



Exelon Generation®

10CFR 50.73

November 21, 2012

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

Peach Bottom Atomic Power Station (PBAPS) Units 2  
Renewed Facility Operating License No. DPR-44  
NRC Docket Nos. 50-277

Subject: Licensee Event Report (LER) 2-12-002

Enclosed is a Licensee Event Report concerning a common cause inoperability and condition prohibited by Technical Specifications involving drift of two Reactor Protection System Turbine Control Valve Fast Closure instruments. 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,

Patrick D. Navin  
Plant Manager  
Peach Bottom Atomic Power Station

PDN/djf/IR 1421069/C0245202

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: 12-78

IE 22  
NRR

# 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](mailto: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.

<b>1. FACILITY NAME</b> Peach Bottom Atomic Power Station (PBAPS) Unit 2	<b>2. DOCKET NUMBER</b> 05000277	<b>3. PAGE</b> 1 OF 4
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**4. TITLE**  
Common Cause Inoperability of Reactor Protection System Turbine Control Valve Instruments

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	DOCKET NUMBER
10	01	2012	12	- 002 -	00	11	21	2012	FACILITY NAME	DOCKET NUMBER
										05000
										05000

<b>9. OPERATING MODE</b>  N	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> <i>(Check all that apply)</i>			
<b>10. POWER LEVEL</b>  0%	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input checked="" type="checkbox"/> 50.73(a)(2)(vii)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER	
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A	

**12. LICENSEE CONTACT FOR THIS LER**

FACILITY NAME PBAPS Unit 2, James M. Armstrong, Regulatory Assurance Manager	TELEPHONE NUMBER <i>(Include Area Code)</i> 717-456-3351
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**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
X	JC	PS	B070	Y					

<b>14. SUPPLEMENTAL REPORT EXPECTED</b> <input type="checkbox"/> YES <i>(If yes, complete 15. EXPECTED SUBMISSION DATE)</i> <input checked="" type="checkbox"/> NO	<b>15. EXPECTED SUBMISSION DATE</b>	MONTH	DAY	YEAR

**ABSTRACT** *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

Based on surveillance testing performed on 10/01/12 during the P2R19 refueling outage, Instrumentation and Controls (I&C) personnel identified that two of the four instruments used to perform the Reactor Protection System (RPS) scram and End-of-Cycle Recirculation Pump Trip (EOC-RPT) functions for Turbine Control Valve (TCV) Fast Closure were outside of their Technical Specification allowable value of  $\geq 500$  psig trip oil pressure. The 'A' pressure sensing instrument (PS-4121A) was found at a trip setting of 495 psig and the 'B' pressure sensing instrument (PS-4121B) was found at a trip setting of 493 psig. The cause of this event is due to instrument drift. This occurrence is reportable as a result of a common cause inoperability that resulted in two instruments drifting low outside of the Technical Specification allowable value. The 'A' and 'B' instruments were replaced and calibrated to within acceptable limits.

There were no actual safety consequences associated with this event. If an operational transient would have occurred during power operations, the 'C' and 'D' instrument channels were operable and would have provided the RPS scram and EOC-RPT trip functions.

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**NARRATIVE**

**Unit Conditions Prior to the Event**

Unit 2 was defueled to support its 19<sup>th</sup> Refueling Outage (P2R19) when the event was discovered on 10/01/12. The condition was discovered during routine surveillance of the Reactor Protection System (RPS) [EIS: JC] Turbine Control Valve (Fast Closure) instruments during the 19<sup>th</sup> Unit 2 Refueling Outage. These instruments are also used to perform the End-of-Cycle (EOC) Recirculation Pump Trip (RPT) function. The RPS and EOC-RPT functions were not required to be operable at the time of discovery of this condition. There were no other structures, systems or components out of service that contributed to this event.

**Description of the Event**

Based on surveillance testing performed on 10/01/12, Instrumentation and Controls (I&C) personnel identified that two of the four instruments used to perform the RPS scram and EOC-RPT trip functions for Turbine Control Valve (TCV) Fast Closure were outside of their Technical Specification allowable value of  $\geq 500$  psig trip oil pressure. The 'A' pressure sensing instrument (PS-4121A) was found at a trip setting of 495 psig and the 'B' pressure sensing instrument (PS-4121B) was found at a trip setting of 493 psig.

The purpose of the RPS Turbine Control Valve (Fast Closure) trip function is to provide a reactor scram signal to respond to generator load reject events in order to ensure that the minimum critical power ratio safety limit is not exceeded.

The purpose of the EOC-RPT Turbine Control Valve (Fast Closure) trip function is to provide a trip of the reactor recirculation pumps in response to turbine trip / generator load reject events to mitigate the neutron flux, heat flux and pressurization transients and to minimize the decrease in the minimum critical power ratio.

Technical Specification (TS) Limiting Condition for Operation (LCO) 3.3.1.1, RPS Instrumentation and TS LCO 3.3.4.2, EOC-RPT Instrumentation, require that two instrumentation channels be operable for each trip system. Each of the four Turbine Control Valves is equipped with a pressure switch [EIS: PS] to detect control valve [EIS: PCV] closure.

The two switches were replaced and recalibrated to an acceptable trip setting by 10/13/12 (prior to startup from P2R19).

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**NARRATIVE**

**Analysis of the Event**

There were no actual safety consequences associated with this event.

This report is being submitted pursuant to:

10CFR 50.73(a)(2)(vii) – Common Cause Failure of Multiple Trains being Inoperable – Two RPS / EOC-RPT Turbine Control Valve (Fast Closure) pressure switches were found to be inoperable (outside of their TS 3.3.1.1 and TS 3.3.4.2 allowable values) on 10/01/12. The cause was due to instrument drift. Therefore, this occurrence is considered as a common cause failure of multiple independent trains being inoperable.

10CFR 50.73(a)(2)(i)(B) – Condition Prohibited by Technical Specifications – Because this event involves a common cause inoperability, it is judged that there exists firm evidence that this condition existed during Unit 2 Cycle 19 operations. Therefore, this occurrence is considered as a condition prohibited by TS since the associated Required Actions and Completion Times are assumed to have not been met.

The purpose of the RPS Turbine Control Valve (Fast Closure) trip function is to provide a reactor scram signal to respond to generator load reject events in order to ensure that the minimum critical power ratio safety limit is not exceeded. The purpose of the EOC-RPT Turbine Control Valve (Fast Closure) trip function is to provide a trip of the reactor recirculation pumps in response to turbine trip / generator load reject events to mitigate the neutron flux, heat flux and pressurization transients and to minimize the decrease in the minimum critical power ratio.

Fast closure of the TCVs results in the loss of a heat sink that produces reactor pressure, neutron flux, and heat flux transients that must be limited. With the reactor and turbine-generator at power, fast closure of the turbine control valves can result in a significant addition of positive reactivity to the core as nuclear system pressure rises. Therefore, a reactor scram is initiated on TCV fast closure in anticipation of the transients that would result from the closure of these valves. The turbine control valve fast closure scram, which initiates a scram earlier than either the neutron monitoring system or nuclear system high pressure, is required to provide a satisfactory margin to core thermal-hydraulic limits for this category of abnormal operational transients. The Turbine Control Valve Fast Closure, Trip Oil Pressure—Low Function is the primary scram signal for the generator load rejection event and the generator load rejection with bypass failure event. For these events, the reactor scram reduces the amount of energy required to be absorbed and ensures that the MCPR safety limit is not exceeded.

The End-of-Cycle Recirculation Pump Trip (EOC-RPT) function improves the response to plant pressurization transients (e.g., turbine trip, generator load rejection) by disconnecting the recirculation pumps from the M-G sets immediately upon receipt of a turbine stop valve (TSV) or control valve (TCV) trip signal to reduce system inertia and effect a quicker pump coastdown.

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**NARRATIVE**

**Analysis of the Event, continued**

Turbine Control Valve Fast Closure, Trip Oil Pressure—Low signals are initiated by the relayed emergency trip supply oil pressure at each control valve. One pressure switch is associated with each control valve, and the signal from each switch is assigned to a separate RPS logic channel. These RPS and EOC-RPT functions are enabled at a thermal power  $\geq 29.5\%$  RTP.

If an operational transient would have occurred during power operations, the 'C' and 'D' instrument channels were operable and would have provided the RPS scram and EOC-RPT trip functions. Additionally, the 'A' and 'B' instruments would have also actuated although slightly delayed. The 'A' pressure sensing instrument (PS-4121A) was found at a trip setting of 495 psig and the 'B' pressure sensing instrument (PS-4121B) was found at a trip setting of 493 psig. The TS allowable value is  $\geq 500$  psig.

This event is not risk significant.

The pressure switches are: Barksdale Control Division (Delaval, Inc.) Model TC9622-3-V.

**Cause of the Event**

The cause of this event is due to instrument drift. The four Unit 2 Turbine Control Valve (Fast Closure) instruments were recently replaced in 2010. Additional causal analysis is being evaluated within the site Corrective Action Program.

**Corrective Actions**

The 'A' and 'B' instruments were replaced and calibrated to within acceptable limits. The 'C' and 'D' instruments were also checked to ensure proper calibration. Although these instruments were found below the acceptable limits of 575 to 625 psig, they were above the TS allowable value of  $\geq 500$  psig. The 'C' and 'D' instruments were recalibrated to within the acceptable limits. Additional corrective actions for Unit 2 and Unit 3 components are being evaluated within the site Corrective Action Program.

**Previous Similar Occurrences**

There were no previous similar events identified involving concerns with these RPS instruments.