

PHILADELPHIA ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION

R. D. 1, Box 208

DELTA, PA 17314

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KEN POWERS
PLANT MANAGER

December 30, 1992

Docket No. 50-278

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

SUBJECT: Licensee Event Report
Peach Bottom Atomic Power Station - Unit 3

This LER concerns a Drywell Oxygen concentration level which exceeded the value specified in the Technical Specification due to a mispositioned valve and an analyzer failure. This revision provides updated information on the cause of the event.

Reference: Docket No. 50-278
Report Number: 3-92-002
Revision Number: 01
Event Date: 01/17/92
Report Date: 12/30/92
Facility: Peach Bottom Atomic Power Station
RD 1, Box 208, Delta, PA 17314

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(i) and 50.73(a)(2)(ii)(B).

Sincerely,

Ken Powers

cc: J. J. Lyash, USNRC Senior Resident Inspector
T. T. Martin, USNRC, Region I

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1/1

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-030), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3156-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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| FACILITY NAME (1) Peach Bottom Atomic Power Station - Unit 3 | | | | | | | | | | DOCKET NUMBER (2) 0 5 0 0 0 2 7 8 | | | | | | | | | | PAGE (3) 1 OF 0 5 | | | | | | | | | | | | | | | |
| TITLE (4) Drywell Oxygen Concentration Level Exceeded the Value Specified in the Technical Specification due to an Analyzer Failure | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EVENT DATE (5) | | | | | | LER NUMBER (6) | | | | | | REPORT DATE (7) | | | | | | OTHER FACILITIES INVOLVED (8) | | | | | | | | | | | | | | | | | |
| MONTH | | DAY | | YEAR | | YEAR | | SEQUENTIAL NUMBER | | REVISION NUMBER | | MONTH | | DAY | | YEAR | | FACILITY NAMES | | | | | | | | | | | | DOCKET NUMBER(S) | | | | | |
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| OPERATING MODE (9) | | | | | | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N | | | | | | 20.402(b) | | | | | | 20.405(c) | | | | | | 50.73(a)(2)(iv) | | | | | | 73.71(b) | | | | | | | | | | | |
| POWER LEVEL (10) | | | | | | 0 5 0 | | | | | | 20.405(a)(1)(i) | | | | | | 50.73(c)(1) | | | | | | 50.73(a)(2)(v) | | | | | | 73.71(c) | | | | | |
| | | | | | | 20.405(a)(1)(ii) | | | | | | 50.73(c)(2) | | | | | | 50.73(a)(2)(vi) | | | | | | OTHER (Specify in Abstract below and in Text, NRC Form 366A) | | | | | | | | | | | |
| | | | | | | 20.405(a)(1)(iii) | | | | | | X 50.73(a)(2)(i) | | | | | | 50.73(a)(2)(vii)(A) | | | | | | | | | | | | | | | | | |
| | | | | | | 20.405(a)(1)(iv) | | | | | | X 50.75(a)(2)(ii) | | | | | | 50.73(a)(2)(viii)(B) | | | | | | | | | | | | | | | | | |
| | | | | | | 20.405(a)(1)(v) | | | | | | 50.73(a)(2)(iii) | | | | | | 50.73(a)(2)(ix) | | | | | | | | | | | | | | | | | |
| LICENSEE CONTACT FOR THIS LER (12) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NAME | | | | | | | | | | | | | | | | | | | | TELEPHONE NUMBER | | | | | | | | | | | | | | | |
| Albert A. Pulvio, Regulatory Engineer | | | | | | | | | | | | | | | | | | | | AREA CODE | | | | | | | | | | | | | | | |
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| COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CAUSE | | SYSTEM | | COMPONENT | | MANUFACTURER | | REPORTABLE TO NRC | | | | CAUSE | | SYSTEM | | COMPONENT | | MANUFACTURER | | REPORTABLE TO NRC | | | | | | | | | | | | | | | |
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| SUPPLEMENTAL REPORT EXPECTED (14) | | | | | | | | | | | | | | | | | | | | EXPECTED SUBMISSION DATE (15) | | | | | | | | | | | | | | | |
| YES (If yes, complete EXPECTED SUBMISSION DATE) | | | | | | | | | | | | | | | | | | | | MONTH DAY YEAR | | | | | | | | | | | | | | | |
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ABSTRACT / Limit to 1400 spaces (i.e. approximately fifteen single space handwritten lines) [16]

On 01/17/92, it was discovered that the Drywell (DW) Oxygen (O2) concentration level exceeded the 4% limit specified in the Technical Specifications (Tech Spec). This resulted in a Tech Spec violation and a condition outside design basis. DW O2 concentration samples were obtained using a portable monitor and this sample indicated that the actual concentration level was about 8.0%. The cause of the event was that the instrument air bypass manual valve was found open which allowed instrument air to leak into the DW. A contributing factor to this event has been determined to be that the analyzer was giving an indicated low reading due to a defective potentiometer. The failure to identify that the DW O2 analyzer was not functioning properly has been attributed to the fact that the acceptance range on the Surveillance Test (ST) was too low. After discovery of the event, the DW O2 concentration levels were reduced and the O2 analyzer on the other unit was verified to be operational. Additionally, round sheets will be revised to include instrument nitrogen compressor run times. Independent containment samples are currently being analyzed on a periodic basis as a compensatory action. The ST used to record the O2 concentration levels will be revised.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | PAGE (3) | | | | | | |
| Peach Bottom Atomic Power Station Unit 3 | | <table border="1"><tr><td data-bbox="1049 268 1153 300">YEAR</td><td data-bbox="1153 268 1273 300">SEQUENTIAL NUMBER</td><td data-bbox="1273 268 1382 300">DIVISION NUMBER</td></tr><tr><td data-bbox="1049 306 1153 346">0</td><td data-bbox="1153 306 1273 346">500027892</td><td data-bbox="1273 306 1382 346">0020102</td></tr></table> | YEAR | SEQUENTIAL NUMBER | DIVISION NUMBER | 0 | 500027892 | 0020102 | OF 05 |
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Requirements for the Report

This report is being submitted pursuant to 10 CFR 50.73 (a)(2)(i) as a result of a Technical Specification (Tech Spec) 3.7.A.7 violation when Drywell (DW) Oxygen (O₂) concentration levels exceeded the value specified and the plant was not in a cold shutdown condition within 24 hours. Additionally, since the DW O₂ analyzer was failed, Tech Spec 4.7.A.5 Surveillance Requirement could not be satisfied. Additionally, this report is submitted to satisfy 10 CFR 50.73 (a)(2)(ii)(B) describing a condition that was outside the Design basis of the plant since the Loss of Coolant Accidents (LOCAs) assume that the O₂ concentrations levels start at less than 4%.

Unit Conditions at Time of Discovery

Unit 3 was in the "RUN" mode at 50% of thermal reactor (EIIS:EA) power. There were no systems, structures, or components that were inoperable that contributed to the event.

Description of the Event

On 01/17/92 at 2200 hours, it was discovered that the DW O₂ concentrations exceeded the 4% limit specified in the Tech Specs for greater than 24 hours. This condition resulted in a Tech Spec violation when DW O₂ concentration levels exceeded the value specified and the plant was not in a cold shutdown condition within 24 hours. Additionally, this resulted in a condition which was outside the design basis of the plant since the LOCA analysis assumes that the O₂ concentrations levels start at less than 4%.

An investigation identified that on 1/08/92 at approximately 0730 hours, the DW O₂ level was 2.1% as indicated on Control Room instrumentation. At approximately 1600 hours, the DW O₂ analyzer (EIIS:AI) indicated low readings. The failed DW O₂ analyzer went undetected for approximately nine days. It was estimated that the DW O₂ concentration levels were greater than 4% for approximately five (5) days. The analyzer readings were recorded each shift on a Surveillance Test (ST). Since the low acceptable value specified in the ST was 0% and the analyzer failed to a value of approximately 0.5%, this condition contributed to the high O₂ concentration condition in the DW being undetected.

On 1/17/92 at 0540 hours, the "Drywell High Oxygen" alarm was received in the Main Control Room. DW O₂ levels appeared to spike to about 8%. The System Engineer was contacted and troubleshooting commenced immediately. At 1745 hours, the Routine Test used to perform a calibration check of the DW and containment O₂ analyzers was completed which verified that approximately 8.0% DW O₂ concentration level existed. At 1758 hours, the Containment Atmospheric Dilution (CAD) system (EIIS:BB) was placed in service to support DW and containment O₂ monitoring. The CAD system O₂ analyzer results confirmed that

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

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Peach Bottom Atomic Power Station
Unit 3

YEAR

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

DW O2 concentration levels were greater than the Tech Spec limit. Torus O2 concentration levels were found to be 3.5% which is less than the Tech Spec limit. Additionally, at 2143 hours, DW O2 concentration samples were obtained using a portable monitor and this sample indicated that the actual DW O2 concentration level was about 8.0%. The appropriate Tech Spec Limiting Condition for Operation (LCO) was entered.

At 2230 hours, an orderly shutdown was commenced and reactor power was reduced. The NRC was notified of the event at 2246 hours. DW inerting commenced using the Containment Atmospheric Control (CAC) system. On 1/18/92 at 0900 hours, the DW O2 concentration levels were reduced to less than the Tech Spec limit. The Torus O2 levels were also reduced to 0.6%. The appropriate LCO was exited, and the nitrogen (N2) inerting into the containment with CAC was terminated.

Subsequently, an instrument air bypass valve (HV-3-36B-55225B) used to backup the instrument N2 system was found open which allowed instrument air to leak into the DW through various small instrument N2 tubing leaks. The leakage into the DW was not detected due to a small leak out through the High Pressure Coolant Injection (HPCI) system exhaust line vacuum breakers into the HPCI Gland Seal Condenser. Normally, air leakage into the DW would cause the DW pressure to increase. Since the instrument N2 leaks were small and leaks of this size can be masked by the HPCI system, they went undetected. After the instrument air bypass manual valve was closed, DW pressure started to decrease which required that N2 makeup to the DW until the HPCI Gland Seal Condenser was filled with water.

Cause of the Event

The instrument air bypass manual valve used to backup the instrument N2 system was found open which allowed instrument air to leak into the DW through various small instrument N2 tubing leaks which caused the O2 concentration to increase. Extensive interviews have been conducted but the cause of the mispositioned valve has not been determined yet. The investigation identified that the valve was verified closed as part of the normal operating procedure on 11/20/91 and after the Integrated Leak Rate Test on 12/24/91.

A contributing factor to this event has been determined to be that the DW O2 analyzer was giving an indicated low reading for about nine days. The analyzer failed low giving false indication of actual DW O2 concentration levels. It has been determined through an investigation that a potentiometer (EIIS:RHE) used to adjust the range of the analyzer was defective and this caused erratic operation. Independent containment samples were obtained and analyzed on a periodic basis as a compensatory action until the analyzer's false indication was fully evaluated and repaired.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

The failure to identify that the DW O2 analyzer was not functioning properly has been attributed to the fact that the acceptance range on the ST was too low. The low acceptable value was 0%. The instrument failed to an indicated value of approximately 0.5%. If the low acceptable value was greater than zero but less than the normal operating range, this would have initiated an investigation sooner which could have prevented the event.

Analysis of Event

No actual safety consequences occurred as a result of this event.

Following a Design Basis LOCA, with a postulated Loss of Offsite Power and a single active failure, the CAD system was available to sample, purge, and vent containment per Emergency Procedures to maintain H2 and O2 concentrations levels as low as possible. Additionally, mixing of DW and Torus atmospheres during a Design Basis LOCA will cause the average DW O2 concentration levels to be lower than the 8%.

If H2 or O2 monitoring systems are unavailable and concentration levels can not be determined, an emergency Reactor Pressure Vessel blowdown and containment spray, in conjunction with containment venting and purging activities can be initiated per the Emergency Procedures, as mitigating actions.

The probability of a Design Basis LOCA occurring within the five (5) day time frame is of the same order of magnitude as the probability of a LOCA occurring within the Tech Spec 90 hour per year limit to perform containment vent and purge.

Corrective Actions

After discovery of the event, the CAD system was placed in service to support DW and containment O2 monitoring. An orderly shutdown was commenced and reactor power was reduced. The DW O2 concentration levels were reduced to less than the Tech Spec limit via CAC, the N2 inerting into the containment was terminated and the appropriate LCO was exited. Additionally, the CAC O2 analyzer on the other unit was verified to be operational.

An evaluation has been performed which determined that the instrument air bypass manual valves will be maintained in the locked closed position as another barrier to prevent future occurrences.

Additionally, round sheets have been revised to include instrument N2 compressor run times. This will provide Operations additional information which would be an indication of excessive DW instrument tubing leaks or an open instrument air backup valve. Above normal instrument N2 compressor run

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FACILITY NAME (1)

Peach Bottom Atomic Power Station
Unit 3

DOCKET NUMBER (2)

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

times could indicate an increase in DW tubing leaks while low compressor run times could indicate an open instrument air backup valve.

The cause of the indicated low readings was a defective potentiometer. The potentiometer was repaired and the analyzer was returned to service with no similar recurrences. In addition, the Unit 2 analyzer was inspected and found to be satisfactory. The analyzers on both units have been placed in the Preventive Maintenance program to perform periodic inspections of the analyzer internal components. Independent containment samples were obtained and analyzed on a periodic basis as a compensatory action until the analyzer's false indication was fully evaluated and repaired.

The STs used to record the O₂ concentration levels have been revised to provide a method to detect analyzer failure earlier. This involved changes to the low acceptable value specified in the STs. Additionally, the STs has been reviewed to identify other similar conditions and no other similar conditions were found.

The pertinent information from this event has been provided to the appropriate Operations and plant staff members.

Previous Similar Events

There were no previous similar events identified involving increased O₂ concentration levels during power operation.