

POWER REACTOR

EVENT NUMBER: 34194

FACILITY: CLINTON		REGION: 3		NOTIFICATION DATE: 05/08/98	
UNIT: [1] [ ] [ ]		STATE: IL		NOTIFICATION TIME: 13:44 [ET]	
RX TYPE: [1] GE-6				EVENT DATE: 05/08/98	
NRC NOTIFIED BY: BYRON SHERMAN				EVENT TIME: 00:00 [CDT]	
HQ OPS OFFICER: BOB STRANSKY				LAST UPDATE DATE: 05/08/98	
EMERGENCY CLASS: NOT APPLICABLE				NOTIFICATIONS	
10 CFR SECTION:				PATRICK HILAND RDO	
CDEG 21.21(c)(3)(i) DEFECTS/NONCOMPLIANCE				VERN HODGE NRR	
UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR
1	N	N	0	COLD SHUTDOWN	0
					COLD SHUTDOWN

## EVENT TEXT

## 10 CFR PART 21 REPORT REGARDING FAILURE OF 12 VDC INVERTER POWER SUPPLY

ON 2/13/98, A NUCLEAR SYSTEMS POWER SYSTEM (NSPS) 12 VOLT DC POWER SUPPLY FAILED. CAUSING THE DIVISION II NSPS INVERTER TO REVERSE TRANSFER TO A DEENERGIZED BYPASS TRANSFORMER. THIS CAUSED A LOSS OF SHUTDOWN COOLING AS DESCRIBED IN LER 98-003, DATED 3/16/98. THE CAUSE OF THE FAILURE WAS AN INADEQUATELY SIZED OUTPUT TRANSISTOR PAIR COMBINED WITH DEGRADED CAPACITORS.

THE 12 VDC POWER SUPPLY INVOLVED IN THIS REPORT IS KEPCO, INC. MODEL RMW12-D-20993. IT WAS PURCHASED BY GENERAL ELECTRIC (GE) AS A NON-SAFETY RELATED COMPONENT, BUT WAS SUBSEQUENTLY INSTALLED AT CLINTON AS PART OF A PANEL SUPPLIED BY GE AS A SAFETY RELATED COMPONENT. KEPCO TYPE RMX POWER SUPPLIES ARE IN USE AT CLINTON FOR ALL FOUR DIVISIONS OF NSPS (16 TOTAL), NEUTRON MONITORING SYSTEM (24 TOTAL), AND THE DISPLAY CONTROL SYSTEM (2 TOTAL).

THE SUPPLIER PROVIDED marginally rated output transistors in the power supplies. THIS CONDITION, COUPLED WITH PREMATURE AGE RELATED DEGRADATION OF ELECTROLYTIC CAPACITORS, RESULTED IN A LARGE CURRENT DRAW WHICH CAUSED THE INVERTER TO TRANSFER TO ITS ALTERNATE SOURCE. SINCE THE ALTERNATE SOURCE WAS UNAVAILABLE, THE CONDITION RESULTED IN A LOSS OF POWER TO THE NSPS BUS LOADS.

THE LICENSEE PLANS TO REPLACE ALL OUTPUT TRANSISTORS AND DEGRADED CAPACITORS IN ALL KEPCO TYPE RMX POWER SUPPLIES AND REFURBISH THESE POWER SUPPLIES ON A ROUTINE BASIS UNDER A NORMAL PREVENTIVE MAINTENANCE PROGRAM.

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Initial notification by facsimile of 10CFR, Part 21, Report No. 21-98-022

On February 13, 1998, a Nuclear Systems Power System (NSPS) 12 volt direct current (VDC) power supply failed causing the Division II NSPS inverter to reverse transfer to a de-energized bypass transformer. This caused a loss of shutdown cooling as described in Licensee Event Report (LER) 98-003, dated March 16, 1998. The cause of the power supply failure was an inadequately designed output transistor pair combined with degraded capacitors.

- (i) Walter G. MacFarland, IV, Senior Vice President and Chief Nuclear Officer of Illinois Power, Clinton Power Station, Post Office Box 678, Highway 54, Six Miles East, Clinton, Illinois, 61727, is informing the Nuclear Regulatory Commission (NRC) of a condition reportable under the provisions of 10CFR, Part 21.
- (ii) The component involved in this report is a 12 VDC power supply, model number RMX12-D-20993 supplied to Clinton Power Station.
- (iii) This power supply is manufactured by KEPCO, Incorporated, and was purchased by General Electric (GE) as a non-safety related component. Subsequently, the power supply was installed during construction of Clinton Power Station as part of a panel supplied by GE as a safety related component.
- (iv) The supplier provided marginally rated output transistors in the power supplies. This condition, coupled with premature age related degradation of electrolytic capacitors, resulted in a large current draw which caused the inverter to transfer to its alternate source. Since the alternate source was unavailable, the condition resulted in a loss of power to NSPS bus loads which included the primary valve for the shutdown cooling mode at the time of the event.
- (v) IP identified on March 12, 1998, that the power supply failed during startup of the division 2 NSPS inverter on February 13, 1998, and determined that it was potentially reportable under 10CFR21.
- (vi) RMX type KEPCO, Inc. power supplies are in use at CPS for all four divisions of NSPS (16 total), Neutron Monitoring System (24 total), and the Display Control System (2 total). Currently, CPS is evaluating the impact on all KEPCO supplied power supplies.
- (vii) Corrective actions to be taken by IP will be to replace the output transistors and degraded capacitors, due to premature aging, of all KEPCO RMX type power supplies and refurbish these power supplies on a routine basis under a normal preventive maintenance program.
- (viii) IP recommends evaluation of all RMX type power supplies manufactured by KEPCO, Inc. to determine impact of this condition.