Form 244

CP&L

Carolina Power & Light Company

Company Correspondence

Brunswick Nuclear Project
P. O. Box 10429
Southport, N.C. 28461-04?
May 24, 1991

FILE: B09-13510C 10CFR50.73

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

BRUNSWICK STEAM ELECTRIC PLANT UNIT 1
DOCKET NO. 50-325
LICENSE NO. DPR-71
LICENSEE EVENT REPORT 1-91-011

Gentlemen:

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

Very truly yours,

J. W. Spencer, General Manager
Brunswick Nuclear Project

WRT/

Enclosure

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

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NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 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.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Brunswick Steam Electric Plant Unit 1	05000325	01 OF 04

TITLE (4): COMPONENT FAILURE OF AN RPS ELECTRICAL PROTECTION ASSEMBLY (EPA) BREAKER LOGIC CARD RESULTS IN UNPLANNED ESF ACTUATIONS.

EVENT DATE (5)			LER NUMBER (6)					REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR		SEQ. NO.		REV. NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	24	91	91	-	011	-	00	05	24	91		

OPERATING MODE (9)	4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)							
			20.402(b)		20.405(c)	X	50.73(a)(2)(iv)		73.71(b)
POWER LEVEL (10)	000		20.405(a)(1)(i)		50.36(c)(1)		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 and Text)
			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
WILLIAM R. TOLER, REGULATORY COMPLIANCE SPECIALIST	(919) 457-2701

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	JC	BKR	G080	Y							

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

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

On April 24, 1991, at approximately 1753 hours (EST), Unit 1 was in cold shutdown. Backup power was being supplied through the alternate power source to Reactor Protection System (RPS) electrical bus B. At that time, Engineered Safety Feature (ESF) actuations were incurred as designed when an unexpected trip on an electrical protection assembly (EPA) output breaker in the alternate power source caused a loss of power to RPS bus B. At approximately 2345 hours (EST) on April 24, 1991, after transferring RPS bus B back to its normal power source, all systems and isolations were restored to normal. Shutdown cooling was maintained throughout this event.

The cause of the event was determined to be component failure of the EPA printed circuit board (PCB) logic card. Corrective action included replacement of the PCB logic card. The safety significance of this event was minimal. Previous similar occurrences, involving failure of EPA logic cards, have been reported in LERs 1-87-00[9], 2-89-021 and 1-90-014.

EVENT

Engineered Safety Feature (ESF) actuations were incurred when an unexpected trip on an electrical protection assembly (EPA) output breaker caused a loss of power to Reactor Protection System (RPS) electrical bus B.

INITIAL CONDITIONS

On April 24, 1991, at approximately 1753 hours (EST), Unit 1 was in cold shutdown. The shutdown cooling mode of the Residual Heat Removal System (RHR Loop B) was maintaining the reactor temperature at approximately 142 degrees fahrenheit. Backup power was being supplied (480V emergency bus E-5) through the alternate power source to RPS electrical bus B. RPS bus B had been placed on the alternate power source at approximately 1700 hours to support removing 480V emergency bus E-6 from service for maintenance on its feeder breaker. This transfer was necessary since 480V emergency bus E-6 is the power supply for motor-generator set B (480V induction drive motor). Motor-Generator Set-B (MG Set B) normally supplies 120V power to reactor trip system B.

DESCRIPTION OF EVENT

On April 24, 1991, at approximately 1753 hours (EST), Unit 1 RPS electrical bus B deenergized when one (EPA-5) of the two alternate power source output breakers unexpectedly tripped open. Two electrical protection assemblies (EPA-5 and EPA-6) are in series between the alternate power source and RPS bus B. As a result of this unexpected trip, a half scram signal and half group isolation signals were generated causing the following ESF actuations:

1. Standby Gas Treatment (SBGT) System A and B start.
2. Reactor Building Ventilation System Isolation.
3. Closure of Primary Containment Isolation System (PCIS) Groups 2 and 6 outboard isolation valves.
4. Closure of PCIS Group 1 Reactor Water Sample Line Outboard Isolation Valve (1-B32-F020).

The PCIS signal Group 2 valves include the Traversing In-Core Probe (TIP) guide tube ball valves, the Drywell Equipment Drain Discharge Va ves and the Drywell Floor Drain Discharge Isolation Valves. Signal Group 6 valves are the Containment Atmospheric Control (CAC) valves.

PCIS Group 3 and 8 signals were also generated when RPS bus B deenergized; however, the associated outboard isolation valves did not ' olate since they were under an equipment clearance with their motor breakers f. This clearance had been previously established, in preparation for removir. mergency bus E-6 from service, to prevent the Reactor Water Cleanup (RWCU) System from isolating and to maintain shutdown cooling. Group 3 valves are the RWCU isolation valves and the Group 8 valves are the RHR Shutdown Cooling Supply Isolation Valves and the RHR Injection Valves. Shutdown cooling was maintained throughout this event. The 480V emergency bus E-6 maintenance was subsequently completed and at approximately 2345 hours (EST) on April 24, 1991, after transferring RPS bus B back to its normal (MG Set B) power source, the incurred RPS half scram and half group isolations were reset.

INVESTIGATION OF EVENT

The EPA circuit breakers of the Reactor Protection System are designed to trip whenever an under-frequency, under-voltage or over-voltage condition is detected to protect against electrical perturbations which could damage RPS components. The breakers will also trip on magnetics or thermal overload. EPA-5 tripped with no indication of cause and was found when the control operator (CO) received the RPS half scram and half group isolations. A Work Request/Job Order (WR/JO) was subsequently initiated by Operations to investigate the cause of the trip and to repair the circuit breaker. On April 25, 1991, Instrumentation and Control (I&C) personnel performed a calibration check of the over-voltage, under-voltage and under-frequency trip function setpoints and found that the over-voltage trip would not trip within the specified tolerance nor could it be calibrated.

CAUSE OF EVENT

The cause of the event was determined to be component failure of the EPA-5 printed circuit board (PCB) logic card.

CORRECTIVE ACTION

A spare PCB logic card (GE Part No. 147D8652G002) was not readily available for replacement; therefore, the defective logic card was sent to General Electric (GE) to be reworked to its original functional and performance requirements. The PCB logic card was replaced following its return from GE and EPA-5 was satisfactorily calibrated on April 30 ,1991.

The Electrical Protection Assembly PCB logic cards for the RPS EPA breakers have contributed to four (4) LERs due to failures. An investigation will be conducted to determine why PCB logic cards are failing and what actions can be taken to prevent recurrence.

ASSESSMENT OF EVENT

The safety significance of this event was minimal. The reactor was in cold shutdown and the safety systems performed as required. The ESF actuations described in this report were incurred as designed when the unexpected trip on EPA-5 caused a loss of power to RPS electrical bus B. Power for the channels and logics of the associated ESF systems are supplied from RPS bus B. The Reactor Protection System is designed (fail-safe) to meet the Institute of Electrical and Electronic Engineers (IEEE) criteria for Protection Systems for Nuclear Power Generating Stations IEEE Standard 279-1971; therefore, the logic systems actuated on loss of power.

This event is reportable per 10CFR50.73 (a)(2)(IV) because an unplanned actuation of the Reactor Protection System occurred. Specifically, an unexpected trip on EPA-5 in the alternate power source caused a loss of power to RPS electrical bus B. The loss of power to bus B resulted in the unplanned half scram signal and half group isolations. Previous similar occurrences involving failure of electrical protection assembly PCB logic cards have been reported in LERs 1-87-009, 2-89-021 and 1-90-014.

EIIS CODES

SYSTEM/COMPONENT	EIIS
RPS/EPA BREAKER	JC/BKR
PCIS	JM
CAC	BB
REACTOR BUILDING VENTILATION	NG/VA
SBGT	BH/FLT
RWCU	CE
RHR	BO
480V EMERGENCY BUS	ED/BU
RPS MG SET	JC/MG
RPS ELECTRICAL BUS	JC/ED/BU