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10CFR 50.73

November 17, 2011

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) 3-11-02

Enclosed is a Licensee Event Report concerning a condition prohibited by Technical Specifications involving a leak from a Residual Heat Removal system relief valve. 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,

P. D. Navin For

Garey L. Stathes
Plant Manager
Peach Bottom Atomic Power Station

GLS/djf/IR 1264909 / 1271780

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: 11-87

IE22
NRR

NRC FORM 366 (10-2010)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

LICENSEE EVENT REPORT (LER)

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

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4. TITLE
Residual Heat Removal Leaking Relief Valve 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
05	04	2010	11	- 002 -	00	11	17	2011		05000
									FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE: 1

10. POWER LEVEL: 100%

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*

☐ 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)
☐ 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

FACILITY NAME	TELEPHONE NUMBER *(Include Area Code)*
PBAPS Unit 3, James M. Armstrong, Regulatory Assurance Manager	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
X	BO	RV	C710	Y					

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 15 single-spaced typewritten lines)*

On 9/19/11, during the P3R18 refueling outage, Engineering personnel determined that a leak on the inlet connection to the D Residual Heat Removal suction piping thermal relief valve was due to cracking of the relief valve body and not due to a mechanical joint leak as originally identifed during cycle 18 operations on 4/27/10. Because the leak involved an American Society of Mechanical Engineers (ASME) Code Class 2 component, the associated component should have been considered inoperable when originally identified on 4/27/10. The inoperable component affected the operability of the B Residual Heat Removal Low Pressure Injection Subsystem. This event is considered as a condition prohibited by Technical Specifications and loss of safety function. The cause of the delay in identifying the inoperable condition was due to inadequate technical rigor when evaluating the operability of the relief valve on 4/27/10. The leaking relief valve was replaced on 10/2/11. Extent of condition reviews were performed for similar components in Unit 2 and Unit 3. Operations has instituted additional training and procedure revisions to drive improved performance regarding operability evaluations. There were no actual safety consequences as a result of this event.

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NARRATIVE

Unit Conditions Prior to the Event

Unit 3 was in Mode 5, operating at 0% of rated thermal power when this event was discovered. The event date is considered to be 5/4/10 (i.e., the expiration of the seven day Technical Specification (TS) Required Action time for the B Residual Heat Removal (RHR) Low Pressure Coolant Injection (LPCI) subsystem being inoperable). The leak was first identified on 4/27/10. On 5/4/10, Unit 3 was in Mode 1 operating at approximately 100% reactor thermal power. From 4/27/10 through 9/11/11 (when Unit 3 was shutdown for the P3R18 refueling outage), other low pressure core cooling subsystems were inoperable for limited time periods for maintenance. There were no other structures, systems or components out of service that contributed to this event.

Description of the Event

On 9/19/11, during the P3R18 refueling outage, Engineering personnel determined that a leak on the inlet connection to the D RHR (EIIS:BO) pump suction piping thermal relief valve (EIIS:RV) was not a mechanical joint leak as originally determined during cycle 18 operations on 4/27/10. Because the leak involved an American Society of Mechanical Engineers (ASME) Code Class 2 component, it should have been considered inoperable when identified on 4/27/10.

During performance of a surveillance test on 4/27/10, a pressure test of the B RHR subsystem was being performed as required by the Inservice Inspection (ISI) program. During the test, an equipment operator (utility, non-licensed) identified a very small leak on the base area of the D RHR pump suction piping thermal relief valve. The leak was identified to be less than 1 drop per minute. At that time, the equipment operator believed that the leak was at a threaded connection under the thermal relief valve (RV-3-10-072D). Subsequent in-office review of the reported condition by two licensed operators on 4/27/10 determined that due to the small amount of leakage and the belief that this was a threaded connection, there would not be any operability impacts on the Low Pressure Coolant Injection (LPCI), Suppression Pool Cooling, Suppression Pool Spray or Drywell Spray modes of the B RHR subsystem and therefore, the equipment remained operable. On approximately 4/28/10, this determination was also reviewed in-office by Engineering personnel, who determined that since it appeared that the leak did not involve a through-wall or through-weld leak, the magnitude of the leakage did not challenge the operability of the RHR subsystem. The concern was subsequently planned for further investigation during the next refueling outage (i.e., P3R18) for resolution.

On 9/18/11, during the P3R18 refueling outage, Maintenance personnel identified that the leak at the base of RV-3-10-072D may not have been mechanical joint leak, but rather a through-wall leak. Based on a review by Engineering personnel on 9/19/11, it was determined that the leak was a through-wall leak and licensed operations personnel promptly declared the 3D RHR pump inoperable. This determination was made as a result of requirements in the site

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NARRATIVE

Description of the Event, continued

operability procedure that high energy pipes and components be declared inoperable if a through-wall or through-weld leak occurs.

Subsequent radiography and dye-penetrant (PT) examinations confirmed the leak to be through the valve body. This examination revealed that there were crack-like indications over about 50% of the circumference of the valve body. The leaking relief valve was replaced on 10/2/11.

The inoperable component affected the B Residual Heat Removal LPCI subsystem. Technical Specification (TS) 3.5.1, TS 3.5.1 – Emergency Core Cooling Systems – Operating, requires that two LPCI subsystems be operable. As a result of the degraded condition the B RHR LPCI subsystem was inoperable for a time period greater than 7 days. Therefore, this event is considered as a condition prohibited by (TS) since the condition existed during cycle 18 operations. Additionally, there were limited time periods where other low pressure core cooling subsystems were inoperable for maintenance resulting in other TS 3.5.1 required actions required to be entered for these situations.

Analysis of the Event

This report is being submitted pursuant to:

10CFR 50.73(a)(2)(i)(B) – Condition Prohibited by TS – This occurrence is reportable under this criterion since the B RHR LPCI subsystem should have been declared inoperable on 4/27/10. Therefore, this event is considered to be a condition prohibited by TS 3.5.1. TS 3.5.1 associated required action completion times were not complied with. Additionally, there were limited occasions where the low pressure core cooling subsystems were inoperable for maintenance resulting in other TS 3.5.1 required actions required to be entered for these situations.

10CFR 50.73(a)(2)(v)(D) – Loss of Safety Function – This occurrence is reportable under this criterion since the B RHR LPCI subsystem was inoperable concurrent with occasions where the A RHR LPCI subsystem was inoperable for limited time periods for maintenance during the period of exposure.

The 3D RHR pump provides a variety of functions including supplying water for the following modes of RHR: Low Pressure Coolant Injection (LPCI), Suppression Pool Cooling (SPC), Suppression Pool Spray, and Shutdown Cooling (SDC).

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NARRATIVE

Analysis of the Event, continued

The 3D RHR Pump suction line thermal relief valve (RV-3-10-072D) primarily provides protection of the 3D RHR pump suction piping from overpressurization only in the event this section of piping is isolated. During power operations, the Suppression pool suction valve (MO-2-10-013D) is normally maintained and keylocked in the open position so that the suction line cannot be isolated, and therefore, thermal overpressurization cannot occur. Only if the MO-3-10-013D valve is isolated (i.e., removal of the 3D RHR pump from service) would it be possible to overpressurize the piping due to thermal expansion. Therefore, the RV-3-10-072D does not provide a safety function in the open (i.e., pressure-relieving) position.

RV-3-10-072D does provide a passive safety function in the closed position. The relief valve is located just downstream of the 3D RHR pump suction valve (MO-3-10-013D) on a 1" pipe riser off the pump suction line. However, the RV-3-10-072D discharge is to the upstream side of the MO-3-10-013D into the RHR suction piping, which is directly connected to the Suppression Pool. The thermal relief valve (as well as MO-3-10-013D) is considered as a Primary Containment Isolation Valve (PCIV) for the Suppression Pool (i.e., primary containment) penetration N-226B.

RV-3-10-07D is a Crosby Style JMBL 1" X 1.5" relief valve.

Based on analysis of the RV-3-10-072D degraded condition, it was determined that the primary containment function of the relief valve still existed. However, because of the crack-like indications on the inlet side (non-containment side) of the relief valve, it is assumed that this side of the relief valve could have become detached from the inlet 1" piping in a worst-case design basis event (e.g., seismic event). If a design event occurred, the leakage from the breached relief valve body would have entered into the D RHR pump room. Operations would be alerted to this condition by a control room annunciator and would, if not required to be operated in accordance with emergency operating procedures, have isolated the 3D RHR pump using the RHR pump suction valve, which is a Primary Containment Isolation Valve (PCIV). This condition would result in the 3D RHR pump being inoperable, thereby affecting the RHR LPCI function. The other B RHR subsystem TS functions (Suppression Pool Cooling, Suppression Pool Spray) could have been maintained since only one RHR pump in the B subsystem would have been isolated. The B RHR Pump was unaffected by this condition.

There were no actual safety consequences associated with this event.

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NARRATIVE

Cause of the Event

The cause of the RV-3-10-072D failure was due to leakage through the relief valve body. Radiography and dye-penetrant (PT) examinations performed during the P3R18 refueling outage confirmed the leak to be through the valve body. This examination revealed that there were crack-like indications over about 50% of the circumference of the valve body. Additional laboratory analysis of the condition is being evaluated in accordance with the corrective action program.

The cause of the delay in identifying the inoperable condition was due to inadequate technical rigor by Operations personnel (utility, licensed). The condition was identified by an equipment operator (utility, non-licensed) on 4/27/10 and it was believed that the leak was from a mechnical joint and therefore, would not result in inoperability due to the very small leakage. The situation warranted an independent in-field inspection to evaluate the condition. Additionally, licensed Operations personnel did not drive a formal operability evaluation to be performed by Engineering to confirm the operability declaration. Engineering was asked to review the condition, but this review was limited and did not include a field walkdown.

Corrective Actions

RV-3-10-072D was replaced on 10/2/11. A formal failure analysis and additional evaluation of the underlying causes for the condition of the relief valve are being further evaluated in the corrective action program.

Extent of condition reviews were performed for similar components in Unit 2 and Unit 3.

Since the occurrence of this event on 4/27/10, Operations has instituted additional training and procedure revisions to drive improved performance regarding operability evaluations. An operations case study will be conducted to further reinforce the event to Operations personnel.

Previous Similar Occurrences

There were no previous similar LERs identified involving a through-body leak of a relief valve. There were no other LERs identified involving the failure to promptly identify an ASME pressure boundary leakage condition.