



10CFR 50.73

June 13, 2012

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Peach Bottom Atomic Power Station (PBAPS) Unit 3
Renewed Facility Operating License No. DPR-56
NRC Docket No. 50-278

Subject: Licensee Event Report (LER) 3-12-001

Enclosed is a Licensee Event Report concerning a condition prohibited by Technical Specifications and a common cause failure related to Barton pressure switches. In accordance with NEI 99-04, the regulatory commitment contained in this correspondence is to restore compliance with the regulations. The specific methods that are planned to restore and maintain compliance are discussed in the LER. If you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,

A handwritten signature in black ink, appearing to read "Garey L. Stathes", written over the printed name.

Garey L. Stathes
Plant Manager
Peach Bottom Atomic Power Station

GLS/dnd/IR 1355773

Attachment

cc: US NRC, Administrator, Region I
US NRC, Senior Resident Inspector
R. R. Janati, Commonwealth of Pennsylvania
S. Grey, State of Maryland
P. Steinhauer, PSE&G, Financial Controls and Co-owner Affairs
INPO Records Center

CCN: 12-46

IE22
NRK

LICENSEE EVENT REPORT (LER)(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME Peach Bottom Atomic Power Station (PBAPS) Unit 3					2. DOCKET NUMBER 05000278					3. PAGE 1 OF 4				
4. TITLE Concurrent Inoperability of Two Trains of Core Spray Pressure Switches Results in Condition Prohibited by TS														
5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED					
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME					
04	19	2012	12	- 001 -	00	06	13	2012	DOCKET NUMBER					
9. OPERATING MODE 1			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)											
10. POWER LEVEL 100%			<input type="checkbox"/> 20.2201(b) <input type="checkbox"/> 20.2201(d) <input type="checkbox"/> 20.2203(a)(1) <input type="checkbox"/> 20.2203(a)(2)(i) <input type="checkbox"/> 20.2203(a)(2)(ii) <input type="checkbox"/> 20.2203(a)(2)(iii) <input type="checkbox"/> 20.2203(a)(2)(iv) <input type="checkbox"/> 20.2203(a)(2)(v) <input type="checkbox"/> 20.2203(a)(2)(vi)											
			<input type="checkbox"/> 20.2203(a)(3)(i) <input type="checkbox"/> 20.2203(a)(3)(ii) <input type="checkbox"/> 20.2203(a)(4) <input type="checkbox"/> 50.36(c)(1)(i)(A) <input type="checkbox"/> 50.36(c)(1)(ii)(A) <input type="checkbox"/> 50.36(c)(2) <input type="checkbox"/> 50.46(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(i)(A) <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)											
			<input type="checkbox"/> 50.73(a)(2)(i)(C) <input type="checkbox"/> 50.73(a)(2)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(ii)(B) <input type="checkbox"/> 50.73(a)(2)(iii) <input type="checkbox"/> 50.73(a)(2)(iv)(A) <input type="checkbox"/> 50.73(a)(2)(v)(A) <input type="checkbox"/> 50.73(a)(2)(v)(B) <input type="checkbox"/> 50.73(a)(2)(v)(C) <input type="checkbox"/> 50.73(a)(2)(v)(D)											
			<input checked="" type="checkbox"/> 50.73(a)(2)(vii) <input type="checkbox"/> 50.73(a)(2)(viii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(B) <input type="checkbox"/> 50.73(a)(2)(ix)(A) <input type="checkbox"/> 50.73(a)(2)(x) <input type="checkbox"/> 73.71(a)(4) <input type="checkbox"/> 73.71(a)(5) <input type="checkbox"/> OTHER											
			Specify in Abstract below or in NRC Form 366A											
12. LICENSEE CONTACT FOR THIS LER														
FACILITY NAME PBAPS Unit 3, James M. Armstrong, Regulatory Assurance Manager										TELEPHONE NUMBER (Include Area Code) 717-456-3351				
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT														
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX					
A	BM	PDS	I204	Y										
14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO										15. EXPECTED SUBMISSION DATE				
										MONTH	DAY	YEAR		
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)														
<p>On 4/18/12, during a calibration surveillance test for the 'A' Core Spray Pump, a differential pressure indicating switch was found to be out of calibration. The switch is used to determine if the minimum flow bypass valve should be opened or closed. On 4/19/12, the same test was performed on the corresponding switch for the 'D' Core Spray Pump and the switch was found to be out of calibration. This occurrence is reportable since both Core Spray subsystems were concurrently inoperable due to a single cause. The preferred method for corrective maintenance had been replacement of the entire pressure switch. Replacement and obtaining replacement parts became increasingly difficult during a period of time when manufacture of qualified Barton switches was interrupted. As a result, PBAPS began to place more emphasis on adjustments to the internal components of the switch instead of replacement.</p> <p>The declining trend was due to insufficient knowledge and skill by maintenance personnel to effectively troubleshoot and maintain the switches. In addition, maintenance procedures did not provide adequate guidance for detecting component failures and to differentiate them from instrument drift. Corrective actions include replacement of the eight Barton pressure switches used for low flow protection of the Units 2 and 3 Core Spray pumps. A site training and qualification program is being developed to establish a group of subject matter experts for Barton pressure switches. Also, procedure enhancements have been made to provide improved guidance for troubleshooting.</p> <p>There were no actual safety consequences as a result of this event.</p>														

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Peach Bottom Atomic Power Station Unit 3	05000278	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 4
		12	- 001	- 00	

NARRATIVE

Unit Conditions Prior to the Event

Unit 3 was in Mode 1, operating at 100% of rated thermal power when this event was discovered. There were no other structures, systems or components out of service that contributed to this event.

Description of the Event

On 4/18/12, Instrument and Controls (I&C) personnel were performing a calibration surveillance test for the 'A' Core Spray Pump (EIS:P) discharge flow logic switches. During the procedure, the differential pressure indicating switch (DPIS)(EIS:PDS) 3-14-081A was found to be out of calibration. This switch indicates the difference in pressure between the suction line and the discharge line of the 'A' Core Spray Pump. The difference in pressure is used by the control logic to determine if the minimum flow bypass valve (EIS:ISV), MO-3-14-005A, should be opened or closed. The switch has two trip setpoints. The high side trip setpoint determines when the bypass valve should open and has a test acceptable range of 341 psi to 349 psi. The low side trip setpoint determines when the bypass valve should close and has a test acceptable range of 321 psi to 329 psi. Technical Specification (TS) allowable range is 319 psi to 351 psi. The surveillance test determined the high side trip setpoint to be 351 psi and the low side trip setpoint to be 317 psi, which is 2 psi below the TS allowable value. The switch was recalibrated in accordance with the procedure and retested to demonstrate that the setpoints were within the acceptable range.

On 4/19/12, the same test was performed on DPIS 3-14-081D, which is the corresponding switch for the 'D' Core Spray Pump. The test found the high side trip setpoint to be within tolerance at 346 psi. The low side trip setpoint was found to be out of tolerance low at 266 psi, or approximately 53 psi below the TS allowable value. The switch was successfully recalibrated in accordance with procedure and returned to service.

Both incidents occurred during scheduled surveillance tests and had no significant impact on train outage time. Following recalibration, both switches were returned to an operable status on the day of the surveillance test. The corresponding surveillance tests were satisfactorily performed for the Unit 3 'B' and 'C' Core Spray pumps on 4/18/12 and 4/19/12 and for all four of the Unit 2 Core Spray pumps on 5/1/12 and 5/2/12.

Technical Specification Requirements

Technical Specification (TS) Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation", Function 1.d, provides requirements for the Core Spray Pump bypass valve instrumentation. With one channel inoperable, TS 3.3.5.1 Condition E requires that the channel be restored to operable within 7 days, and, if the redundant ECCS initiation capability is inoperable, the supported feature must be declared inoperable within one hour.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Peach Bottom Atomic Power Station Unit 3	05000278	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 4
		12	- 001	- 00	

NARRATIVE

Reportability

This report is being submitted pursuant to:

10CFR 50.73(a)(2)(i)(B) – Any operation or condition which was prohibited by the plant's TS, and
10CFR 50.73(a)(2)(vii) – Any event where a single cause or condition caused at least one
independent train or channel to become inoperable in multiple systems or two independent trains or
channels to become inoperable in a single system.

Based on the amount that DPIS 3-14-081D was out of calibration (53 psi) on 4/19/12, it is likely that it
was inoperable on 4/18/12 when DPIS 3-14-081A was out of calibration and inoperable. In addition, a
single cause resulted in more than one instrument channel in one system being inoperable.

Analysis of the Event

The Core Spray System consists of two independent trains (subsystems), each with two 50% capacity
pumps (four pumps total). Each pump has a minimum flow bypass valve that provides a safety related
function for both its opening and closing operations. In the event that less than minimum flow exists
through the pump discharge line, the valve opens to prevent overheating and pump damage. This
condition could occur in response to a loss of coolant accident (LOCA), when an initiation signal starts
the pumps prior to the injection signal. Once an injection signal is received, the bypass valve is required
to close to ensure the full design flow to the core is provided.

To detect flow through the pump, a pressure switch detects the differential pressure between the suction
and discharge lines of the pump. The switches are Barton Model 580A differential pressure indicating
switches (DPIS), currently manufactured by Cameron Measurement Systems. Each DPIS contains two
internal switches which actuate at the high and low setpoints. A series of gears, cams and pivots
transmit movement from the bellows to the internal switches. Accurate operation of the DPIS requires
correct alignment of the internal mechanical components and wear and corrosion can affect reliability of
the switches.

The preferred method for corrective maintenance is replacement of the entire pressure switch instead of
replacement of worn components or recalibration of the internal switches. Replacement of the entire
switch and obtaining replacement parts became increasingly difficult following a change in ownership in
2007 and production of qualified Barton replacement switches was discontinued until 2010. As a result,
PBAPS began to place more emphasis on adjustments to the internal components of the switch instead
of replacement.

In January 2012, two Barton pressure switches on the Unit 3 Core Spray system were found out of
calibration (one 4.6% high and the other 10.6% low). A cause evaluation was performed and a
degrading trend in component performance was identified that started in 2008. Several corrective
actions were initiated, including switch replacement and improvements in training. Cameron established
an environmental qualification program in 2010 and has begun supplying qualified Barton pressure
switches. PBAPS has established an expedited procurement and replacement schedule for the Core
Spray system. A training and qualification program was established to develop site subject matter

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Peach Bottom Atomic Power Station Unit 3	05000278	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 4
		12	- 001	- 00	

NARRATIVE

experts for Barton pressure switches. The training included a Barton training lab, with a technical representative from Cameron to provide guidance on design and adjustments to the switches.

The out of calibration events described above occurred during normal scheduled surveillance testing. There were no actual safety consequences associated with this event. In the event of a valid signal, it has been determined that the Core Spray system would still have been able to perform its safety function.

Cause of the Event

The declining trend in performance of Barton pressure switches at PBAPS since 2008 was due to insufficient knowledge and skill by maintenance personnel to effectively troubleshoot and maintain the instruments. Prior to 2008, maintenance personnel would typically have replaced the entire switch. During the period of time when qualified Barton pressure switches were no longer being manufactured, additional emphasis was placed on adjustments to the internal components of the switch.

In addition, during lab training with a Cameron technical representative, it was determined that the high and low trip setpoints for the switches in the Core Spray system are sufficiently close together such that it can cause setpoint interferences and create additional drag on the cam assemblies. This makes the switches sensitive to wear, increases the potential for setpoint drift and increases the level of knowledge and skill needed to maintain them. It was also identified during the lab training that maintenance procedures did not provide adequate guidance for detecting component failures and to differentiate them from instrument drift.

Corrective Actions

Replacement of the eight Barton pressure switches for the Core Spray pump bypass valves in the Units 2 and 3 Core Spray systems has begun and is being tracked within the corrective action program.

A site training and qualification program has been developed to establish a group of subject matter experts for Barton pressure switches. Also, procedure enhancements have been made to provide improved guidance for troubleshooting.

The site corrective action program is tracking these corrective actions and has evaluated the extent of condition.

Previous Similar Occurrences

As stated above, there has been a declining trend in Barton pressure switches for the Core Spray system being out of calibration or failing since 2008. From 1998 to 2007 there were approximately 6 occurrences. From 2008 to present, there have been approximately 8 occurrences. Setpoint drift issues for Barton pressure switches have also been identified as an industry issue (reference NRC Information Notice 86-065).