



Carolina Power & Light Company

Brunswick Nuclear Project
P. O. Box 10429
Southport, NC 28461-0429
July 13, 1990

FILE: B09-13510C
SERIAL: BSEP/90-0499

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
SUPPLEMENT TO LICENSEE EVENT REPORT 1-90-06

Gentlemen:

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

Very truly yours,

L. L. Harness, General Manager
Brunswick Nuclear Project

WDL/mcg.LTR5

Enclosure

cc: Mr. S. D. Ebnetter
Mr. N. B. Le
BSEP NRC Resident Office

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 800 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (9-830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3180-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Brunswick Steam Electric Plant

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TITLE (6)

Hydraulic Perturbation of Reactor Vessel Level Instrumentation

EVENT DATE (5)			LEA NUMBER (8)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (9)												
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)											
0	4	2	6	9	0	9	0	0	0	0	6	0	1	0	7	1	3	9	0	Brunswick Unit 2	0 5 1 0 0 0 3 2 4
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)										0 5 1 0 0 0											
OPERATING MODE (5)			20.602(h)			20.608(c)			20.73(a)(2)(iv)			20.731(b)									
POWER LEVEL (10)			20.605(a)(1)(i)			20.608(c)(1)			20.73(a)(2)(iv)			20.731(c)									
1			20.608(a)(7)(iv)			20.608(c)(2)			20.73(a)(2)(iv)(A)			OTHER (Specify in Abstract below and in Text, NRC Form 366A)									
1,0,0			20.608(a)(1)(iii)			20.73(a)(2)(i)			20.73(a)(2)(iv)(B)												
			20.608(a)(1)(iv)			20.73(a)(2)(ii)			20.73(a)(2)(iv)(C)												
			20.608(a)(1)(v)			20.73(a)(2)(iii)			20.73(a)(2)(iv)(D)												
			20.608(a)(1)(vi)			20.73(a)(2)(iv)			20.73(a)(2)(iv)(E)												

LICENSEE CONTACT FOR THIS LER (12)

NAME

Wayne D. Link, Senior Generation Specialist

TELEPHONE NUMBER

AREA CODE

9 1 9 4 5 7 - 2 0 5 4

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

1 1 0 0 8 9 1 0

☒ YES (If yes, complete EXPECTED SUBMISSION DATE)

☐ NO

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

Unit 1 and Unit 2 were operating at 100% power. At 1603 on 4-26-90, while performing 1MST-RSDP21Q, a hydraulic perturbation occurred on the variable leg of instrumentation used to sense reactor water level. This caused the Reactor Water Cleanup system (G31-F004) to isolate, the Standby Gas Treatment system to initiate, and the Reactor Building Ventilation system to isolate.

This event poses no safety significance since the affected systems responded as expected to the instrument trip.

Other perturbations have been reported under LERs 2-89-017, 1-87-017, and 2-86-020.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 300 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 (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT: If more space is required, use additional NRC Form 253A (1/77)

EVENT

While performing surveillance testing on Unit 1 reactor vessel level instrumentation on 4-26-90, a hydraulic perturbation resulted in an isolation of the Reactor Water Cleanup (RWCU) system, an auto initiation of the Standby Gas Treatment (SBGT) system, and an isolation of the Reactor Building Ventilation (RB HVAC) system at 1603.

INITIAL CONDITIONS

Unit 1 and Unit 2 were operating at 100% power before and after the event. No major equipment was out of service at the time of the event.

EVENT DESCRIPTION

Maintenance surveillance test (MST), 1MST-RSDP21Q, is an instrument channel calibration test performed quarterly to determine the operability of Remote Shutdown Panel (RSDP) reactor water level monitoring instrumentation. Instruments tested are B21-LT-N026B, B21-LI-R604BX, B21-LT-3331, B21-LI-3331, B21-LT-N017D-3, and B21-LSH-N017D-3. The MST had been scheduled by the Surveillance Test Scheduling system (STSS) and approved by the Site Work Force Control Group (SWFCG).

At the time of the event, B21-LT-3331 and B21-LT-N017D-3 loops had been checked satisfactorily. Level transmitter B21-LT-N026B was removed from service to perform the calibration check in accordance with the procedure. It was found out of calibration and the appropriate steps were performed to calibrate the transmitter and check the corresponding indicators B21-LI-R604B and B21-LI-R604BX. When B21-LT-N026B was returned to service, the Unit 1 Control Operator (CO) noticed that B21-LI-R604B indicated approximately 8" lower than other reactor water level instruments. This discrepancy was discussed with the Instrumentation and Control (I&C) personnel involved in the performance of the MST. It was decided that a probable cause for the low readings could be trapped air in the

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 800 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-330), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555 AND TO THE PAPERWORK REDUCTION PROJECT (3180-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

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TEXT (If more space is needed, use additional NRC Form 253A's) (17)

transmitter. The transmitter was valved out and the calibration checked again. These results, when compared to the previous readings, indicated that a change had occurred which could possibly be attributed to air being trapped in the transmitter diaphragm assembly. The transmitter was vented again and another calibration performed. Following the calibration of the transmitter, preparations were made to return it to service. The transmitter was pressurized to reactor pressure and the pressure source isolated in accordance with the procedure. The transmitter high and low pressure isolation valves were still closed at this point, the equalizing valve was open, and both instrument drain valves were closed. When the technician attempted to open the transmitter low pressure isolation valve, a perturbation involving the variable leg of the instrument caused RWCU to isolate (G31-F004), SGBT to initiate, and the RB ventilation system to isolate. RB ventilation and SGBT were returned to normal at 1621. RWCU was unisolated and placed in service at 1720. At approximately 1830, after determining by use of ERFIS that a hydraulic perturbation had caused the isolation signal, the transmitter was restored to service. The MST was completed satisfactorily at 1910.

EVENT INVESTIGATION

No problems had been encountered with reactor vessel level instrumentation channel checks before performing 1MST-RSDP21Q. The three I&C technicians were experienced utility personnel familiar with the procedure being performed.

After the instrument was removed from service, the test lines were flushed to verify that no air existed in the test lines. Following the flush, both instrument vent plugs on the transmitter were opened to vent entrapped air. An air pressurized (5-6 psig) portable water tank was used for the flushing and venting. In spite of these efforts, it appears that air remained in the transmitter diaphragm assembly. With air present in the transmitter, the I&C technicians calibrated what they believed to be an out of calibration instrument. When the instrument was restored to service, the CO noticed a level discrepancy of approximately 8". Maintenance was contacted and the B21-LT-N026B transmitter was valved out again and the calibration reverified. The as found results were compared to the as left readings from the initial calibration. Since there was a difference in them, another

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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 (7430), 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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calibration was performed on the transmitter and the as left data was recorded. As preparations were being made to valve in the transmitter, an unexplained hydraulic perturbation occurred involving the transmitter's variable leg. This variable leg is common to other level instrumentation and includes level transmitters for B21-LT-N025A-1 and B21-LT-N025B-1. The Emergency Response Facility Information system (ERFIS) was utilized to determine that a low level 2 signal sensed by these transmitters caused RWCU to isolate, SBGT to auto initiate, and the Reactor Building ventilation to isolate. The affected equipment responded as designed. Other instruments located on the instrument rack showed a perturbation but it was not of sufficient magnitude to cause protective actions. Two of these, B21-LTM-N025A-2 and B21-LTM-N025B-2 caused annunciators A-02 4-3 and A-02 4-8 to alarm. These are, respectively, the Division I and Division II Emergency Core Cooling System Trip Cabinet Trouble/Recirculation Pump Trip/Alternate Rod Injection Trip annunciators. The logic did not see a full trip signal since the affected instruments only provide one half of the trip logic.

EVENT CAUSE

Three Work Request/Job Orders (WR/JOs) were initiated in 1989 by I&C describing suspected leaking instrument valves located on instrument rack H21-P005. WR/JOs 89-ASSY1 and 89-ASTF1 were written to document problems found while performing 1MST-RSDP21Q and 89-ANGU1 was initiated while performing other maintenance on instrument rack H21-P005.

The hydraulic perturbation was caused by a leaking drain valve. WR/JO 89-ASTF1 documented the need to replace the low pressure drain valve on B21-LT-N026B. After the deadweight tester, which was used to equalize the instrument lines with the reactor pressure, was removed, the instrument lines started to depressurize. By the time that the restoration of the instrument to service had begun, a significant differential pressure existed. When the technician began opening the low pressure isolation valve, the pressure equalized and was sufficient to generate a hydraulic perturbation.

The level discrepancy noted after the initial instrument calibration was caused by poor work practices. The polyflo tubing

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 800 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-430), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3160-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If more space is required, use additional NRC Form 890A's (17))

that was used in conjunction with the portable water tank evidently contained a small amount of air which was not seen by the technician. This air was unknowingly introduced into the transmitter during the initial flushing of the instrument with some of it remaining in the diaphragm assembly.

CORRECTIVE ACTIONS TAKEN

Affected systems were restored to service by 1720. The transmitter diaphragm assembly was vented again and recalibrated satisfactorily. At approximately 1830, B21-LT-N026B was returned to service and the MST completed without any further problems.

Other corrective actions that are either being taken or being evaluated are to replace suspect valves (planned), revise MST-RSDP21Q to an 18 month calibration cycle (being evaluated), and to establish a maintenance policy to perform a channel check of instruments following calibration (being evaluated). In addition, this event will be reviewed with maintenance personnel during Second Quarter Maintenance Real Time Training.

WR/JO 89-ASSY1 was completed on 10-06-89. WR/JO's 89-astf1 and 89-ANGU1 were completed on 5-24-90. On an interim basis, maintenance has established a Maintenance Policy Notice 90-009 (expires 9-1-90). This requires the presence of either quality control personnel or, in their absence, an I&C Foreman to witness valving evolutions on wide range reference leg instruments. The purpose of this policy is to serve as a data gathering phase to determine what long term corrective actions will be appropriate. A supplement to this LER will be completed by 10-8-90 describing corrective actions to be taken on a long term basis.

EVENT ASSESSMENT

This event poses no safety significance since the affected systems responded as expected due to the instrument trip. The transmitter air problem and hydraulic perturbation are considered to be spurious events. Other perturbations have been reported under LERs 2-89-017, 1-87-017, and 2-86-020.

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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&30), 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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ELIS CODE

Reactor Water Cleanup
Standby Gas Treatment
Reactor Building Ventilation
Level Indicator
Level Switch
Level Transmitter
ERFIS
Nuclear Boiler (B21)
Drain/Test Valve
Annunciator

CE
BH
VA
LI
LS
LT
IQ
BLR
TV
ANN