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AUTH.NAME AUTHOR AFFILIATION
DUVALL,D.D. Brown Boveri Corp. (subs. Brown Bouveri & Co.,Ltd.)
RECIP.NAME RECIPIENT AFFILIATION
STELLO,V. Director's Office, Office of Inspection and Enforcement

SUBJECT: Follow-up deficiency rept re dc ground in shunt trip coil circuit of 480-volt K600 circuit breaker.Caused by incorrect routing of wires.QC procedures are being revised.All circuit breakers will be spiral wrapped.

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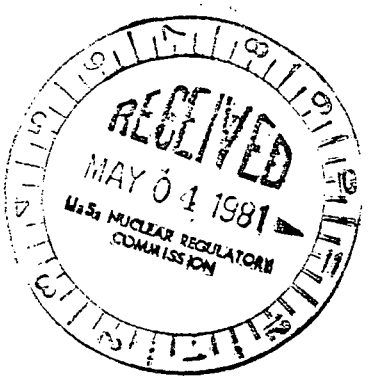
Brown Boveri Electric, Inc.

Manufacturer of I-T-E Electrical Power Equipment



April 28, 1981

Mr. Victor Stello, Jr.
Director,
Office of Inspection & Enforcement
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Stello:

This letter is a follow-up report to a 10CFR50.55(e) Report sent to the Director, Office of Inspection and Enforcement, Region V, by the Southern California Edison Company dated January 12, 1981.

During start-up testing at the San Onofre Nuclear Generating Station, Units 2 & 3, it was discovered that a DC ground existed in the shunt trip coil circuit of a 480V K600 circuit breaker.

Investigation revealed that the wire from the shunt trip runs near the racking gears, and that these gears apparently wore away the insulation on the wire causing the grounded condition.

In this case, grounding this wire resulted in an alarm on the ungrounded 125V DC battery system but did not affect circuit operation. However, if the conductor of the trip coil wire were to be cut through, it would result in a situation wherein the circuit breaker would not trip.

Normally the wires from the shunt trip device are connected into the main wiring harness and are protected by a plastic spiral wire wrap as they are routed by the gears of the racking mechanism. If the wire is not routed correctly, there is a possibility that it could be damaged by the gears of the racking mechanism.

A visual inspection of the wires from the shunt trip device in the area of the racking gears will determine if this problem exists. If the problem does exist, there is a simple solution to eliminate the wires touching the gear. The shunt trip wires may be tied with a plastic tie wrap to the side plate of the circuit breaker to eliminate any play in the wires and to keep them from coming in contact with the gear.

Just below the racking cam arm on the left side of the circuit breaker there are two holes in the side plate. In the same horizontal line there is a 15/32 inch hole and a 1 inch hole. The shunt trip wires must be placed between these two holes behind the side plate of the circuit breaker and fastened securely with a large eight (8) inch tie wrap strung between the two holes.

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Switchgear Systems Division
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This potential problem could exist in BBEL (ITE) K600 and KDON600 circuit breakers manufactured prior to May, 1981. The problem was caused by incorrect routing of some wires. The BBEL investigation of this problem to date indicates that the problem is not widespread, however, the inspection and recommended corrective action should be performed at the next scheduled maintenance period.

Quality Control Procedures are being revised to preclude a reoccurrence of this problem. All circuit breaker wires will be spiral wrapped to preclude any chance of the shunt trip wires touching the racking gears.

Other than the initial report of the problem that was determined during start-up testing at San Onofre, no other problems have been reported. It should also be noted that the report from San Onofre indicated that the insulation of the wire was damaged by the "teeth of the gear reducer on the charging spring motor". This report was not correct since the charging motor is a sealed unit and there are no exposed gears. The gear should have been defined as the racking mechanism gear.

BBEL has also advised that all personnel who are performing maintenance work on the circuit breakers, when a trip coil is replaced in the field, that it is important that the control wires be routed such that they are inside of the spiral wire wrap or tied to the side plate as recommended above.

If you require any additional details on this matter, please contact Mr. E. W. Rhoads at 215-628-7660.

D. D. DUVALL
Vice President & General Manager
Switchgear Systems Division

EWR/jm

cc: W. D. Breder
M. A. Franchi
W. E. Laubach
E. W. Rhoads
L. H. Schmidt
C. J. Village