UNITED STATES NUCLEAR REGULATORY COMMISSION OFFICE OF NUCLEAR REACTOR REGULATION WASHINGTON, D.C. 20555

August 8, 1988

NRC INFORMATION NOTICE NO. 88-58: POTENTIAL PROBLEMS WITH ASEA BROWN BOVERI ITE-51L TIME-OVERCURRENT RELAYS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

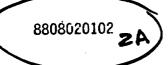
This information notice is being provided to alert addressees to potential problems involving ASEA Brown Boveri ITE-51L time-overcurrent relays. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Several spurious actuations of ASEA Brown Boveri (ABB) ITE-51L relays have occurred at the Beaver Valley nuclear power plant. These actuations resulted in unnecessary interruptions of the electrical power supply to safety-related equipment. The ITE-51L relays monitor circuit current. When the magnitude of the current exceeds a reference value for a specific duration, the relay actuates to energize the circuit breaker's trip coil. The licensee has determined that the spurious relay actuations were caused by faulty siliconcontrolled rectifiers (SCRs) that were manufactured by the Motorola Company.

SCRs are solid-state devices that are used as electronic switches in electrical circuits. When a voltage is applied across the terminals of the SCR, the device is designed to allow current to flow only when "gated" or switched on by the proper electrical signal. The SCRs that failed at Beaver Valley allowed current to flow in the absence of the proper gating signal. These "leakage" currents were of sufficient magnitude to energize the trip coil of the as-sociated circuit breaker.

The licensee was informed by Motorola that SCRs manufactured between the late 1970s and early 1980s are susceptible to this mode of failure and that these SCRs are likely to fail within the first 2 years of service. Since 1982, all SCRs manufactured by Motorola have been subjected to a "burn-in" test. In this test, the SCRs are placed in a high-temperature environment both with and without voltage applied. SCRs that pass this test are expected to perform normally for an extended period.



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Beaver Valley Unit 2 has approximately 105 ITE-51L relays installed in safetyrelated applications, and Unit 1 has 10. The licensee is testing all the relays in Units 1 and 2 to determine whether the SCRs are faulty.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

Charles E. Rom

Charles E. Rossi, Director Division of Operational Events Assessment Office of Nuclear Reactor Regulation

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Technical Contacts: K. R. Naidu, NRR (301) 492-0980

> N. E. Fields, NRR (301) 492-1173

Attachment: List of Recently Issued NRC Information Notices

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LIST OF RECENTLY ISSUED NRC INFORMATION NOTICES

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Information Notice No.	Subject	Date of Issuance	Issued to
88-57	Potential Loss of Safe Shutdown Equipment Due to Premature Silicon Controlled Rectifier Failure	8/8/88	All holders of OLs or CPs for nuclear power reactors.
88-56	Potential Problems with Silicone Foam Fire Barrier Penetration Seals	8/4/88	All holders of OLs or CPs for nuclear power reactors.
88-55	Potential Problems Caused by Single Failure of an Engineered Safety Feature Swing Bus	8/3/88	All holders of OLs or CPs for nuclear power reactors.
88-54	Failure of Circuit Breaker Following Installation of Amptector Direct Trip Attachment	7/28/88	All holders of OLs or CPs for nuclear power reactors.
88-53	Licensee Violations of NRC Regulations, Which Led to Medical Diagnostic Misadministrations	7/28/88	All manufacturers and distributors of radio- pharmaceuticals for human use, nuclear pharmacies, and medical licensees.
88-52	Failure of Intrauterine Tandem of Fletcher Applicator Brachytherapy Devices During Patient Treatment	7/27/88	Medical licensees.
88-46, Supplement 1	Licensee Report of Defective Refurbished Circuit Breakers	7/26/88	All holders of OLs or CPs for nuclear power reactors.
88-51	Failures of Main Steam Isolation Valves	7/21/88	All holders of OLs or CPs for nuclear power reactors.

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OL = Operating License CP = Construction Permit

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Beaver Valley Unit 2 has approximately 105 ITE-51L relays installed in safetyrelated applications, and Unit 1 has 10. The licensee is testing all the relays in Units 1 and 2 to determine whether the SCRs are faulty.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

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*see previous concurrence

	EAB:NRR NFields* 7/14/88	DFischer	TECH:ED *BCature* / /88	EBaker*	VIB:NRR WBrach* 7/20/88	AD:DRIS BGrimes* 7/22/88	C:EAB:NRR WLanning* 8/2/88
*C:GCB:NRF CHBerlinge 8/1/88			0:0057: CER0551 8/3/88	NBA			

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Beaver Valley Unit 2 has approximately 105 ITE-51L relays installed in safetyrelated applications, and Unit 1 has 10. The licensee is testing all the relays in Units 1 and 2 to determine whether the SCRs are faulty.

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*see previous concurrence							
	/ /88 D:PEST	CER	TECH:EO *BCature / /88 OEA:NRR ossi / /88	NRR:RVIB EBaker / /88	VIB:NRR WBrach* / /88	AD:DRIS BGrimes* / /88	C:EAB:NRR WLanning &/2/88

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Beaver Valley Unit 2 has approximately one hundred and five ITE-51L type relays installed in safety-related applications. Unit 1 has ten of the faulty relays in safety related applications. The licensee is in the process of testing all the relays in Units 1 and 2 to determine whether the SCRs are faulty.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the Regional Administrator of the appropriate regional office.

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NF fg for NRR:RVIB C:GCB:NRR EAB! NRR TECH: EO C:EAB:NRR EAB:NRR AB:NRR CHBerlinger EBaker WLanning **NFields** DFischer KNaidu / 788 / /88 7/19/88 88 7/14/88 7/1*9*/88 7 /K/88 U:DULA:NRR CEROSSI / /88