

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Brunswick Steam Electric Plant Unit 1 DOCKET NUMBER (2) 0500032151 PAGE (3) 1 OF 03

TITLE (4) Inoperability of High Pressure Coolant Injection HPCI System (E41) Resulting From Failure of HPCI Pump Suction Supply Outboard Isolation Valve E41-F041

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 NAMES		DOCKET NUMBER (S)
04	20	88	88	011	00	05	18	88			050000
04	20	88	88	011	00	05	18	88			050000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)

OPERATING MODE (9) <u>1</u>	20 402(b)	20 405(e)	50 73(a)(2)(i)	73.71(b)
POWER LEVEL (10) <u>100</u>	20 405(a)(1)(i)	50 38(c)(1)	50 73(a)(2)(ii)	73.71(c)
	20 405(a)(1)(ii)	50 38(c)(2)	X 50 73(a)(2)(iii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20 405(a)(1)(iii)	50 73(a)(2)(iv)	50 73(a)(2)(iv)(A)	
	20 405(a)(1)(iv)	50 73(a)(2)(v)	50 73(a)(2)(v)(B)	
	20 405(a)(1)(v)	50 73(a)(2)(vi)	50 73(a)(2)(vi)	

LICENSEE CONTACT FOR THIS LER (12)

NAME M. J. Pastva Jr., Regulatory Compliance Specialist TELEPHONE NUMBER 919 457 1231

AREA CODE 919

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

CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NPROS
X	B	J	M O L 200	Y					

SUPPLEMENTAL REPORT EXPECTED (14)  YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15) MONTH 07 DAY 01 YEAR 88

ABSTRACT (Limit to 1400 spaces; i.e., approximately fifteen single-spaced typewritten lines) (16)

At 0930 hours on 4/20/88, performance of the instrument channel calibration and functional test (Maintenance Surveillance Test 1MST-HPCI27M) of the Unit 1 condensate storage tank low water level interlock function of the High Pressure Coolant Injection (HPCI) System (E41) and the Reactor Core Isolation Cooling (RCIC) System revealed the HPCI pump suction from the suppression pool, E41-F041, would not open. Unit 1 was at 100%. The HPCI System was declared inoperable and a limiting condition for operation was established. The RCIC, residual heat removal/low pressure coolant injection, Automatic Depressurization Systems, and the A and B core spray subsystems were operable.

E41-F041 would not open due to a failure of the valve direct current (dc) powered motor, Limitorque Corp. Part No. 150-B56-189, attributed to failure of the electrical insulation between the motor shunt and series windings of the motor. The failed motor was replaced and the valve was returned to service. The involved LCO was canceled and the HPCI System was returned to standby readiness at 0857 hours on 4/22/88.

The motor was sent to the CP&L test facility to determine the failure mode. A supplement will be issued by July 1, 1988.

Prior failures of DC-powered motors have been reported in LERs 1-87-023 and 2-87-001.

8806010038 880518  
PDR AD0CK 05000325  
S PDR

7E88  
11

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Brunswick Steam Electric Plant Unit 1	DOCKET NUMBER (2)  0 5   0   0   0 3   2   5 8   8	LER NUMBER (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		88	011	00	02	OF	03

\*EXT (if more space is required, use additional NRC Form 368A s) (17)

Initial Conditions

Unit 1 was operating at 100% power. The instrument channel calibration and functional test of the unit condensate storage tank (CST) (EIIS/KA/TK) low water level interlock functions of the High Pressure Coolant Injection (HPCI) System (E41) (EIIS/BJ) and the Reactor Core Isolation Cooling (RCIC) System (EIIS/BN) was in progress in accordance with Maintenance Surveillance Test 1MST-HPCI27M. This test verifies the capability for automatic switch over of each system's pump suction supply, which is normally aligned from the CST, to the suppression pool (EIIS/BT/TK) upon a low level in the CST. The RCIC and HPCI Systems, Residual Heat Removal (RHR) System (EIIS/BO), Automatic Depressurization System (EIIS/\*), and the A and B core spray subsystems (EIIS/BM) were operable.

Event Description

Performance of this test revealed at 0930 hours on April 20, 1988, that the HPCI pump suction Primary Containment Isolation System outboard isolation valve, 1-E41-F041, (EIIS/JM/ISV) would not open in response to a test-simulated CST low level. The valve showed a dual position indication on the Control Room reactor turbine gauge board (RTGB) (EIIS/IU/MCBD). In response to this discovery, the Reactor Building (EIIS/NG) Auxiliary Operator (AO) was dispatched to check the status of the valve operator 250 volt (V) direct current (dc) motor breaker (EIIS/EJ/BKR), which is located on motor control center (MCC) 1XDA (EIIS/EJ/MCC). The AO found the breaker had tripped on magnetic (current) overload.

Effective at 0930 hours, the HPCI System was declared inoperable and a limiting condition for operation (LCO) was established due to the inoperable flow path from the suppression pool.

Event Investigation

A review of the valve historical file found that the actuator for the F041 valve had been rebuilt and the valve reworked during the 1987 outage. The motor was replaced during the rebuild, because the nameplate did not list the insulation class.

Initial troubleshooting found that the fuses were not blown, but that the breaker was tripped. The motor, Limitorque part No. 150-B56-189 was bridged and meggered and the series field was found shorted to ground. The breaker was removed and tested with no problems found. The actuator was inspected and found in closed position. The valve was opened using a torque wrench; however, 30 ft-lbs of torque was required to pull the valve out of the seat.

\*EIIS system description unavailable.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Brunswick Steam Electric Plant Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 3 2 5	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 8	— 0 1 1	— 0 0	0 3	OF	0 3

TEXT (If more space is required, use additional NRC Form 366A (11/77))

The normal torque range of this actuator should have been 12-17 ft-lbs of torque to seat the valve with a torque wrench. After the valve was pulled from the seat several attempts were made to manually seat the valve with a torque wrench. The torque switch opened at 10 ft-lbs repeatedly. The spring pack and torque switch were removed and bench-tested with satisfactory results. Another motor was installed and the actuator was tested using the motor actuator characterizer (MAC) test equipment. The initial MAC test with the as-found torque switch settings obtained a unit output torque of 155 ft-lbs. The unit output torque range for this actuator is 172 to 234 ft-lbs. The torque switch was adjusted and another MAC test was performed, obtaining a satisfactory output torque of 200.5 ft-lbs. A review of the MAC traces by Maintenance and Technical Support found no evidence of actuator or valve problems that may have caused this failure.

The apparent cause of the motor failure is indeterminate. The motor is being sent to Harris E&E Center for analysis. A supplement to this report will be issued by July 1, 1988, following the completion of this analyses.

Corrective Action

The failed HPCI E41-F041 actuator motor was removed, a replacement motor was installed, and the valve was returned to service. The involved LCO was subsequently canceled and the HPCI System was returned to standby readiness at 0857 hours on April 22, 1988. The failed motor has been sent to the Carolina Power & Light Company failure analysis facility for failure analysis.

Event Assessment

This event would not have been more severe under reasonable and creditable conditions as the supply from the CST would have been available. The CST can be supplied from the other units CST or from the makeup water system, thus ensuring a supply to the HPCI suction.

Prior failures of DC-powered motors have been reported in LER 1-87-023 and 2-87-001.



Carolina Power & Light Company

Brunswick Steam Electric Plant  
P. O. Box 10429  
Southport, NC 28461-0429

May 18, 1988

FILE: B09-13510C  
SERIAL: BSEP/88-0492

10CFR50.73

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

BRUNSWICK STEAM ELECTRIC PLANT UNIT 1  
DOCKET NO. 50-325  
LICENSE NO. DPR-71  
LICENSEE EVENT REPORT 1-88-011

Gentlemen:

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

Very truly yours,

C. R. Dietz, General Manager  
Brunswick Steam Electric Plant

MJP/ah

Enclosure

cc: Dr. J. N. Grace  
Mr. E. D. Sylvester  
BSEP NRC Resident Office

IE22  
11