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FACIL:50-261 H. B. Robinson Plant, Unit 2, Carolina Power and Ligh 05000261
AUTH.NAME AUTHOR AFFILIATION
STARKEY,R.B. Carolina Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
Region 2, Atlanta, Office of the Director

SUBJECT: LER 80-027/01T-0:on 801122,reactor protection relay RT-9 in reactor protection train A failed,Caused by de-energized relay coil resulting in continuous reactor trip signal.Relay replaced.

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	MECH ENG BR	33	1	1	MPA		3	3
	NRC PDR	02	1	1	OP EX EVALU BR	34	3	3
	OR ASSESS BR	35	1	1	POWER SYS BR	36	1	1
	RAD ASSESS BR	39	1	1	REACT SYS BR	40	1	1
	REG FILE	01	1	1	RELI & RISK A	41	1	1
	SFTY PROG EVA	42	1	1	STRUCT ENG BR	44	1	1
	SYS INTERACT B	45	1	1				
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LICENSEE EVENT REPORT

CONTROL BLOCK: (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01 | LICENSEE CODE: S C H B R 2 (2) | LICENSE NUMBER: 0 0 - 0 0 0 0 0 - 0 0 (3) | LICENSE TYPE: 4 1 1 1 1 (4) | CAT (5)

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EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

02 At approximately 1000 hours on November 22, 1980, Reactor Protection Relay RT-9 in
03 Reactor Protection Train "A" failed. This failure occurred during the periodic test
04 of the Reactor Protection Logic. This constitutes a reportable occurrence per
05 Technical Specification Section 6.9.2.a.9. The relay had failed in the safe
06 configuration. Thus, no increase in risk to the health and safety of the public
07 resulted.
08

	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
09	I A (11)	B (12)	B (13)	R E L A Y X (14)	A (15)	Z (16)

(17) LER/RO REPORT NUMBER

EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
8 0	—	0 2 7	/	0 1	T	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
C (18)	C (19)	Z (20)	Z (21)	0 0 0 0	Y (23)	Y (24)	N (25)	W 1 2 0 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

10 The failed and replacement relays are Westinghouse Model NBFD-31 S, style 5072A49G03
11 with 125 to 130 volt coils. The relay coil was found de-energized which caused a
12 continuous reactor trip signal. The relay was replaced with an identical unit and
13 tested satisfactorily.
14

	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
15	E (28)	1 0 0 (29)	NA	B (31)	Periodic Test

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
16	Z (33)	Z (34)	NA	NA

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION (39)
17	0 0 0 (37)	(38)	NA

PERSONNEL INJURIES

	NUMBER	DESCRIPTION (41)
18	0 0 0 (40)	NA

LOSS OF OR DAMAGE TO FACILITY (43)

	TYPE	DESCRIPTION
19	Z (42)	NA

PUBLICITY

	ISSUED	DESCRIPTION (45)	NRC USE ONLY
20	N (44)	NA	

8012090462

NAME OF PREPARER R. B. Starkey, Jr. PHONE: (803) 383-4524

PO 917-926

Supplemental Information

for

Licensee Event Report 80-027

1. Cause Description and Analysis: On November 22, 1980, at approximately 1000 hours, with the plant at 100% power, Reactor Protection Relay RT-9 in Reactor Protection Train "A" failed to re-energize during the periodic test of the Reactor Protection Logic. The relays are installed in a fail safe configuration (normally energized); therefore, no loss of safety function resulted or would have resulted from their failure to re-energize.

   The failure appears to be the result of a shorting condition where the lead wires connect to the coil wires. This has been confirmed by a manufacturer investigation of the coil failures.

   This is the same condition as reported previously on LER 80-006, LER 80-015, and LER 80-025.

2. Corrective Action: The failed relay was replaced with an identical unit and the Periodic Test was completed satisfactorily.

3. Corrective Action to Prevent Further Occurrence: An investigation by the manufacturer of the failed relay coils has confirmed the failures to be caused by an insulation breakdown at the point where the lead wire is soldered to the coil wire. Sharp edges left on this connection during the manufacturing process contribute to the failure which apparently occurs when the voltage to the relay coil is interrupted. The collapsing electrical field under this condition generates an instantaneous reverse voltage of more than 2000 volts. CP&L was told that the manufacturing process on these relays will be changed to better insulate these coil connections.

   Due to the number of failures at the Robinson Plant and the apparent lack at other facilities, it appears that a particular Robinson Plant order of NBFD-31 S relays was a defective batch. Therefore, new relays manufactured under the improved process will be obtained and installed in the Reactor Protection System as soon as practicable. Until such time that they are replaced, current periodic surveillance and the fail-safe application of these relays is sufficient to maintain safe operation of the plant. When a schedule for replacement of these relays is determined, a supplement to this LER will be submitted.