

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

June 23, 1988

NRC INFORMATION NOTICE NO. 88-42: CIRCUIT BREAKER FAILURES DUE TO LOOSE
CHARGING SPRING MOTOR MOUNTING BOLTS

Addressees:

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

Purpose:

Information Notice No. 87-41, "Failures of Certain Brown Boveri Electric Circuit Breakers" was issued August 31, 1987. This information notice is being provided to alert recipients of additional information regarding circuit breaker failures due to loose charging spring motor mounting bolts. 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:

There are two emergency diesel generators (EDGs) at North Anna Unit 2 ("H" and "J"). On May 18, 1988, with the unit at power, the licensee removed the "J" EDG from service for scheduled preventive maintenance. On May 19, 1988, following completion of the scheduled preventive maintenance, the "J" EDG failed to pick up and carry the required load during preoperational testing. The licensee then shut down the "J" EDG and performed unplanned corrective maintenance. The licensee's technical specifications require that the operable EDG be tested within 24 hours if the inoperable EDG is inoperable due to any cause other than preplanned preventive maintenance or testing; thus, because of the unplanned maintenance on the "J" EDG the licensee tested the "H" EDG. During this test, the "H" EDG output circuit breaker (ITE Type 5HK) failed to close. The licensee's investigation determined that the "H" EDG output breaker closing spring had not been charged because the charging spring motor mounting bolts had become loose, allowing the motor to become detached from the frame. The output breaker for the "H" EDG had been successfully closed on May 6, 1988; however, procedures did not require verification that the closing spring had successfully charged. Thus, both EDGs were inoperable for approximately 38 hours.

A similar occurrence was previously reported in accordance with the requirements of 10 CFR 50.55(e) by Philadelphia Electric Company (the Limerick Units 1 and 2 licensee) on August 27, 1984. During an EDG preoperational test, the charging

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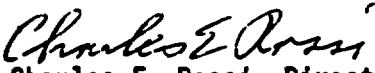
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spring motor of a BBC Brown Boveri, Inc. 5HK breaker failed to perform its intended function. The licensee determined that three out of the four horizontal charging spring motor mounting bolts had loosened, allowing the charging spring motor to rotate. Subsequent inspections identified a similar breaker with loose charging spring motor mounting bolts. The licensee indicated that the charging spring motor mounting bolts had not been sufficiently torqued by the vendor (e.g., measured torque values were 3 to 4 foot-pounds). Although the vendor recommends inspections of all accessible bolts after 1000 breaker operations, the breaker failure occurred after only several hundred operations. The licensee indicated that charging spring motor mounting bolts in similar breakers would be removed, cleaned, coated with Locktite, and torqued to 12 foot-pounds.

Discussion:

Failure of a circuit breaker to perform its intended function can result in the loss of a power supply (such as a vital bus or an EDG). The occurrence of these events, including the event at River Bend previously discussed in Information Notice 87-41, indicates that loose charging spring motor mounting bolts may be a generic concern. In addition, because of changes in corporate name, mergers, etc., circuit breakers similar to those discussed above may indicate manufacture by ITE, ITE Imperial, Gould, Brown Boveri, or a combination thereof. Recipients may need to be cognizant of this when determining whether they utilize similar equipment.

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, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical Contact: Jack Ramsey, NRR
(301) 492-1167

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-41	Physical Protection Weaknesses Identified Through Regulatory Effectiveness Reviews (RERs)	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-40	Examiners' Handbook for Developing Operator Licensing Examinations	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-39	LaSalle Unit 2 Loss of Recirculation Pumps With Power Oscillation Event	6/15/88	All holders of OLs or CPs for BWRs.
88-38	Failure of Undervoltage Trip Attachment on General Electric Circuit Breakers	6/15/88	All holders of OLs or CPs for nuclear power reactors.
88-37	Flow Blockage of Cooling Water to Safety System Components	6/14/88	All holders of OLs or CPs for nuclear power reactors.
88-36	Possible Sudden Loss of RCS Inventory During Low Coolant Level Operation	6/8/88	All holders of OLs or CPs for PWRs.
88-35	Inadequate Licensee Performed Vendor Audits	6/3/88	All holders of OLs or CPs for nuclear power reactors.
88-34	Nuclear Material Control and Accountability of Non-Fuel Special Nuclear Material at Power Reactors	5/31/88	All holders of OLs or CPs for nuclear power reactors.
87-61, Supplement 1	Failure of Westinghouse W-2-Type Circuit Breaker Cell Switches	5/31/88	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
 CP = Construction Permit

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D/DOEA/NRR
CERossi
06/14/88
*C/OGCB:DOEA:NRR
CHBerlinger
06/17/88

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