



10CFR50.73

LR-N16-0176

OCT 04 2016

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-001

Hope Creek Generating Station Unit 1
Renewed Facility Operating License No. NPF-57
Docket No. 50-354

Subject: Licensee Event Report 2016-001-00, High Pressure Coolant Injection System Found to be Inoperable During Testing.

In accordance with the requirements of 10 CFR 50.73(a)(2)(v)(D), PSEG Nuclear LLC is submitting the enclosed Licensee Event Report (LER) Number 2016-001-00, High Pressure Coolant Injection System Found to be Inoperable During Testing.

If you have any questions or require additional information, please contact Mr. Thomas MacEwen at (856) 339-1097.

There are no regulatory commitments contained in this letter.

Sincerely,

A handwritten signature in black ink, appearing to read "Edward T. Casulli".

Edward T Casulli
Plant Manager
Hope Creek Generating Station

ttm

Attachment: Licensee Event Report 2016-001-00

cc: Mr. Daniel Dorman, Regional Administrator – Region I, NRC
Ms. Carleen Parker, Project Manager - US NRC
Mr. Justin Hawkins, NRC Senior Resident Inspector – Hope Creek (X24)
Mr. Patrick Mulligan, Manager IV, NJBNE
Mr. Thomas MacEwen, Hope Creek Commitment Tracking Coordinator (H02)
Mr. Lee Marabella - Corporate Commitment Tracking Coordinator (N21)



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 Hope Creek Generating Station	2. DOCKET NUMBER 05000354	3. PAGE 1 OF 4
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4. TITLE High Pressure Coolant Injection System Found to be Inoperable During Testing

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
04	07	2016	2016	- 001	- 00	10	04	2016	FACILITY NAME	DOCKET NUMBER 05000

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

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT Thomas MacEwen, Principal Compliance Engineer	TELEPHONE NUMBER (Include Area Code) 856-339-1097
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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	BJ	XCV	T147	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
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

A review of plant conditions from April 2016, revealed a condition that could have prevented the fulfillment of a safety function. On April 7, 2016, at 0352, with the Hope Creek reactor operating at 100% power, the High Pressure Coolant Injection (HPCI) system turbine over-speed assembly did not respond as expected during post maintenance testing. The HPCI system was in the process of post maintenance testing following a planned maintenance window, and was inoperable at the time of the event. During system testing, the HPCI turbine was momentarily tripped by the over-speed assembly, and then reset itself with no operator action. Subsequent investigation found that the HPCI over-speed assembly reset spring did not have the correct preload. A review of the maintenance completed during the scheduled system outage determined that there was no maintenance performed on the over-speed assembly. Therefore, the condition could have been present prior to the start of the maintenance window on April 5, 2016 at 0205.

This report is being submitted under 10 CFR 50.73(a)(2)(v)(D), as an event or condition that could have prevented the fulfillment of a safety function of systems that are needed to mitigate the consequences of an accident. No specific cause was identified; however there is industry operating experience that the reset spring will relax over time, reducing the preload.



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

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NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

General Electric – Boiling Water Reactor (BWR/4)
Reactor Protection System – EIS Identifier {BJ/XCV}*

*Energy Industry Identification System {EIS} codes and component function identifier codes appear as {SS/CCC}

IDENTIFICATION OF OCCURRENCE

Event Date: 04/07/2016
Discovery Date: 09/07/2016

CONDITIONS PRIOR TO OCCURRENCE

Hope Creek was in Operational Condition 1 at 100 percent rated thermal power (RTP). HPCI System {BJ} post maintenance testing was in progress. The HPCI system was inoperable following planned maintenance.

DESCRIPTION OF OCCURRENCE

On April 7, 2016, while performing a post maintenance test of the HPCI turbine and pump, the system did not respond as expected. Following startup, the HPCI turbine tripped and reset in an approximate 5 second time span. The HPCI turbine and pump then continued to accelerate to normal speed with proper pressure and flow rates. Because the turbine tripped and reset, station operators considered the system to remain inoperable, although all other test results were satisfactory.

The HPCI system ensures that the reactor core is not uncovered if there is a small break in the reactor coolant pressure boundary (RCPB) that does not result in rapid depressurization of the reactor vessel. The HPCI system controls automatically start the system and bring it to design flow rate within 35 seconds from receipt of a reactor pressure vessel (RPV) low water level signal or a primary containment (drywell) high pressure signal.

During the trip and reset event, plant data indicates that the 35 second response time from system initiation to full flow would not have been accomplished, because the event delayed the development of full system flow rate, discharge pressure, and pump/turbine speed. Troubleshooting determined that the reset spring was set at 1 pound (lb.), which is outside the prescribed range of 2 to 5 lbs. The spring preload was adjusted to 3.5 lbs. and the system was retested satisfactorily. There was no record of any maintenance performed on the trip mechanism or reset spring during the system maintenance window on April 5, 2016 at 0205 through April 7, 2016 at 0352. The last maintenance performed on the trip mechanism was during the previous refueling outage which completed in May, 2015. At that time the spring was set to 3.5 lbs.

The HPCI system was run for testing on March 1, 2016, approximately five weeks prior to the trip and reset event. The HPCI system is tested quarterly as part of system surveillance testing. It was successfully run in June, September, and December, 2015 and March, 2016 with no abnormal operation of the trip mechanism. Based on this, it was concluded that the reset spring preload most likely relaxed to less than the required preload during the period between March 1, 2016, at 1427, when HPCI was last operated successfully, and April 7, 2016 at 0352 when the event occurred. Based on the suspected failure mode, the HPCI system could have been unavailable for a period of time prior to April 5, 2016, at 0205, when the system was required to be operable. This meets the reporting criterion of 10 CFR 50.73 (a)(2)(v)(D), a condition that could have prevented the fulfillment of a safety function to mitigate the consequences of an accident. The condition was also reviewed under 10 CFR 50.73 (a)(2)(i)(B), as a condition prohibited by Technical Specifications. However, because there is no firm evidence that the system would not have worked, the event is not required to be reported under that section.



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CAUSE OF EVENT

No specific cause was identified. However, there is industry operating experience that the reset spring may relax over time, reducing the preload on the reset mechanism. Relaxation of the reset spring is considered to be the most probable cause.

SAFETY CONSEQUENCES AND IMPLICATIONS

This event resulted in inoperability of the single train HPCI system, resulting in the inability of the HPCI system to perform its required safety function to mitigate the consequences of an accident. The HPCI system is part of the Emergency Core Cooling System (ECCS), and is specifically intended for a small break in the reactor coolant pressure boundary (RCPB) that does not result in rapid depressurization of the reactor vessel. The system was found in a condition in which it remained capable of injecting water into the reactor vessel, however because of the momentary trip and reset, the system would not have met the full flow injection time limit of 35 seconds.

In the event that the HPCI system fails, the Automatic Depressurization System (ADS) {SB} uses a number of the reactor safety/relief valves to reduce reactor vessel pressure during small or isolated breaks. When reactor vessel pressure is reduced to within the design capability of the low pressure systems (Core Spray {BM} and Low Pressure Coolant Injection {BO}), these systems provide reactor vessel coolant inventory makeup, so that acceptable post-accident reactor core coolant temperatures are maintained.

During the time period between the last successful HPCI test on March 1, 2016 to until the condition was discovered on April 7, 2016, the following ECCS systems were unavailable for scheduled maintenance:

- The B Low Pressure Coolant Injection (LPCI) system was unavailable due to planned maintenance from March 8, 2016 at 0300 until March 9, 2016 at 2140.
- The B Core Spray subsystem was unavailable due to planned maintenance from March 22, 2016 at 0300 until March 23, 2016 at 2337.

ECCS logic requires at least one Core Spray subsystem or one LPCI pump be operating in order for the ADS to depressurize the reactor vessel and restore core cooling. At no time during the period of HPCI unavailability was the combination of operable low pressure ECCS pumps less than the required number for ADS system operation.

During the time period that the HPCI system was unavailable, sufficient systems were available to provide the required safety functions needed to protect the health and safety of the public.

SAFETY SYSTEM FUNCTIONAL FAILURE

This condition is a safety system functional failure as defined in NEI 99-02, Revision 7, Regulatory Assessment Performance Indicator Guideline.

PREVIOUS EVENTS

A review of events at Hope Creek for the past three years was performed to determine if any similar events had occurred. No similar events were identified.



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CORRECTIVE ACTIONS

The over-speed assembly reset spring was reset to 3.5 lbs., which is within the proper pre-load band.

The preventative maintenance strategy for HPCI will be reviewed and revised as necessary to include periodic replacement of the over-speed assembly reset spring.

Other corrective actions are being tracked in the licensee's Corrective Action Program.

COMMITMENTS

This LER contains no regulatory commitments.