



PECO ENERGY

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November 4, 1994

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

Docket No. 50-278

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

This LER concerns an automatic scram when the Main Turbine tripped on high water level following a Static Inverter failure.

Reference:	Docket No. 50-278
Report Number:	3-94-005
Revision Number:	00
Event Date:	10/11/94
Report Date:	11/04/94
Facility:	Peach Bottom Atomic Power Station RD1, Box 208, Delta, PA 17314

This LER is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv).

Sincerely,

GDE/GAJ:gaj

enclosure

cc: R. A. Burricelli, Public Service Electric & Gas  
R. R. Janati, Commonwealth of Pennsylvania  
INPO Records Center  
T. T. Martin, US NRC, Administrator, Region I  
R. I. McLean, State of Maryland  
W. L. Schmidt, US NRC, Senior Resident Inspector  
A. F. Kirby III, DelMarVa Power  
H. C. Schwemm, VP - Atlantic Electric

CCN 94-14161 08/057

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## LICENSEE EVENT REPORT (LER)

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 20585, 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 1 OF 0 3

PAGE (3)

TITLE (4)

Unit 3 Scram Due to a Static Inverter 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)
1	0	1	1	9	4	9	4	0	0	5	0
1	0	1	1	9	4	9	4	0	0	1	1
1	0	1	1	9	4	9	4	0	0	1	1
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)			X 50.73(a)(2)(iv)		
POWER LEVEL (10)			20.405(a)(1)(i)			50.38(c)(1)			50.73(a)(2)(v)		
1 1 0 1 0			20.405(a)(1)(ii)			50.38(c)(2)			50.73(a)(2)(vii)		
			20.405(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(viii)(A)		
			20.405(a)(1)(iv)			50.73(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

Anthony J. Wasong, Manager-Experience Assessment

AREA CODE

7 1 7 4 5 6 7 0 1 4

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

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 fifteen single-space typewritten lines) (16)

On 10/11/94, the "A" & "C" Reactor Feed Pumps (RFP) locked up and both Recirculating (Recirc) Pumps ran back. The lockup of the two RFPs in conjunction with the Recirc Pump run back caused the reactor water level to increase to the high water level Main Turbine trip setpoint. At 1121 hours, the Main Turbine trip caused a closure of the Turbine Stop Valves which is an input to the Reactor Protection System (RPS) scram logic. Immediately following the scram, Primary Containment Isolation System (PCIS) Group II/III isolations also occurred when the Reactor water level decreased below 0". Troubleshooting revealed that a failed Static Inverter caused a momentary loss of electrical power to the 30Y050 panel which in turn caused the two RFPs to lockup and both Recirc Pumps to run back. After the scram occurred, the appropriate PCIS and RPS scram logics were reset. The failed transformer was replaced and infrared thermography was performed on the Unit 2 and 3 Static Inverters to identify elevated component temperatures. No questionable indications were identified on either unit. An evaluation will be performed to establish a frequency for performance of infrared thermography on Static Inverters and to identify what additional transformer testing can be performed. In addition, PM activities for the replacement transformers will be initiated. No previous similar events have been identified.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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FACILITY NAME (1) Peach Bottom Atomic Power Station Unit 3	DOCKET NUMBER (2) 0500027894	LER NUMBER (6)			PAGE (3)	
		YEAR 05	SEQUENTIAL NUMBER 01	REVISION NUMBER 00	02	OF 03

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

Requirements of the Report

This report is being submitted pursuant to 10 CFR 50.73 (a)(2)(iv) due to Engineered Safety Feature (ESF) actuations.

Unit Conditions at Time of Event

Unit 3 was in the "RUN" mode at 100% of rated thermal reactor power. There were no other systems, structures, or components that were inoperable that contributed to the event.

Description of the Event

On 10/11/94 at 1120 hours, the Static "Inverter Trouble" alarm was received in the Main Control Room. Subsequently, the "A" & "C" Reactor Feed Pumps (RFP) locked up and both Recirculating (Recirc) Pumps ran back. The lockup of the two RFPs in conjunction with the Recirc Pump run back caused the reactor water level to increase to the high water level Main Turbine trip setpoint. At 1121 hours, the Main Turbine trip caused a closure of the Turbine Stop Valves which is an input to the Reactor Protection System (RPS) scram logic. Immediately following the scram, Primary Containment Isolation System (PCIS) (EIS:JM) Group II/III isolations also occurred when the Reactor water level decreased below 0". The RFPs were used to restore Reactor water level. At 1154 hours, the PCIS logics were reset and the affected systems were restored to the appropriate configuration. In addition, the Reactor Protection System (RPS) (EIS:JC) scram logic was reset at 1310 hours. The NRC was notified of the event via ENS at 1353 hours.

Cause of the Event

The cause of the scram has been determined to be a Main Turbine trip due to a high reactor water level condition. The high water level condition occurred when the "A" & "C" RFPs locked up in conjunction with both Recirc Pumps running back. Troubleshooting revealed that a failed Static Inverter (30D037) (EIS:INVT) caused a momentary loss of electrical power to the 30Y050 panel which in turn caused the two RFPs to lockup and both Recirc Pumps to run back. The cause of the Static Inverter failure was a short within its "T1" transformer. An evaluation performed at PECO Energy's test facility identified that inadequate dampening of the transformer core vibration caused a short circuit in the transformer. This was due to the combination of inadequate lamination of the shunt core and insufficient insulating material between the shunt core and its coil.

The design of the system is to have an automatic transfer to another power supply on loss of a static inverter, however, the transfer did not occur fast enough to prevent the RFP lockup and the Recirc Pump run backs. The transfer did not properly occur due to

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FACILITY NAME (1)  Peach Bottom Atomic Power Station Unit 3	DOCKET NUMBER (2)  0 5 0 0 0 2 7 7	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

the transformer failure which impacted the inverter's ability to transfer to the alternate electrical source.

Analysis of Event

No actual safety consequences occurred as a result of this event. All isolations and initiations functioned per design. Had this event occurred at another power level, isolations and initiations would have also functioned per design.

Corrective Actions

After the scram occurred, the appropriate PCIS and RPS scram logics were reset and the affected systems were reset to the appropriate configuration.

The failed Unit 3 transformer was replaced and properly setup. Infrared thermography was performed on the Unit 2 and 3 Static Inverters to identify elevated component temperatures. No questionable indications were identified on either unit. Replacement transformers which are not susceptible to this type of failure have been ordered and work orders have been initiated for transformer replacements on the Unit 2 and Unit 3 Static Inverters.

An evaluation will be performed to establish a frequency for performance of infrared thermography on Static Inverters and to identify what additional transformer testing can be performed during normal Preventive Maintenance (PM) activities. In addition, PM activities for the replacement transformers will be initiated.

Previous Similar Events

No previous similar events have been identified which involved a plant transient following a static inverter failure.