



Exelon Generation®

10CFR 50.73

CCN: 19-60

April 11, 2019

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

Peach Bottom Atomic Power Station (PBAPS) Unit 2 and Unit 3
Renewed Facility Operating License No. DPR-44 and DPR-56
NRC Docket No. 50-277 and 50-278

Subject: Licensee Event Report (LER) 2-19-001

Enclosed is a Licensee Event Report concerning a loss of a safety function following a partial loss of off-site power. In accordance with NEI 99-04, the regulatory commitment contained in this correspondence is to restore compliance with the regulations. The specific methods that have been 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 Matthew Retzer at 717-456-3351.

Sincerely,

Patrick D. Navin
Site Vice President
Peach Bottom Atomic Power Station

PDN/dnd/IR 4219191

Enclosure

cc: US NRC, Administrator, Region I
US NRC, Senior Resident Inspector
R. R. Janati, Commonwealth of Pennsylvania
D. Tancabel, State of Maryland
B. Watkins, PSE&G, Financial Controls and Co-Owner Affairs

IEZ
NRR

bcc: Sr. Vice President, Mid-Atlantic Operations
Site Vice President-PBAPS
Plant Manager-PBAPS
Director Operations-PBAPS
Sr. Mgr. – Operations Spt & Svcs
Shift Ops Superintendent – PBAPS
Operations Support Manager – PBAPS
Director, Site Training-PBAPS
Manager, PBAPS Operations Training
Manager, Regulatory Assurance-PBAPS
Sr. Regulatory Assurance Engineer-PBAPS
Manager, Licensing
Manager, PBAPS Nuclear Oversight - PB, SMB4-5
Commitment Coordinator
Director, Mid-Atlantic Licensing
Sr. Manager, PRA - Corporate
Greenlee, Scot
Krueger, Greg
INPO Records via ICES Report (Site OPEX Coordinator)
Records Management - PB



LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by 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 Unit 2	2. Docket Number 05000277	3. Page 1 OF 5
---	-------------------------------------	--------------------------

4. Title
Emergency Bus Breaker Relay Failure Results in Loss of Safety Function

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
02	11	2019	2019	- 001	- 00	04	11	2019	Peach Bottom Atomic Power Sta. Unit 3	05000278
									Facility Name	Docket Number

9. Operating Mode		11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)								
1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
10. Power Level		<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)					
100%	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)						
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(i)						
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)						
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)							

12. Licensee Contact for this LER

Licensee Contact Matthew E. Retzer, Regulatory Assurance Manager	Telephone Number (Include Area Code) 717-456-4351
--	---

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES
X	ED	2	T351	Yes					

14. Supplemental Report Expected				15. Expected Submission Date		
<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No						

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On February 11, 2019, at 2232 hours, an off-site power source was lost due to a malfunction of a lightning arrester located at an off-site substation. As a result, six of the site's eight 4kV emergency buses transferred to their alternate offsite source. During this process, a breaker that supplies power to a 480 volt load center (E434) fed from the E43 emergency 4kV bus failed to automatically re-close due to a failed relay. This resulted in the E4 emergency diesel generator being inoperable and loss of safety function of the 'B' Core Spray loop. The 'A' Core Spray loop was inoperable at the time due to planned maintenance. This resulted in a loss of the Core Spray safety function for approximately 7 hours and 44 minutes. The 'A' Core Spray loop was restored and returned to an operable status at 0616, which restored the Core Spray safety function.

The transfer to the alternate offsite power source also resulted in a Group II and III primary containment isolation, as designed. This is considered an invalid actuation. There were no actual safety consequences as a result of this event.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by 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	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Peach Bottom Atomic Power Station Unit 2	05000277	2019	- 001	- 00

NARRATIVE

Unit Conditions Prior to the Event

Unit 2 and Unit 3 were both operating in Mode 1 at approximately 100% rated thermal power. The Unit 3 'A' Core Spray [EIS:BM] loop was out of service for planned maintenance.

Description of Event

On February 11, 2019, at 2232 hours, the Cooper-Nottingham (220-08 line) off-site power source was lost due to a malfunction of a lightning arrestor located at an off-site substation. At the time of the transient, six of the site's eight 4kV emergency buses [EIS:EB] were aligned to the #2 Emergency Auxiliary Transformer, which is normally fed by the 220-08 line. The loss of the 220-08 line caused the 4kV emergency buses to transfer to the #3 Emergency Auxiliary Transformer, which is fed by the Newlinville (220-34 line) offsite source. The transfer resulted in the loss of the running Control Rod Drive (CRD) [EIS:AA] pumps and Group II and III primary containment isolations for both units. This is the designed response for this event and operators responded in accordance with plant procedures. The transfer also resulted in isolation of the Unit 3 main condenser off-gas recombiner, which caused a reduction in condenser vacuum and a reduction in Unit 3 power to 85%.

Due to the loss of one offsite power source, Technical Specification (TS) 3.8.1 Condition A was entered, which has required actions to restore the offsite circuit within seven days.

Following transfer of power for the E43 emergency 4kV bus to the alternate source, the E434 transformer breaker, which supplies power from the E43 bus to the Unit 3 E434 480 volt emergency load center [EIS:ED], failed to automatically re-close. With the E434 breaker open, the Unit 3 E434 load center was de-energized and inoperable. TS 3.8.7 Condition A was entered for Unit 2 and TS 3.8.7 Condition C was entered for Unit 3, which requires the E434 load center to be restored within 8 hours. At 2250 hours the E434 breaker was manually closed from the main control room to re-energize the emergency load center and TS 3.8.7 Condition A and Condition C was exited. The Unit 3 E434 load center was inoperable for 18 minutes.

On February 12, 2019, at 0430 hours, the E4 diesel generator was declared inoperable due to not meeting surveillance requirement conditions. TS Surveillance Requirement (SR) 3.8.1.11.c.2 and SR 3.8.1.19.c.2 require the E434 breaker to have the capability to automatically close in order for the E4 diesel generator to be considered operable. With one off-site source inoperable and one diesel generator inoperable, TS 3.8.1 Condition E was entered, which requires the off-site source or the diesel generator to be restored to operable within 12 hours.

The 'A' Core Spray loop was out of service at the beginning of this event for planned maintenance and was restored and returned to an operable status on February 12, 2019 at 0616 hours.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by 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	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Peach Bottom Atomic Power Station Unit 2	05000277	2019	- 001	- 00

NARRATIVE

Troubleshooting identified that a failed timing relay caused the E434 transformer breaker to not automatically close. The relay was replaced and post-maintenance testing performed to restore E434 breaker function. The E4 diesel generator was returned to an operable status at 1559 hours on February 12, 2019.

The failed off-site lightning arrester was replaced and the 220-08 line was re-energized. The source was returned to an operable status at 1921 hours on February 12, 2019, and TS 3.8.1 Condition A was exited. The source was inoperable for a total of 20 hours and 49 minutes.

Analysis of Event

Equipment required for safe shutdown of the plant is supplied with power from eight independent 4kV emergency switchgear buses (four for each unit). The 4kV buses are normally supplied by either of two preferred offsite sources via emergency auxiliary transformers. Upon loss of power from one of the preferred offsite sources, automatic fast transfer is made to the other offsite source. If both preferred offsite sources are lost, emergency power will be supplied by four standby diesel generators, each of which can supply power to two 4kV buses, one for each unit.

The 4kV emergency buses supply power directly to larger loads and to 480 volt load centers for smaller loads. The E434 transformer breaker supplies power to the E434 480 volt load center, which powers valves needed for Unit 3 'D' Core Spray pump operation and support equipment for the E4 diesel generator. The E434 load center supports operability of the electrical power distribution system for TS 3.8.7 and the E434 breaker needs to be closed to meet TS SR 3.8.7.1. On February 11, 2019, between 2232 hours and 2250 hours, the E434 breaker was open, resulting in one Unit 3 AC electrical power distribution subsystem to be inoperable (TS 3.8.7 Condition C) for 18 minutes. In reviewing this event for reportability, a past operability review determined that the Unit 3 'B' Core Spray loop was inoperable during this time period because valves needed for maintaining the loop operable are powered from the E434 load center. TS 3.0.6 allows for TS Required Actions to not be entered for a supported system as long as there is not a loss of safety function. At the time the E434 breaker was open, the Unit 3 'A' Core Spray loop was inoperable for planned maintenance. As a result, both loops of Core Spray were inoperable (TS 3.5.1 Condition I).

The E4 diesel generator was discovered and declared to be inoperable at 0430 hours on February 12, 2019, due to the inability of the E434 breaker to automatically close, as required for E4 operability by TS SR 3.8.1.11.c.2 and SR 3.8.1.19.c.2 (LOCA/LOOP surveillance tests). These surveillance requirements ensure the 480 volt load centers are sequenced onto the 4kV busses within three seconds after the 4kV busses are energized by the diesel generators following a total loss of offsite power. In reviewing this event for reportability, a past operability review determined the E4 diesel generator was inoperable beginning at 2232 hours on February 11, 2019. As a result, the E4 diesel generator was inoperable for 17 hours and 27 minutes.



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

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by 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.

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Peach Bottom Atomic Power Station Unit 2	05000277	2019	- 001	- 00

NARRATIVE

At 0616 hours on February 12, 2019, the 'A' Core Spray loop was returned to an operable status. As a result, both loops of Core Spray would have been inoperable (TS 3.5.1 Condition I) for 7 hours and 44 minutes.

This event is being reported in accordance with the following:

- 10CFR 50.73(a)(2)(v)(D) – Any event or condition that could have prevented the fulfillment of the safety function of systems needed to mitigate the consequences of an accident.

On February 11, 2019, between 2232 and 0616 hours (7 hours and 44 minutes), both the 'A' and 'B' Core Spray loops would not have been able to perform their safety function, resulting in a loss of the Core Spray system safety function.

- 10CFR 50.73(a)(2)(iv)(A) – Manual or automatic actuation of general containment isolation valves in more than one system

The fast transfer to the alternate off-site power source caused a momentary loss of power to electrical distribution panels, resulting in a Group II and III containment isolation in both units. This resulted in valve movement in more than one system, including Reactor Water Cleanup, and Drywell Equipment and Floor Drains. The isolations occurred as designed and are expected with the momentary loss of power. They did not occur as a result of plant conditions that would require a containment isolation. They are therefore classified as invalid.

There were no actual safety consequences as a result of this event. The plant's safety analysis assumes one EDG is unavailable. Although the loss of the Core Spray system safety function would impact the ability to mitigate a design bases accident, the amount of time it was inoperable is within the time allowed by TS 3.0.3 for the condition to exist prior to entering a shutdown condition. At all times operators in the control room would have been able to restore core spray function by closing the E434 breaker.

Cause of the Event

The cause of the initial event, loss of the 220-08 off-site source, was determined to be due to a failed lightning arrester located at an off-site substation. The failure of the E434 transformer breaker was the resulted of a failed Agastat ETR series time delay relay for the E434 breaker. Investigation by an off-site vendor determined the relay failed due to a catastrophic failure of the resistor and varistor in the power input circuit of the relay timing board. The relay was manufactured in 2008 and installed in 2013. The relay is replaced on a 12-year frequency and calibrated every four years.

Corrective Actions

The lightning arrester and the E434 breaker relay were replaced. Additional corrective actions are documented in the corrective action program.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by 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	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Peach Bottom Atomic Power Station Unit 2	05000277	2019	- 001	- 00

NARRATIVE

Previous Similar Occurrences

During a surveillance test for the E42 4kV bus on October 4, 2012, a similar Agastat ETR relay exhibited a longer than expected time delay in closing due to higher than normal resistance in the time delay adjustment potentiometer. The normally de-energized relay was 22 years old at the time of the failure. For the event described in this LER, the normally energized relay was approximately 10 years old, had been in service for approximately six years, and was not beyond the allowable service life when the failure occurred.