CP&L
Carolina Power & Light Company
Brunswick Nuclear Project
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Southport, NC 28461-0429

October 6, 1989

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

BRUNSWICK STEAM ELECTRIC PLANT UNIT 2
DOCKET NO. 50-324
LICENSE NO. DPR-62
LICENSEE EVENT REPORT 2-89-013

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,

J. L. Harness, General Manager
Brunswick Nuclear Project

TH/mcg

Enclosure

cc: Mr. S. D. Ebneter
Mr. E. G. Tourigny
BSEP NRC Resident Office

IE22
1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Brunswick Steam Electric Plant Unit 2	0 5 0 0 0 3 2 4	1 OF 0 4

TITLE (4)
Failure of the HPCI Auxiliary Oil Pump Seal

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)
										0 5 0 0 0
0 9	0 9	8 9	8 9	0 1 3	0 0	1 0	0 6	8 9		0 5 0 0 0

OPERATING MODE (9)	2	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		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 (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Tony Harris, Regulatory Compliance Specialist	9 1 9 4 5 7 - 2 0 3 8

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	B J	S E A L	T 3 4 3	Yes							

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X YES (If yes, complete EXPECTED SUBMISSION DATE)	NO		0 3	1 0	9 0

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

While performing overspeed testing of the HPCI turbine during plant shutdown for the pending refuel outage for Unit 2, the HPCI Turbine Auxiliary Oil Pump developed a shaft seal leak of approximately 1 gpm. The turbine was secured and event investigation begun.

Review of the event with the pump vendor has identified three potential failure modes: Overpressurization of the turbine during the overspeed testing, incompatibility of the seal material with the turbine lube oil and normal wear. A failure analysis of the seal is being performed. Final results of the analysis, along with additional testing of the system during overspeed testing during startup following completion of the outage will be described in a supplement to this LER. The supplement will be issued within 30 days following the end of the outage and subsequent overspeed testing. Outage completion is currently scheduled for 2/09/90.

NRC Form 366

Event

Failure of the Unit 2 HPCI Auxiliary Oil Pump Seal.

Initial Conditions

The Unit 2 Reactor was being shut down for the scheduled Recirculation Pipe Replacement/Refuel Outage. The Reactor was in Mode 2 (Hot Standby/Startup). Reactor Power was 0%, control rods were fully inserted and Reactor pressure was at 245 psig. The High Pressure Coolant Injection (HPCI) System (EIIS/BJ) was placed under clearance at 0940 on 9/9/89 to permit uncoupling of the HPCI turbine (EIIS/BJ/TRB) for overspeed testing. The Residual Heat Removal (RHR)/Low Pressure Coolant Injection (LPCI) System (EIIS/BO), Core Spray System (EIIS/BG), Reactor Core Isolation Cooling (RCIC) System (EIIS/BN) and Automatic Depressurization System (ADS) (EIIS/**) were in standby readiness.

Event Description

On 9/9/89 at 1335 during startup of the HPCI turbine for overspeed testing, the HPCI Turbine Auxiliary Oil Pump (EIIS/BJ/TRB/P) developed approximately a one gallon per minute (gpm) leak. The operator secured the Auxiliary Oil Pump, and terminated the testing to determine the origin of the leak. The Reactor was placed in Hot Shutdown (Mode 3) at 1447.

Event Cause

Upon termination of the overspeed testing, investigation into the cause of the leakage was begun immediately. Upon inspection of the shaft seal for the Tuthill Pump Company Model # 5CEN Rotary HPCI Turbine Auxiliary Oil pump (EIIS/BJ/TRB/P/SEAL), it was found that failure of the shaft seal was the cause of the leakage. The pump seal was replaced and investigation to determine the root cause of the seal failure initiated.

A review of historical data for the Auxiliary Oil Pump seal noted no past catastrophic failures of this BUNA-N material type shaft seal (manufacturer part # 5CF94). A previous partial failure of the shaft seal on the Unit 1 HPCI Auxiliary Oil Pump had occurred on 9/3/89. The Unit 1 shaft seal failure was attributed to leakage past a scored shaft, which was not present in the Unit 2 failure. Two other minor seal leaks were identified during work order research.

**No EIIS System Code Available

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Brunswick Steam Electric Plant Unit 2	0 5 0 0 0 3 2 4	8 9	— 0 1 3	— 0 0	0 3 OF 0 4

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

The Unit 2 HPCI Auxiliary Oil Pump had an outstanding work request (89-A67H1) written for seal leakage prior to this event. The HPCI System Engineer confirmed that the Unit 2 seal leakage had not increased on 9/06/89, following the Unit 1 seal failure. Based on the results of this inspection, the Unit 2 seal was not deemed to need replacing since:

1. Seal leakage had not increased in approximately six months.

2. Seal leakage typically increases gradually prior to failure.

3. Seal replacement was scheduled to be completed during the current Unit 2 refuel outage.

4. The HPCI Auxiliary Oil Pump only runs briefly during turbine startup, turbine shutdown and when the turbine is run at low speeds.

The manufacturer of the HPCI Auxiliary Oil Pump, Tuthill Pump Company, was contacted regarding potential seal failure modes. It was determined that the Unit 2 seal could have failed due to:

1. Overpressurization of the oil system during the overspeed testing.

2. Incompatibility of the seal material with the turbine lube oil.

3. Normal wear.

Corrective Actions

The failed Unit 2 Auxiliary oil pump shaft seal has been replaced. The failed seal has been sent to the CP&L Energy and Environmental Center for a compatibility/failure analysis. In addition, the oil system will be monitored during the overspeed testing done prior to startup from the current Unit 2 outage, in order to monitor system pressures. The results of the analyses and system pressure testing during startup will be provided in a supplement to this LER 30 days following the end of the overspeed testing at the end of the Unit 2 outage, which is currently scheduled for completion 2/09/90.

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Event Assessment

The safety significance of this event was determined to be minimal. It is believed that the HPCI system was capable of starting and delivering design flow, since the Auxiliary Oil Pump normally runs only during system startup, shutdown and at low turbine speeds. A significant lube oil inventory loss would be expected only if the turbine were operated at low speeds for an extended period of time. It is also noted that during the 6/17/89 Loss of Off-site Power Event at BSEP on Unit 2, the HPCI Turbine operated during intermittent periods for the duration of the event for vessel level and vessel pressure control with no problems noted. Additionally, the RHR/LPCI System, Core Spray System, RCIC System and Automatic Depressurization System were operable and capable of bringing the unit to a safe condition under other reasonable and credible conditions.