

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

April 25, 1996

NRC INFORMATION NOTICE 96-24: PRECONDITIONING OF MOLDED-CASE CIRCUIT BREAKERS
BEFORE SURVEILLANCE TESTING

Addressees

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

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to the detrimental effect that preconditioning of molded-case circuit breakers could have on the diagnostic validity of surveillance tests. 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 are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

During an inspection at the Diablo Canyon Nuclear Power Plant (IR 50-275, 323/94-27 dated December 21, 1994), NRC inspectors noted that the licensee preconditioned circuit breakers before performing surveillance testing. Before the overcurrent trip testing, Diablo Canyon staff exercised the circuit breakers by manually opening and closing them three times. The plant staff did not record the as-found condition of the breakers in terms of unexercised trip currents and times.

During another inspection at the South Texas Project (IR 50-498, 499/94-35 dated January 19, 1995), NRC inspectors noted that the licensee exercised similar circuit breakers manually at least five times before testing the overcurrent trip unit.

Discussion

A molded-case circuit breaker is one of the most widely used protective devices for electrical circuits at nuclear power plants. Its proper operation is essential for the protection and safe operation of plant electrical equipment. Many circuit breakers are continuously energized for long periods. Often they are in service for years and are rarely, if ever, called upon to perform a protective function. Nevertheless, when needed, they must rapidly isolate a faulted or overloaded circuit to prevent equipment damage. Therefore, for the safe operation of the electrical distribution system equipment of a nuclear power plant, it is important to periodically verify their continued reliability.

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Updated on 4/26/96

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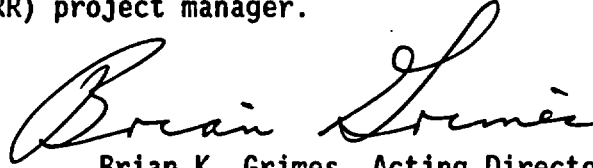
Periodic inspection and testing of circuit breakers in their as-found condition is an appropriate way of demonstrating the functional operability of the breaker and of detecting any degradation. However, the practice of preconditioning before testing (e.g., lubricating pivot points and manually cycling the breaker) defeats the purpose of the periodic test. Such preconditioning does not confirm continued operability between tests nor does it provide information on the condition of the circuit breaker for trending purposes. Testing some circuit breakers in the as-found condition can provide useful data on which to base decisions on surveillance intervals and the ability of the untested circuit breakers to perform their intended function. Since only a fraction of the circuit breakers are tested each refueling outage to justify the operability of the remaining circuit breakers, preconditioning before testing does not provide the expected assurance of the operability of remaining breakers which are not tested. By preconditioning circuit breakers, useful information may be lost because the breaker may not have been capable of performing its intended function without preconditioning.

To correct this situation, Diablo Canyon Power Plant plans to revise the electrical maintenance procedure before the next surveillance test has to be performed. The revised procedures will state that electrical testing should be performed before any intentional manual exercising of the breakers, and to ensure that electrical testing on breakers with removable trip units is performed before removing the trip unit.

Some plants have older technical specification bases that cite National Electrical Manufacturers Association (NEMA) Standard AB 2-1980. This version of the standard specifies mechanical cycling of circuit breakers prior to electrical testing. In later versions of this standard, this procedure was deleted. There appears to be no valid technical need for mechanical cycling prior to electrical surveillance testing.

The NRC has issued other generic communications on molded-case circuit breaker applications and testing: NRC Information Notice (IN) 92-51, and its Supplement 1, "Misapplication and Inadequate Testing of Molded-Case Circuit Breakers;" IN 93-26, "Grease Solidification Causes Molded Case Circuit Breaker Failure to Close;" and IN 93-64, "Periodic Testing and Preventive Maintenance of Molded-Case Circuit Breakers."

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.



Brian K. Grimes, Acting Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Technical contacts: Sikhindra Mitra, NRR
(301) 415-2783
Internet: skml@nrc.gov

Steve Alexander, NRR
(301) 415-2995
Internet: sda@nrc.gov

Christopher Myers, RIV
(817) 860-8144
Internet: cjm@nrc.gov

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LIST OF RECENTLY ISSUED
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Information Notice No.	Subject	Date of Issuance	Issued to
96-23	Fires in Emergency Diesel Generator Exciters During Operation Following Undetected Fuse Blowing	04/22/96	All holders of OLs or CPs for nuclear power reactors
96-22	Improper Equipment Settings Due to the Use of Nontemperature-Compensated Test Equipment	04/11/96	All holders of OLs or CPs for nuclear power reactors
96-21	Safety Concerns Related to the Design of the Door Interlock Circuit on Nucletron High-Dose Rate and Pulsed Dose Rate Remote Afterloading Brachytherapy Devices	04/10/96	All U.S. NRC Medical to the Licensees authorized to use brachytherapy sources in high- and pulsed-dose-rate remote afterloaders
96-20	Demonstration of Associated Equipment Compliance with 10 CFR 34.20	04/04/96	All industrial radiography licensees and radiography equipment manufacturers
96-19	Failure of Tone Alert Radios to Activate When Receiving a Shortened Activation Signal	04/02/96	All holders of OLs or CPs for nuclear power reactors
96-18	Compliance with 10 CFR Part 20 for Airborne Thorium	03/25/96	All material licensees authorized to possess and use thorium in unsealed form
95-03 Supp. 1	Loss of Reactor Coolant Inventory and Potential Loss of Emergency Mitigation Functions While in a Shutdown Condition	03/25/96	All holders of OLs or CPs for PWR power plants

OL = Operating License
 CP = Construction Permit

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original signed by

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Office of Nuclear Reactor Regulation

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(301) 415-2995
Internet:sda@nrc.gov

Christopher Myers, RIV
(817) 860-8144
Internet:cjm@nrc.gov

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DOCUMENT NAME: 96-24.IN Tech Editor reviewed 9/21/95

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DATE	4/22/96	4/15/96	4/22/96	4/27/96

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