Exelon Generation

10CFR 50.73

CCN: 19-142

December 19, 2019

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) 3-19-001

Enclosed is a Licensee Event Report concerning 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 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 Dan Dullum at 717-456-3339.

Sincerely,

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

PDN/dnd/IR 4289548

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

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 – PBABS
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 IRIS Report (Site OPEX Coordinator)
Records Management - PB

NRC FORM 366 (04-2018) | U.S. NUCLEAR REGULATORY COMMISSION | APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

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 3	05000278	1 OF 3

4. Title

Failure of Reactor Mode Switch 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
										05000
10	21	2019	2019	- 001	- 0	12	16	2019	Facility Name	Docket Number 05000

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

12. Licensee Contact for this LER

Licensee Contact	Telephone Number (Include Area Code)
Dan Dullum, Regulatory Assurance Engineer	717-456-3339

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	JC	HS	G080	Yes					

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

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

On 10/21/19, Unit 3 was being shut down for a scheduled refueling outage. When the Reactor Mode Switch was moved to the Shutdown position, a reactor scram did not occur as expected. The operator depressed the nearby manual scram pushbuttons in accordance with plant procedures, which resulted in a successful scram of the reactor.

An Unusual Event was declared as a result of this condition. Local, State and NRC notifications were made (ENS #54340).

Investigation determined an internal connection in the switch had failed. The switch was repaired during the refueling outage. There were no actual safety consequences as a result of this condition.

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 3	05000278	2019	- 001	- 0

NARRATIVE

Unit Conditions Prior to the Event

Unit 3 was operating in Mode 1 at approximately 5% rated thermal power. There were no structures, systems or components out of service that contributed to this event.

Description of Event

On 10/21/19, Unit 3 was being shut down for a scheduled refueling outage in accordance with plant operating procedures. At approximately 0039 hours and approximately 5% of rated thermal power, the reactor operator rotated the Reactor Mode Switch [EIIS:HS] from Run (Mode 1) to Shutdown (Mode 3). The Mode Switch is a pistol grip type switch located on the reactor operator's console in the main control room. The switch is part of the Reactor Protection System (RPS) [EIIS:JC] instrumentation and provides input to each of the two manual scram logic channels. When the Mode Switch was rotated to Shutdown, a reactor scram did not occur as expected. The reactor operator pressed the nearby scram pushbuttons, which initiated a successful scram. It was determined that the internals of the Mode Switch had only partially rotated and where in the Startup (Mode 2) position.

In accordance with site emergency plan procedures, an Unusual Event was declared on 10/21/19 at 0050 hours for a manual scram failing to shut down the reactor. Local, State and NRC notifications were made (ENS #54340).

The Mode Switch failure resulted in the following equipment becoming inoperable as required by the plant Technical Specifications (TS):

- Reactor Mode Switch - TS 3.3.1.1, Condition C was entered at 0039 hours, which requires the Mode Switch trip capability to be restored in one hour. The Mode Switch was not repaired within one hour, which resulted in Condition G being entered at 0139 hours, requiring the unit to be in Mode 3 in 12 hours.
- Control Rod Scram Accumulators – although all control rods were fully inserted and the scram accumulators were not needed, TS 3.1.5 requires the scram accumulators to be operable when in Mode 2. Since the Mode Switch was in Mode 2, TS 3.1.5, Condition C was entered at 0039 hours, which requires all control rods to be fully inserted and the control rods to be declared inoperable in one hour.
- Control Rods – as required by the above, TS 3.1.3, Condition C was entered at 0139 hours, which requires control rods to be inserted and the control rod drives to be disarmed. All control rods had previously been inserted and they were disarmed in accordance with plant procedures.

The Unusual Event was terminated at 0230 hours on 10/21/19.

Station personnel were able to access the internal portion of the Mode Switch and manually rotate the switch to the Shutdown position, which placed the unit in Mode 3. The TS requirements for the equipment identified above are no longer applicable in Mode 3 and TS required actions were exited at 0724 hours on 10/21/19. The equipment was inoperable for approximately 6 hours and 45 minutes as a result of this event.

NARRATIVE

Analysis of Event

The RPS monitors a number of plant parameters and initiates a reactor scram if the parameters are outside of their expected range. The system consists of two trip systems with two automatic channels and one manual channel per trip system. The Reactor Mode Switch provides input signals to each of the manual channels and causes a scram when placed in the Shutdown position. The Mode Switch also interlocks functions such as control rod blocks and refueling equipment restrictions. In the Shutdown position, it bypasses various scram signals such as the main steam line isolation scram and the main condenser low vacuum scram.

The Mode Switch was last operated during a Unit 3 outage in October of 2018. It was rotated from Run to the Shutdown position on 9/30/18 and operated several times during the outage for control rod testing. It was operated twice during startup, from Shutdown to Startup on 10/9/18 and Startup to Run on 10/10/18. The switch was not used between that time and when it failed on 10/21/19.

As described further in the Cause section below, the switch failed due to wear. No failure mechanism was identified that caused degradation of the switch when it was not being manipulated and the evidence suggest that it would not have been able to perform its safety function at any time after it was operated on 10/10/18. As a result, the Mode Switch was inoperable from 10/10/18 to 10/21/19. The Mode Switch is required to be operable by TS 3.3.1.1 (Table 3.3.1.1-1, Function 12). If inoperable, it is required to be restored in one hour or the unit needs to be placed in Mode 3 in 12 hours. Since these times were exceeded, the event is being reported as a violation of TS in accordance with 10 CFR 50.73(a)(2)(i)(B).

Although the Mode Switch was inoperable, the overall risk to the plant was very low. The RPS relies primarily on input from instrumentation and performs protective functions automatically, which were not affected by this condition. The Mode Switch is not specifically credited in the accident analysis, but provides overall redundancy and diversity for the RPS. There are several other methods to manually scram the reactor, including the manual scram pushbuttons, which were used successfully.

Cause of the Event

Due to the number of functions the switch controls, there is a large number of electrical contacts that change position when the switch is operated, requiring more force to rotate than is typical for a similar switch. A coupling between the handle and the shaft internal to the switch showed wear and deformation, allowing it slip around the square shaft of the switch.

Corrective Actions

The shaft coupling on the Mode Switch was replaced. Additional corrective actions are documented in the corrective action program.

Previous Similar Occurrences

No previous similar occurrences have been identified.