



PEACH BOTTOM—THE POWER OF EXCELLENCE

**PHILADELPHIA ELECTRIC COMPANY**

PEACH BOTTOM ATOMIC POWER STATION

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D. B. Miller, Jr.  
Vice President

February 26, 1993

Docket Nos. 50-277  
50-278

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

Subject: Peach Bottom Atomic Power Station - Units 2 and 3  
Response to Notice of Violation 92-82-03 (Unit 2 and 3)  
(Combined Inspection Report No. 50-277/92-82; 50-278/92-82)

Dear Sir,

In response to the referenced inspection report dated January 21, 1993, which transmitted the Notice of Violation, we submit the attached response. We have also addressed the administrative controls of our corrective actions process that were ineffective in this violation. The subject inspection report concerned a team evaluation of our actions developed in response to NRC Generic Letter 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance". The inspection was conducted on-site from October 19-23, 1992, and the overall inspection effort was concluded November 30, 1992.

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

Sincerely,

cc: R. A. Burricelli, Public Service Electric & Gas  
W. P. Dornsife, Commonwealth of Pennsylvania  
J. J. Lyash, US NRC Senior Resident Inspector  
T. T. Martin, US NRC Region I Administrator  
R. I. McLean, State of Maryland  
C. D. Schaefer, DelMarVa Power  
H. C. Schwemm, Atlantic Electric

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52A-5, Chesterbrook  
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51A-13, Chesterbrook  
51A-1, Chesterbrook  
52A-5, Chesterbrook  
61B-3, Chesterbrook  
53A-1, Chesterbrook  
63B-5, Chesterbrook  
S23-1, Main Office  
A3-1S, Peach Bottom  
A4-4N, Peach Bottom  
S13-1, Main Office  
SMO-1, Peach Bottom  
Doctype 231  
A4-1S, Peach Bottom  
B-2-S, Peach Bottom  
52A-6, Chesterbrook  
62C-3, Chesterbrook  
52C-7, Chesterbrook

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APPENDIX A

NOTICE OF VIOLATION

PHILADELPHIA ELECTRIC COMPANY      DOCKET NOS. 50-277, 50-278  
PEACH BOTTOM ATOMIC POWER STA.      LICENSE NO. DPR-44, DPR-56

As a result of the inspection conducted from October 19 through November 30, 1992, and in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the following violations were identified:

10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," states, in part, that "...Measures shall be established to assure that conditions adverse to quality, such as ...non-conformances ... are promptly identified and corrected."

The Philadelphia Electric Company Nuclear Quality Assurance Plan, General Program section PR 16.0, Corrective Action, requires, in part, that measures be established to assure that conditions adverse to quality are promptly corrected and that ...safety-related equipment non-conformances are controlled.

Contrary to the above, as of October 23, 1992, the licensee's measures established for the assurance of quality were inadequate or untimely as evidenced by the following examples.

1. The following represent examples where no documentation of nonconforming conditions was recorded:
  - a. Reactor water cleanup (RWCJ) loop isolation valve 2-12-018 experienced an over-thrust condition at 286% in March 1992. The actuator was replaced and the new actuators's as-left thrust also exceeded the vendor's nominal thrust rating by 150%. Neither the original nor the as-left over-thrust conditions were documented or evaluated through a formal non-conformance report (NCR). Also, no documentation or evaluation was performed to consider if the original over-thrust condition exceeded the rating of other related components (such as valve internals). The licensee did not establish a basis for accepting the replacement actuator in the as-left over-thrust condition.
  - b. Reactor core isolation cooling (RCIC) system minimum flow valve 3-13-027 was left in an over-thrust condition at 161% on October 17, 1991. The licensee did not initiate an NCR to document and evaluate the nonconforming condition.

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- II. The following represent examples where documented nonconforming conditions were inappropriately resolved:
- a. The as-found under-thrust condition and the as-left over-torque condition for MOV 3-12-015 (documented in NCR 92-00001) was not properly resolved because: 1) The torque switch was set at approximately 116% of the actuator torque rating without an engineering evaluation as specified by the manufacturer; and 2) The licensee relied on a commercial actuator rating instead of the manufacturer's published nuclear actuator rating to disposition this concern without an engineering evaluation.
  - b. An over-thrust condition experienced by MOV 2-12-015 (documented in NCR 92-00111) was not properly resolved because: 1) The licensee considered 200% of the actuator's thrust rating acceptable based on a study by a contractor on the capability of MOV actuators to withstand thrust greater than the manufacturers published ratings. The actuator thrust of 200% exceeded the maximum thrust allowable specified by the manufacturer (162%). The licensee did not perform an internal engineering evaluation when 162% of the actuator's rated thrust was exceeded; and 2) the NCR did not identify if the actuator torque ratings was also exceeded.
  - c. An under-thrust condition in MOV 3-23-015 in the closing direction (documented in NCR 92-00582) was not properly resolved. The resolution of this NCR did not incorporate conditions from the manufacturer when planning to raise the allowable thrust.
  - d. NCRs 92-00353 and 92-000395 provided final dispositions of over-thrust conditions where the actuators for MOVs 2-13-027 and 3-13-025 had potentially been subjected to 210% and 162% of their rated thrust respectively. The licensee justified the acceptability of these over-trust conditions without fully implementing vendor recommendations such as evaluating the actuator for potential over-torque problems.
- III. The following represents an example of untimely corrective action:
- a. On April 29, 1992, torus cooling loop injection valve 2-10-34B failed to function properly. Subsequently, a surface crack was discovered and repaired in the valve yoke. After the companion RHR valves were inspected on August 7, 1992, surface cracks were also found in the yoke of MOV 2-10-34A. The approximate five months taken to inspect valve 2-10-34A subsequent to identifying crack in the 2-10-34B valve was untimely corrective action.

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

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Reason for the Violation

- I. On April 6, 1992, the actuator for motor operated valve (MOV) 2-12-018 was found to be overthrusting by 28%. It was determined through conversation with Nuclear Engineering Division (NED) that an overthrust value of that amount necessitated replacement of the operator. The potential damage caused to the other valve components as a result of the overthrust was also discussed. NED determined that the operator was the limiting component at that overthrust value and that no other corrective action was required for the valve. Procedure NA-03N001, "Control of Non-conformances", requires that any non-conforming condition that cannot be resolved by rework shall be documented on an NCR. Station personnel believed that the "in kind" replacement of the operator met the condition of rework and an NCR was not initiated. The operator was then replaced and the new operator was tested. The final thrust of the new operator was found to be 150% of the operator rating. The new overthrust condition was discussed with NED who determined the valve to be operable based on a recent study by Kalsi Engineering. The initial overthrust, the as left overthrust and potential valve component damage were not evaluated in the NCR process. Similarly, an NCR for the minimum overthrust condition of the reactor core isolation cooling (RCIC) system minimum flow valve 3-13-027 on October 17, 1991, was not initiated. In both these examples however, neither station personnel nor NED initiated NCRs to document the as-found or as-left condition.
- II. The examples where documented non-conforming conditions were improperly resolved were a result of the use of engineering judgement and third party information without consulting the equipment manufacturer prior to making operability determinations. In the case of MOV 3-12-015, the use of the commercial actuator rating instead of the manufacturer published nuclear actuator rating in the engineering evaluation, to show that the integrity of the valve was not compromised and that no damage to the operator was anticipated, was not appropriate. Additionally, in the case of MOV 2-12-015 and MOV 3-23-015, the use of the Kalsi Study on the capability of MOV actuator to withstand thrust greater than Limitorque Corporations published ratings without prior approval from Limitorque Corporation was not appropriate. Limitorque Corporation was also not contacted prior to use of the torque correction factor methodology prescribed by Liberty Technologies. In addition, some information that was part of engineering evaluations was not incorporated into the NCRs. Torque switch settings that were below the torque that would have caused damage to the operator and spring pack were not documented because this condition was not considered to be a non-conformance issue.

- III. On April 25, 1992, the torus cooling loop injection valve 2-10-34B failed to function properly. The valve was subsequently discovered with a surface crack on the valve yoke on April 29, 1992. Surface cracks were also found on companion Residual Heat Removal (RHR) MOV 2-10-34A on August 7, 1992. The three and a half months taken to inspect MOV 2-10-34A subsequent to identifying cracks in the MOV 2-10-34B valve was a result of inadequate follow-up to inspect other similar valves, confusion concerning valve operability with respect to allowable stress load calculations and inadequate resource support.

Personnel did not follow through with a questioning attitude following discovery of cracks on MOV 2-10-34B. NED was contacted and an NCR was written, but station personnel did not pursue potential generic implications with cracked yokes on other similar valves. Additionally, there was a lack of NED support personnel available to address motor operated valve actuator and valve concerns such as NCR dispositions and other related generic programmatic issues when this event took place. At the time the original flaws were identified there was only one support person assigned the responsibility of the PECO MOV program.

NED initiated Reportability Evaluation/Event Investigation Form (RE/EIF) 2-10-159 on June 19, 1992, which recommended that companion valves MOV 2-10-034A, MOV 3-10-34A, and MOV 3-10-034B be inspected to verify the extent of this type of failure. This partial event investigation considered the valve operable at the time it was initiated. This was received by the station on August 3, 1992.

On August 7, 1992, the MOV 2-10-034A, MOV 3-10-034A and 034B valve yokes were inspected. Cracks were identified on the MOV 2-10-034A and were documented by an NCR. The original NCR operability/reportability determination by NED on August 8, 1992, deemed the MOV 2-10-034A operable pending further investigation. Further evaluations by NED revealed that the original allowable stress load determined in calculations for the valve yoke member did not account for the presence of cracks or flaws, and that MOV 2-10-34A and 034B should have been considered inoperable.

Cracks identified on the MOV 2-10-034A and MOV 2-10-034B were weld repaired under direction of their respective NCRs. However, since the cause of the cracks was indeterminate both loops of torus cooling may have been inoperable prior to the repair of MOV 2-10-034B. This led to a confusion concerning the operability status of the valves and the untimeliness of the final operability determination. Notification to the NRC concerning these valves was made October 5, 1992.

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Administrative Controls Deficiencies in the Corrective Action Process for MOVs

In the first example of the violation, non-conforming conditions were not documented. Station personnel felt they were within the bounds of Procedure NA-03N001, "Control of Non-conformances", Rev. 4 to replace the operator "in-kind", without the generation of an NCR. The new non-conformance procedure A-C-901, effective March 1, 1993, requires any individual who identifies a non-conforming condition to generate a Plant Information Management System (PIMS) action request to document the non-conformance. Additionally, Maintenance Procedure M-511-130, "Procedure for Diagnostic Testing of Limitorque Motor Operated Valves Using the Liberty Technologies Votes Method" is under revision to provide instruction to generate an NCR upon the discovery of any underthrust or overthrust condition in the as-found or as-left condition. This procedure revision will enhance the generation of an NCR with any future non-conformance.

The second example of the violation involved the failure to properly disposition existing non-conformance conditions. This weakness was due to a lack of overall guidance that defined for PECO what considerations should go into determining the acceptability of MOVs. This weakness has subsequently been corrected by the generation of a MOV program description. Personnel who disposition NCRs concerning MOVs now have clear guidance as to the considerations in determining MOV acceptability. Additionally, a flow chart that depicts the steps of an appropriate review of MOV non-conformance and the consistent resolution through the corrective action process is under development and will be amended to the Generic Letter 89-10 program document.

Concerning the untimely corrective actions involving non-conforming conditions involving MOVs in our Generic Letter 89-10 program, we feel that at the time, less than adequate interim corrective action control existed. For example, when the MOV 2-10-34B deficiency was found, no clear programmatic control existed to ensure the MOV 2-10-34A valve was inspected for similar deficiencies. An NCR was promptly generated to resolve the specific 34B problem. A Reportability Evaluation/Event Investigation Form (RE/EIF) was later generated approximately 7 weeks later to investigate generic implications with similar valves. After the RE/EIF was generated, approximately 7 weeks elapsed before plant walkdowns were performed on similar valves. The delay between generation of an NCR and generation of a RE/EIF to consider generic implications is attributable to no direction in the NCR procedure existing at that time to generate a review for generic implications. The NCR procedure has subsequently been revised and is effective March 1, 1993, that requires consideration of trending as well as generic implications. In the event of generic implications the procedure gives direction to initiate a RE/EIF. The delay between the time the RE/EIF was generated and the plant walkdown was performed is due to unclear direction in the in-house event process to consider and document interim corrective actions. This process has subsequently been improved effective January 4, 1993, to require consideration and documentation of interim corrective actions on the RE/EIF.

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Corrective Steps That Have Been Taken and Results Achieved

An investigation was conducted by Nuclear Quality Assistance (NQA) to determine if there were any other programs where non-conforming issues could be dispositioned without an NCR. Interviews were conducted with personnel regarding programs such as set points, breakers, relays, timers, and snubbers. Based upon the results of these interviews, it was concluded that NCRs are initiated when conditions are found which do not meet design basis. The investigation also concluded that personnel were either knowledgeable of the method for the identification of NCRs or to make proper notification to their supervision if a non-conforming condition is found.

Prior to the return of Unit 2 to service, on December 6, 1992, and Unit 3 on November 8, 1992, all motor operated valves were reviewed for non-conformance issues generated during diagnostic testing associated with the Generic Letter 89-10 Program. For each valve that was identified as underthrusting, overthrusting or overtorqueing, existing NCRs were reviewed and reverified or new NCRs were issued. These NCRs addressed the appropriate concern as well as an evaluation for the as-found and as-left condition. This review did not identify any valves that were considered inoperable in the as-left condition.

Site MOV personnel were counselled on the importance of generating NCRs in a timely manner when non-conforming conditions are identified and to aggressively pursue and identify any other components which may be affected by or have the same failures as components identified by NCRs, RE/EIFs, or visual inspections.

Engineering has conducted reviews and discussions with staff and supporting contractors to ensure that consistent evaluations are performed for nonconforming valve conditions. These discussions were conducted during the re-evaluation of valves contained in the scope of Generic Letter 89-10. The discussions emphasize requirements to evaluate test results from both the as-found and as-left conditions for any underthrust, overthrust, and overtorque condition. In addition, it was stressed that the evaluation and resolution of any nonconforming condition has to be based on positions that are approved by Limitorque Corporation and any appropriate valve vendor.

Engineering has also increased staffing to provide additional support for the station to adequately address MOV programmatic issues and any potential non-conformances. The increased staffing will better facilitate the needs of the station and will improve the timeliness of problem resolution.

Corrective Steps That Will Be Taken To Avoid Future Violations

Maintenance procedure M-511-130, "Procedure For Diagnostic Testing of Limitorque Motor Operated Valves Using the Liberty Technologies VOTES Method" will be revised to provide instruction to generate an NCR upon discovery of any underthrust or overthrust valve in either an as-found or as-left condition. This revision will be completed by March 5, 1993.

A flow chart that depicts the steps of an appropriate review for motor-operated valves with nonconforming conditions and a consistent resolution of those conditions through the corrective action process will be developed and incorporated into the Generic Letter 89-10 program document. Additionally, engineering evaluations will be conducted in accordance with component manufacturers guidelines and recommendations. The appropriate Limitorque documentation will also be appended to this program document. These actions will be completed by March 31, 1993.

Training will be conducted for engineering and supplementary contract personnel to ensure effective and consistent implementation of the flow chart and Generic Letter 89-10 program document requirements. This will also include a discussion of the corrective actions process for MOV non-conformances. Training will be completed by April 16, 1993.

A lessons learned evaluation of the Generic Letter 89-10 Program is currently underway. This evaluation is scheduled to be completed by May 1, 1993. Results of the evaluation will be incorporated into the program as appropriate and will also be reviewed with responsible personnel. Additionally, many of the issues evaluated are currently being incorporated into the design basis for motor operated valves. The addition of these issues and associated resolutions to the design basis document will provide an improved information resource and will enhance the resolution of future potential non-conformance issues.

#### Date When Full Compliance Will Be Achieved

Full compliance was achieved when motor operated valves with nonconforming issues were reviewed and re-evaluated prior to the start-up of Unit 2 on December 6, 1992, and Unit 3 on November 8, 1992. For each of the valves identified either the existing NCR was reviewed and re-verified or a new NCR was issued. No valves in this review were considered inoperable in the as-left condition.