



Carolina Power & Light Company

Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461-0429
JUN 06 1994

SERIAL: BSEP 94-211
10CFR50.73

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

BRUNSWICK NUCLEAR PLANT UNIT 1
DOCKET NO. 50-325/LICENSE NO. DRP-71
LICENSEE EVENT REPORT 1-94-09

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.73, Carolina Power & Light Company submits the enclosed Licensee Event Report. This report fulfills the requirement for a written report within thirty (30) days of a reportable occurrence and is submitted in accordance with the format set forth in NUREG-1022, September 1983.

Please refer any questions regarding this submittal to Mr. M. A. Turkal at (910) 457-3066.

Very truly yours,

J. Cowan, Director-Site Operations
Brunswick Nuclear Plant

WRM/wrm

Enclosures

1. Licensee Event Report
2. Summary of Commitments

cc: Mr. S. D. Ebnetter, Regional Administrator, Region II
Mr. P. D. Milano, NRR Project Manager - Brunswick Units 1 and 2
Mr. R. L. Prevatte, Brunswick NRC Senior Resident Inspector

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PDR ADDCK 05000325
S PDR

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Brunswick Steam Electric Plant, Unit 1

DOCKET NUMBER (2)

05000325

PAGE (3)

1 of 4

TITLE (4)

High Pressure Coolant Injection System Cooling Water Valve Rendered Inoperable

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
05	13	94	94	- 09 -	00	06	06	94	FACILITY NAME	DOCKET NUMBER 05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)								
		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)		
POWER LEVEL (10)	100	20.405(a)(1)(i)		50.36(c)(1)	X	50.73(a)(2)(v)		73.71(c)		
		20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER		
		20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract and Text)		
		20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)				
		20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(ix)				

LICENSEE CONTACT FOR THIS LER (12)

NAME

William R. Murray, Regulatory Affairs Project Engineer

TELEPHONE NUMBER

(910) 457-2842

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	BJ	IL	S521	N					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single space typewritten lines) (16)

On May 13, 1994, Unit 1 was operating at 100 percent power. Following completion of a partial performance of the HPCI System Operability Test, an Auxiliary Operator noted that the position indication light for valve 1-E41-F059, "HPCI cooling water supply valve" was not illuminated. Expecting a blown bulb, the operator proceeded with replacing the bulb. Upon removal of the green lamp lens, but prior to removal of the bulb, the glass portion of the bulb blew out of the socket while the metal portion remained in the socket. This resulted in two blown control power fuses, rendering "HPCI cooling water supply valve" 1-E41-F059 inoperable. A loss of the cooling water valve removes the ability to cool the HPCI System lubrication oil, thus rendering the HPCI System inoperable. The bulb, bulb socket, and fuses were replaced, valve 1-E41-F059 was tested, and the system was returned to service. The system was out of service for 2 hours, 39 minutes, which is within the allowable out-of-service time of 14 days permitted by Technical Specification 3.5.1. During this time, the Automatic Depressurization System (ADS), Reactor Core Isolation Cooling (RCIC) System, Residual Heat Removal/Low Pressure Coolant Injection (RHR/LPCI) System, and the Core Spray (CS) System were operable. As such, the safety significance of this event was minimal. The cause classification for this event per the criteria of NUREG-1022 is other.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Brunswick Steam Electric Plant Unit 1	05000325	94	- 09 -	00	2 of 4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

TITLE

High Pressure Coolant Injection System Cooling Water Valve Rendered Inoperable

INITIAL CONDITIONS

On May 13, 1994, Unit 1 was operating at 100 percent power. The Automatic Depressurization System (ADS), Reactor Core Isolation Cooling (RCIC) System, Residual Heat Removal/Low Pressure Coolant Injection (RHR/LPCI) System, and the Core Spray (CS) System were operable.

EVENT NARRATIVE

At 0337 on May 13, 1994, following a partial performance of OPT-09.2 (High Pressure Coolant Injection System Operability Test), an Auxiliary Operator noted that the Motor Control Center (MCC) 1XDA, compartment B15, "HPCI cooling water supply valve," 1-E41-F059 green indicating light was not illuminated. Expecting a blown bulb, the operator proceeded to attempt replacement of the bulb. Upon removal of the green lamp lens, but prior to removal of the bulb, the bulb blew out of the socket with an accompanying flash. Upon examination, it was noted that the glass portion of the bulb had blown out of the socket, the metal portion of the bulb remained in the socket, and the control power fuses had blown. These indications support that the initial fault occurred within the bulb. The bulb was verified to be the correct bulb for the application. Due to the blown control power fuses 1FU and 2FU, valve 1-E41-F059 "HPCI cooling water supply valve" was rendered inoperable. A loss of the cooling water valve removes the ability to cool the High Pressure Coolant Injection (HPCI) System lubrication oil, thus rendering the HPCI System inoperable. Replacement of the bulb, bulb socket, and fuses was initiated. These items were replaced, the 1-E41-F059 valve was successfully stroked, and the HPCI System was declared operable at 0616.

This event is being reported in accordance with 10 CFR 50.73(a)(2)(v) in that failure of the HPCI cooling water supply valve control power fuses caused by the failed valve position indicator bulb could have prevented the High Pressure Coolant Injection System from mitigating the consequences of an accident.

CAUSE OF EVENT

The most probable cause of the event was a short within the 1-E41-F059 valve position indication bulb which resulted in the "blowing" of control power fuses 1FU and 2FU for HPCI System cooling water valve. It has previously been determined that these bulbs are susceptible to failure of the cement which bonds the glass bulb to the metal base. If this occurs, and an attempt is made to unscrew the bulb from its base, a short circuit path can be set up through the twisting of the filament leads inside the bulb. In this case, the short circuit occurred while removing the lens cover. It is most probable that the rotating action of the lens cover was being transferred to the bulb due to bulb's position. This would have set up a typical failure pattern assuming the

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Brunswick Steam Electric Plant Unit 1	05000325	94	- 09 -	00	3 of 4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

bonded joint of the bulb yielded during the process. The Auxiliary Operator noted the glass portion of the bulb shot out of the socket while the metal base remained.

The failure mechanism described above has been previously addressed. Corrective actions included adding lamp socket inspection to the motor control center compartment preventive maintenance procedure, inspection of bulbs in stock to verify their integrity and disposal of those bulbs found bad, and inspection of bulbs upon their receipt. These previously implemented corrective actions reduced, but did not totally eliminate, the occurrence of these bulb failures.

CORRECTIVE ACTIONS

The bulb, bulb socket, and control power fuses have been replaced.

Engineering Support is aware of the failure mechanism and is recommending a replacement using light-emitting diodes (LEDs) as direct replacements for incandescent lights. LEDs are more reliable than incandescent bulbs and operate for up to 10 years. LEDs do not generate significant heat and, therefore, cause less physical damage to themselves and the associated light socket. Operations and Engineering personnel have indicated the use of LEDs is an acceptable alternative to the current incandescent bulbs. Accordingly, LEDs will be installed in the following locations:

Unit 1 Motor Control Centers

- 1XDA All compartments
- 1XDB All compartments
- 1XA Compartments DE4, DE2
- 1XB Compartment DQ0
- 1XC Compartments DS4, DS1, DT2
- 1XD Compartments DW2, DW1

Unit 2 Motor Control Centers

- 2XDA All compartments
- 2XDB All compartments
- 2XA Compartment DE4
- 2XB Compartments DL5, DQ0
- 2XC Compartment DS4
- 2XD Compartment DW1

The replacements will be coordinated with Operations in order to minimize additional safety system losses due to these bulb failures. This corrective action is scheduled for completion by March 31, 1995.

SAFETY ASSESSMENT

The safety significance of the event was minimal. All equipment operated as designed. As a result of this event, a loss of the cooling water valve removed the ability to cool the HPCI System lubrication oil, thus rendering the HPCI System inoperable. The facility is analyzed for a HPCI System failure. At the time of the event, the HPCI System had been returned to service following planned system surveillance testing. The Core Spray System, Automatic Depressurization System, and Low Pressure Coolant Injection System were available for operation as a back-up.

PREVIOUS SIMILAR EVENTS

Previous similar events include LER 2-90-020 and 1-89-020.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Brunswick Steam Electric Plant Unit 1	05000325	94	- 09 -	00	4 of 4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

EIIS COMPONENT IDENTIFICATION

System/Component

HPCI cooling water supply
valve motor control center
control power fuse

Indicating light

Light socket

(*) EIIS component identifier not found

EIIS Code

BJ/V/MCC/72/JC/FU

IL

IL/*

Enclosure
List of Regulatory Commitments

The following table identifies those actions committed to by Carolina Power & Light Company in this document. Any other actions discussed in the submittal represent intended or planned actions by Carolina Power & Light Company. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager-Regulatory Affairs at the Brunswick Nuclear Plant of any questions regarding this document or any associated regulatory commitments.

Commitment	Committed date or outage
1. Replace the affected bulb, bulb socket, and control power fuses.	Complete
2. Install LEDs in the following Unit 1 Motor Control Center locations: 1XDA All compartments 1XDB All compartments 1XA Compartments DE4, DE2 1XB Compartment DQ0 1XC Compartments DS4, DS1, DT2 1XD Compartments DW2, DW1	03/31/95
3. Install LEDs in the following Unit 2 Motor Control Center locations: 2XDA All compartments 2XDB All compartments 2XA Compartment DE4 2XB Compartments DL5, DQ0 2XC Compartment DS4 2XD Compartment DW1	03/31/95