

EXPIRES: 5/31/95

## LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, 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

PAGE (3)

1 of 4

TITLE (4)

Engineered Safety Feature Actuation Due To Malfunction Of Reactor Protection System  
Electrical Protection Assembly Logic Card

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 NAME	DOCKET NUMBER
07	21	95	95	- 16 -	00	08	17	95	FACILITY NAME	DOCKET NUMBER
										05000
										05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)							
POWER LEVEL (10)	100	20.402(b)		20.405(c)	X	50.73(a)(2)(iv)		73.71(b)	
		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	
		20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract and Text)	
		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

Steve F. Tabor, Regulatory Affairs Specialist

TELEPHONE NUMBER

(910) 457-2178

## 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)

X YES (If yes, complete EXPECTED SUBMISSION DATE)		NO		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
					11	03	95

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

On July 21, 1995, at 1226 hours, with Unit 1 operating at rated power, the Unit 1 Reactor Protection System Bus B Electrical Protection Assembly breaker #4 (EPA-4) tripped. As designed, the loss of this breaker resulted in a Division II RPS trip signal and Primary Containment Isolation System (PCIS) Group 1 (reactor water sample outboard isolation valve), Group 2 (drywell floor and equipment drain outboard isolation valve), Group 3 (Reactor Water Cleanup System outboard isolation valve), and Group 6 (Containment Atmospheric Control) isolations. Additionally, the Reactor Building Ventilation System and Secondary Containment isolated and both trains of the Standby Gas Treatment System started. RPS Bus B was aligned to the alternate power source at 1237 hours and the bus re-energized at 1243 hours. The affected systems were returned to their normal lineup configuration by 1406 hours. During troubleshooting, the RPS Bus B was realigned to the normal power source. At 1933 hours a second EPA-4 trip occurred resulting in the same actuations/isolations that occurred at 1226 hours. RPS Bus B was again realigned to the alternate source and remained connected to the alternate source until August 2, 1995, following the completion of troubleshooting and the replacement of the EPA-4 logic card. Investigation into the cause of these events determined that the EPA-4 logic card under-voltage and under-frequency setpoints had drifted outside the desired range. An investigation is in progress to determine the cause of the setpoint drift problem and whether setpoint drift caused the breaker to trip. The results of this investigation will be reported in a supplement to this LER. The cause classification for this event per the criteria of NUREG-1022 is X, Other.

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

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		1995	- 16 -	00	

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

**TITLE**

Engineered Safety Feature Actuation Due To Malfunction Of Reactor Protection  
System Electrical Protection Assembly Logic Card

**INITIAL CONDITIONS**

On July 21, 1995, Unit 1 was operating at 100% power. The Reactor Protection System (RPS) Bus A and B were aligned to their normal power source, the RPS Motor Generator (MG) Sets.

**EVENT NARRATIVE**

On July 21, 1995, at 1226 hours, the RPS Bus B Electrical Protection Assembly breaker #4 (EPA-4) tripped resulting in a Division II RPS trip signal (-4 Primary Containment Isolation System (PCIS) Group 1 (reactor water sample outboard isolation valve), Group 2 (drywell floor and equipment drain outboard isolation valve), Group 3 (Reactor Water Cleanup System outboard isolation valve), and Group 6 (Containment Atmospheric Control) isolation. Additionally, the Reactor Building Ventilation System and Secondary Containment isolated and both trains of the Standby Gas Treatment System started.

At 1237 hours, RPS Bus B was aligned to the alternate power source, the bus re-energized at 1243 hours, the actuation/isolation signals reset, and affected systems restored by 1511 hours.

Initial review of RPS Bus voltage data indicated that a momentary RPS Bus B low voltage condition may have caused EPA-4 to trip. Believing EPA-4 responded to an actual low voltage condition and recognizing that the alternate power source under-voltage trip setpoint is higher by design than that of the normal source, Operations restored the RPS Bus B to the normal power source (i.e., RPS B Motor Generator (MG) set through EPA-3 and EPA-4) at 1653 hours, while investigation into the cause of the potential low voltage condition continued.

At 1933 hours, EPA-4 tripped again resulting in the same actuations and isolations that occurred as a result of the EPA-4 trip at 1226 hours. RPS Bus B was realigned to the alternate source and the actuation/isolation signals reset by 1945 hours. Having been unable to identify the source of the potential low voltage condition, the focus of the investigation into the cause of the events shifted to identifying possible problems with the EPA-4 logic card.

On July 22, 1995, a calibration check of the EPA-4 logic card setpoints was performed. The as-found data indicated the under-voltage and under-frequency trip setpoints had drifted out of the desired range. The under-frequency trip setpoint was found at 59.27 Hz (desired setpoint upper limit is 57.8 Hz and the under-voltage trip setpoint was found at 108.05 volts (desired setpoint upper limit is 107 volts). EPA-4 was then recalibrated to the desired specifications, a test load connected across the output of the breaker, and the RPS MG Set B and EPA-4 output voltages monitored for approximately three days. No notable abnormal frequency or voltage variations were noted. Although a calibration recheck was performed on EPA-4 with satisfactory results, the EPA-4 logic card was replaced on July 27, 1995, and left operating under a monitored test load for approximately five days prior to restoring RPS Bus B to the normal power source at 0248 hours, on August 2, 1995.

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

This event is reportable in accordance with requirements of 10 CFR 50.73 (a) (2) (iv) in that the malfunction of EPA-4 resulted in unplanned Engineered Safety Feature actuation.

CAUSE OF EVENT

Based on the troubleshooting performed and a review of historical calibration data, either frequency or voltage setpoint instability appears to have caused the EPA-4 trip. An investigation is in progress to determine the cause of the setpoint drift and whether the drift problem caused the EPA-4 trip.

A review of the data taken during the past two calibrations indicates that EPA-4 logic card had experienced setpoint drift. The magnitude of setpoint drift discovered during the troubleshooting performed following this event was much larger than experienced during the two previous calibrations. Review of the past calibration data for the other RPS EPAs did not indicate an adverse setpoint drift trend. Based on the troubleshooting performed and review of past calibration data, a generic problem with EPA logic card setpoint drift does not exist.

The EPA-4 logic card setpoint instability is the first failure of an upgraded version of the EPA logic card installed at Brunswick. Investigation into the cause of LER 1-91-011 and other previous events involving EPA logic card failures initiated an effort to replace the logic cards installed at Brunswick with an upgraded card which had been developed by the vendor to resolve recognized industry problems. A review of industry experience including the Nuclear Plant Reliability Data System, Operational Experience, and vendor information does not indicate a setpoint drift issue with the upgraded EPA logic card.

CORRECTIVE ACTIONS

The RPS Bus B EPA-4 logic card was replaced and the newly installed breaker satisfactorily tested on July 27, 1995.

An investigation to determine the cause of the EPA-4 logic card setpoint drift and whether the drift problem caused the EPA-4 trip is in progress. The results of this investigation and any corrective actions, if needed, will be reported in a supplement to this LER by November 3, 1995.

SAFETY ASSESSMENT

This event has minimal safety significance in that the safety systems responded as designed.

PREVIOUS SIMILAR EVENTS

Previous similar occurrences involving the failure of EPA logic cards have been reported in LERs 1-87-009, 2-89-021, 1-90-014, and 1-91-011. The EPA logic cards installed at the time of these events were not the upgraded versions.

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

EIIS COMPONENT IDENTIFICATION

<u>System/Component</u>	<u>EIIS Code</u>
RPS/EPA Breaker	JC/BKR
PCIS	JM
CAC	BB
Reactor Building Ventilation	NG/VA
SBGT	BH/FLT
RPS MG Set	JC/MG



Enclosure  
List of Regulatory Commitments

The following table identifies those actions committed to by Carolina Power & Light Company in this document. Any other actions discussed in the submittal represent intended or planned actions by Carolina Power & Light Company. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager-Regulatory Affairs at the Brunswick Nuclear Plant of any questions regarding this document or any associated regulatory commitments.

Commitment	Committed date or outage
1. An investigation to determine the cause of the EPA-4 logic card setpoint drift and whether the drift problem caused the EPA-4 trip is in progress. The results of this investigation and any corrective actions, if needed, will be reported in a supplement to this LER.	11/03/95