NRC FORM 366 (7-77) UPDATE - PREVIOUS REPORT, 12-05-80 U. S. NUCLEAR REGULATORY COMMISSION

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)

CON'T 01 REPORT SOURCE: L (6) DOCKET NUMBER: 0 5 0 0 0 2 6 1 (7) EVENT DATE: 1 1 2 2 8 0 (8) REPORT DATE: 1 0 1 1 8 2 (9)

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

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

(17) LER/RO REPORT NUMBER: EVENT YEAR 8 0 — SEQUENTIAL REPORT NO. 0 2 7 / OCCURRENCE CODE 0 1 REPORT TYPE T — REVISION NO. 1

ACTION TAKEN: C (18) FUTURE ACTION: C (19) EFFECT ON PLANT: Z (20) SHUTDOWN METHOD: Z (21) HOURS (22): 0 0 0 0 ATTACHMENT SUBMITTED: Y (23) NPRD-4 FORM SUB.: Y (24) PRIME COMP. SUPPLIER: N (25) COMPONENT MANUFACTURER: 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. All NBFD relay coils which are subject to the
13 failure mechanism as identified by the relay supplier and IE Information Notice 82-02
14 have been replaced with the new design coils.

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

16 ACTIVITY RELEASED: Z (33) CONTENT OF RELEASE: Z (34) AMOUNT OF ACTIVITY (35): N/A LOCATION OF RELEASE (36): N/A

17 PERSONNEL EXPOSURES NUMBER: 0 0 0 (37) TYPE: (38) DESCRIPTION (39): N/A

18 PERSONNEL INJURIES NUMBER: 0 0 0 (40) DESCRIPTION (41): N/A

19 LOSS OF OR DAMAGE TO FACILITY (43) TYPE: Z (42) DESCRIPTION:

20 PUBLICITY ISSUED: N (44) DESCRIPTION (45): N/A NRC USE ONLY

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Supplemental Information

for

Licensee Event Report 80-027, Revision 1

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. Pursuant to an agreement with NRC Region II, no further relay failures will be reported, but will be tabulated and included in a revision to this report upon completion of all corrective actions. Table I provides this listing of unreported relay failures.

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. The manufacturing process on these relays has been changed to better insulate these coil connections.

   A shipment of NBFD relays which contained the new coil design was received and all Reactor Trip (RT) relays in the Reactor Protection System (RPS) logic trains were replaced in August, 1981. However, in October, 1981, the relay supplier issued a notice of a potential substantial safety hazard concerning NBFD relay performance. Although all NBFD relay failures reported had been in normally energized relays, the supplier determined that the failure mechanism was applicable to normally de-energized relays and could result in the prevention of required safety circuit actions under certain conditions. Based on the relay supplier's recommendations all affected NBFD relays in the RPS and safeguards system were identified and a Periodic Test was implemented as an interim measure until the affected relays could be replaced.

During the 1982 Refueli ıg Outage, all NBFD relay coils subject to the failure mechanism identified by the supplier and IE Information Notice 82-02 were replaced with the new design coil. This completed the corrective action with respect to NBFD relay failures as identified by this report and by IE Notice 82-02. However, a recent failure of the new style NBFD relay coil has occurred and is currently being investigated by the relay vendor. This event will be reported in LER-82-14.

TABLE I

RELAY FAILURES SUBSEQUENT TO NOVEMBER 22, 1980

DATE	RELAY NUMBER	RPS TRAIN
3-19-81	SL-X, SR-X	A
3-20-81	RT-5, RT-8, RT-9	B
4-27-81	RC-5	A
	RT-3	B
5-14-81	RT-6	A
5-17-81	RC-4	A
5-18-81	RT-4	B
6-21-81	RT-5	A
7-18-81	RT-4	A
10-20-81	RC-5	B
11-30-81	RC-3	B
12-7-81	SL-X	B