



10CFR 50.73

February 26, 2016

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) 3-15-001

Enclosed is a Licensee Event Report concerning a loss of function of the High Pressure Coolant Injection System due to a failed signal converter associated with the system's flow controller. 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 us.

Sincerely,

A handwritten signature in black ink, appearing to read "Patrick D. Navin".

Patrick D. Navin
Plant Manager
Peach Bottom Atomic Power Station

PDN/dnd/IR 2606215

Attachment

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

CCN: 16-17



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 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 3

2. DOCKET NUMBER

05000278

3. PAGE

1 OF 3

4. TITLE

Loss of High Pressure Coolant Injection System Function as a Result of Failed Flow Controller Signal Converter

| 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 |
| 12 | 31 | 2015 | 2015 | 001 | 0 | 02 | 26 | 2016 | FACILITY NAME | DOCKET NUMBER |
| | | | | | | | | | 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 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) | | | | | | | |
| | <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 checked="" type="checkbox"/> OTHER | Specify in Abstract below or in NRC Form 366A | | | | | | | |

12. LICENSEE CONTACT FOR THIS LER

| | |
|---|--|
| LICENSEE CONTACT James 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 | MANUFACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX |
|-------|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
| B | BJ | FIC | M422 | Y | | | | | |


| | | | | |
|--|-------------------------------------|-------|-----|------|
| 14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO | 15. EXPECTED SUBMISSION DATE | MONTH | DAY | YEAR |
| | | -- | -- | -- |

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

On 12/31/15, at approximately 0630 hours, during shift turnover panel walk-downs, a licensed operator identified that the High Pressure Coolant Injection (HPCI) flow controller output indication was showing zero percent. The controller was in automatic with the set point at 5000 gpm, which would typically result in a controller output value of 100%. This condition would have prevented the HPCI system from performing its design function in the event of an accident. The HPCI system was declared inoperable and the appropriate Technical Specification Action was entered. Other standby systems (Reactor Core Isolation Cooling and low pressure emergency core cooling systems) remained operable.

Troubleshooting of the flow controller and related circuitry identified a failed signal converter. The signal converter was replaced and the HPCI system was declared operable at approximately 2110 hours on 12/31/15.

There were no actual safety consequences associated with this event.

| | | | | | | | |
|--|--|---|--|--------------------------------|----------------------|---------------------|---|
| NRC FORM 366A (11-2015) | | U.S. NUCLEAR REGULATORY COMMISSION | | APPROVED BY OMB: NO. 3150-0104 | | EXPIRES: 10/31/2018 | |
|  LICENSEE EVENT REPORT (LER) CONTINUATION SHEET | | <p>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.</p> | | | | | |
| | | 1. FACILITY NAME | | 2. DOCKET NUMBER | | 3. LER NUMBER | |
| Peach Bottom Atomic Power Station, Unit 3 | | 05000278 | | YEAR | SEQUENTIAL NUMBER | REV NO. | |
| | | | | 2015 | - 001 | - | 0 |
| NARRATIVE | | | | | | | |
| Unit Conditions Prior to the Event | | | | | | | |
| <p>Unit 3 was in Mode 1 and operating at approximately 100% rated thermal power when the event occurred. There were no structures, systems or components out of service that contributed to this event.</p> | | | | | | | |
| Description of the Event | | | | | | | |
| <p>On 12/31/15, at approximately 0630 hours, during shift turnover panel walk-downs, a licensed operator identified that the High Pressure Coolant Injection (HPCI) (EIIS:BJ) flow controller (EIIS:FIC) output indication was showing zero percent. The controller was in automatic with the set point at 5000 gpm, which would typically result in a controller output value of 100%. This condition would have prevented the HPCI system from performing its design function in the event of an accident. The HPCI system was declared inoperable and the appropriate Technical Specification Action was entered. Other standby systems (Reactor Core Isolation Cooling and low pressure emergency core cooling systems) remained operable.</p> | | | | | | | |
| <p>This condition was reported to the NRC on 12/31/15 at approximately 1315 hours pursuant to the requirements of 10CFR 50.72(b)(3)(v)(D) (Event Notification # 51630).</p> | | | | | | | |
| <p>Subsequent troubleshooting of the HPCI system determined that a signal converter in the HPCI control circuitry had failed, resulting in the HPCI system not being capable of providing a sufficient flow rate if it had been required for a design basis event. The signal converter was replaced. HPCI was satisfactorily tested and returned to an operable status on 12/31/15 at approximately 2110 hours. The elapsed time from discovery to the time when the system was returned to service was approximately 14 hours and 40 minutes.</p> | | | | | | | |
| Analysis of the Event | | | | | | | |
| <p>The HPCI system is part of the Emergency Core Cooling System (ECCS) network that provides cooling water to the reactor vessel for certain design basis events. The HPCI system uses a turbine driven pump that is designed to provide core cooling for a wide range of reactor pressures. As a result of this failure, upon receipt of an initiation signal, the HPCI turbine would have started, but the flow controller would have provided a flow demand of 0%. This would cause the governor control valve to close, stopping the turbine shortly after receiving the initiation signal.</p> | | | | | | | |
| <p>A documented walk down of this panel on 12/30/15 at approximately 2200 hours shows that the flow controller indicated 100% at that time. In addition, the operator also observed the controller at 100% at approximately 0400 on 12/31/15. It was observed during shift turnover walk downs at approximately 0630 hours to be at 0%. Therefore, the duration of inoperability prior to discovering the condition was at most approximately 2-1/2 hours. During the inoperability time period, other core cooling systems (Automatic Depressurization System (ADS) (EIIS: RV), Core Spray (EIIS: BM) and Low Pressure Coolant Injection (EIIS: BO)) were operable and could have adequately</p> | | | | | | | |

NRC FORM 366A
(11-2015)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104

EXPIRES: 10/31/2018



LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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| Peach Bottom Atomic Power Station, Unit 3 | 05000278 | 2015 | - 001 | - 0 |

NARRATIVE

responded to a design basis event to maintain the plant in a safe condition. The Reactor Core Isolation Cooling (RCIC) system (EIS: BN) was also operable during this time period. This event is not considered to be risk significant. There were no actual safety consequences associated with this event.

This event is being reported in accordance with 10CFR 50.73(a)(2)(v)(D), as a condition that could have prevented the fulfillment of the safety function of a system needed to mitigate the consequences of an accident. This LER also satisfies the reporting obligations of 10CFR Part 21, as stated in 10CFR 21.2(c).

Cause of the Event

Troubleshooting of the HPCI system determined that a signal converter in the HPCI control circuitry had failed. The signal converter converts the HPCI Flow Controller 4-20 mA output to a 10-50 mA signal that is required by the HPCI Electronic Governor Module.

The signal converter is manufactured by Moore Industries, Model #SCT/4-20MA/10-50MA and supplied by Nutherm International. The signal converter had been installed and tested in October 2015 during the recent refueling outage.

Following its failure on 12/31/15, it was sent off site for failure analysis. A failed transistor in the signal converter was identified. When replaced with a new transistor, the new transistor also failed during functional tests, suggesting it was the result of another sub-component within the signal converter. Additional testing and analysis could not determine what other sub-component had failed.

Corrective Actions

The signal converter was replaced. HPCI was satisfactorily tested and returned to an operable status on 12/31/15 at approximately 2110 hours.

The failure has been classified as a latent manufacturing issue resulting in an infant mortality of the device. Similar installed equipment has been in operation for a period of time adequate for identifying this type of failure. The replacement signal converter has been in-service since 12/31/15 with satisfactory performance. Additional corrective actions are being evaluated in accordance with the corrective action program.

Previous Similar Occurrences

LERs 3-04-001 and 3-05-001 both reported a failure of a HPCI flow controller due to failure of an internal power supply. The corrective actions taken for the previous events would not have been expected to prevent this recent event.