



OCT 01 2007
LR-N07-0263

10CFR50.73

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

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

Subject: Licensee Event Report 2007-004-00

In accordance with 10 CFR 50.73(a)(2)(i)(B), 10 CFR 50.73(a)(2)(v)(B) and 10 CFR 50.73 (a)(2)(v)(D), PSEG Nuclear LLC, is submitting Licensee Event Report Number 2007-004-00.

Should you have any questions concerning this letter, please contact Mr. Francis D. Possessky at (856) 339-1160.

Sincerely,

A handwritten signature in cursive script that reads "John F. Perry".

John F. Perry
Plant Manager
Hope Creek Generating Station

Attachment: Licensee Event Report

IE22
NRR

cc: Mr. S. Collins, Administrator - Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. R. Ennis, Licensing Project Manager - Hope Creek
U.S. Nuclear Regulatory Commission
Mail Stop 08B1
Washington, DC 20555-0001

USNRC Resident Inspector office - Hope Creek (X24)

Mr. P. Mulligan, Manager IV (Acting)
Bureau of Nuclear Engineering
PO Box 415
Trenton, New Jersey 08625

NRC FORM 366 (6-2004)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0104	EXPIRES: 06/30/2007
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2> <p style="margin: 0;">(See reverse for required number of digits/characters for each block)</p>		Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 05000 354	3. PAGE 1 OF 4
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4. TITLE
 HPCI System Inoperability due to feedwater injection valve failure to stroke open

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
07	31	2007	2007	- 004 -	00	09	28	2007	N/A	
									FACILITY NAME	DOCKET NUMBER
									N/A	

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

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Francis D. Possessky, Compliance Engineer	TELEPHONE NUMBER (Include Area Code) 856-339-1160
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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
B	BJ	INV	L200	N					

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

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

On 7/31/2007, at 0051 hours with the quarterly Inservice Test (IST) for High Pressure Coolant Injection (HPCI) system valves in progress, HPCI Feedwater injection valve BJ-HV-8278 failed to stroke open. The valve tripped on electrical overloads 10 seconds after the open pushbutton was depressed. Failure of the valve to open resulted in HPCI inoperability and an unplanned 14-day hot shutdown Limiting Condition for Operation (LCO). HPCI was inoperable from May 29, 2007 to July 31, 2007.

The cause of the HPCI Feedwater injection valve not opening on July 31, 2007 was that it was thermally bound as a result of a short duration HPCI injection event on May 29, 2007. The root cause is that thermal binding was not anticipated during the design of the system.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(i)(B), 10 CFR 50.73(a)(2)(v)(B) and 10 CFR 50.73 (a)(2)(v)(D).

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17. TEXT (If more space is required, use additional copies of NRC Form 366A)

PLANT AND SYSTEM IDENTIFICATION

General Electric – Boiling Water Reactor (BWR/4)
High Pressure Coolant Injection - {BJ}
Injection valve - {INV}

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

IDENTIFICATION OF EVENT

Event Date/Time: May 29, 2007 / 0834
Discovery Date/Time: July 31, 2007 / 0051

CONDITIONS PRIOR TO EVENT

Hope Creek was in Operational Condition 1 with reactor power at 100%. No other structures, systems, or components were inoperable that contributed to the event.

DESCRIPTION OF EVENT

On May 29, 2007, at 0834 while operating with the reactor at 100% power and the main generator synchronized to the grid, a manual scram was initiated in anticipation of a low reactor water level condition. After the scram, reactor water level lowered to Level 2 and a valid ECCS initiation signal caused HPCI {BJ} and Reactor Core Isolation Cooling (RCIC) to start and inject to the core. This HPCI injection was secured by control room operators 17 seconds after initiation in accordance with procedures. On July 31, 2007, at 0051 during performance of the quarterly In-service Test (IST) for HPCI system valves, the HPCI Feedwater injection valve (BJ-HV-8278) {BJ/INV} failed to stroke open. The valve tripped on electrical overloads 10 seconds after the open pushbutton was depressed. Failure of the valve to open resulted in HPCI inoperability and an unplanned 14-day hot shutdown LCO. The HPCI feedwater injection Valve is an Anchor / Darling 8 inch – 900 lb carbon steel flex wedge gate valve with a Limitorque SMB-0-25 actuator. The root cause is that the thermal binding was not anticipated during the design of the system.

CAUSE OF EVENT

The cause of the HPCI Feedwater injection valve not opening on July 31, 2007 was that it was thermally bound as a result of the short duration HPCI injection event on May 29, 2007. Previous to the HPCI injection the Feedwater injection valve was approximately 424°F due to its close proximity to the feedwater line. During the 17 second HPCI injection, cold water, at approximately 85°F, was injected through the HPCI Feedwater injection valve and cooling of the valve seat and the valve disc occurred at different rates. When HPCI was secured, and the valve shut, the disc went further into the seat than normal. During the subsequent heatup of the valve, the disc and seat rings expanded, increasing the wedging interference and therefore, the required opening force. The increase in wedging interference resulted in the required opening force exceeding the actuator capacity and failure of the valve to open. The root cause is that the thermal binding was not anticipated during the design of the system. This type of thermal binding is different than the classical thermal binding experienced in the industry. Classical thermal binding involves a valve that is closed 'hot' and after cooling, the valve is thermally bound.

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EXTENT OF CONDITION

The only similar configuration as the HPCI Feedwater injection valve is the RCIC injection valve. RCIC also injects into the feedwater system and uses the same source of low temperature water as HPCI. The RCIC Feedwater injection Valve, BD-HV-F013, is a 6 inch 900# Flexwedge gate valve with a SMB-0 Limatorque Operator. The RCIC System injects 600 GPM upon initiation, which is much less than the HPCI system. During a plant transient when reactor water level reaches Level 2, HPCI and RCIC inject. Due to the higher HPCI flow, HPCI typically is shutdown earlier than RCIC. Thus RCIC typically does not have short duration injections.

During the May 29, 2007 event, RCIC also injected into the reactor through the feedwater system. During HPCI system shutdown, its suction pressure oscillated. The oscillation caused a RCIC trip. The RCIC injection duration was a few seconds longer than the HPCI injection of 17 seconds. RCIC injection valve was stroked open and closed successfully during its quarterly IST on June 12, 2007 proving it was not thermally bound.

A review of the previous IST open stroke time test results for BD-HV-F013 revealed that there are no inconsistencies in the test-to-test times that might suggest the presence of minor classical thermal binding.

The RCIC Feedwater injection Valve has similarities to the HPCI Feedwater injection valve but has operational differences; therefore it is difficult to conclude whether the RCIC Feedwater injection Valve could have the same thermal binding issue. Based upon the data gathered, the RCIC Feedwater injection valve does not exhibit the same characteristics as the HPCI Feedwater injection valve. Therefore the investigation team expects the thermal binding issue does not exist for the RCIC Feedwater injection Valve. To confirm this, an analysis will be performed which will determine if thermal binding is plausible for the RCIC valve.

HPCI also injects into the reactor vessel through the Core Spray system via the BJ-HV-F006 injection valve. The Core Spray system is cool and Core Spray has a check valve between the HPCI connection and the hot reactor vessel. Therefore HPCI Core Spray injection valve is cool and not susceptible to thermal binding of this type.

PREVIOUS OCCURRENCES

A review of previous reportable events at Hope Creek was performed to determine if a similar event had occurred. No similar events were identified.

SAFETY CONSEQUENCES

The safety consequences of this event were minimal. This event resulted in no nuclear, radiological, or industrial safety consequences. Although HPCI was inoperable from May 29 to July 31, 2007 due to the binding of the feedwater injection valve, HPCI was still capable of starting and injecting some flow through the core spray injection valve. A PRA assessment was performed for the failure of the feedwater injection valve to open with a 64-day exposure time. This PRA assessment determined that the delta in core damage frequency (CDF) for this period was 2.27E-7/yr and the delta large early release frequency (LERF) was 1.0E-8/yr. In accordance with NRC Inspection Manual Chapter 0609 this event would not be considered risk-significant.

A review of this event determined that a Safety System Functional Failure (SSFF) occurred as defined in Nuclear Energy Institute (NEI) 99-02.

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17. TEXT (If more space is required, use additional copies of NRC Form 366A)

CORRECTIVE ACTIONS

A compensatory action to re-open the HPCI Feedwater injection valve following a short duration HPCI injection has been added to the system operating procedures.

Longer-term solutions to prevent re-occurrence are currently being developed.

COMMITMENTS

This LER contains no commitments.