamber reading at the same location in the plant (44 mR/hr vs 70 mR/hr). Records show that this extendable GM detector read high at calibration but was within the station's ± 20 percent acceptance criteria defined in TL-12-00519-1. Relative response characteristics of other instruments also tended to correlate with calibration records (instruments which read higher at calibration read higher in the field, etc.).

Discussions with health physics personnel and observations in the field indicated that extendable GM detectors are used for hot spot evaluations and other special applications. Ion chamber instruments are preferred for most survey applications for personnel protection. Although underresponse of GM detectors at higher dose rates has been observed, GM detectors provided higher estimates of area exposure rates at all times during this evaluation at PBAPS. Licensee personnel will evaluate and correct, as appropriate, the conflicting guidance found in these instrument procedures. This item will be reviewed during future inspections.

The inspector reviewed the computer database for instrument inventory control and found several inaccuracies in the data. Discrepancies were also observed in the instrument issue and source check logs. Discrepancies include improper or inconsistent calibration due dates and instrument location entries. No violations were observed. However, no effective method currently exists to anticipate the number of survey instruments which will soon need calibration or to determine which survey instruments were maintained with a given piece of calibration equipment. A review of the data stored on the instrument control computer indicates that sometimes entries are made in a timely fashion and other times they are not made. The inspector indicated that inadequate tracking of instrument inventories could result in shortages which could impact program performance during outages. During the course of this inspection period, instruments were available in ample numbers to support field work.

No violations were identified.

5.0 Dosimeter Placement

The inspector noted in NRC Combined Inspection Report Nos. 50-277/90-16; 50-278/90-16 that the criteria established in station procedure HP-603 for dosimeter placement was confusing and difficult to implement. PBAPS personnel, in conjunction with personnel at the Limerick Station, have since developed a draft revision to HP-603. The inspector's limited review of the draft procedure indicated that the draft procedure provides improved guidance on the station's criteria for use of dosimeters for measuring skin, extremity, and whole body doses. The adequacy of the established criteria will be evaluated in further detail during future inspections.

6.0 Spent Fuel Pool Diving Efforts

Modification of the Unit 3 spent fuel storage racks has required more extensive use of underwater divers than was originally anticipated. Radiological controls appear to have been well managed during most evolutions. However, on October 26, 1990, the requirements of procedure HP-320, "Health Physics Requirements

for Diving Operations" and Radiation Work Permit (RWP) No. PB3905819 were violated when a diver was sent into the Spent Fuel Pool without extremity dosimeters. Apparently, a miscommunication between the Health Physics Technicians at the turnover for lunch break contributed to the program failure. The inspector's review indicated that it did not appear likely that the diver would have exceeded 25 percent of the extremity dose limit and therefore the extremities were not required to be monitored as per 10 CFR 20.202(a)(1). However, because of the extreme radiation dose rate gradients encountered during diving operations, it was appropriate that the procedure specified dosimetry be worn. The diver was assigned a calculated extremity dose of 160 mrem for the dive. Radiological controls, which were implemented to reduce the diver's radiation exposure, included use of a tether line to restrict diver movement, a physical barrier to reduce access to high dose rate areas, pre-dive briefings, headphone communications, and radiation detectors set to alarm at dose rate and integral dose setpoints. Whole body dosimetry was also supplied. Failure to follow station radiation protection procedures is a violation of Technical Specification 6.11. However, the incident meets the criteria found in 10 CFR Part 2, Appendix C, V. G., "Exercise of Discretion", for classification as a non-cited violation. The incident was identified by the licensee. The occurrence was not willfully performed and was not required to be reported to the Nuclear Regulatory Commission. Prompt and effective corrective actions have been implemented. The instance was not a severity level III or higher violation. Immediate corrective actions include increased supervisory oversight and approval for each dive evolution and counseling of technicians involved in diver support functions. Program improvements resulting from this incident, which will soon be implemented, include increased training for HP Technicians, modification of the predive checklist for dosimetry placement, and separation of the underwater survey procedure from the diving procedure. The incident has received senior management attention through the Radiological Occurrence Report (ROR) program and other informal processes. Inspector follow-up on this issue will include review of implemented corrective actions for future diving operations. (NCV 50-278/90-21-01)

7.0 Other Radiological Controls

An inventory check of the licensee's Locked High Radiation Area (LHRA) keys and review of the LHRA key issue log resulted in no significant findings. Technicians were able to resolve minor anomalies in record-keeping and all areas above 1 rem/hr were found to be adequately controlled. The inspector observed radiological housekeeping, postings and barriers in tours of the facility and found them to be adequate. Radiological postings were found to be in accordance with regulatory requirements. Use of additional postings to assist workers with radiological information in the field is not practiced at PBAPS. For example, High Radiation Areas are posted as required by 10 CFR 20.203 but do not

include the entry requirements defined in the facility's Technical Specifications. Licensee personnel have decided not to include additional information in the field in order to simplify postings. The inspector noted that the required postings were clear and concise. Worker knowledge of radiological condition and health physics restrictions will be assessed in the field during future inspections.

The station was undergoing a "mini-outage" during the inspection period. The Radiological Engineering Department personnel adequately demonstrated to the inspector the justification for not installing temporary shielding during this shutdown period. Accurate assessment of the As Low As Reasonably Achievable (ALARA) program performance was not possible at this early point in the outage and will be reviewed during the next inspection period.

8.0 Exit Meeting

A meeting was held with licensee representatives at the end of the inspection period on November 2, 1990. Inspection findings were discussed in detail at that time.