

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-277/95-23, 50-278/95-23

Docket Nos. 50-277, 50-278

License Nos. DPR 44, DPR-56

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

Inspection At: Delta, Pennsylvania

Inspection Conducted: August 28-31, 1995

Inspector: RL Nimitz
R. L. Nimitz, CHP, Senior Radiation Specialist

9/20/95
date

Approved by: R. Bores
R. Bores, Chief, Facilities Radiation
Protection Section

9/21/95
date

Areas Inspected: Areas reviewed included planning and preparation for the Unit 3 outage, program changes and enhancements, oversight of program activities, efforts to maintain radiation exposures as low as is reasonably achievable (ALARA), external and internal exposure controls, and radioactive material and contamination controls.

Results: The overall results of the inspection indicated that a generally effective radiological controls program was implemented. The overall external and internal occupational exposure controls and radioactive material and contamination controls programs were considered very good. The review of the TIP shield disassembly event identified four examples of personnel failing to adhere to radiation protection procedures. (Details section 6.0.)

DETAILS

1.0 INDIVIDUALS CONTACTED DURING THE INSPECTION

1.1 LICENSEE PERSONNEL

- * S. Baker, Manager, Radioactive Waste
- * M. Dedrich, HP Supervisor
- * D. DiCello, Radiation Protection Manager (RPM)
- * G. Edwards, Plant Manager
- * R. Farrell, Radiological Engineering Manager
- * D. Foss, Regulatory Engineer
- A. Fulvio, Manager, Peach Bottom Quality Assurance
- * G. Gellrich, Senior Manager, Operations
- G. Rainey, Vice President, Peach Bottom Atomic Power Station
- * H. Trimble, Manager, Health Physics Support
- * B. Wargo, Nuclear Quality Assurance (NQA) Assessor
- * T. Wasong, Experience Assessment Manager

Other licensee personnel were contacted during the inspection.

* Denotes attendance at the exit meeting on August 31, 1995.

1.2 NRC PERSONNEL

- * P. Bonnet, Resident Inspector
- W. Schmidt, Senior Resident Inspector

* Denotes attendance at the exit meeting on August 31, 1995.

1.3 OTHERS

S. Mangi, Nuclear Engineer, Pennsylvania Bureau of Radiation Protection

2.0 PURPOSE AND SCOPE OF INSPECTION

The inspection was an announced inspection of the radiological controls program. The following areas were reviewed during the inspection.

- planning and preparation for the Unit 3 outage
- program changes
- program oversight activities
- maintenance of personnel occupational radiation exposure as low as is reasonably achievable (ALARA)
- external and internal exposure controls
- radioactive material and contamination controls
- general plant tour observations

3.0 PLANNING AND PREPARATION FOR THE UNIT 3 OUTAGE AND ALARA PROGRAM PERFORMANCE

The inspector selectively reviewed the licensee's planning and preparation to reduce personnel occupational radiation exposure to as

low as is reasonably achievable (ALARA) during the upcoming Unit 3 refueling outage. Items reviewed included special training including the use of mock-ups, ALARA reviews of work packages, and development and tracking of ALARA goals. Also reviewed were planned increases in radiological controls staffing. The inspector also reviewed general ALARA program performance. The evaluation of the licensee's performance was based on discussions with cognizant personnel, review of documentation, and inspector observations during tours of the station.

The licensee provided good work scope control for the upcoming Unit 3 outage. An outage work scope committee was established and the work scope was "frozen" earlier in 1995. Any added outage work activities are to be reviewed by the work scope control committee. Regarding staffing, the licensee plans to augment the staff with about 62 experienced additional radiological controls personnel.

The licensee performed effective planning and preparation for the Unit 3 outage. Reasonable occupational exposure goals were implemented and the licensee plans to use various mockups for training purposes. These include a traversing incore probe assembly mockup and an undervessel control rod drive mockup. The inspector's review indicated the licensee established a Unit 3 outage occupational exposure goal of 310 person-rem and a total annual exposure goal for Units 2 and 3 of 499 person-rem.

The inspector's review of various previous radiological controls outage reports and work plans verified that lessons learned, as appropriate, were included in planning activities for the upcoming Unit 3 outage.

The licensee sustained 276 person-rem for the fall 1994 Unit 2 refueling outage as compared to an outage goal of 288 person-rem. The licensee also sustained 579 person-rem in 1994 as compared to annual goal of 545 person-rem. The licensee's radiation protection personnel attribute exceeding of the annual exposure goal, in part, to welding problems on the Unit 2 bottom head drain line. The licensee plans special welder qualifications to preclude a recurrence.

Based on the above review, the inspector concluded that the licensee implemented generally effective exposure controls to minimize unnecessary radiological exposure. Exposure goals were reasonable, ALARA controls were implemented, and lessons learned (as appropriate) from previous outages were implemented. The licensee's overall ALARA planning was considered good.

No safety concerns or violations were identified.

4.0 CHANGES AND ENHANCEMENTS

The inspector selectively reviewed changes at the licensee's facility, in the area of radiological controls, since the previous inspection. Changes were reviewed in the areas of organization and staffing, procedures and programs, and facilities and equipment.

ORGANIZATION AND STAFFING:

Since the previous inspection in this area, the licensee selected a new Manager, Technical Support. The inspector reviewed the individual's training and qualifications and concluded he met applicable qualification requirements. The licensee's radiation protection group also lost five technicians who transferred to the operations and maintenance groups. The licensee has augmented the staff with contractor support personnel.

PROCEDURES AND PROGRAMS:

No significant change in procedures and programs was noted since the previous inspection in this area. The inspector noted that the licensee established and implemented Procedure A-C-31, Revision 0, "Nuclear Staff Qualification Requirements and Organizational Structure Control", on July 31, 1995. The procedure clearly identifies selection and qualification criteria for station positions.

FACILITIES AND EQUIPMENT:

The licensee has initiated action to construct a new radiological controls and chemistry facility at the north end of Unit 3. The licensee expects to place the facility in service some time after the Unit 3 outage. The licensee will construct and use a trailer at the south end of Unit 2 during construction. The licensee was also phasing in new personnel whole body friskers and was reviewing the option of using gamma-sensitive whole body friskers as passive whole body counters.

The inspector's overall review indicated that the licensee implemented a number of very good initiatives to enhance the overall performance and capabilities of the radiation protection program.

No safety concerns or violations were identified.

5.0 OVERSIGHT OF PROGRAM ACTIVITIES AND GENERAL PERFORMANCE

The inspector selectively reviewed the licensee's efforts to oversee radiological controls program performance. The inspector reviewed audits, assessments, surveillances, radiological occurrence issues and corrective actions, personnel contamination reports, and audits performed by outside industry groups. Documents reviewed included the 1995 dosimetry, ALARA, operations and respiratory protection audit; 1995 QA surveillance reports, and the 1995 training assessment.

The inspector's review indicated the licensee implemented generally very good oversight through audits, self-assessments, and performance monitoring and also implemented appropriate corrective actions for self-identified concerns (e.g., personnel shoe contamination action plans). Corrective actions were timely and comprehensive. The inspector noted

that the licensee developed and planned to implement a Unit 3 refueling outage surveillance program.

The inspector brought the following matters to the licensee's attention.

- Consider development of a radiation protection program content matrix to ensure all aspects of the program are audited in accordance with 10 CFR 20.1101c. The inspector's review did not identify a clear indication as to what aspects of the program should be audited on a periodic basis.
- Consider enhancing radiation protection program audits by using national and international radiation protection standards. Current audits appeared heavily focused on compliance aspects of the current program. There appeared to be limited quality assurance evaluation of program adequacy.

No safety concerns or violations were identified.

6.0 GENERAL RADIOLOGICAL CONTROLS (EXTERNAL AND INTERNAL EXPOSURE CONTROLS)

The inspector selectively reviewed the implementation and adequacy of radiological controls at Units 2 and 3 including those for on-going and previously completed work.

The review was against criteria contained in applicable licensee procedures and 10 CFR Part 20, "Standards for Protection Against Radiation". The inspector reviewed and discussed radiological surveys, radiation work permits, and discussed radiological conditions and radiological controls with cognizant personnel, as appropriate. Matters reviewed included the following.

- posting, barricading and access control, as appropriate, to radiation, high radiation, and airborne radioactivity areas
- adequacy of radiological surveys (radiation, contamination, and airborne radioactivity) to support on-going work activities
- personnel adherence to radiation protection procedures, radiation work permits, and good radiological control practices
- use and appropriate placement of dosimetry devices

The inspector's review of general station radiological conditions during station tours indicated generally good radiological controls were implemented. The inspector noted that the licensee had constructed access barriers around the fuel pool cooling heat exchangers (165' elevation reactor building) to preclude access to the high radiation areas around them.

Also reviewed were the circumstances and licensee evaluations associated with an event involving disassembly of a traversing incore probe (TIP) shield in the station's "Hot Machine Shop". The licensee was performing a modification of the TIP system and had removed two TIPs. The TIP shields were moved from the reactor building to the "Hot Machine Shop"

for decontamination and disposal. The event involved contractor workers, some of whom were advanced radiation workers, disassembling the TIP shield. Also, some were unaware that the interior of the shield exhibited potentially significant levels of radioactive contamination. The disassembly, on August 24, 1995, resulted in contamination levels up to about 200,000 disintegrations per minute per 100 centimeters squared (dpm/100 cm²) being released into a normally contaminated area and subsequently contaminating clean areas of the "Hot Machine Shop" complex. Although no intakes of radioactive material occurred, two individuals sustained low-level shoe contamination.

The inspector's review indicated very good radiological controls were implemented for the modification and removal. However, once the TIP shields were transferred out of the reactor building to the "Hot Machine Shop", weaknesses in personnel communications, understanding of radiological conditions associated with the work activity, supervisor oversight, and control of contractor work activities were apparent.

The inspector's review identified the following apparent procedure violations associated with the event.

- Procedure A-C-100, requires in Section 5.4.2, that workers obey written instructions including those on radiation work permits.

The inspector noted that written instructions on RWP No. PB-0-99-00007 were not obeyed on August 24, 1995, in that personnel disassembling a TIP shield did not have an understanding of the radiological conditions of their work area. They did not know the radiological conditions associated with disassembly of a TIP shield. The workers performed limited contamination surveys which did not detect the elevated levels of contamination.

- Procedure A-C-100 requires in Section 7.7.1, that radioactive surface contamination be controlled in order to minimize possible inhalation and ingestion.

The inspector noted that on August 24, 1995, significant levels of radioactive surface contamination (interior surfaces) of a TIP shield, and tools inserted into the shield, were not adequately controlled to minimize inhalation or ingestion or radioactive material. The contamination was dispersed and contaminated normally clean areas of the "Hot Machine Shop" complex.

- Procedure HP-C-111, requires in Section 5.4, that advanced radiation workers are responsible for coordination of work with health physics.

The inspector noted that on August 24, 1995, an advanced rad worker disassembled a TIP shield and did not coordinate the work with health physics.

- Procedure HP-C-818, requires in Section 7.2.3, that minor clothing contamination be documented on the Minor Contamination Log.

The inspector noted that two individual working in the "Hot Machine Shop" sustained minor shoe contamination on August 24, 1995, were decontaminated, and the contamination events were not documented on the Minor Contamination Log.

Following identification of the event, the licensee implemented a review of its causes. An investigation was initiated and work on the TIP shields was stopped.

The inspector noted that the above examples of failure to follow procedures represent an apparent violation of Technical Specification 6.11, which requires that radiation protection procedures be adhered to for all operations involving personnel radiation exposure.
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The following additional observations relative to the TIP shield event were noted.

- It was not apparent that, due to air flows in the "Hot Machine Shop" and the location of the air samplers, airborne radioactivity samples collected during handling of the contaminated TIP shield were representative of the workers' breathing zones. However, the licensee whole body counted the individuals and no intake of airborne radioactive material was identified.
- The workers dumped lead shot from the TIP shield into various size buckets. The workers did not contact the licensee's Industrial Risk Management personnel regarding handling of the lead.
- Procedure A-C-100, requires in Section 5.3, that supervisors ensure workers use and follow applicable health physics procedures, perform their work activities using good radworker practices, and ensure that ALARA and radiation controls are addressed in all work activities.

The inspector's review indicated it was not apparent that supervisors overseeing the inspection and disassembly of the TIP shield ensured that workers use and follow applicable health physics procedures, perform their work activities using good radworker practices, and ensure that ALARA and radiation controls are addressed in all work activities.

- Subsequent licensee review indicated the TIP shield and components were inspected on August 17, 1995. It was not apparent that that inspection was coordinated with radiological controls personnel.

7.0 RADIOACTIVE MATERIAL CONTROL AND CONTAMINATION CONTROL

The inspector reviewed the adequacy and effectiveness of radioactive material, contaminated material, and contamination controls at Units 2 and 3. The inspector principally focused on review of the following matters.

- personnel frisking practices
- posting and labeling (as appropriate) of contaminated and radioactive material
- surveying and monitoring of material and equipment removed from the radiological controlled area (RCA)

The evaluation of the licensee's performance in this area was based on independent observations by the inspector, discussions with cognizant personnel, and review of documentation including training records.

No safety concerns or violations were identified.

8.0 GENERAL PLANT TOUR OBSERVATIONS

The inspector toured the station periodically during the inspection. The inspector noted that general housekeeping appeared good as did the material condition of the station.

During tours of the outside areas, the inspector observed a wide open door at the rear of the station. Subsequent inspector review indicated the area (CAD tank) was a confined space which required a permit to enter. The licensee posted the door and initiated an investigation.

Subsequent inspector review also indicated that an old and new confined space permit and confined space sign were behind the door. The sign and permits were not visible to an individual entering the area. The inspector noted the new confined space permit was not numbered, contained no work description, and was not consistent with the previous permit. The licensee initiated an investigation of the new permit and identified several administrative issues. The licensee also initiated an audit of all outstanding permits. Further, the licensee plans to require Industrial Risk Management review of new permits. The licensee also initiated training of operations and radiation protection personnel on confined space permits. The licensee concluded that the atmosphere had been sampled and the new permit provided adequate access controls.

The inspector also observed an extension cord being used outdoors (south side of Unit 2) with an electrically powered open light socket. The licensee initiated a review of this matter.

During the tours, the inspector observed three rusting 55-gallon drums at the south side of Unit 2. The drums were filled with liquid and were not identified in any manner. The drums were apparently in the area since about April 1995. The licensee initiated a review of this matter.

The inspector toured the new radwaste storage facility and observed washed-out areas under the fence. It appeared personnel could gain unauthorized access to the facility grounds. The licensee initiated a review of this matter. The inspector noted radioactive material was secured from unauthorized removal.

9.0 EXIT MEETING

The inspector met with licensee representatives (denoted in Section 1.0) on August 31, 1995. The inspector summarized the purpose, scope and findings of the inspection. The licensee acknowledged the findings and had no substantive comments at that time regarding them. No written material was provided to the licensee.