

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 silicon-controlled 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 associated 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 safety-related 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. Rossi*

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

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

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 Ampetector 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.

OL = Operating License  
CP = Construction Permit

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\*see previous concurrence

EAB:NRR KNaidu*	EAB:NRR NFields*	EAB:NRR DFischer*	TECH:ED BCature*	NRR:RVIB EBaker*	VIB:NRR WBrach*	AD:DRIS BGrimes*	C:EAB:NRR WLanning*
7/18/88	7/14/88	7/19/88	1/88	7/19/88	7/20/88	7/22/88	8/2/88
*C:GCB:NRR CHBerlinger	*D:DEST LShao	D:DOEA:NRR CERossi					
8/1/88	7/29/88	8/3/88					

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July , 1988  
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Beaver Valley Unit 2 has approximately 105 ITE-51L relays installed in safety-related 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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/ /88	/ /88	/ /88	/ /88	/ /88	/ /88	/ /88	8/2/88
C:GCB:NRR CHBerlinger	D:DOEA:NRR LShao	D:DOEA:NRR CERossi					
6/1/88	7/29/88	/ /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.

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*EB*  
EAB:NRR  
KNaidu  
7/18/88

*NE*  
EAB:NRR  
NFields  
7/14/88

*Mr. 49 for*  
EAB:NRR  
DFischer  
7/19/88

*TECH:ED*  
NRR:RVIB  
EBaker  
7/19/88

*Grimes*  
7/22/88

C:EAB:NRR  
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/ /88

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CHBerlinger  
/ /88

U:DOEA:NRR  
CERossi  
/ /88

*BRACH VIB*  
7/20/88

*Grimes*  
7/20/88