

CP&L

Carolina Power & Light Company

Brunswick Nuclear Project
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December 14, 1989

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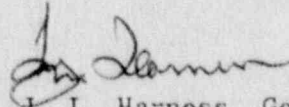
U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT UNIT 1
DOCKET NO. 50-325
LICENSE NO. DPR-71
LICENSEE EVENT REPORT 1-89-023

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

TMJ/mcg

Enclosure

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

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, 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) 0 5 0 0 0 3 2 5	PAGE (3) 1 OF 0 4
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TITLE (4) Tech Spec Required Shutdown Due to an Open Drywell to Suppression Chamber Vacuum Breaker Found During the Performance of Periodic Test 02.3.1

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)
1	1	1989	8	9	023	0	0	1989			0 5 0 0 0
1	1	1989	8	9	023	0	0	1989			0 5 0 0 0

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 8: (Check one or more of the following) (11)											
POWER LEVEL (10) 1 0 0	20.402(b)			20.405(c)			50.73(a)(2)(iv)			73.71(b)		
	20.405(a)(1)(i)			50.36(a)(1)			50.73(a)(2)(v)			73.71(c)		
	20.405(a)(1)(ii)			50.36(a)(2)			50.73(a)(2)(vii)			OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
	20.405(a)(1)(iii)			X 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)(ix)						

LICENSEE CONTACT FOR THIS LER (12)

NAME Terri M. Jones, Regulatory Compliance Specialist	TELEPHONE NUMBER 9 1 9 4 5 7 - 2 0 3 9
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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
E	B	F V A C B	G 2 0 2	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

On November 16, 1989, the Unit 1 reactor was shutdown, in accordance with Technical Specification 3.6.4.1 action statement (b), when it was determined that a drywell to suppression chamber vacuum breaker was open. The reactor was initially at 100% power with the Emergency Core Cooling Systems operable in standby readiness. During the monthly Periodic Test (PT)02.3.1, Suppression Chamber to Drywell Vacuum Breakers Operability Test, the F vacuum breaker did not indicate closed following eight cycling operations per the test. Subsequent testing, per Technical Specification Surveillance Requirement 4.6.4.1.b, revealed that it was open. The cause for the event is believed to be a combination of excessive vibration experienced during the performance of PT-02.3.1 and the absence of a vendor recommended space of 1/16 inch between the actuator arm and piston. The appropriate maintenance procedures will be revised to include the 1/16 inch space and other vendor recommendations will be reviewed and incorporated into procedures if appropriate. PT-02.3.1 will be revised to limit the number of breaker operations. Prior to the startup of Unit 2 from the current refueling outage the 1/16 inch spaces will be verified. The safety significance of this event is minimal.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 600 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3160-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

TEXT IN more space is required, use additional NRC Form 306A's (17)

Event

Completion of a Unit 1 shutdown in accordance with Technical Specification 3.6.4.1 action statement (b), due to the inability to satisfy the Containment Atmosphere Control (CAC) (EIIS/BF/VACB) Drywell to Suppression Pool Vacuum Breaker surveillance requirement 4.6.4.1.b.

Initial Conditions

Unit 1 was at 100% power. The High Pressure Coolant Injection System (HPCI) (EIIS/BJ), Reactor Core Isolation Cooling System (RCIC) (EIIS/BN), Automatic Depressurization System (ADS) (EIIS/*), A and B Residual Heat Removal/Low Pressure Cooling Injection system (RHR/LPCI) (EIIS/BO) and the A and B Core Spray system (CS) (EIIS/BM) were operable in standby readiness. The monthly "Suppression Chamber to Drywell Vacuum Breakers Operability Test" was in progress in accordance with Periodic Test (PT) 02.3.1 (rev. 17).

Event Description

On November 15, 1989, at 2030 the position indication for the F Suppression Pool to Drywell Vacuum Breaker, 1-CAC-X18F, did not indicate closed following several cycling operations per the test. Subsequent testing via PT-02.3.1a, Suppression Pool to Drywell Vacuum Breaker Position Check, in accordance with Technical Specification 4.6.4.1.b, revealed that the vacuum breaker was open and that the differential pressure between the suppression chamber and the drywell could not be maintained to meet the specification. On November 16, 1989, at 0144 a shutdown of the unit was initiated per Technical Specification 3.6.4.1 action statement (b). At 1323, with the reactor at 5.87% power, the reactor was manually scrammed per plant shutdown procedures. Work was completed, the drywell and suppression chamber were closed, and reactor startup commenced at 0850 on November 18, 1989. The unit was synchronized to the system at 2332.

Event Investigation

At approximately 0230 on November 17, 1989, the initial entry was made into the suppression pool chamber to determine the reason why the vacuum breaker would not close. Troubleshooting indicated that the 1-CAC-X18F was prevented from closing because the actuator piston rod head set screw had vibrated loose and allowed the head to extend, preventing the vacuum breaker disc from contacting its seat. While adjusting the piston rod head, the magnet, which prevents the vacuum breaker from opening until a set differential pressure, was determined to be broken. The magnet was replaced and adjusted for the proper differential pressure per procedure 1MST-CAC21R with the drywell purge fans shutdown.

(*) EIIS component identifier not found

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, 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	LER NUMBER (8)			PAGE (3)	
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TEXT (if more space is required, use additional NRC Form 305A's) (17)

The work request on 1-CAC-X18C stated that the "closed" breaker indication was lost each time the drywell was vented until the vacuum breaker was manually cycled. During this outage, with the drywell purge fans shutdown, the vacuum breaker was found to be opening at too low of a differential pressure because its magnet was out of adjustment. 1-MST-CAC21R was performed to adjust the magnet.

The outage work scheduled for the CAC system included a visual inspection of the ten (i.e., 1-CAC-X18A - J) vacuum breakers and repair work on vacuum breakers C and F in accordance with work requests 89-AXG1 and AZQA1. The visual inspections identified the need to tighten the set screw on 1-CAC-X18I which was accomplished by work request 89-AZSP1. In addition, it was initially thought that 1-CAC-X18D, H and I needed linkage and physical stop adjustments because they appeared to open too easily when personnel "pushed" on the discs. It was subsequently determined that the drywell purge fans were creating a differential pressure between the suppression chamber and the drywell which is not present during refueling outages when the vacuum breakers are scheduled for surveillance per Maintenance Surveillance Test (MST) 1-MST-CAC21R, CAC Drywell to Suppression Pool Vacuum Breaker Channel Calibration. During this brief outage the drywell air lock door remained closed with the purge fans in operation. As a result a significant differential pressure was established across the vacuum breakers since the torus was open to the Reactor Building. This effect caused the vacuum breakers to open more easily than previously experienced. Given the differential pressure and no past indications of operability problems with the involved vacuum breakers, it was determined that no additional work scheduling was warranted.

Event Cause

Based on observation of the operation of the vacuum breakers by Maintenance personnel during this outage the cause for the loose set screws on 1-CAC-X18F and I and for the out of adjustment magnet on C and the broken magnet on F is believed to be a combination of excessive vibration experienced during cycling of the vacuum breakers while performing PT-02.3.1 and the absence of a vendor recommended space of 1/16 inch between the actuator arm and piston. In 1978, corrective actions for LER 1-78-004, which resulted from failure of the limit switches associated with the position indication for 1-CAC-X18G and H because of infrequent operation, required that PT-02.3.1 be revised to cycle the vacuum breakers an additional eight times to exercise the limit switches. Maintenance personnel who observed the operation of the vacuum breakers during this outage have suggested that PT-02.3.1 be revised to decrease the number of breaker cycles and that the spacing between the piston head and the actuator arm be added to 1MST-CAC21R to decrease the amount of vibration and shock transmitted to the piston rod head.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

Corrective Actions

1MST-CAC21R will be revised to incorporate the 1/16 inch of space between the piston head and the actuator arm and to include the shutdown of the drywell purge fans by March 15, 1990.

Prior to the startup of Unit 2 from the current refueling outage the 1/16 inch of space will be verified on the Unit 2 vacuum breakers.

Maintenance will review the vendor instruction manual to determine if additional maintenance checks are appropriate.

PT-02.3.1 will be revised to limit the number of vacuum breaker operations by March 15, 1990.

Event Assessment

The safety significance of this event was minimal. The failure was found during routine surveillance, properly evaluated, and appropriate Technical Specification actions were implemented. The vacuum relief system is provided to prevent primary containment external overpressure (i.e., vacuum), to permit flow of noncondensable gases from the suppression chamber to the drywell and to minimize water level oscillations in the downcomers. In this event the F vacuum breaker was held partially open and would, therefore, allow the exchanging of noncondensibles and equalizing of drywell and suppression chamber pressures. The position of the vacuum breaker (i.e., propped open approximately 1 inch at lower edge of disc) did result in a small leakage path from the drywell to the suppression chamber atmosphere. This type of leakage is termed "Bypass" because it allows blowdown steam to pass directly to the suppression chamber atmosphere without being fully condensed. FSAR Section 6.2.1.1.3.4 analyzes the plants capability to tolerate bypass leakage in the event of an accident. The analysis indicates that leakpath areas equivalent to a 24 inch pipe or a 6 inch pipe are tolerable during a Design Basis Accident or a small piping system failure, respectively. Given it is not reasonable or credible to assume a LOCA, this event had minimal safety significance.