

Carolina Power & Light Company

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

June 1, 1989

FILE: B09-13510C SERIAL: BSEP/89-0492 10CFR50.73

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

BRUNSWICK STEAM ELECTRIC PLANT UNIT 2 DOCKET NO. 50- 0324 LICENSE NO. DPR-62 SUPPLEMENT TO LICENSEE EVENT REPORT 2-89-01

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,

malamin

J. L. Harness, General Manager Brunswick Nuclear Project

KAH/pb

Enclosure

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

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NRC Form 366 (9-83)

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US NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104 EXPIRES 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)	PAGE (3)			
		YEAR SEQUENTIAL REVISION				
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Initial Conditions

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Unit 2 was at 100% power. Residual Heat Removal (RHR)/Low Pressure Coolant Injection (LPCI) (EIIS/BO) System loops A and B, Core Spray (CS) (EIIS/BM) System Loops A and B, Reactor Core Isolation Cooling (RCIC) (EIIS/BN), Automatic Depressurization System (ADS) (EIIS/**), and High Pressure Coolant Injection (HPCI) (EIIS/BJ) system were operable and in standby readiness. I&C technicians were performing a monthly calibration test on the Division II Emergency Core Cooling System (ECCS) trip calibration units.

Event Description

On February 14, 1989, at 2002 hours, a momentary HPCI initiation signal was generated while instrumentation and calibration (I&C) technicians were performing Maintenance Surveillance Test (MST), 2MST-RHR23M, on ECCS trip unit instrument 2-B21-LTS-NO31B-2 (EIIS/AC/***). Control Room Operators (COs) noted the following conditions:

- 1. Annunciator (EIIS/BJ/ANN) 2-A-1 1-4, HPCI Flow Low, was lit.
- 2. HPCI initiation light was on.
- 3. The Steam Supply Valve (E41-F001) (EIIS/BJ/ISV), Turbine Stop Valve (E41-V8) (EIIS/BJ/SHV), Governor Valve (E41-V9) (EIIS/BJ/SCV), and Minimum Flow Valve (E41-F012) (EIIS/BJ/***) were observed open.
- The Main Pump Discharge Valve (E41-F006) (EIIS/BJ/INV) was observed closed.

The HPCI system auto started and operated in the minimum flow mode for approximately four minutes. HPCI did not inject into the reactor pressure vessel. After the COs verified actual reactor vessel level and primary containment pressure were both within normal operating range, the I&C technicians were instructed to return the equipment to service per the MST. After the equipment was returned to service, the initiation signal was determined to be invalid and reset. The HPCI system was secured and returned to its standby lineup per the guidance of Operating Procedure (OP)-19, section 7.0, the HPCI shutdown procedure. The calibration testing was halted until the origin of the initiation signal could be determined.

EIIS System Code Not Available *EIIS Component Code Not Available

LICENSEE EVENT	REPORT (LER)	TEXT	CONTINUATION
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US NUCLEAR REQULATORY COMMISSION

APPROVED OM8 NO 3150-0104 EXPIRES: 8/31/28

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Event Cause

ORC Form 3961

The ECCS logic for HPCI initiation is an "H" logic, two out of four configuration. For the initiation signal to be present, one or both of the "A" and "B" contacts, along with one or both of the "C" and "D" contacts must be closed at the same time. The "B" contact logic was being verified at the time of the initiation signal. The "A" and "C" logic checks had just been completed, and restored to a verified open position per the MST. It was known that the initiation input signal was of short duration, since the system stayed in the minimum flow mode, with the F006 valve closed. A review of the Emergency Response Facility Information System (ERFIS) computer transmitter output data showed current change data for the "B" channel only, verifying that 2 channels were not inadvertently selected by the technicians.

The CDs in the Control Room noticed during the course of the "B" instrument check that the trip signal annunicated on 3 occasions as opposed to the 2 occasions expected. It was after the third signal input that the initiation signal was received. Normal calibrations of the trip unit have the technician go beyond the trip setpoint on 2 occasions, first to verify setpoint and reset, then to continue the indicator calibration check. When questioned about the 3 signals the technician stated that he had missed his reading on the first attempt, and had to clear the signal and reperform the initial and verification setting checks. Had a "D" or "C" channel input signal been present from the beginning of the "B" channel check, the initiation signal would have been received following the initial trip input signal, and not on the third signal as noted by the COs.

Because of the short duration of the initiation signal, as evidenced by the F006 valve remaining closed, it is believed that the "C" or "D" contact received a spurious closure signal, completing the logic circuit for the initiation function. Because the "C" circuit logic had just been functionally verified, and the fact that the "D" contact is in the same cabinet as the "B" contact ("A" and "C" are in an adjacent cabinet), it is believed that the "D" convact received a spurious input caused by electrical noise, giving the initiation signal.

Subsequent testing and completion of the MST could not duplicate the initiation nor could it conclusively identify a cause for the event. Therefore, it is concluded the event occurred due to spurious initiation from electrical noise.

LICENSEE EVENT REPO							RT (LER) TEXT CONTINUATION													US NUCLEAR REGULATORY COMMISSION APPROVED OMB NO 3150-0194 EXPIRES 8/31/88						
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Corrective Actions

No definite cause of the inadvertent trip could be determined. Further discussions with the vendor (Rosemount) revealed no previous experience with crosstalk or noise problems on the 510DU trip units. Although the most probable cause of the event was a spurious trip on an adjacent trip unit, there is currently no feasible method to identify the exact cause. Even during this event, the signal came in so quickly that it could not be determined exactly which trip unit initiated the trip. Any further troubleshooting or root cause research would require monitoring of both trip units until the spurious signal could be detected again. Since this MST (2MST-RHR23M) had been performed monthly prior to this event and has been successfully completed three times since the event with no spurious trips, this is not considered feasible. Since this is considered to be an isolated event, replacement of the trip units is not considered to be necessary at this time. Component failures are tracked as part of the Repetitive Failure Program to ensure repeat failures are identified.

The Rosemount technical manual for the 510DU and 710DU trip units was reviewed to determine if there is any significant differences in the circuits of the units. As a result of reviewing the circuit schematics for the 510DU and 710DU units and further conversations with Rosemount, it was determined that there is virtually no difference between the circuitry for the units. The identification in the original LER report of the existence of a diode across the output to help suppress noise was in error.

Event Assessment

The F006 valve was cycled to ensure operability at the time of the event. The initiation signal was proven to be invalid, based on the operating parameters of the reactor pressure vessel being within the normal operating range through the entire event. Operator actions and the invalid initiation signal prevented injection into the vessel. In addition, at no time was the HPCI system unavailable for injection had a valid initiation signal been received from the governing logic. Because of these reasons, the safety significance of this event was considered minimal.