



PHILADELPHIA ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION
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PEACH BOTTOM—THE POWER OF EXCELLENCE

D. B. Millet, Jr.
Vice President

December 21, 1990

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 & 3
Response to Notice of Violation
(Combined Inspection Report Nos. 50-277/90-17;50-278/90-17)

Dear Sir:

In response to your letter dated November 16, 1990, which transmitted the Notice of Violation concerning the referenced Inspection Report, we submit the attached response. The subject Inspection Report concerned a routine resident safety inspection during the period August 14 through September 24, 1990.

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

Sincerely,

Attachment

- cc: R. A. Burricelli, Public Service Electric & Gas
- T. M. Gerusky, Commonwealth of Pennsylvania
- J. J. Lyash, USNRC Senior Resident Inspector
- T. T. Martin, Administrator, Region I, USNRC
- H. C. Schwemm, Atlantic Electric
- R. I. McLean, State of Maryland
- J. Urban, Delmarva Power

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52A-5, Chesterbrook
51A-13, Chesterbrook
51A-1, Chesterbrook
52A-5, Chesterbrook
61B-3, Chesterbrook
S23-1, Main Office
A3-1S, Peach Bottom
A4-4N, Peach Bottom
A4-1S, Peach Bottom
A4-1S, Peach Bottom
51A-11, Chesterbrook
52A-5, Chesterbrook
53A-1, Chesterbrook
53A-1, Chesterbrook
S13-1, Main Office
SMO-1, Peach Bottom
A4-2S, Peach Bottom
B-2-S, Peach Bottom
63B-5, Chesterbrook
51A-13, Chesterbrook
52C-7, Chesterbrook

Attachment

Response to Notice of Violation 90-17-03

Restatement of Violation

10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires that measures be established to assure that conditions adverse to quality are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

Contrary to the above, from November 1989, until September 11, 1990, Unit 3 was operated with level transmitters LT 3-2-3-99C and LT 3-2-3-99D indicating non-conservatively and in violation of the Technical Specifications. Prompt actions to determine the cause of this condition adverse to quality and to correct it were not implemented. The deficient condition was identified by the operating staff on several occasions during that period. However, adequate investigation and corrective actions were not implemented until September, 1990.

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

Event Description

On September 11, 1990, level transmitter (LT) 3-2-3-99D was valved out and calibrated. The "as found" data indicated that the level transmitter was out of calibration. This resulted in the level indicating switch (LIS) 3-2-3-99D trip setpoint exceeding technical specification limits. Similarly, on September 25, 1990, (LT) 3-2-3-99C was found out of calibration resulting in (LIS) 3-2-3-99C trip setpoint also to exceed technical specification limits. LT/LIS 3-2-3-99C and D are two of four instrument loops which provide a Group I Primary Containment Isolation System (PCIS) signal on triple low reactor water level. The logic for initiating a PCIS isolation is one-out-of-two-twice, or a trip of LIS 3-2-3-99A or C and LIS 3-2-3-99B or D. Although two loops were found out of calibration, the other two instrument loops were fully operational. A PCIS isolation could have occurred at the proper water level even though redundancy was 100%.

Prior to identifying the calibration discrepancies in September, 1990, the local reactor water level indications on LIS 3-2-3-99C and D had been recognized at various times as being outside of their acceptance range (5" to 35") as specified on the daily shift surveillance log ST 9.1.3X between November 30, 1989 and August 30, 1990. Maintenance Request Forms (MRF's) were initiated at various times during this period, but were cancelled when the transmitter readings returned to the acceptable range.

On November 30, 1989 and December 10, 1989, the abnormal indications were observed by Operations personnel but discounted because they were believed to be associated with the transmitters being outside their normal operating pressure and temperature ranges during start-up. The wide range level transmitters, which are calibrated for power conditions, normally read high in the operating range of reactor water level when at reduced pressure. No action therefore was taken to address the high readings.

On December 27, 1989 and March 17, 1990, during reduced reactor power operations, the abnormal indications were again noticed by Operations personnel. Work orders were initiated but later discounted because the level indications subsequently returned within the acceptable range at higher power. At reduced power on May 2, 1990, abnormal indications were again noticed. Work orders were initiated on May 13, 1990 and May 21, 1990, for LT 3-2-3-99D and C, respectively. A calibration check of the transmitters was scheduled for the Unit 3 mid-cycle outage in October, 1990, because it was realized that performing the calibration at power could result in a reactor scram. An additional investigation performed by Instruments and Controls (I&C) engineering personnel on August 7, 1990, involving instrument voltage outputs and comparisons to the narrow range water level instruments led to the conclusion that the C and D instruments were properly calibrated and the A and B loops were probably calibrated in the conservative low direction.

While investigating a Unit 2 reactor level indication problem on August 30, 1990, I&C personnel performing the investigation became aware of the effects of reactor recirculation (recirc) flow on wide range level instrumentation. It was noted that as recirc flow increases, the level indications on reactor vessel wide range level instruments are reduced by the dynamic effects of recirc flow in the areas where their sensing lines penetrate the reactor vessel. Taking the effects of recirc flow into account, further investigation was performed and it was determined on September 10, 1990, that LT 3-2-3-99C and D could have been out of calibration in the high, non-conservative direction.

Corrective Steps Taken And Results Achieved

The trip setpoints for LIS 3-2-3-99C and D were raised to -130 inches on September 11, 1990, to compensate for the potential out of calibrated condition of LT 3-2-3-99C and D. LT 3-2-3-99D was recalibrated on September 11, 1990, and the trip setpoint was restored after this condition was confirmed. LT 3-2-3-99C was similarly found out of calibration and was recalibrated September 25, 1990, with the appropriate trip setpoint restored.

An event investigation and LER were initiated to examine the evolution of the event, determine root cause and contributing causal factors, and to develop recommendations to prevent recurrence of this incident.

A potential cause of this event was the initial calibration of LT 3-2-3-99C and D. Both level transmitters were calibrated on the same day by the same I&C personnel using the same test equipment. Since the transmitters were out of calibration by virtually the same amount, it is presumed a common factor affected both calibrations. Investigation into this area, however, has been unable to determine the exact cause of the event. Based on an analysis of the daily surveillance log data performed during the period of this event, it appears that LIS 3-2-3-99C and D were out of calibration from the time they were last calibrated. The calibration data of the transmitters completed on July 5, 1989, indicated that the calibration was performed satisfactorily without any apparent discrepancies. The I&C technician who directed the calibration was interviewed, but remembered no abnormalities associated with the calibration. The test equipment used during the calibration was found to be within tolerances during subsequent scheduled accuracy checks on August 17, 1989 and December 29, 1989 for the pressure gauge and digital voltmeter, respectively.

Information concerning this event and investigation was disseminated to I&C foremen on 12/19/90. Additionally, this event and its implications were discussed at the I&C All-Hands Meeting the same day.

On 10/26/90, ST 9.1-2(3)X, Y, and Z, "The Surveillance Log (Hot Shutdown, Startup/Hot Standby or Run Mode)" was reviewed and revised to include adequate acceptance criteria for indicating mismatches between instruments monitoring the same parameter, to provide appropriate acceptable ranges for reactor wide range level instruments at different reactor power ranges, and to provide operator guidance to ensure that significant instrument problems are identified and evaluated. A brief description of each change is summarized below.

A maximum differential limit ($\text{MAX } \Delta$) was developed for comparing instrument readings from instruments monitoring the same parameter. Prior to this revision, Operators were required to compare readings on instruments that monitor the same parameter, but the point at which corrective action should have been taken was not specified. Now, if the $\text{MAX } \Delta$ is exceeded, an investigation is required to determine instrument operability. This revision also allows Operations personnel to initiate corrective action on any unusual reading or abnormal trend that they suspect as a potential problem before the $\text{MAX } \Delta$ limit is exceeded.

It has been determined that wide range level instrumentation tends to read low as the plant is moved from startup to full power conditions due to the effects of recirc flow. The acceptance limits of the reactor water level instrumentation were revised to account for these effects. Prior to this revision there was only one set of limits that applied to the instrumentation for all plant power levels and conditions. A problem could exist where an instrument indicating beyond the higher acceptance limit at low core flow could read below that limit at high core flow. The instrument would appear to have returned to normal operation even though there could be a calibration or equipment problem. This revision will aid in the identification of instrumentation that is not operating correctly. Additionally, some of the acceptance limits have been narrowed to aid in the detection of instrument drift before a maximum upscale or downscale failure occurs.

Administrative controls have been enhanced to require that an operability determination be made for all Technical Specification instrument readings where apparent abnormal indications exist. The operability determination and any corrective actions taken are now required to be documented within the test. Additionally, if the operability determination of the instrument can not be determined on the shift where an instrument discrepancy is identified, efforts to determine operability shall actively continue on subsequent shifts until operability status is clearly determined. This will ensure that decisions made concerning instrument operability are actively pursued and that the rationale used to make these decisions is properly documented.

The reactor vessel level instrumentation lesson plan for licensed operator training was revised October 16, 1990. Additional information concerning level instrumentation characteristics is now included in this training. This enhanced lesson plan is now utilized during presentations of licensed operator reactor level instrumentation.

A review of the Maintenance Request Form (MRF) process was initiated to evaluate the effectiveness of the program in regard to the review process, prioritization and disposition of the MRF's, particularly regarding MRF cancellation. The authority to cancel work orders has been changed so that

only designated personnel with appropriate computer access now have that ability. The cancellation of any MRF that would eliminate a work activity now requires the approval of first line supervision (Unit Coordinators) prior to cancellation. A program has also been established to track and review cancelled work orders.

The system engineer for reactor pressure vessel instrumentation now receives work order information that affects activities of instrumentation or equipment in the individuals area of responsibility.

Corrective Steps That Will Be Taken To Avoid Future Violations

A discussion of the effects of recirc flow, reactor pressure, and reactor power on the wide range reactor level instrumentation and how these factors affect transmitter level data will be included in Technical Staff and Management (TS&M) training. This training presentation will be administered December, 1990 and January, 1991, to appropriate personnel.

ST 9.1.A- 2(3)X, Y, and Z, "The Surveillance Log (Refuel or Cold Shutdown Mode)" will be revised prior to the start of the upcoming Unit 2 Refuel Outage, scheduled for mid-January, 1991.

To provide a thorough understanding of the effect of recirculation flow on wide range level indication, training will be developed for appropriate Operations and I&C personnel.

Corrective actions previously discussed that have been completed will also prevent future violations.

Date When Full Compliance Was Achieved

Full compliance was achieved on September 11, 1990, when the trip setpoints for LIS 3-2-3-99C and D were re-established within Technical Specification limits. LT 3-2-3-99D was successfully re-calibrated later that day and LT 3-2-3-99C was similarly recalibrated September 25, 1990.