

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

February 27, 1989

NRC INFORMATION NOTICE NO. 89-21: CHANGES IN PERFORMANCE CHARACTERISTICS
OF MOLDED-CASE CIRCUIT BREAKERS

Addressees:

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

Purpose:

This information notice is being provided to alert addressees to an observed practice in which vendors make changes to the performance characteristics of molded-case circuit breakers without making any corresponding revisions to the breaker part number. It is expected that recipients will review the 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:

During several inspections performed by the NRC, it was discovered that manufacturers of molded case circuit breakers frequently altered the time-current characteristic curves pertaining to a particular style or type of breaker. These changes were made without changing the part number of the breaker and often without any specific notification to the customer. The changes identified during the NRC inspections ranged from very minor alterations to the thermal portion of the curves to major alterations to the magnetic instantaneous trip portion of the curves. One change for ITE-type 100-amp breakers involved the movement of the instantaneous band from 600-1000 amps to 1200-2000 amps. Although product literature usually contains the appropriate curves, the curves are not routinely provided with the breakers.

Discussion:

As a result of these changes, many licensees who procure replacement breakers by part number only are receiving breakers with performance characteristics that may be different from those assumed in the original plant design. If the breakers are not analyzed for performance characteristics, upon installation these breakers potentially could degrade the electrical protection system and/or cause premature tripping upon the energizing of vital safety-related systems. Additionally, many perceived failures of circuit breakers detected

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during pre-installation or routine testing may actually be the result of unknown changes in time-current characteristic curves. One way to ensure that the breakers purchased conform to a particular curve would be to reference the specific curve (including the applicable revision) as part of the purchase requirements. If the breaker was no longer manufactured to meet the specifications of that specific curve, the new curve would have to be analyzed for its effect on the overall system.

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.

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

Technical Contact: J. B. Jacobson, NRR
(301) 492-0996

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-73, Supplement 1	Direction-Dependent Leak Characteristics of Containment Purge Valves	2/27/89	All holders of OLs or CPs for nuclear power reactors.
89-20	Weld Failures in a Pump of Byron-Jackson Design	2/24/89	All holders of OLs or CPs for nuclear power reactors.
89-19	Health Physics Network	2/23/89	All holders of OLs or CPs for nuclear power reactors, and the following fuel facilities: Nuclear Fuel Services of Erwin, General Atomic, UNC Montville, B&W LRC Lynchburg, and B&W Lynchburg.
89-18	Criminal Prosecution of Wrongdoing Committed by Suppliers of Nuclear Products or Services	2/22/89	All holders of OLs or CPs for nuclear power reactors.
89-17	Contamination and Degradation of Safety-Related Battery Cells	2/22/89	All holders of OLs or CPs for nuclear power reactors.
89-16	Excessive Voltage Drop in dc Systems	2/16/89	All holders of OLs or CPs for nuclear power reactors.
89-15	Second Reactor Coolant Pump Shaft Failure at Crystal River	2/16/89	All holders of OLs or CPs for nuclear power reactors.
89-14	Inadequate Dedication Process for Commercial Grade Components Which Could Lead to Common Mode Failure of a Safety System	2/16/89	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
 CP = Construction Permit

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*SEE PREVIOUS CONCURRENCES

*VIB:DRIS:NRR	*SC/VIB:DRIS:NRR	D/DOEA:NRR CERossi 02/2//89	*C/OGCB:DOEA:NRR CHBerlinger 02/09/89	*PPMB:ARM TechEd 02/17/89
JJacobson 01/30/89	UPotapovs 02/01/89	*BC/VIB:DRIS:NRR EWBrach 02/07/89	*BC/SELB:DEST:NRR FRosa 02/06/89	*D/DRIS:NRR BKGrimes 02/07/89

plant design. If unanalyzed, upon installation these breakers could potentially degrade the electrical protection system and/or cause premature tripping upon energization of vital safety-related systems. Additionally, many perceived circuit breaker failures detected during pre-installation or routine testing may actually be due to an unknown change in Time - Current Characteristic Curves. One way to ensure that received breakers conform to a particular curve would be to reference the specific curve (including revision applicable) as part of the purchase requirements. If the breaker needed is no longer manufactured to that specific curve, the new curve would need to be analyzed for its effect on the overall system.

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*See previous concurrence.

OFC	:VIB:DRIS	:SC:VIB:DRIS	:BC:VIB:DRIS	:BC:SELB:DEST	:D:DRIS:NRR	:BC:GCB
NAME	:JJacobson:nrp	:UPotapovs*	:EWBrach*	:FRosa*	:BKGrimes*	for CBerlinger
DATE	:01/30/89*	:02/01/89	:02/07/89	:02/06/89	:02/07/89	:02/19/89

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DATE	: 02/ /89	: 2/17/89

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- Central Files
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OFC	:VIB:DRIS	:SC:VIB:DRIS	:BC:VIB:DRIS	:D:DRIS:NRR	:BC:GCB	:D:DOEA
NAME	:JJacobson:nrp	:UPotapovs	:EWBrach	:BKGrimes	:CBerlinger	:CERossi
DATE	:01/30/89*	:02/1/89	:02/7/89	:02/ /89	:02/ /89	:02/ /89

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NAME	:JJacobson:nrp	:UPotapovs	:EWBrach	:	:	:
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