



831 Power Building
TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

files
50-296

June 30, 1975

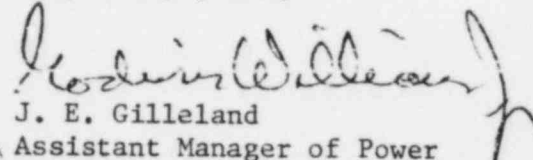
Mr. Donald F. Knuth, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Knuth:

BROWNS FERRY NUCLEAR PLANT UNIT 3 - REPORTABLE DEFICIENCY -
CORE SPRAY INBOARD INJECTION VALVE - IMPROPERLY WIRED MOTOR
BRAKE

Initial report of the subject reportable deficiency was made
to G. R. Klingler, NRC-IE, Region II, on May 29, 1975. In
compliance with paragraph 50.55(e) of 10 CFR Part 50,
we submit the enclosed final report of the deficiency.

Very truly yours,


J. E. Gilleland
Assistant Manager of Power

Enclosure

CC (Enclosure):

Mr. Norman C. Moseley, Director
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II - Suite 818
230 Peachtree Street, NW.
Atlanta, Georgia 30303

8308180168 750717
PDR ADOCK 05000296
S PDR

50514

ENCLOSURE
BROWNS FERRY NUCLEAR PLANT UNIT 3

IMPROPERLY WIRED MOTOR BRAKE
CORE SPRAY INBOARD INJECTION VALVE FCV-3-75-53
DDN 214

FINAL REPORT

On May 29, 1975, an initial report was made by telephone to NRC Region II Inspector G. R. Klinger by T. W. Barkalow, R. D. Bradley, and L. W. Elevins. The initial report was made in compliance with 10CFR50.55(e). This is the final report for this occurrence.

Description of Occurrence

While performing preoperational test G-12, core spray inboard injection valve FCV-3-75-53 locked in midstroke and would not move open or closed. It was then discovered that the valve brake solenoid was smoking heavily.

An inspection later that day revealed that the valve solenoid-operated brake wires had been improperly connected to the motor. The remaining core spray injection line valves (including those on Units 1 and 2) were examined. No deficiencies were found in the valves on Units 1 and 2. However, the other three valves on Unit 3 (FCV-3-75-23, -25, and -51) were also found to have solenoid wires improperly connected to the motor.

Cause of Deficiency

The valves were improperly connected by the manufacturer. Attached to this report are Figures 1 and 2. Figure 1 shows how valve FCV-3-75-53 was wired. It can be seen that the motor was wired for 480 volts, 3 phase, but the brake was connected with two "Y" connections in parallel (a 240-volt, 3-phase arrangement). Thus the brake was receiving 480 volts, 3 phase, on a 240-volt scheme.

Figure 2 shows how valve FCV-3-75-23, -25, and -51 were connected between the motor windings. This arrangement allowed too much current through the motor windings.

Safety Implications

The core spray system is one of the core standby cooling systems, thus making it a safety-related system. All of the brake solenoid circuits on the four core spray injection line valves of Unit 3 were found to be improperly connected. It is possible that all four could have suffered a common-mode failure during plant lifetime, if they had not been rewired. The core spray system has two loops with valves FCV-3-75-51 and -53 on one loop and valves FCV-3-75-23 and -25 on the other. Valves FCV-3-75-23 and -51 are normally open and valves FCV-3-75-25 and -53 are normally closed. If in the highly

unlikely event there was a common-mode failure and one valve in each loop failed in a closed position, the core spray system would be unavailable for emergency core cooling. However, the remaining equipment in the ECCS (RCIC and HPCI) would be available for this function.

Description of Corrective Action

The valves were rewired as shown in attached Figure 3. The solenoid on valve FCV-3-75-53 was checked carefully for damage and was found to be in satisfactory condition. All four valves were then tested and proven to perform as specified.

Means Taken to Prevent a Recurrence

The valves were supplied in 1970 by Walworth under a contract with General Electric. The valve operators were supplied to Walworth by Limitorque, a division of Philadelphia Gear Company. General Electric has been notified of the deficiencies and will contact Walworth's current owners on the matter.

No other valves of this type will be installed in Unit 3 since its construction is nearly finished.

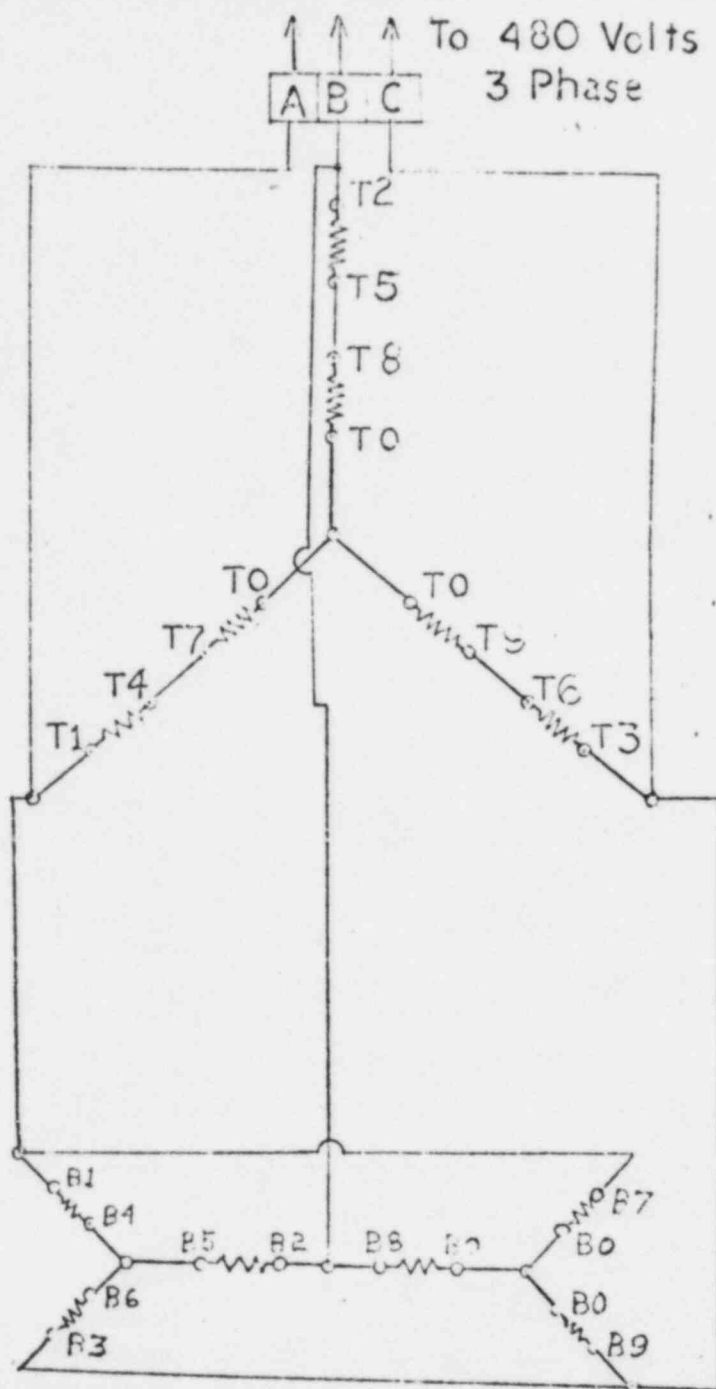


Figure 1

Wiring Diagram Showing FCV-3-75-53 Before Rewiring.
T0 Through T9 Mark Motor Connections. B0 Through B9
Mark Brake Connections

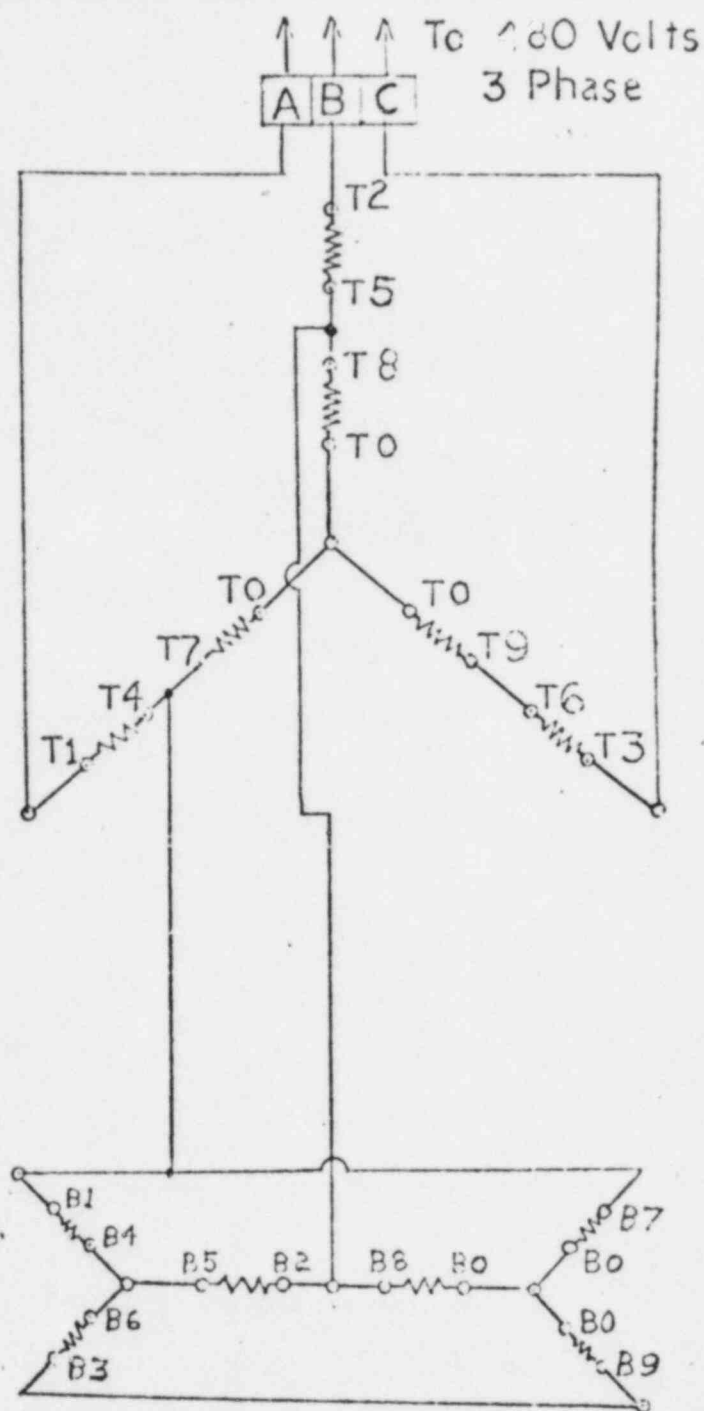


Figure 2

Wiring Diagram Showing FCV-3-75-23,-25,&-51 Before Rewiring. T0 Through T9 Mark Motor Connections. B0 Through B9 Mark Brake Connections.

SUBJECT DDN 214PROJECT BEND

COMPUTED BY

DATE

CHECKED BY

DATE

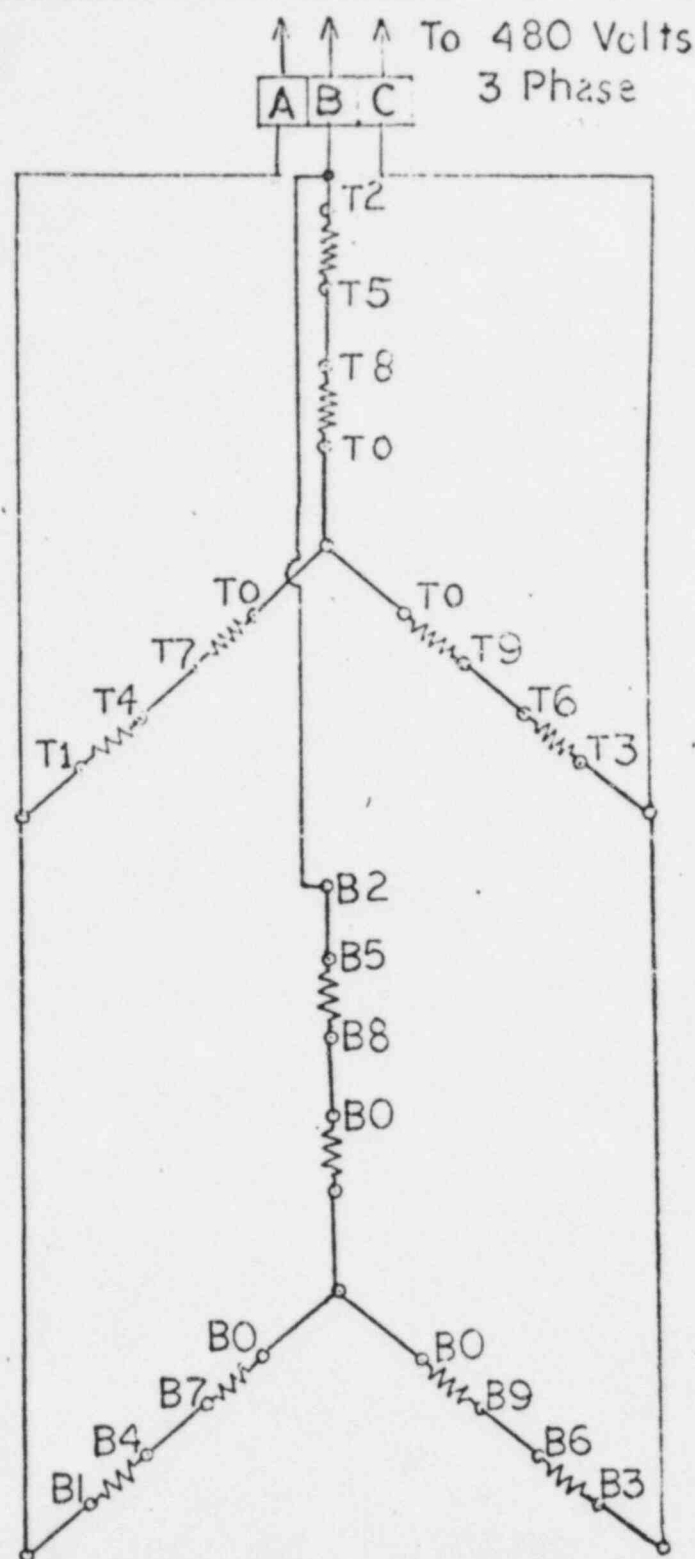


Figure 3

Wiring Diagram Showing FCV-3-75-23,-25,-51, &-53 After Rewiring. TO Through T9 Mark Motor Connections. B0 Through B9 Mark Brake Connections.