Constellation.

10 CFR 50.73

CCN: 24-45

September 05, 2024

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

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

Subject: Licensee Event Report (LER) 2024-003-00 Automatic Reactor Scram Following Main Turbine Trip due to Degraded Condenser Vacuum

Reference: ENS 57221

The subject report is being submitted in accordance with 50.73(a)(2)(iv)(A) for actuation of the Reactor Protection System and Containment Isolation signals.

There are no commitments contained in this letter. If you have any questions, please contact the Peach Bottom Regulatory Assurance Engineer, Ms. Amy Huber at (267) 533-7247.

Respectfully,

Stiltner, Ryan C

Digitally signed by Stiltner, Ryan C
Date: 2024.09.05 07:34:00 -04'00'

Ryan C. Stiltner
Plant Manager
Peach Bottom Atomic Power Station

Enclosure

cc: USNRC, Administrator, Region I
USNRC, Senior Resident Inspector
W. DeHaas, Commonwealth of Pennsylvania
S. Seaman, State of Maryland
B. Watkins, PSE&G, Financial Controls and Co-Owner Affairs

NRC FORM 366 (04-02-2024) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 04/30/2027

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, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by email to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

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/)

1. Facility Name		2. Docket Number	3. Page
Peach Bottom Atomic Power Station, Unit 2	☒ 050 ☐ 052	00277	1 OF 3

4. Title

Automatic Reactor Scram Following Main Turbine Trip due to Degraded Condenser Vacuum

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved		
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	☐ 050	Docket Number
07	10	2024	2024	- 003 -	00	09	05	2024	Facility Name	☐ 052	Docket Number

9. Operating Mode	10. Power Level
1	25.6

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.1200(a)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	☐ 73.1200(b)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	☐ 73.1200(c)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.36(c)(2)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)	☐ 73.1200(d)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**	☐ 73.1200(e)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.77(a)(1)	☐ 73.1200(f)
☐ 20.2203(a)(2)(iii)		☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(2)(i)	☐ 73.1200(g)
☐ 20.2203(a)(2)(iv)		☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)	☐ 73.1200(h)
☐ 20.2203(a)(2)(v)		☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)		

☐ **OTHER** (Specify here, in abstract, or NRC 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Amy Huber, Regulatory Engineer	(267) 533-7247

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

Cause	System	Component	Manufacturer	Reportable to IRIS		Cause	System	Component	Manufacturer	Reportable to IRIS
X	SG	HX	I075	Y		X	WF	RV	T095	Y

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☒ No	☐ Yes (If yes, complete 15. Expected Submission Date)				

16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

While conducting power ascension following a maintenance outage, Peach Bottom Unit 2 began experiencing increasing condensate pump discharge chlorides because of a condenser tube leak. A condenser water box was isolated to facilitate repairs, but due to high river temperatures combined with elevated offgas inleakage, the water box isolation resulted in degrading condenser vacuum. Attempts to restore vacuum were unsuccessful and ultimately required a trip of the main turbine. Because the Reactor Protection System (RPS) input for Turbine Stop Valve (TSV) and Turbine Control Valve fast (TCV) closure was armed, the turbine valve closure generated a scram signal. Group II and III Primary Containment Isolation Valves isolated because reactor water level reached the isolation setpoint. Reactor water level was maintained with feedwater and pressure was maintained with bypass valves. The scram occurred without complication and all systems responded as expected. Unit 3 was not impacted by this event.

This event is reportable under 10CFR50.73(a)(2)(iv)(A) due to manual or automatic isolation of systems listed in 10CFR50.73(a)(2)(iv)(B) including RPS and containment isolation signals. An ENS notification was made within 4 hours of the event, reference ENS 57221.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

1. FACILITY NAME		2. DOCKET NUMBER	3. LER NUMBER		
			YEAR	SEQUENTIAL NUMBER	REV NO.
Peach Bottom Atomic Power Station, Unit 2	■ 050 ☐ 052	00277	2024	- 003	- 00

NARRATIVE

Plant Operating Conditions Before the Event

Prior to the event, on July 10, 2024, Peach Bottom Unit 2 was in Mode 1 conducting power ascension following a maintenance outage. It was identified that condensate pump discharge chloride conductivity was increasing, indicative of a condenser (EIIS: SG) tube leak. To facilitate investigation and repair of leaking tubes, a condenser waterbox was isolated with the reactor at approximately 62% power. Waterbox isolation combined with seasonally high river temperatures and elevated offgas (EIIS: WF) inleakage from a degraded valve in the offgas system resulted in degrading condenser vacuum. Although the waterbox was returned to service, condenser vacuum continued to degrade. The operating crew reduced power per station procedures, but condenser vacuum reached the threshold requiring a manual trip of the main turbine (EIIS: TA).

Event Description

The turbine was manually tripped on July 10, 2024 at 07:28 with the reactor at 25.6% power, which is within the physical capability of bypass valves (EIIS: SO). This is below the power level at which the Reactor Protection System (RPS) input for Turbine Stop Valve (TSV) and Turbine Control Valve (TCV) fast closure (EIIS: TA) is required to be armed per Technical Specifications, but due to conservative instrument setpoints, the input was still armed and the closure of the valves generated a scram signal. The scram occurred without complication. The Reactor Pressure Vessel (RPV) low level setpoint was reached, resulting in isolation of Group II and III Primary Containment Isolation System (PCIS) (EIIS: JM) valves as expected. Water level in the RPV was restored and maintained with Feedwater (EIIS: SJ) and pressure was maintained with bypass valves.

This event is reportable under 10CFR50.73(a)(2)(iv)(A) due to manual or automatic isolation of systems listed in 10CFR50.73(a)(2)(iv)(B) including RPS and containment isolation signals. An ENS notification was made within 4 hours of the event, reference ENS 57221.

Safety Consequences

The reactor Scram occurred as designed and resulted in no safety consequences. All safety systems responded as expected. Use of emergency core cooling systems for level and pressure control was not required. Unit 3 was not impacted by this event.

Cause and Corrective Actions

The cause of the scram was RPS input from TSV and TCV fast closure due to a manual trip of the Main turbine. Procedures directed tripping the turbine if steam flow was within bypass valve capability but did not warn that the RPS logic may be armed. Actions have been taken to revise procedures from tripping the turbine “if within bypass valve capability” to “if it is known that the Main TCV/TSV closure is bypassed on A or B RPS”.

Additionally, the cause of the degraded condenser vacuum condition was investigated. The root cause of this condition is that the station did not recognize and evaluate the cumulative effect of increased offgas air inleakage and isolation of a condenser waterbox with high river temperatures, culminating in a rapid lowering of main condenser vacuum. As a contributor, station models were unable to accurately predict the impact of elevated offgas inleakage on condenser performance. The corrective actions focus on enhancing the station governance for isolating a waterbox.

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Peach Bottom Atomic Power Station, Unit 2	■ 050 ☐ 052	00277	2024	- 003	- 00

NARRATIVE

Previous Similar Events

In February 2004, Peach Bottom manually scrammed due to decreasing condenser vacuum. The cause of the loss of vacuum was inleakage of non-condensable gases from a crack in a feed pump turbine expansion joint. Ref. LER 2004-002-00, dated 4/30/2004.

In August 2022, Peach Bottom experienced condenser vacuum degradation during a load drop in support of condenser cleaning activities, after isolating condenser water boxes. In this case, conditions were stabilized without requiring a trip of the main turbine or a reactor scram. Increased offgas flow was not a factor in this event.