



# Progress Energy

JUN 29 2012

SERIAL: BSEP 12-0074

10 CFR 50.73

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit No. 1  
Renewed Facility Operating License No. DPR-71  
Docket No. 50-325  
Licensee Event Report 1-2012-004

Ladies and Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc., submits the enclosed Licensee Event Report (LER). This report fulfills the requirement for a written report within sixty (60) days of a reportable occurrence.

Please refer any questions regarding this submittal to Mr. Lee Grzeck, Acting Supervisor - Licensing/Regulatory Programs, at (910) 457-2487.

Sincerely,

Joseph M. Frisco, Jr.  
Plant General Manager  
Brunswick Steam Electric Plant

MAT/mat

Enclosure:

Licensee Event Report

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II  
ATTN: Mr. Victor M. McCree, Regional Administrator  
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U. S. Nuclear Regulatory Commission **(Electronic Copy Only)**  
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Chair - North Carolina Utilities Commission  
P.O. Box 29510  
Raleigh, NC 27626-0510

# LICENSEE EVENT REPORT (LER)

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

<b>1. FACILITY NAME</b> Brunswick Steam Electric Plant (BSEP), Unit 1	<b>2. DOCKET NUMBER</b> 05000325	<b>3. PAGE</b> 1 of 4
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**4. TITLE**  
High Pressure Coolant Injection (HPCI) Inoperable due to Erratic Governor Operation

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	02	2012	2012 - 004 - 00			06	29	2012	FACILITY NAME	DOCKET NUMBER

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>									
	<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)						
<b>10. POWER LEVEL</b>  037	<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 checked="" 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**

FACILITY NAME Mark Turkal, Lead Engineer - Licensing	TELEPHONE NUMBER (Include Area Code) (910) 457-3066
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**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
E	BJ	SC	G080	Y					

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

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

On May 2, 2012, at approximately 1758 Eastern Daylight Time (EDT), the Unit 1 High Pressure Coolant Injection (HPCI) system was declared inoperable due to inability to maintain stable system flow and discharge pressure due to erratic governor operation. The failure was discovered during performance of Surveillance Requirement 3.5.1.7 (i.e., HPCI high pressure testing at greater than or equal to 945 psig) during startup from the recently completed refueling outage. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(v)(D) as an event or condition that could have prevented the fulfillment of the safety function of a system that is needed to mitigate the consequences of an accident and 10 CFR 50.73(a)(2)(i)(B) as operation prohibited by the plant's Technical Specifications.

The direct cause of the erratic HPCI governor operation was a failed Ramp Generator Signal Converter (RGSC) operational amplifier. The root cause of the RGSC failure is the lack of a replacement preventive maintenance (PM) task for the RGSC. The corrective action to prevent recurrence for this event is to establish the appropriate PM for periodic replacement of the RGSC on both units' HPCI systems.

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		2012 -- 004 -- 00			

**NARRATIVE**

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

Introduction

*Initial Conditions*

At the time of the event, Unit 1 was in Mode 1, at approximately 37 percent of rated thermal power (RTP). The Reactor Core Isolation Cooling (RCIC) system [BN], Automatic Depressurization System (ADS), Low Pressure Coolant Injection (LPCI) system [BO], and Core Spray (CS) system [BM] were operable at the time of the event.

*Reportability Criteria*

On May 2, 2012, at approximately 1758 Eastern Daylight Time (EDT), the Unit 1 High Pressure Coolant Injection (HPCI) system [BJ] was declared inoperable due to inability to maintain stable system flow and discharge pressure due to erratic governor operation. The failure was discovered during performance of Surveillance Requirement (SR) 3.5.1.7 (i.e., HPCI high pressure testing at less than or equal to 1045 psig and greater than or equal to 945 psig) during startup from the recently completed refueling outage. This condition is being reported in accordance with 10 CFR 50.73(a)(2)(v)(D) as an event or condition that could have prevented the fulfillment of the safety function of a system that is needed to mitigate the consequences of an accident. The NRC was initially notified of this event on May 2, 2012 (i.e., Event Number 47893).

Additionally, post-event investigations revealed erratic behavior of the HPCI turbine during performance of SR 3.5.1.8 (i.e., HPCI low pressure testing at less than or equal to 180 psig). This test was performed on April 30, 2012, and Unit 1 entered Mode 1 at approximately 0551 EDT on May 1, 2012. Therefore, this event is also being reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as operation prohibited by the plant's Technical Specifications (TSs). Contrary to Limiting Condition for Operation 3.0.4, a mode change was made with HPCI inoperable.

Event Description

On May 2, 2012, during Unit 1 startup from the 2012 refueling outage, operability testing of the HPCI system was commenced in accordance with OPT-09.2, "HPCI System Operability Test." This procedure begins with startup of the HPCI turbine with the flow controller in automatic. Following the turbine start, HPCI flow is verified greater than 4000 gpm at a pressure greater than 1000 psig. Next, the system is adjusted to obtain a pump discharge pressure of 1110 psig and a pump flow rate greater than or equal to 4250 gpm. The system is then operated in this configuration for several minutes to record other data and perform additional system checks required by the procedure. Following these checks, the flow controller is taken to manual and adjusted to reduce turbine speed to approximately 2500 rpm with a system flow of 4500 gpm.

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**NARRATIVE**

Event Description (continued)

After the flow controller had been placed in manual and speed adjusted to 2500 rpm, the HPCI governor exhibited erratic behavior characterized by momentary fluctuations in speed between 400 rpm and 2500 rpm (i.e., with slight overshoot before settling back to 2500 rpm).

Trouble shooting activities were undertaken and, on May 5, 2012, the Ramp Generator Signal Converter (RGSC) and electronic governor – magnetic pickup (EGM) were replaced with spare units that had been warmed up and calibrated as a pair. After replacement of these items, HPCI was successfully tested per OPT-09.2. Bench testing of the RGSC and EGM revealed that the RGSC output voltage signal dropped off erratically with constant input current. The subject RGSC was sent to ATC Nuclear for vendor failure analysis and repair. The failure of the RGSC was caused by a failed operational amplifier. The cause of the operational amplifier failure was determined to be age-related based on the best available information.

Event Cause

The root cause of the erratic HPCI operation is the lack of a replacement preventive maintenance route for the RGSC. The observed erratic operation was a result of an age-related failure of the RGSC operational amplifier.

Safety Assessment

The safety significance of this event is minimal. The RCIC system, ADS, LPCI system, and CS system were operable at the time of the event.

Corrective Actions

The following corrective action has been completed.

- The Unit 1 HPCI EGM and RGSC were replaced.

The following corrective actions are planned.

- The Unit 2 HPCI RGSC is currently planned to be replaced during an online system outage in 2014.
- The Unit 1 RCIC RGSC is currently planned to be replaced during an online system outage in 2013.
- The Unit 2 RCIC RGSC is currently planned to be replaced during an online system outage in 2013.
- Replacement preventive maintenance routes will be established for the Unit 1 and 2 HPCI and RCIC RGSCs. These routes are currently planned to be established by October 11, 2012.

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**NARRATIVE**

Previous Similar Events

A review of LERs for the past three years identified the following similar previous occurrences.

- LER 1-2012-001, Manual Reactor Protection System Actuation in Anticipation of a Loss of Condenser Vacuum. This LER reported a February 22, 2012, manual Reactor Protection System (RPS) actuation on Unit 1, which was inserted in anticipation of a loss of condenser vacuum. The event was caused when balance of plant (BOP) bus Common C unexpectedly de-energized. The root cause of this event is inadequate preventive maintenance for the 4160/480V transformer associated with the Common C BOP bus. Corrective actions for this event focused on establishing appropriate preventive maintenance tasks for the 4160/480V transformers. As such, they could not have reasonably prevented the HPCI inoperability discussed in LER 1-2012-004.
- LER 2-2009-001, High Pressure Coolant Injection (HPCI) System Inoperable Due to Water in the HPCI Turbine Casing. This LER reported a January 27, 2009, inoperability of the HPCI system. The direct cause of the event was failure of the HPCI barometric condenser condensate pump. One of the root causes of the event was lack of preventive maintenance activities for the barometric condenser condensate pump and motor. Corrective actions for this event focused on establishing appropriate preventive maintenance tasks for the pump and motor. As such, they could not have reasonably prevented the HPCI inoperability discussed in LER 1-2012-004.

Commitments

No regulatory commitments are contained in this report.