U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-277/82-12

50-278/82-12

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

Licensee: Philadelphia Electric Company

Facility Name: Peach Bottom Atomic Power Station

Inspection at: Delta, Pennsylvania

Inspection conducted: June 15-17, 1982

NRC Personnel: Nemen M. Terc, Exercise Team Leader — 7/15/82 date signed

Raymond Smith, DEPOS, NRC I
Marie T. Mojta, DEPOS, NRC I
Karl Abraham, PAO, NRC I
Hilbert W. Crocker, DEPOS, NRC I
Perry D. Robinson, EPLB, DEP, NRC
John L. Kenoyer, Battelle, NW
Kenneth L. Swinth, Battelle, NW
Gregory L. Stoetzel, Battelle, NW
James D. Jamison, Battelle, NW

Approved by: H. W. Crocker, Chief Emergency Preparedness Section, DEPOS, R-I — 7/19/82 date signed

Summary:
Inspection on June 15-17, 1982 (Report Number 50-277/82-12, 50-278/82-12)
Area Inspected: Routine announced Emergency Preparedness Exercise observation, evaluation, and inspection. The inspection involved 304 hours by a team of ten NRC, Region I and NRC Headquarters inspectors, and contractor personnel.

DETAILS

1. Persons Present During Exit Interview

Name	Title	Affiliation
Boyer, S. V.	Senior Vice President - Nuclear Power	PECO
Daltroff, S. L.	Vice President - Electric Production	PECO
Cooney, M. J.	Superintendent Nuclear Generation Division	PECO
Firth, E. G.	Site Emergency Planning Coordinator	PECO
Gallagher, J. W.	Manager - Electric Production Dept.	PECO
Hogan, A. J.	Staff Engineer - Engineering and Research	PECO
Kankus, R. A.	Engineer - Radiation Protection Section	PECO
Knapp, W. J.	Director - Radiation Protection Section	PECO
Payne, T. B.	Senior Engineer - Electric Production	PECO
Ullrich, W. T.	Station Superintendent	PECO
Winzenried, J. E.	Engineer - Technical Department	PECO

2. Emergency Exercise

The Peach Bottom Atomic Power Station, Unit 1 and 2 emergency exercise was conducted on June 16, 1982 from about 0630 to 2100.

A. Pre-exercise Activities

On June 6, 1982, prior to the emergency exercise, the NRC Team Leader held discussions with licensee representatives to review the nature, scope and adequacy of the exercise scenario.

In addition, on June 15, 1982, NRC observers attended a briefing held by the licensee with the intent of familarizing NRC observers with the scenario.

The licensee stated that certain functional areas of emergency response would be simulated or reduced in scope in order to prevent the disturbance of normal plant operations (e.g. relocation of evacuees, hours of access to the health physics checkpoints, and extended operator actions to bring the plant to cold shutdown). This latter aspect is routinely exercised during simulation training and walkthroughs.

The licensee's emergency scenario involved significant fuel deterioration and a large release of radioactivity to the environment with the intent of exercising the onsite emergency organization, the corporate support organization, and the response of offsite groups, States and counties. For this reason, some aspects of the exercise were developed in coordination with participating agencies.

Other peripheral events (i.e. independent failures not relevant to the postulated accident) were incorporated into the basic scenario, either to satisfy periodic drill requirements or to comply with requests made by offsite agencies (e.g. States).

B. Exercise Observation

During the exercise, 9 NRC observers made detailed observations of the following activities:

(1) Operational staff actions concerning: detection, classification and operational assessment of the accident;

(2) Notification of licensee's personnel and offsite agencies;

(3) Radiological (dose) assessment and protective action recommendations;

(4) Assembly and accountability:

(5) Security and access control;

(6) In-plant, onsite and offsite radiological surveys;

(7) Radiation protection of emergency workers;

(8) Communications and information flow;

(9) Recordkeeping and sample disposition;

(10) Coordination and direction;

(11) Technical support; and

(12) Public information.

The NRC team noted that the licensee's organizational response to the simulated accident was, for the most part, in accordance with their emergency implementing procedures and that facilities and equipment were consistent with these procedures. The NRC team determined, however, that there were procedural, equipment, and facilities shortcomings identified by NRC and licensee's observers, that needed to be evaluated and resolved.

The NRC team noted that the licensee had a sufficient number of observers and controllers who provided independent assessment and who gave necessary control cards and contigency messages to participants during the various phases of the scenario.

Additionally, the NRC team noted that many functional areas of emergency response were exercised with enough depth and free play, and that within the scope and limitations inherent in the scenario, the licensee's response was effective.

C. Exercise Critique

The NRC reviewed the results of a post-exercise critique conducted by the licensee on June 17, 1982. A comparison of licensee and NRC team findings showed that many coincided.

The following deficiencies were identified by NRC observers:

Scenario Limitations

These limitations may be grouped into three classes: one refers to the limitations inherent in any scenario pertaining to its scope and as a consequence to those functional areas of emergency response (e.g., emergency tasks) which are left out of the exercise; another class refers to the extent of simulation involved in functional areas of response which were encompassed by the scenario; and the third class refers to the quality and amount of information available to participants and observers pertinent to the given scenario (e.g., radiological data, operational parameters, etc.).

- Site evacuation; assembly and re-assembly of personnel evacuated, was not fully exercised.

- Monitoring and decontamination of groups of emergency workers, or other personnel who may have become radioactively contaminated during the simulated accident, was not exercised.

- The Radiological Environmental Monitoring Program (e.g., sampling of soil, water, vegetation, animal feed) was not exercised.

- Controllers allowed unnecessary simulation in the analysis of reactor coolant samples when a real failure of the primary counting equipment ensued. This prevented the free play of participants who were prompted later to use the back up analysis equipment in Unit One. In a real accident, emergency workers should know that backup equipment is available in Unit One. In addition, applicable procedures should instruct the user concerning the use of backup equipment whenever the primary instrumentation is out of order.

- Prompting was noted during the taking of a reactor coolant sample in a high radiation area, supposedly inaccessible (i.e. levels greater than 10 R/hr). In this case the controller repeated aloud the dose rate in the area until a team member got the message that they should evacuate the area according to procedure.

- The Control Room controller was late in providing pertinent data to the control room staff players (e.g. was late in authorizing depressurization) and as a consequence confused operators who expected a logical sequence of events.

- Simulation was excessive during the injured contaminated person event. Hidden sources of radioactivity were not used; frisking techniquies were not demonstrated; and isotopic identification of contaminants was not performed.

- Prompting due to a scenario deficiency was observed when the player was provided with the isotopic analysis of water contaminants. With the portable instrumentation he was using during this event, he could only have obtained a quantative estimate. (This prompting occurred during the second injury event at about 1730.)

- The location of the weld failure on the floor drain collector tank was reported as non-isolatable by the scenario, when in fact, it could have been isolated.

Personnel Training/Proficiency

This category of findings refers to how well licensee personnel performed their emergency duties during the exercise (e.g., technical kown-how, following procedures and instructions). In some cases, it is not evident from the observations of isolated instances (e.g., during an exercise) whether deficiences are due to faulty training or other factors.

- An inplant survey team did not carry data forms in which to record radiation readings at the various locations and failed to post contaminated or high radiation areas, in accordance with paragraph 2.2 of procedure EP 2058. In addition the team used the wrong instruments for ascertaining the extent of surface contamination (i.e. used an RO-2A Ion Chamber instead of a GM survey meter prescribed in paragraph 3.5 of EP-205B) and failed to frisk themselves upon returning from areas in which airborne contamination was known to be present.

- The onsite survey team failed to use air sampling equipment and allowed too much time between Ion Chamber Meter readings. In addition, the individual performed the survey with the 'beta window' closed, possibly underestimating actual doses emanating from a plume consisting of noble gases some which have radiation energies below 100 Kev.

- Search and rescue team members failed to perform radioisotopic analysis of material removed from an injured/contaminated individual according to procedure EP-207C.

- A member of the post-accident coolant sampling team insisted on handling a sample that had a radiation level of 49 R/hr emanating through the shielding container, thus showing poor Health Physics practices.

- Members of the post-accident coolant sampling team remained within a radiation area in excess of 10 R/hr, against their procedure, EP 205A.5, which states they should have left the area.

- The control room staff failed to inform security immediately prior to evacuation, according to procedure EP-305

- The spokesperson at the News Center showed poor understanding of radiological data, and as a consequence, lost credibility with the media. In addition, information regarding the nature and consequences of certain events (e.g. jet pump failure) was lacking.

- Personnel in charge of coordinating the data used for dose assessment failed to provide a comprehensive and timely report of conditions to assist the Emergency Coordinator in making appropriate protective action recommendations.

- The Emergency Coordinator was unable to provide the States of Maryland and Pennsylvania with firm and timely protective action recommendations based on the best available plant parameters, measured release rates, and offsite monitoring results.

- Personnel at the EOF, in charge of the Dose Assessment and Emergency Coordination failed to recognize that offsite releases for radioiodine should be based primarily on measurements of stack effluents rather than "a priori" theoretical radioiodine and noble gas proportions.

- During stack effluent sampling and analysis, the team demonstrated poor handling of a highly radioactive sample during preparation prior to analysis.

- A Chemistry supervisor delayed post-accident sampling (up to 70 minutes). As a consequence personnel radiation exposures were greater since radiation levels were increasing with time. On one occassion, this delay allowed such an increase in radiation levels that the area became inaccessible and the sample could not be taken.

Radiological Controls

This category of findings refers to inadequacies concerning the radiation protection of emergency workers. The reason for these deficiencies could be traced to training, procedures and management (direction/ coordination) areas.

- Radiological precautions (e.g. radiation and airborne surveys)

to insure habitability were not performed at the EOF, on a continuous basis during the simulated accident until prompted by evaluators. As a consequence, a large number of persons (e.g. State and county representatives, emergency workers, etc) were left unmonitored.

- Habitability surveys were not taken inside the HP/Operational Support Center (OSC). As a consequence, a number of radiation workers were exposed to unknown levels of airborne contamination and direct radiation.

- In some instances (e.g. In Plant Surveys) personnel radiation exposure control was not being maintained. In a real event, this could result in overexposure to radiation.

Information Flow

Efficient means of communications are necessary, but alone are not sufficient for an accurate and timely transmittal of relevant information. The Information-flow category of findings refers to the entire process of information exchange between emergency organizational elements, including communications and the ability to discriminate critical information that should be acted on a timely manner.

- In some occasions, offsite survey teams members failed to verify radio messages. This could result in an inaccurate description of the radiological environment.

- Two way communications among in-plant, on-site team members and the OSC were not established (e.g. using radio transceivers). As a consequence, there was a greater risk for the individual taking the survey, and additionally, a continuous flow of data feedback needed for further direction and refinement of radiation surveys was not possible.

- Self Contained Breathing apparatus should include microphones to facilitate communications.

- While the Emergency Coordinator and his Assistant were involved in briefings throughout the exercise, information was not being received and acted upon by an assigned individual who had been properly trained and qualified to discriminate critical information that should be acted on a timely manner. As a consequence, while a large release of radioactivity to the environment occurred at 1550 (which could in itself have prompted the immediate declaration of a General Emergency) the Emergency Coordinator did not become aware of this until 1610, and did not declare a General Emergency until 1620.

Sample and data disposition

This category of findings refers to regrouping and collecting onsite and field sampling media and data sheets for further analysis of results.

- The licensee lacked a method, and the organizational set-up for performing sample and data disposition during the simulated accident. As a consequence, actions and recommendations were, in some cases, based on preliminary results (i.e. without further verification). In addition, there were no provisions for further analysis of field samples for trend analysis of data. A more accurate updated picture of the radiological panorma could not be constructed.

Procedures

This category of findings refers to written instructions and guidelines used to perform the various emergency response tasks.

- The licensee's emergency procedures failed to include a proper method for establishing and coordinating all the data required for assisting the Emergency Coordinator in making adequate Protective Action Recommendations (e.g. effluent sample results, airborne concentrations etc.). Procedures failed to clearly define: the criteria for deciding priorities in the selection of certain data over another and lacked a format which included In-plant sampling results, a comparison of Onsite results with offsite measurements, and the guidelines for making certain recommendations (e.g. shelter).

- Procedure EP 205 B failed to instruct field monitoring teams to zero their self-reading dosimeters. Some team members started with 300 mr on a 500 mr scale, limiting their monitoring capability to 200 mr. As a consequence, after a short exposure, team members would not be able to perform their functions. This could result in unnecessary delays.

Other Improvement Areas

The NRC team, in addition to the above areas, suggested other improvements as follows:

- Perform a study to improve the clarity of CRT displays (e.g. stack gas monitor) so that every instrument needed during emergencies is clearly readable.

- Provide team members with larger scale floor plans and drawings to facilitate quicker and easier recognition of data.

- Clarify the responsibilities of the Plant Survey Group leader in Paragraphs 1.1 and 1.2 of Procedure EP 205B.

- Review the logistics for the HP technicians and chemical analysis groups concerning their alternative locations in Unit II or Unit I, to prevent delays in communications and consequently in the taking of inplant samples.

- Ensure that data sheets required for performing dose assessment calculations are readily available in the control room.

- Ensure that needed data sheets, procedures and forms (e.g. EP 205 B) are included in offsite emergency kits.

- Include dosimeter chargers in offsite kits.

- Investigate how to extend radiocommunications with offsite teams to the 8 to 10 mile range, and implement your findings.

- Reduce noise levels at the information center and add more telephones to the News Center and to the NRC office at the EOF.

- Improve parking conditions at the News Center to take into account extreme whether conditions.

- Develop means to keep Status Boards updated at the News Center.

- Provide instructions for using telephones at the New Center.

- Improve the procedure for packaging and labeling samples for further identification.

- Improve the timing of controllers' actions at the Control Room to prevent them from confusing operators.

3. Exit Meeting and NRC Critique

Following the critique by licensee's observers, the NRC Team met with licensee representatives listed in Section 1 above. The licensee provided the NRC team with a written list of their critique findings. The Exercise Team Leader summarized the purpose and scope of the NRC inspection and major findings. The Team Leader discussed the findings and informed the licensee that the number of observers and controllers were adequate; the amount of simulation was minimal and that enough free play allowed exercising the various functional areas of emergency response.

The Team Leader concluded that within the scope and limitations of the scenario, the licensee's actions were found to be adequate to protect the health and safety of the public and that such actions were consistent with their Emergency Plans and Emergency Implementing Procedures.