

PHILADELPHIA ELECTRIC COMPANY

PEACH BOTTOM ATOMIC POWER STATION

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KEN POWERS
PLANT MANAGER

July 20, 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 the potential inoperability of the Automatic Depressurization System due to solenoid valve and wiring being unqualified as a result of insulation not being installed properly. This revision provides updated information involving the event.

Reference:	Docket No. 50-278
Report Number:	3-91-017
Revision Number:	01
Reportability Date:	11/08/91
Report Date:	07/20/92
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)(ii)(B), 10 CFR 50.73(a)(2)(v), and 10 CFR 50.73(a)(2)(i).

Sincerely,

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

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PDR ADOCK 0500027B
S PDR

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION: 7.0 QUEST. 50.0 HRS. FORWARD COMMENTS R. GARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545 AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Peach Bottom Atomic Power Station - Unit 3 DOCKET NUMBER (2) 0 5 0 0 0 2 7 B PAGE (3) 1 OF 0 6

TITLE (4) Automatic Depressurization System Inoperability Due to Components Being Unqualified, as a Result of Insulation not being Installed Properly

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)
09	24	91	91	017	01	07	20	92			0 5 0 0 0
											0 5 0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)

OPERATING MODE (9) N	20.402(b)	20.405(d)	80.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0100	20.406(a)(1)(ii)	50.38(e)(1)	80.73(a)(2)(iv)	73.71(c)
	20.406(a)(1)(iii)	50.38(e)(2)	80.73(a)(2)(v)	OTHER (Specify in Abstract below and in Text, NRC Form 365A)
	20.406(a)(1)(iv)	X 50.73(a)(2)(i)	80.73(a)(2)(v)(A)	
	20.406(a)(1)(v)	X 50.73(a)(2)(ii)	80.73(a)(2)(v)(B)	
	20.406(a)(1)(vi)	50.73(a)(2)(iii)	80.73(a)(2)(vi)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Albert A. Pulvio, Regulatory Supervisor TELEPHONE NUMBER 7117 456-1710 114

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	USE SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) X NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e. approximately 1 single space written line) (16)

On 9/24/91 at 1300 hours, the Main Steam Relief Valve (MSRV) solenoid valves (SV) wiring insulation was discovered to be degraded. An investigation revealed that the MSRV thermal insulation had been improperly installed. This caused an unusually high temperature environment in the immediate vicinity of the SVs and associated wiring. On 11/8/91, it was determined by engineering analysis that there was no longer a reasonable assurance that certain Automatic Depressurization System relief valves were operable. The temperature increase from the insulation installation error caused the expiration of the Environmental Qualification life of the components. A causal factor analysis has been performed concerning this event and corrective actions will be implemented as appropriate. The insulation was properly reinstalled and the SVs were replaced. No previous similar LERs identified.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 900 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20548, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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Peach Bottom Atomic Power Station Unit 3	0 5 0 0 0 2 7 8	9 1	- 0 1 7	- 0 1	0 2	OF 0 6

TEXT (If more space is required, use additional NRC Form 885A's) (17)

Requirements for the Report

This report is being submitted to satisfy the requirements of 10 CFR 50.73 (a)(2)(i)(B) describing conditions which were potentially outside the design bases of the plant and 10 CFR 50.73(a)(2)(v) due to a potential loss of a safety system function. In addition, per 10 CFR 50.73 (a)(2)(i)(B) because Technical Specification 3.5.E Limiting Condition for Operation (LCO) was violated during the event.

Unit Conditions at Time of Discovery

Unit 3 was in the REFUEL mode.

Description of the Events

On 9/24/91 at 1300 hours, during the performance of routine preventive maintenance on the Main Steam Relief Valve (MSRV) solenoid valves (SV) associated with the eighth Refueling Outage, the MSRV SV wiring insulation was discovered to be degraded. An investigation revealed that the MSRV thermal insulation had been improperly installed (see attached drawing) during the previous Refueling Outage in 1989. This caused an unusually high temperature environment in the immediate vicinity of the SVs and associated wiring. This high temperature condition caused the MSRV SV wiring insulation to degrade.

On 11/8/91, it was determined by engineering analysis that there was no longer a reasonable assurance that three Automatic Depressurization System (ADS) (E11S:RV) relief valves were operable. The purpose of the insulation is to ensure that the Drywell environment is maintained at design conditions. It was determined by engineering analysis that the temperature increase from the insulation installation error caused the expiration of the Environmental Qualification (EQ) life of the components after approximately three days of operation. The ADS MSRVs comprise 5 of the 11 MSRVs. This condition had existed since the last Refueling Outage in November of 1989 when the MSRV thermal insulation was improperly installed after it had been removed to support the piping replacement modification. The NRC was notified via ENS on 11/8/91 at 1220 hours.

Cause of the Events

The cause of this event has been determined to be that the MSRV insulation was improperly installed.

A causal factor analysis has been performed concerning this event. A significant contributing factor of this event was that no one perceived any technical risk with insulation. It was determined that the personnel involved in this event were primarily concerned with insulating piping and components. They believed that the function of insulation was limited to thermal

**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-830), 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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TEXT (If more space is required, use additional NRC Form 366A's (1)).

efficiency or personnel protection. It was only after the event that the significance of insulating critical equipment from high temperatures was fully realized. Additionally, due to this perception, information was never requested or provided on areas where insulation could be critical to surrounding equipment or components.

Inadequate training and guidance and inattention to detail were contributing factors in this event. A Maintenance Request Form did not contain sufficient MSR/V insulation inspection details. The inspection of drywell insulation after the pipe replacement failed to identify the discrepancies with the installed MSR/V insulation. The performer of the post maintenance test had seen the damaged MSR/V insulation prior to its repair and, when performing the final inspection, was so impressed by the improved visual and physical condition of the MSR/V insulation that he did not identify the installation discrepancies.

There was also an occurrence where the lack of a questioning attitude by the technical staff failed to identify the improperly installed insulation. This opportunity occurred when a maintenance fitter craftsman questioned the orientation of the MSR/V insulation after the 'E' MSR/V replacement in October of 1990. This information was given to the work activity coordinator who decided, based on his knowledge of the reinstallation, that the MSR/V's insulation were properly installed. No action was taken to investigate the potential problem.

Analysis of Event

The MSR/V SVs and associated wiring were functionally tested in a cold condition which provides some basis to expect the MSR/V's to be functional prior to and possibly during a design basis event.

If a design basis event had occurred and the ADS did not perform properly, the HPCI system was available approximately 96.4% of the time during the last operating cycle. HPCI is used to provide core cooling and to reduce reactor (EIIS:RPV) pressure to allow the Low Pressure Coolant Injection (EIIS:BO) and the Core Spray (EIIS:BM) Systems to inject.

During the time that the HPCI system was unavailable, the Reactor Core Isolation Cooling (RCIC) System (EIIS:BN) was available for high pressure core cooling but its capacity may have been inadequate for all design basis events.

Eight of the Unit 3 MSR/V SVs and associated wiring were sent to a test facility to undergo testing in an accident environment. The test result findings have been used to determine the actual operability condition and safety consequences of this event.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 90.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-330), 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) Peach Bottom Atomic Power Station Unit 3	DOCKET NUMBER (2) 0 5 0 0 0 2 7 8 9 1 — 0 1 7 — 0 1	LER NUMBER (6)			PAGE (3)		
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TEXT (if more space is required, use additional NRC Form 366A's) (17)

Our analysis of the most severe conditions concluded that safe shutdown was achievable. This worst case analysis assumed: 1) an intermediate break Loss of Coolant Accident (LOCA), 2) HPCI unavailable, 3) loss of offsite power, and 4) only two ADS valves available. The assumption that only two ADS valves were available is considered to be conservative. This assumption takes no credit for the one ADS valve whose solenoid valve was unavailable for testing because it had been discarded. Further, this assumption takes no credit for the two ADS valves whose solenoid valves passed the as-found "click" test in the Drywell, passed the as-found functional test and passed the vibration test at the test facility, but required multiple attempts to pass either the LOCA or the normal Drywell environment condition test.

Additional information which supports the conclusion that safe shutdown was achievable is found in General Electric (GE) Report NEDC 30936P-A, "BWR Owners Group Technical Specification Improvement Methodology (With Demonstration for BWR ECCS Actuation Instrumentation) Part 1" dated December, 1988. This report has been previously docketed with the NRC. Table 3-7 of the NEDC states that two ADS valves are sufficient to depressurize the reactor for all small and intermediate break LOCAs. The sensitivity study associated with this table ensures that peak clad temperature does not exceed 2200 degrees F. PECO has confirmed the applicability of this GE Report to PBAPS.

Corrective Actions

After discovery of the event, the Unit 3 MSR/V thermal insulation was properly reinstalled and the SVs were replaced.

An engineering evaluation determined that the U/2 ADS relief valves were operable.

Eight of the Unit 3 MSR/V SVs and associated wiring were sent to a test facility to undergo testing in an accident environment. The test result findings have been used to determine the actual operability condition and safety consequences of this event.

Administrative Procedure A-26, "Plant Work Process," was revised to prevent insulation tasks on certain safety-related components from being performed on blanket work orders. A-26 now requires that insulation tasks on components such as MSR/V's, Main Steam Isolation Valves, HPCI and RCIC Turbine must receive Control Room approval for the release and return of equipment to service.

Insulation inspections were performed by the system engineers on high temperature safety-related systems. These inspections did not identify any problems that adversely affected system operability.

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 (PC-30) 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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TEXT (if more space is required, use additional NRC Form 388A's) (13)

This event was reviewed with the plant staff during a January 21, 1992, supervisory meeting. Emphasis was placed on the importance of insulation from an operability standpoint and the various functions that insulation provides to a component, system, and its surroundings. Attention to detail and the pitfalls of poor detection practices when conducting acceptance of close-out inspections were also stressed. A letter from the Plant Manager concerning the purpose of insulation and the controls to maintain its integrity was distributed to the plant staff on January 24, 1992.

As a follow-up to discussions with maintenance planners and foremen, the Maintenance Planner Training Course has been revised to include guidance on insulation. Additionally, the course has been enhanced to emphasize the importance of providing appropriate references and specifications to ensure complete work packages.

This event has been formally discussed with maintenance planners and foremen. The importance of providing necessary information and references to ensure work is completed properly has been stressed. This event has also been provided in a Technical Staff and Manager Continuing Training Course.

Critical areas with insulation design requirements will be identified and inspected. Insulation design requirements for components, systems and environmental effects will be reviewed to ensure proper application. Other subtle design concerns which could potentially cause operability concerns on safety equipment will also be evaluated.

Information concerning design requirements will also be captured in the Plant Information Management System for use by maintenance planners. This will ensure that insulation tasks are not lost and will enhance the capability to provide complete work package information.

This event has been reviewed and discussed with personnel who supervise contractors. The importance of fully evaluating work scope and providing adequate information to perform the work has been stressed. Additionally, the role of supervisors to ensure that work is performed correctly has been emphasized.

Previous Similar Events

There have been no previous similar LERs identified involving unqualified components due to insulation installation.

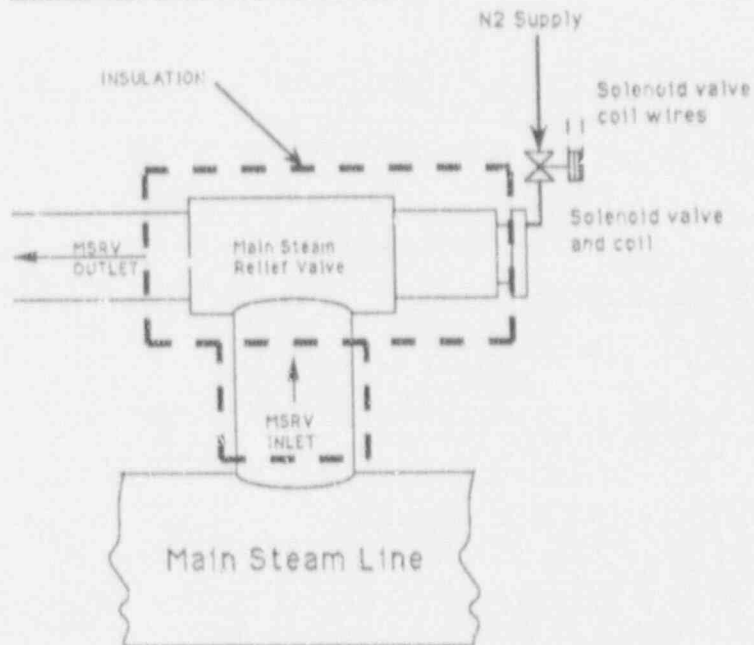
LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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 (F-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Peach Bottom Atomic Power Station Unit 3	DOCKET NUMBER (2) 05000218	LER NUMBER (6)			PAGE (3)		
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

CORRECTLY INSTALLED INSULATION



INCORRECTLY INSTALLED INSULATION

