

CP&L

Carolina Power & Light Company

Brunswick Nuclear Project
P. O. Box 10429
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February 15, 1991

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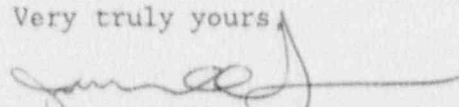
U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

BRUNSWICK STEAM ELECTRIC PLANT UNIT 1
DOCKET NO. 50-325
LICENSE NO. DPR-71
SUPPLEMENT TO LICENSEE EVENT REPORT 1-90-029

Gentlemen:

In accordance with Title 10 of 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,


J. W. Spencer, General Manager
Brunswick Nuclear Project

TMJ/

Enclosure

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

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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) Brunswick Steam Electric Plant Unit 1

DOCKET NUMBER (2)
05000325

PAGE (3)

01 OF 03

TITLE CBEAF System Actuator Resulting From The Failure of the 1-D22A-K2 Relay Coil.

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	
12	16	90	90	- 29	- 01	02	15	91	BSEP UNIT 2	05000324	

OPERATING MODE (9) 5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 9: (Check one or more of the following) (11)									
	20.402(b)		20.402(c)		<input checked="" type="checkbox"/> 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)(vi)		OTHER (Specify in Abstract and Text)			
	20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(vii)(A)					
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(vii)(B)					
POWER LEVEL (10) 000	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)					

LICENSEE CONTACT FOR THIS LER (12)

NAME THERESA M. JONES, REGULATORY COMPLIANCE SPECIALIST

TELEPHONE NUMBER

(919) 457-2039

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS
X	VI	RLY	GOBO	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

YES (if yes, complete EXPECTED SUBMISSION DATE)

NO

DATE (15)

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

On December 16, 1990, the control building ventilation system was operating in its normal mode. At 0623, the alarm "Control Building High Radiation" (UA-3 6-7) annunciated and the Control Building Emergency Air Filtration (CBEAF) system automatically initiated. The Area Radiation Monitors (ARM) were checked and trip indications were not found, however, the faint smell of over heated electronics was detected in the Unit 1 ARM cabinet located in panel H12-P600 of the control room. The cause of the alarm was determined to be a failed relay coil. The relay is a normally energized, General Electric model CR-120, 115 vac relay and its coil failure resulted in the relay opening, causing the alarm and automatic actuation of the CBEAF system. The relay failure was determined to be a normal end of life failure due to aging. Relay coils are electrically insulated by a thin epoxy coating, on a continuously energized coil the epoxy coating can crack resulting in a short circuit across the coil and the observed "burned up" coil. This is termed an end of coil "life" failure. Only five (5) failures of this type relay have been experienced at Brunswick in the past twenty five months, of the five only two (2) are directly attributable to a coil failure. The relay coil has been replaced. The control building ventilation system was restored to normal operation. An investigation utilizing the repetitive failure program to determine actions that may be required to avoid recurrence of this situation will be conducted. This event had minimal safety significance. The equipment functioned as designed.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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FACILITY NAME (1) Brunswick Steam Electric Plant Unit 1	DOCKET NUMBER (2)		LER NUMBER (6)			PAGE (7)
	05000325	YEAR		SEQUENTIAL NUMBER		REVISION NUMBER
		90	-	29	-	01

TEXT (IF MORE SPACE IS REQUIRED, USE ADDITIONAL NRC FORM 366A'S) (17)

EVENT

Automatic actuation of the Control Building Emergency Air Filtration (CBEAF) system resulting from the failure of 1-D22A-K2 relay.

INITIAL CONDITIONS

On December 16, 1990, the Unit 1 reactor was shutdown in the eighty first (81) day of a scheduled refuel/maintenance outage and the Unit 2 reactor was operating at 100% power. The control building ventilation system was operable.

EVENT DESCRIPTION

At 0623, the alarm "Control Building High Radiation" (UA-03 6-7) annunciated and the CBEAF system automatically initiated in accordance with the system design. The UA-03 6-7 annunciator procedure was referenced and its associated area radiation monitor (ARM), located in control room panel H12-P600, was checked. No ARM trip indications were illuminated, however, the faint smell of over heated electronics was detected. A work request/job order (WR/JO 90-AWZP1) was initiated to investigate the suspected circuit malfunction. The cause was determined to be a "burned up" relay coil in the control building, control room operating area, upscale trip relay, 1-D22A-K2. The relay coil is normally energized. Its failure de-energized the relay, causing the observed alarm and automatic initiation of the CBEAF system. The relay coil was replaced and the control room ventilation system was restored to its normal line up.

EVENT INVESTIGATION

The 1-D22A-K2 relay is a normally energized relay in the ARM system logic. The relay coil generates an intense magnetic field which pulls the ferrous plunger of the relay down. This motion is mechanically coupled to the coil. The most likely reason for the coil failure was determined to be a normal end of life failure due to aging of the normally energized relay. Relay coils are electrically insulated by a thin epoxy coating, on a continuously energized coil the epoxy coating can crack resulting in a short circuit across the coil and the observed "burned up" coil. This is termed an end of coil "life" failure. Further investigation into the CR-120 relay failures showed five, 115 vac, CR-120 relay failures in the past twenty five (25) months. Only two of these failures were directly related to the 115 vac coil. The involved relay type is commonly used throughout the plant (ie; approximately one thousand (1000) GE CR-120 relays of which one hundred and forty two (42) are currently identified as normally energized relays).

Two other BSEP LERs were due to failed GE CR-120 relays since 1986. LER 2-89-20 involved a failure of relay contacts, not the coil, in the Reactor Protection System (RPS) B motor-generator (MG) set control panel. LER 1-90-23 reported a

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failed coil in the Containment Atmosphere Control (CAC) system logic which resulted in a partial Primary Containment Isolation System (PCIS) Group 6 isolation. The CAC event was of minimal safety significance as the valves failed in the closed position per their design. This investigation has determined that the GE CR 120 relays do not have a history of this type of failure.

A recent control room habitability analysis has identified a design concern when the CBEAF system is operating in the recirculation mode coincident with a chlorine event and a loss of power to the control building inlet dampers. This design issue will be addressed in LER 1-91-003.

CORRECTIVE ACTIONS

The relay coil has been replaced. The control building ventilation system was restored to normal operation. An investigation utilizing the repetitive failure program to determine actions that may be required to avoid recurrence of this situation will be conducted.

EVENT ASSESSMENT

The safety significance of this event is minimal. The failure of the relay resulted in the CBEAF system actuating. This is in accordance with the system configuration's "fail safe" design and, therefore, the failure of the relay coil would not have been more severe under other reasonable and credible scenarios.

ELIS CODES

SYSTEM/COMPONENT

CBEAF
ARM
UA-03 6.7
1-D22A-K2
CAC
PCIS
RPS MG set
CB Inlet Dampers

CODE

VI
IL
VI/IL/ANN
IL/RLY
BB
JM
JC/MG
VI/DMP