



PECO NUCLEAR

A Unit of PECO Energy

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May 16, 1997

Docket Nos. 50-278
License Nos. DPR-56

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Peach Bottom Atomic Power Station Units 2 & 3
Supplemental Response to Notice of Violations (50-278/97-03-01 and
50-278/97-03-02)

References: NRC Routine Integrated Inspection 50-277/96-06 and 50-278/96-06
to PECO Energy Company dated October 6, 1996

NRC Combined Inspection Report 50-277/97-03 and 50-278/97-03;
and Notice of Violation to PECO Energy Company dated
February 10, 1997

Peach Bottom Atomic Power Station Units 2 & 3
Response to Notice of Violation to NRC dated March 20, 1997

NRC Supplemental Violation Response Request to PECO Energy
Company dated May 7, 1997

Gentlemen:

In response to your letter dated May 7, 1997 concerning the referenced Response to Notice of Violation dated March 20, 1997, we submit the attached supplemental response. The subject inspection reports and the violation response concerned an event that was evaluated during a resident integrated inspection conducted July 7 through September 7, 1996 and a radiological environmental monitoring program and meteorological monitoring program inspection conducted December 9, 1996 through January 24, 1997.

If you have any questions or desire additional information, do not hesitate to contact us.

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CCN # 97-14034



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62A-1, Chesterbrook
61B-3, Chesterbrook
62A-1, Chesterbrook
63C-3, Chesterbrook
63C-3, Chesterbrook
SMB4-9, Peach Bottom
62C-3, Chesterbrook
53A-1, Chesterbrook
S23-1, Main Office
SMB4-6, Peach Bottom
62A-1, Chesterbrook
62A-1, Chesterbrook
S13-1, Main Office
A4-1S, Peach Bottom
SMB3-5, Peach Bottom
SMB3-1, Peach Bottom
PB-TC, Peach Bottom
61C-1, Chesterbrook
PS2-1, Peach Bottom
PS1-3, Peach Bottom
A4-4S, Peach Bottom
A4-5S, Peach Bottom

RESPONSE TO NOTICE OF VIOLATIONS 97-03-01 & 97-03-02

Restatement of Violations

1. 10 CFR 50.59(b)(1), states, in part, that the licensee shall maintain records of changes in the facility ..., to the extent that these changes constitute changes in the facility as described in the safety analysis report. These records must include a written safety evaluation which provides the bases for the determination that the change..., does not involve an unreviewed safety question.

Contrary to the above, on July 18, 1996, the licensee made a change to the facility that involved penetrating the turbine building wall that was not described in the safety analysis report. The safety evaluation record failed to provide the bases for the determination that the penetrations, which resulted in an unmonitored release to the environment, did not involve an unreviewed safety question.

This is a Severity Level IV Violation (Supplement IV).

2. Technical Specification 5.5.4 states that the program for the control of radioactive effluents, and for maintaining the doses to members of the public from radioactive effluents as low as reasonable achievable, conforms to 10 CFR 50.36a. The program shall be contained in the ODCM, be implemented by procedures, and include remedial actions to be taken whenever the program limits are exceeded. The program shall include: (1) monitoring, sampling, and analysis of radioactive liquid and gaseous effluents in accordance with 10 CFR 20.1302 and with the methodology and parameters in the ODCM; and (2) limitations to ensure gaseous effluent treatment systems are described in the ODCM.

Offsite Dose Calculation Manual 3.8.C.5 indicates that the turbine building atmosphere is processed through permanently or temporarily installed equipment in the turbine building and the vent stack prior to discharge. In addition, the UFSAR (Section 10.15.3) describes that exhaust ventilation air from the turbine building and radwaste building is discharged to the atmosphere from the (monitored reactor building vent stack) roof.

Contrary to the above, from July 18 to July 29, 1996, during a modification to the turbine building, the licensee did not assure the turbine building atmosphere, exhausted through penetrations in the turbine building wall, was processed through permanently or temporarily installed equipment, and vented and discharged to the atmosphere through the monitored reactor building vent stack.

This is a Severity Level IV Violation (Supplement IV).

Event Background

Modification P00248 involved the construction of the new Plant Entrance and Radiological Laboratory Building. Associated work activities included penetrations to be made in the west wall of the Unit 3 Turbine Building to install ventilation duct supports. On July 16, 1996 a sample hole was cut in the west wall of the Unit 3 Turbine Building for Health Physics (HP) to smear the work area. The smear was counted and determined to be clean. On July 18, 1996 the first of seven 3' x 5' openings was cut for duct support installation. It was at this time a worker who was working on the outside of the Turbine Building was identified with short-lived activity (less than 100 counts per minute) on his hand. On July 19, 1996 an HP supervisor instructed workers on the radiological hazards of short-lived activity and RCA exit requirements. Subsequently, five of the seven openings were cut in the Turbine Building. Following this series of events, various HP, Chemistry, Project Management and Engineering personnel performed several walkdowns and inspections of the work area. Temporary flat sheeting was observed installed over the corrugated outer wall of the Turbine Building and air flow was felt flowing from inside the Turbine Building to the outside. An air sample was taken inside the Turbine Building near the openings on July 25, 1996 that identified short-lived activity, but no long-lived isotopes. A meeting was held on July 29, 1996 with various work groups where it was decided to stop work until appropriate compensatory measures could be developed and implemented.

Reasons for Violation 97-03-01

During modification design activities prior to work performance, a 10 CFR 50.59 safety evaluation was prepared to support the modification work. The design activities on which the safety evaluation was based and developed considered the Turbine Building ventilation system, but only in the context of potentially increasing the probability of an accident or its consequences or the possibility of a different type of accident as previously evaluated in the Safety Analysis Report (SAR). The safety evaluation also considered whether equipment important to safety would be impacted by this modification. The preparer based the safety evaluation on the net effect of whether the activity would increase the expected frequency of an accident or the malfunction of equipment important to safety. Since no accident mitigation credit is assumed for the Turbine Building in the case of an accident and the probability of an occurrence or consequences of a malfunction of equipment important to safety would not be increased or a different type of malfunction created, the preparer also determined that the margin of safety would not be reduced for this modification. The preparer therefore concluded that the proposed activity did not involve an unreviewed safety question. This was a result of the preparer's focus and mindset on the potential impact of accident occurrence or mitigation and the failure to recognize and consider the ODCM. The potential impact on routine Turbine Building effluent monitoring during normal operation was therefore considered insignificant. In addition, since the penetrations were considered only as a short term interim configuration to install ventilation duct supports, the preparer did not fully analyze and document the proposed change with respect to the Turbine Building ventilation and ODCM.

The safety evaluation was also developed under the premise that the Turbine Building as a whole was maintained at a slightly negative pressure so that air would not flow out through the Turbine Building penetrations. The airflow created by the slightly negative pressure is to preclude the unmonitored release of potentially contaminated air from inside the building flowing to the outside. This premise was based on the Peach Bottom Updated Final Safety Analysis Report (UFSAR) Section 10.15.3.1 which states, in part, "Generally, airflow is routed from areas of lesser to areas of progressively greater contamination potential prior to final exhaust." It was also based on DBD No. P-S-08G "Turbine Building and Cable Spreading Room HVAC Systems" Section 2.5.3 which states, in part, "The Turbine Building Ventilation System shall be designed to maintain negative pressure in potentially contaminated areas with respect to clean areas." This prevents the exfiltration of air containing potentially contaminated particulate to clean areas. It was assumed that when the penetrations were cut in the Turbine Building that airflow would be pulled from the outside of the building to the inside. Therefore, a contingency plan was not thoroughly evaluated and documented in the safety evaluation for this interim configuration to address the potential for an unmonitored release pathway. After the penetrations were cut there were areas surrounding the openings where an egress of air was felt. Areas such as these are very localized areas of slightly higher pressure which can occur and are affected by outside atmospheric conditions and the point of location in the Turbine Building. This creates a localized pocket of positive pressure which when compared to the total volume of air that is exhausted through the roof vents is a relatively small volume. Engineering determined that during the occurrence of this event the Turbine Building ventilation line-up was appropriate and that overall building pressure did remain slightly negative with respect to the outside atmosphere. This was based on previous smoke tests with a ventilation equipment line-up similar to that during the event. Although this event was determined not to be an issue with Turbine Building ventilation design, it was concluded that any work activities that result in new penetrations or openings must be approached, analyzed and documented in the safety evaluation as a potential unmonitored release pathway.

Corrective Steps That Have Been Taken & the Results Achieved

Performance Enhancement Program (PEP) Reports (I0005918) and (I0006884) were initiated July 26, 1996 and April 15, 1997, respectively, to investigate the event, determine potential causes and develop appropriate corrective actions. Results of these reports were used to develop this response and the associated corrective actions.

Engineering re-addressed and documented the basis for why this activity was not an unreviewed safety question in an action evaluation (12) in PEP I0005918. Concerning reduction of safety margin, the actual installation activities for the exhausts systems provided an unmonitored release path from the Turbine Building. While the Turbine Building is maintained at a slightly negative pressure with respect to outside conditions, momentary local conditions created the possibility of localized positive pressure conditions. These conditions presented the potential for and actually resulted in an unmonitored release. The calculated magnitude of the release using conservative assumptions (discussed below) was determined to be well below the quarterly and annual limits prescribed in the ODCM.

Site Chemistry and HP provided monitoring for all openings after discovery of the event and special compensatory actions were added to the work order instructions to minimize any additional potential releases.

The initial and final configurations of the installation did not present a similar potential for an unmonitored release based on the design of the installation. Since the margin of safety was not actually reduced and there was no impact to accident promulgation or impact to equipment important to safety as a result of this activity, the change did not involve an unreviewed safety question.

The Director of Engineering and the Senior Manager of Design Engineering counseled the safety evaluation preparer concerning this event and the rationale used to develop the safety evaluation. Management expectations concerning the proper review and assessment of program requirements and proper record documentation in the safety evaluation was stressed.

Corrective Steps That Will Be Taken To Avoid Further Violations

A procedural review of Licensing Regulatory Common Guideline (LR-CG-13) "Performing 50.59 Reviews" was performed to evaluate the guidance available to preparers of 10 CFR 50.59 reviews. Although in general the guidance provided in LR-CG-13 was adequate, the procedure will be revised to specifically define the ODCM and to provide additional guidance when evaluating the potential reduction in safety margin with respect to normal or routine plant operations. This revision will be completed by August 29, 1997.

A training segment will be prepared and presented to appropriate personnel in Engineering Support Personnel Continuing Training (ESPCT) by personnel involved in this event to reinforce the use of the ODCM and other licensing base documents. This will be completed by September 19, 1997.

Date When Full Compliance Was Achieved

Full compliance was achieved for the violation on July 29, 1996 when work activities were stopped and the integrity of the Turbine Building was restored. The work package was revised to include appropriate compensatory measures including proper radiological monitoring and work control precautions. These actions precluded the potential for any further unmonitored releases due to temporary monitoring and included precautions that should have been addressed in the 50.59 safety evaluation. As a result of the compensatory actions added to the work order and the calculated results of the unmonitored release, safety margin was not reduced and did not result in an unreviewed safety question.

Reasons for Violation 97-03-02

The 50.59 safety evaluation and Engineering Design Input Document (DID) were incorporated into an Engineering Change Request (ECR) to support activities of modification P00248 prior to the actual performance of work. These documents addressed the identified design inputs and provided requirements of the modification to the work planner to be included in the work order, which is the actual mechanism to perform work activities. The ECR stated "This work will require penetrating the insulated Unit 3 Turbine Building siding and attaching to the turbine building steel columns. Cuts in the turbine building are to be made in a neat and workmanlike manner. Upon completion of the work, the insulated Turbine Building wall is to be patched, repairing insulation and skin, leaving a neat finished appearance with a minimum of gaps and seams. All seams are to be caulked for a weather-tight installation." The DID stated that "the cutting of penetrations required for personnel and for the routing of commodities into the new building from existing plant areas shall be coordinated with Security, Fire Protection, HP and other plant organizations to assure compliance with barrier requirements." The DID also stated that the modification would involve the penetration of radiation barriers. This information was translated into the work order under "HP Special Instructions" as "Health Physics required for system breach." Although a HP planner was contacted about this modification, the discussion was general and did not include any notification or briefing concerning the planned Turbine Building penetrations. This work order activity referenced the ECR, but did not include detailed information in the radiological engineering part of the work order or requirements that would have provided better clarity to the HP planner concerning the proposed work activities. The detail provided in the work order and the verbal communication between the work planner and HP was inadequate. There was also a lack of questioning attitude on the part of the work planner and HP planner. Additionally, the final review of the work order package failed to identify the lack of special instructions. As a result, holes were cut in the Unit 3 Turbine Building without HP knowledge or appropriate compensatory measures to prevent an unmonitored release.

The ECR listed A-C-134 "Control of Hazard Barriers" as a reference document to be utilized for penetration of radiation barriers. Upon investigation, however, it was determined that the procedure as written was not applicable. The procedure addresses any wall, floor/ceiling, penetration, door or hatch constructed of building materials used to physically separate areas and contain hazards. Hazards is defined as a condition that could jeopardize the operation of safety related equipment which includes fire, water, air (secondary containment), steam, smoke and hot gas and security. The Turbine Building and related activities did not meet this definition. This procedure did not address precautions or prerequisites for a potential unmonitored release pathway.

Corrective Steps That Have Been Taken & the Results Achieved

Performance Enhancement Program (PEP) Reports (I0005918) and (I0006884) were initiated July 26, 1996 and April 15, 1997, respectively, to investigate the event, determine potential causes and develop appropriate corrective actions. Results of these reports were used to develop this response and the associated corrective actions.

Work activities were stopped on July 29, 1996. The following requirements were developed and added to the work order. The requirements were implemented prior to continuing work.

1. Information was added to the work order to work only one opening at a time. This reduced the area open to the outside environment.
2. Permanent corrugated closure material was required to be available to reduce the amount of times the penetration was open to the outside environment.
3. HP was required to take appropriate air samples during the work evolution to monitor and control work.

These actions provided appropriate compensatory measures to ensure that any future potential release pathways were sampled or monitored.

On July 25, 1996 an air sample was taken when it was realized that there was air flow from inside the Turbine Building to the outside atmosphere. An ODCM calculation was then performed to qualify and quantify the unmonitored release. The HP sample indicated Cesium-138 activity and no long-lived isotopes. Cesium-138 (half-life of 32 minutes) is a particulate daughter decay product of the noble gas isotope Xenon-138 (half-life of 14 minutes). Using the standard equilibrium decay equation, the Xe-138 parent activity corresponding to the measured Cs-138 activity was then calculated. This calculated Xe-138 activity was then used as the source term for the release. Since actual volume of the release was not known, a conservative estimate of 20,000 cubic feet per minute was utilized. The value chosen corresponded to 10 percent of the nominal Unit 3 vent flow of 200,000 cubic feet per minute. If the estimated amount of flow had actually diverted through the Turbine Building holes, an equivalent drop in the Unit 3 vent flow would have been identified. With the aforementioned values, the dose rates were then calculated. Since an actual release duration was also not known, the release duration was postulated to continue for an entire week. The assumptions utilized correlate to a release duration of seven days (10,080 minutes) at a flow rate of 20,000 cubic feet per minute, for a total release of 200 million cubic feet. Even with these conservatisms, the total dose calculated as a result of the Turbine Building outflow was $6.32\text{E-}7$ millirem. This compares to the total 1996 third quarter gamma air dose of $3.91\text{E-}2$ millirem. Although the calculated total dose of the Turbine Building release was added to the 1996 Annual Effluent Report to the NRC dated April 23, 1997, the amount was insignificant when compared to the total dose reported for the quarter.

This event was discussed and evaluated with personnel involved and plant staff in 1996 and 1997. This has resulted in a heightened awareness of and sensitivity to the ODCM with respect to the Turbine Building and the need to consider and evaluate potential unmonitored release paths.

As a result of this event, the HP department took the following corrective action:

- On August 12, 1996, Compliance expectations of HP-C-214 "Collection and Analysis of Air Samples" were reviewed with HP personnel to sample any time there is a pathway for a unmonitored release of radioactive material.
- On September 19, 1996, An article was published in the daily Peach Bottom newsletter, Today @ PBAPS concerning Work Order/ Radiation Work Permit (RWP) interface.

- On October 7, 1996, Procedure AG-CG-026.3 "Work Order (W/O) Planning Process" was reviewed with Radiological Engineering personnel to communicate clear expectations on what is required in the work order fields (i.e. special instructions) prior to assigning the work order to a RWP.
- During cycle 3 of HP Continuing Training, conducted October 31 through November 26, 1996, this event and air sampling requirements were re-emphasized and discussed with HP personnel.

This event was also discussed and reviewed with appropriate work planning personnel on October 10, 1996.

In addition, this event was discussed with appropriate Chemistry personnel in Cycle 1 of HP Continuing Training which was conducted January 16 through February 14, 1997.

An article concerning this event was published in the March 1997 edition of the Experience Assessment Group publication 'PECO Nuclear Experiences'. This publication reports lessons learned from industry and internal operating experience and is distributed throughout the PECO Nuclear Generation Group.

These actions have resulted in an increased awareness and sensitivity to overall work planning and air sampling requirements with respect to work activities where potential unmonitored release paths could be created.

Corrective Steps That Will Be Taken to Avoid Further Violations

This event will be further communicated to appropriate personnel involved in the work planning process. The importance of performing a thorough review of input documentation and effective communication will be stressed. This action will be completed by June 30, 1997.

Procedure AG-CG-026.3 "Work Order (W/O) Planning Process" will be revised to include notification of HP and Chemistry for a review of the potential effect on the ODCM and required compensatory measures, such as appropriate monitoring, for any work order activity which could potentially create an unmonitored radioactive release as a result of work activities. This revision will be completed by July 31, 1997.

Procedure A-C-134 "Control of Hazard Barriers" will be revised to include direction for breaching potential radioactive contamination barriers to prevent an unmonitored radioactive release path. In addition, the development of site drawings that depicts structures as radioactive contamination barriers which require HP and Chemistry notification for compensatory actions prior to work will also be evaluated. These actions will be completed by July 31, 1997.

As an enhancement, Procedure HP-C-214 "Collection and Analysis of Air Samples" will be revised to provide additional guidance concerning potential unmonitored release paths. This revision will be completed by July 31, 1997.

Date When Full Compliance Was Achieved

Full compliance was achieved for the violation by July 29, 1996 when work activities were stopped and the work package was revised to include proper radiological monitoring and work control precautions. These actions reduced the potential for any future unmonitored release as a result of temporary monitoring and more stringent work area controls. A dose calculation was also performed to estimate the quantity of the unmonitored dose released and was reported in the 1996 Annual Effluent Report to the NRC.