

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Report No. 50-277/84-33  
50-278/84-27

Docket No. 50-277  
50-278

License No. DPR-44  
DPR-56 Priority -- Category C

Licensee: Philadelphia Electric Company  
2301 Market Street  
Philadelphia, Pennsylvania

Facility Name: Peach Bottom Atomic Power Station

Inspection At: Delta, Pennsylvania

Inspection Conducted: October 16-18, 1984

Inspectors: *I. Cohen*  
I. Cohen, Team Leader, EPS, RPB  
DETP RI, NRC

January 30, 1985  
date

- R. Blough, Senior Resident Inspector (PB) DPRP, RI
- H. Williams, Resident Inspector (PB), DPRP, RI
- T. Johnson, DPRP, RI
- J. Beall, DPRP, RI
- J. Grant, DPRP, RI
- J. Hauxhurst, DETP, RI
- C. Amato, DETP, RI

- J. Will, Sonalyst, Inc.
- R. Fox, Battelle, PNL
- G. Stoetzel, Battelle, PNL

Approved by: *T. Harpster*  
T. Harpster, Chief Emergency Preparedness  
Section, RPB, DETP, RI, NRC

2/5/85  
date

Inspection Summary:

Inspection on October 16-18, 1984 (Report Nos. 50-277/84-33 and 50-278/84-27)

8502270202 850206  
PDR ADOCK 05000277  
Q PDR

Areas Inspected: Routine announced emergency preparedness inspection and observation of the licensee's annual emergency exercise performed on October 17, 1984. The inspection involved 244 inspection hours by a team of eleven NRC and NRC contractor personnel.

Results: One violation was identified, failure to provide accurate initiating conditions for emergency action levels.

## DETAILS

### 1. Persons Contacted

The following licensee representatives attended the exit meeting on October 17, 1984:

M. J. Cooney, Vice President, Nuclear Generating Division  
R. S. Fleischmann, Station Superintendent  
R. L. Gambone, Site E.P.C.  
R. A. Kankus, Director, E.P.  
R. H. Logue, Superintendent, Nuclear Services  
J. J. Tucker, Site E.P.C.

The NRC team also observed and interviewed several other licensee emergency response personnel.

### 2. Emergency Exercise

The Peach Bottom Atomic Power Station, Units 2 and 3 annual full scale exercise was conducted on October 17, 1984 from 10:00 a.m. until 9:45 p.m.

#### A. Pre-exercise Activities

Prior to the emergency exercise, NRC Region I representatives had telephone discussions with licensee representatives to review the scope and content of the exercise scenario. As a result, certain revisions were made by the licensee to the scenario package. NRC observers attended a licensee briefing for licensee controllers and evaluators on October 16, 1984 and participated in the discussion of emergency response actions expected during the various phases of the scenario. The NRC observers noted that the licensee had indicated which activities would be simulated and which events would require contingency messages.

The exercise scenario included the following events:

- Initial conditions consisted of Unit 2 operating at 100% power. The high pressure coolant injection (HPCI) pump was out of service due to a turbine governor failure and repairs would take at least one day.
- Two personnel injuries one of which was contaminated.
- A fire in the auxiliary boiler building.
- A missing person within the plant.
- A rupture of a discharge flange on a condensate pump, a reactor feed pump trip, a rupture in a reactor water cleanup pipe, the failure of an isolation valve, the failure of the safety relief

valves and effluent releases through the standby gas treatment system.

The above events resulted in the activation of the licensee's emergency facilities and permitted the state and counties to exercise their Emergency Plans.

B. Exercise Observation

During the conduct of the licensee's exercise, NRC team members made detailed observations of the activation and augmentation of the emergency organization; activation of emergency response facilities; and actions of emergency response personnel during the operation of the emergency response facilities. The following activities were observed:

- Detection, classification, and assessment of the scenario events;
- Direction and coordination of the emergency response;
- Notification of licensee personnel and offsite agencies of pertinent information;
- Communications/information flow, and record keeping;
- Assessment and projection of radiological (dose) data and consideration of protective action;
- Provision for in-plant radiation protection;
- Performance of offsite and in-plant radiological surveys;
- Maintenance of site security and access control;
- Performance of technical support;
- Performance of repair and corrective actions;
- Performance of first aid and rescue;
- Fire fighting;
- Management of Accident recovery operations; and
- Dissemination of public information.

The NRC team noted that the licensee's activation and augmentation of the emergency organization; activation of the emergency response facilities; and actions and use of the facilities were generally consistent with their emergency response plan and implementing procedures.

The team also noted the following areas where the licensee's activities were efficiently implemented:

- The exercise objectives and scenario were submitted in a timely manner to the NRC.
- There was no evidence of prompting by any of the licensee controllers/observers nor of pre-positioning on the part of the licensee players.
- The pre-exercise briefing and exercise critique was pre-planned and performed in an efficient manner.
- Control room players handled announcements and notifications very well, exhibited plant knowledge, worked well together and followed the appropriate procedures.
- The Technical Support Center (TSC) and Emergency Operations Facility (EOF) were manned expeditiously and in a professional manner.
- The use of mimic instruments for plant status information was very effective.
- Excellent casualty assistance aids were used which included:
  - a) TV monitor scanners of Control Room instruments
  - b) Enlarged TRIP (Transient Response Implementation Plan) logic diagrams.
  - c) Copies of blueprints produced by microfiche cards kept at the TSC.
  - d) Plant status printouts.
- Good use was made of most TSC status boards especially the plant parameter board, i.e., operators did not allow the TV monitors to be used as a substitute.
- Noise level within the TSC was maintained at a reasonably low level and personnel played the exercise well and effectively throughout.
- The Operational Support Center (OSC) activation was prompt and orderly. The OSC command and control was good.
- The ambulance entry into the protected area was prompt and in accordance with the security procedures.

- The fire brigade responded promptly to the fire scene and there were excellent coordination and strategy discussions between the fire brigade leader and the offsite fire chief.
- The first aid team responded promptly to the accident scene. Contamination control in the decontamination area and first aid room was good.
- The physicians assistant provided competent care to the injured worker.
- Command and control of the Auxiliary OSC was handled well. The Auxiliary OSC was handled well. The Auxiliary OSC Coordinator and Plant Survey Team Leader worked well together. Team briefings were good and periodic updates on plant status were given to the OSC. Appropriate authorization was received when emergency worker exposure in excess of established limits were required. In general record keeping was good.
- HP practices used by in-plant teams were good. All teams frisked upon leaving contaminated areas. Habitability checks were done periodically in the Auxiliary OSC.
- PASS samples were obtained and analyzed in a timely fashion. Two small volume reactor coolant samples, a secondary containment gas sample and an iodine/particulate sample were all completed within 90 minutes.
- Protective Action Recommendations were made based on degrading plant conditions which indicated an overall understanding of the situation and the recognition of expeditious actions to be taken.
- It was clearly evident that appropriate command and control existed throughout the exercise with the TSC and EOF.
- The need to make an initial dose calculation was promptly recognized and performed in a timely manner.
- The offsite monitoring teams were promptly dispatched and performed their duties in an efficient manner.
- The Muddy Run News Center was well-organized and functioned effectively.

The NRC team findings in areas for licensee improvement were as follows (the licensee also identified some of these areas in their critique of the exercise):

- At 2:05 p.m. when MO-15 failed to close on Group II isolation an "Unusual Event" (incorrect valve position during Group 1, 2, 3 isolation) should have been identified by the Control Room staff.

- At 2:30 p.m. the RWCU pipe rupture occurred and since primary containment integrity was not established (MO-15 open) this condition should have initiated a site area emergency (Loss of Primary Containment Integrity with LOCA). Since this event was not recognized by the scenario writers or the operators, the procedure EP-101 "Classification of Emergencies" may not be adequate. This matter relates to a previously identified NRC open item (50-277/83-33-02) which dealt with suggestive changes and additions to emergency action levels.
- A control room player was observed to operate a fire pump without notifying the on-shift operator.
- The Control Room status board at times did not reflect correct information.
- It appeared that Control Room operators focused mainly on reactor vessel level and pressure control and did not address other items such as leak identification, evaluation of effected areas, the need of the personnel safety team to make surveys or the plant survey team to monitor the site boundary.
- The Equipment Failure and Damage Information status board within the TSC was not used effectively in that data displayed was frequently inconsistent with actual status. In addition, the data was not displayed in a manner to focus on the major problems and the time column data did not correspond with the prognosis update.
- The Emergency Director status reports to the TSC were given infrequently with one interval exceeding one hour and fifteen minutes.
- The Emergency Support Personnel Roster within the TSC was not kept current.
- Announcements over the public address system could not be heard outside of the buildings.
- In regard to the injured person, vital signs were not taken promptly. The pulse was taken at the scene, however, once the patient was taken to the first aid room, blood pressure wasn't taken until the physicians assistant arrived (approximately 50 minutes after discovery of the injury).
- Contamination control leaving the accident scene was poor. Personnel carrying the stretcher left the area with contaminated booties and tracked contamination all the way to the first aid room. The stretcher could have been handed to personnel outside the contaminated area for transport to the first aid room.

- The uninjured contaminated worker was left at the accident scene without instructions although an HP arrived to attend to the worker within a few minutes.
- There weren't an adequate number of Scott air packs at the fire scene. Only two were available during the course of the drill. The fire team leader said he had requested additional packs but they were never observed to arrive during the course of the drill.
- During the fire drill it was not observed if thought was given to personnel who may still have been in the building.
- No HP was observed at the fire scene as specified within procedure EP-206A.
- During the collection of the PASS samples it was observed that the chemistry technician did not always wear gloves when handling the samples and that the runner who carried the samples back to the chemistry lab was not accompanied by a HP technician.
- The Plant Survey Team Leader (PSTL) permitted a maintenance person to close a suction valve to the B condensate pump without being accompanied by another person or HP. The PSTL based his decision on the fact that recent readings indicated stability. However, plant conditions were getting worse as a General Emergency had been declared 50 minutes before.
- In-plant teams were not observed to carry radios for communications with the OSC/HSC. Plant phones and intercom were relied on for communications. This presented no problem however, radios would be useful for situations where phones and intercom were not available or inoperable.
- One plant entry (to the standby liquid control tank) involved sending a team outside the plant to enter a back way. During the briefing to the team radiological conditions (location of the plume, shine dose) were not observed to be discussed.
- Implementing Procedure EP-205 specifies that written NRC approval is required if exposure limits are to be exceeded. There is no NRC requirement for this approval, and this guidance could result in a delay of collecting critical samples.
- All meteorological data should be readily available to the dose assessment team. Currently, the meteorological data from the river tower and tower 1A is not directly available through the data acquisition system in the EOF. In addition, the format used to provide average meteorological data in the control room is not available in the emergency plan or procedures.



- The method used to determine atmospheric stability is not consistent with the guidance provided by NRC and generally accepted throughout the nuclear industry.
- During the observation of activities of an offsite monitoring team it was noted that a runner was left at the side of the road, out of the plume, without a radio or a survey instrument to alert him to a possible change in the plume direction.
- During the initial release, teams were sent to specific locations and surveyed around those points to detect the plume but there was never a co-ordinated effort to verify the existence of a plume. In addition, there was no attempt to track or monitor initial low level releases on the river.
- There was no evidence that protective clothing or respirators were used or simulated when entering the plume.
- News release #3 contained a technical error (LPCI Operating) which had been identified by the News Center staff. This error should have been clarified in a subsequent news release. In addition, news release #5 contained errors in defining a Site Area Emergency and an Alert.

In addition, a number of scenario/controller related events hampered the exercise as follows:

- The actions of Control Room players were unobserved by controllers/observers for an undue length of time.
- Initial conditions and early events were too leading in that only one pump (HPCI) was out of service; only one generic problem (SRV diaphragms) was listed; only one abnormality (clean-up system valve failure to isolate). All of these were important to the drill and leading. The scenario could have presented more of a challenge if "nuisance" malfunctions were included. In addition, messages appeared to be leading in that some messages relayed the event rather than a symptom.
- The release rate was increasing at an inexplicably sharp rate which was misleading and limited free-play.

#### C. Exercise Critique

The NRC team attended the licensee's post exercise critique on October 18, 1984 during which the lead controller presented a summary of the licensee's observations. The lead controller highlighted areas for improvement which the licensee indicated would be evaluated and appropriate action taken. In addition, the lead controller submitted a typewritten copy of the preliminary licensee identified findings to the NRC team leader.

#### 4. Review of Emergency Plan Implementing Procedures

During procedures review, about 5:00 p.m., on October 16, the inspectors identified inadequacies in the emergency action levels for radioactive releases, as specified in Procedure EP-101, Revision 9, October 12, 1984, Classification of Emergencies. Specifically, the procedure specified emergency action levels (EALs) that were above the full scale capabilities of the associated radiation monitoring instruments as listed below.

<u>Instrument</u>	<u>Action Level--Class.</u>	<u>Full Scale</u>
Reactor Building Ventilation	2.5E+6 cpm -- Site Emerg.	1 E+6 cpm
Reactor Building Ventilation	2.5E+7 cpm -- General Emerg.	1 E+6 cpm
Main Stack	6.5E+6 cps -- General Emerg.	1 E+6 cps

Also, the EALs for the reactor building ventilation high range radiation monitors were apparently incorrect, in that the normal background readings (about 1 E+8 cpm for each reactor building) were above the ALERT EAL (1.5 E+7 cpm), almost at the SITE EMERGENCY EAL (1.5 E+8 cpm). The previous revision of the procedure, EP-101, Revision 8, January 10, 1984, contained one similar example, in that the GENERAL EMERGENCY EAL for the reactor building ventilation monitor was 6E+6.

Technical Specification 6.8 and Section 5.3 of ANSI N18.7 (1972) require procedures for implementing the emergency plan actions. Administrative Procedure A-21, Revision 5, April 20, 1981, Generation of Emergency Plan Procedures, requires that procedures include action levels where necessary.

Failure to adequately specify EALs is a violation (277/84-33-01, 278/84-27-01).

When informed of the problem, the licensee made temporary procedure changes to restore the procedure to usability, as an interim measure. The inspector noted that a large number of Emergency Plan procedures was revised shortly before the exercise. This violation indicates that, in at least one case, the review was not adequate with respect to usability and consistency with plant equipment and parameters.

#### 5. Exit Meeting and NRC Critique

Following the licensee's critique, the NRC team met with licensee representatives listed in Section 1. The team leader summarized the observations made during the exercise and discussed the areas described in Section 2.b. In addition, the team leader indicated that there was a repetition of two improvement items:

- Announcements over the public address system could not be heard outside of the buildings.
- Implementing Procedure EP-205 specifies that written NRC approval is required if exposure limits are to be exceeded. This guidance could result in a delay of collecting critical samples.

The licensee was informed, in summary, that although one violation was identified (as discussed in paragraph 4) and although there were areas identified for improvement, the NRC team determined that within the scope and limitations of the scenario, the licensee's performance demonstrated that they could implement their Emergency Plan and Emergency Plan Implementing Procedures in a manner which would adequately provide protective measures for the health and safety of the public.

Licensee management acknowledged the findings and indicated that appropriate action would be taken regarding the identified areas.

At no time during this inspection was written material provided to the licensee by the inspectors.