



Exelon Generation®

10CFR 50.73

October 17, 2014

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

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

Subject: Licensee Event Report (LER) 2-14-002

Enclosed is a Licensee Event Report concerning a pinhole leak identified in the Emergency Service Water system, resulting in a condition prohibited by Technical Specifications. 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/dnd/IR 1695675

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: 14-90

IE22
NRR

**LICENSEE EVENT REPORT (LER)**(See Page 2 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 and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollections.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 4

4. TITLE

Emergency Service Water Pinhole Leak Results in Condition Prohibited by Technical Specifications

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
8	23	14	14	- 002	- 00	10	17	14	PBAPS Unit 3	05000278
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
Unit 2: 1 Unit 3: 1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☒ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL Unit 2: 100% Unit 3: 100%	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
	☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT

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
E	BI	PSF	Unkwn	N					

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

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

On August 23, 2014, a pin-hole leak was identified in a 6" diameter pipe elbow in the Emergency Service Water (ESW) system. The piping is classified as safety-related, ASME Code Class 3, moderate energy piping. Engineering evaluated the piping flaw and determined that it did not meet NRC approved ASME code case requirements for acceptance of flaws in Class 3 moderate energy piping.

As a result, both subsystems of the ESW System were declared inoperable at 1300 hours on Saturday, August 23, 2014, for both Units 2 and 3. Technical Specification (TS) 3.7.2, Condition B, requires the unit to be in Mode 3 within 12 hours due to two inoperable ESW subsystems.

Ultrasonic examination of the pipe was performed to determine the size and nature of the flaw. The flaw was caused by internal pitting likely caused by corrosion and flow effects of river water in the elbow. A risk assessment was performed and it was determined that the condition met the requirements for requesting a Notice of Enforcement Discretion (NOED) from the NRC. A verbal request was made to the NRC to extend the required completion time for TS 3.7.2, Condition B by 48 hours, to allow for additional time to obtain an emergent ASME code relief request. The NRC granted the NOED at 1922 hours on August 23, 2014.

**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 FOIA, Privacy and Information Collections Branch (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	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Peach Bottom Atomic Power Station Units 2 and 3	05000277	14	- 002	- 00	2 OF 4

NARRATIVE**Unit Conditions Prior to the Event**

Units 2 and 3 were both at approximately 100% power when this condition was discovered. There were no structures, systems or components out of service that contributed to this event.

Description of the Event

On August 23, 2014, a pin-hole leak was identified in a 6" diameter, carbon steel pipe elbow in the Emergency Service Water (ESW) system (EIS: CC). The ESW system is a standby system that provides cooling water to the emergency diesel generators, Emergency Core Cooling Systems (ECCS) room coolers and other safety-related equipment during design basis accident conditions. During normal operating conditions, this equipment is cooled by the non-safety related Service Water system. The ESW system consists of two redundant subsystems, and is common to Unit 2 and Unit 3. Normal water supply for the ESW system is from the Conowingo Pond. The ESW piping is classified as safety related, ASME Code Class 3, and of moderate energy (piping design rating of 150 psig @ 100 degrees F).

The pin-hole leak was located on an elbow between a check valve and a normally open manually operated isolation valve on a line that provides cooling to Unit 2 (which can be supplied by either ESW subsystem). The leak was located on a section of ESW piping (EIS: P) that is connected to the Service Water (SW) system at a point just downstream of the check valve that prevents SW flow into the remainder of the ESW system. As a result, the elbow is normally pressurized at SW system pressure, but only experiences flow when the ESW system is being operated (e.g., periodic testing).

The leak rate was measured with a graduated cylinder and determined to be approximately 3 ml/min. Since operability of the degraded piping could not be immediately established, both ESW subsystems were declared inoperable at 1300 hours on August 23, 2014. Technical Specification 3.7.2, Condition B was entered for both units, which requires the units to be in Mode 3 in 12 hours and in Mode 4 in 36 hours.

Ultrasonic examination of the pipe elbow was performed to determine the size and nature of the flaw. An area around the leak with a diameter of approximately 0.6 inches was identified as being below the minimum wall thickness of 0.100 inches. To obtain additional time to pursue ASME code relief, a verbal request was made to the NRC for a Notice of Enforcement Discretion (NOED) to extend the required completion time for TS 3.7.2, Condition B, by 48 hours. The NRC verbally granted the NOED at 1922 hours on August 23, 2014 with a follow-up written approval on August 28, 2014.

The ASME code relief request was made in a telephone call to the NRC on August 24, 2014 at 1157 hours. Verbal approval was provided by the NRC with a follow-up written approval on August 26, 2014. Based on the code relief, an operability evaluation determined that the through wall leak and surrounding wall thickness is acceptable for continued operation. The ESW system was declared operable and TS 3.7.2 Condition B was exited at 0348 hours on August 25, 2014.

Initial notification of this event was made to the NRC (EN# 50395) in accordance with 10CFR 50.72(b)(3)(v)(A) and (B), as a condition that could have prevented the fulfillment of the safety function of

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Peach Bottom Atomic Power Station Units 2 and 3	05000277	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 4
		14	- 002	- 00	

NARRATIVE

structures or systems needed to shutdown the reactor and maintain it in a safe shutdown condition, and to remove residual heat. With receipt of the relief request, this follow-up report is being made in accordance with 10CFR 50.73(a)(2)(i)(B), as a condition prohibited by the plant's technical specifications, and in accordance with 10CFR 50.73(a)(2)(vii)(A) and (B), as an event where a single cause or condition caused two independent trains to become inoperable in a single system designed to shut down the reactor and maintain it in a safe shutdown condition, and to remove residual heat.

Analysis of the Event

There were no actual safety consequences associated with this event. The ESW system was available to perform its design function at all times during this event.

The ultrasonic examination (UT) of the elbow identified an area of interior corrosion around the location of the through-wall leak. The corrosion is on the outer radius of the elbow, immediately downstream of the check valve. The corrosion consists of localized pitting, likely caused by corrosion under deposits and microbiologically influenced corrosion. The corrosion was likely accelerated by flow directed towards the pipe wall as it leaves the check valve. The area found to be less than the minimum wall thickness value of 0.100 inch is approximately 0.6 inch in both the axial and circumferential direction. The surrounding area was examined to identify the extent of the area with less than 87.5% of nominal wall thickness (i.e., 0.245 inch) and was determined to have a diameter of approximately 2.9 inches in the axial direction and 3.6 inches in the circumferential direction.

The piping minimum wall thickness is specified in ANSI B31.1 and ensures that the piping stresses will remain within code allowable limits. Failure of the piping to meet minimum required wall thickness due to a flaw requires an evaluation to determine if stresses are within code allowable values.

10 CFR50.55a(g)(4) and NRC Regulatory Guide (RG) 1.147 allow the use of ASME Code Case N-513-3, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping," to evaluate flaws located in straight pipe. Evaluation criteria for fittings such as elbows has been added to a revision to N-513-3 (designated as N-513-4), which has been approved by ASME but not yet approved by the NRC. The ASME Code relief requested by PBAPS and approved by the NRC on August 24, 2014, allowed for evaluation of the flaw in the ESW elbow to be performed using N-513-3 provided the stresses used in the evaluation are adjusted to account for geometric differences, as required by N-513-4.

The flaw evaluation determined that the calculated stress intensity factors for normal and emergency conditions were well below the allowable fracture toughness. This demonstrates the integrity of the elbow and the code case allows for temporary acceptance of the flaw. The NRC requires the repair or replacement activity to be performed during the next scheduled outage.

Cause of the Event

The cause of the leak has been determined to be localized pitting caused by corrosion under deposits and microbiologically influenced corrosion. In addition, the upstream check valve disc tends to direct flow towards the corrosion area, which may have accelerated the corrosion rate.

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Peach Bottom Atomic Power Station Units 2 and 3	05000277	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 4
		14	- 002	- 00	

NARRATIVE

Corrective Actions

The elbow is scheduled to be repaired or replaced during the Unit 2 refueling outage, which is scheduled to begin in October 2014. Until then, inspection during daily operator rounds (once per shift) is being performed to identify any increase in leakage. Additional evaluation in accordance with the code case will be performed if additional leakage is identified. An additional UT exam was performed on September 23, 2014, and no change to the component's condition was identified.

Adjustments are being made to the site's risk-based inspection program to be able to better identify low-margin piping in raw water systems and perform repairs or replacement to meet code requirements.

Previous Similar Occurrences

On July 6, 2008, a 6" diameter ESW pipe was found to have a leak on the supply header to the E1 Emergency Diesel Generator (EDG) coolers. The leak was determined to be caused by under deposit corrosion. Corrective actions were focused on ESW piping to the EDGs and, as a result, did not prevent this event.