

MAINTENANCE PROCEDURE
FOR

UNDERVOLTAGE TRIPPING DEVICE OF THE GE AK-2-25 CIRCUIT BREAKERS
IN THE REACTOR TRIP SWITCHGEAR

SOUTHERN CALIFORNIA EDISON COMPANY

SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3

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1.0 OBJECTIVE

This procedure defines the maintenance actions required for the inspection, cleaning, adjustment and testing of the GE AK-2-25 Circuit Breaker, Undervoltage Tripping Device.

2.0 REFERENCES

2.1 BECHTEL DRAWINGS

- a) One Line Diagram, 480V Loadcenter 2B15, 30129 Rev. 5.
- b) One Line Diagram, 480V Loadcenter 2B16, 30130 Rev. 6.
- c) One Line Diagram, 125VDC Distribution Switchboard 2D1, 30173 Rev. 4.
- d) One Line Diagram, 125VDC Distribution Switchboard 2D2, 30174 Rev. 3.
- e) One Line Diagram, 125VDC Distribution Switchboard 2D3, 30175 Rev. 4.
- f) One Line Diagram, 125VDC Distribution Switchboard 2D4, 30176 Rev. 4.
- g) Wiring Diagram, Radwaste Building Trip Circuit Breaker Cabinet 2L033.

2.2 VENDOR DRAWINGS

Wiring Diagrams - Reactor Trip Circuit Breaker, Bechtel Spec. No. S023-944-33 through S023-944-41-3.

2.3 VENDOR DATA

- a) Instruction Manual - Combustion Engineering, Inc., Reactor Trip Circuit Breaker Switchgear, San Onofre, Bechtel Spec. No. S023-944-351-0
- b) Instruction Manual - (GEI-50299B - Power Circuit Breaker Instructions AK-2-25)
- c) Instruction Manual - (GEX-7302B - Installation and Operation of Type AK Low Voltage Circuit Breakers)
- d) Service Letter - (GE No. 175 (CPPD) 9.3)
- e) Drawing - (CE No. E-ICE-411-501-05 - Plant Protection System, Simplified)

3.0 PREREQUISITES

- 3.1 Notify the Control Operator and the cognizant System Engineer (Startup) and Startup QA/QC concerning the activity that will be performed.
- 3.2 Tools, test equipment and consumables listed in Exhibit B are available.

- 3.3 The Reactor Trip Switchgear and the 480V Motor-Generator supply breakers shall be isolated and tagged out in accordance with the approved plant clearance procedures.
- 3.4 Test equipment shall be undamaged within the calibration due date and shall have the proper calibration tag or sticker attached.
- 3.5 Test equipment used to check a circuit de-energized shall be verified operational by testing on a known energized voltage source.
- 3.6 Equipment operations, such as positioning of switches or circuit breakers as required in this procedure, are to be performed with the concurrence of SCE Operations. The maintenance person shall request the operation from the Control Operator.

4.0 PRECAUTIONS

- 4.1 When working on equipment, the Watch Engineer or his designee shall determine the need for and establish Safety Precautions in accordance with the SCE "Safety Rule Book".
- 4.2 This procedure requires the use of volatile solvents.
 - a) Ensure adequate ventilation, and
 - b) No smoking and no open flame.
- 4.3 Verify all the incoming feeder lines to the Reactor Trip Switchgear are de-energized.

5.0 CHECK-OFF LISTS

- 5.1 Maintenance Data Record Form, Exhibit H, and the Maintenance Activity Report (MAR) shall be used to record and document the following:
 - a) Data taken during this maintenance action.
 - b) Problems discovered during the performance of this maintenance action.

6.0 PROCEDURE

Problems noted shall be reported to the responsible Watch Engineer, or his designee, immediately.

The responsible Watch Engineer, or his designee, shall ensure that discrepancies found during these maintenance actions are properly documented (i.e., NCR, SPR, SWP, etc.).

Only the steps of this procedure that apply to the intended maintenance need be completed.

6.1 INITIAL TRIP TEST BY UNDERVOLTAGE DEVICE OF ALL TCB BREAKERS (FIG. 4, EXHIBIT F).

NOTE

Operate indication is by manual flag on front of breaker.

- 6.1.1 Verify breaker is in the "OPERATE" position and "CLOSED". Green Off/Red On.
 - 6.1.2 Verify D.C. Control Power is on. (2D1P103, 2D2P103, 2D3P101, 2D4P101, "CLOSED"). (Refer to Table 1, Exhibit G).
 - 6.1.3 Verify 2B1509 is "OPEN".
 - 6.1.4 Verify 2B1606 is "OPEN".
 - 6.1.5 Open 2D1P103 (Removes 125V DC Control Power Source #1) and verify TCB-1 and TCB-5 "OPEN". Green Off/Red Off.
 - 6.1.6 Close 2D1P103 and verify TCB-1 and TCB-5 "OPEN". Green On/Red Off.
 - 6.1.7 Open 2D2P103 (Removes 125V DC Control Power Source #2) and verify TCB-2 TCB-6, and TCB-9 "OPEN". (Tie-breaker) Green Off/Red Off.
 - 6.1.8 Close 2D2P103 and verify TCB-2, TCB-6, and TCB-9 "OPEN". Green On/Red Off.
 - 6.1.9 Open 2D3P101 (Removes 125V DC Control Power Source #3) and verify TCB-3 and TCB-7 "OPEN". Green Off/Red Off.
 - 6.1.10 Close 2D3P101 and verify TCB-3 and TCB-7 "OPEN". Green On/Red Off.
 - 6.1.11 Open 2D4P101 (Removes 125V DC Control Power Source #4) and verify TCB-4 and TCB-8 "OPEN". Green Off/Red Off.
 - 6.1.12 Close 2D4P101 and verify TCB-4 and TCB-8 "OPEN". Green On/Red Off.
- 6.2 CHECK THE UNDERVOLTAGE DEVICE FOR ARMATURE CLEARANCE. VERIFY ON EXHIBIT H, SHEETS 4 AND 5.

NOTE

Refer to Figure 1, Exhibit C and the Maintenance Data Record Sheets for location of parts and verification requirements.

- 6.2.1 Trip breaker using manual Trip Button on breaker.
- 6.2.2 Place or verify breaker in "TEST" position, Exhibit A.
- 6.2.3 Open appropriate 125V DC Control Power Switch (refer to Table 1, Exhibit G). Green Off/Red Off.
- 6.2.4 Loosen screws (Item 11 of Figure 1, Exhibit C).
- 6.2.5 Move magnet (Item 10 of Figure 1, Exhibit C) up or down to obtain proper armature (Item 3 of Figure 1, Exhibit C) freedom with respect to its pivot on magnet and guide provided by rivet (Item 13 of Figure 1, Exhibit C).
- 6.2.6 Retighten screws.
- 6.2.7 Repeat Section 6.2 for TCB's 2 through 9.
- 6.3 CHECK INSTANTANEOUS UNDERVOLTAGE PICK UP SETTING. VERIFY ON EXHIBIT H, SHEETS 5 THROUGH 9.
 - 6.3.1 Trip breaker using manual Trip Button on breaker.
 - 6.3.2 Place or verify breaker in "TEST" position, Exhibit A.
 - 6.3.3 Open appropriate 125V DC Control Power Switch (refer to Table 1, Exhibit G). Green Off/Red Off.
 - 6.3.4 Connect Variable DC Power Supply (100 to 130V DC) to Circuit Breaker Terminal C3 (Positive) and C2 (Negative).
 - 6.3.5 Remove locking wire (Item 15 of Figure 1, Exhibit C).
 - 6.3.6 Set Power Supply to 106V (+0.5V) DC measured across C3 and C2.
 - 6.3.7 Turn the adjusting screw (Item 14 of Figure 1, Exhibit C) clockwise to raise the pick-up to the desired setting.
 - 6.3.8 Reinstall the locking wire (Item 15 of Figure 1, Exhibit C).
 - 6.3.9 Disconnect the Variable Power Supply.
 - 6.3.10 Reinsert breaker to "OPERATE" position (Exhibit A).

- 6.3.11 Close appropriate 125V DC Control Power Switch from Table 1, Exhibit G. Green On/Red Off.
- 6.3.12 Repeat Section 6.3 for TCB's 2 through 9.
- 6.4 POSITIVE TRIP CHECK AND ADJUSTMENT. VERIFY ON EXHIBIT H, SHEETS 10 AND 11.
 - 6.4.1 Place breaker in "SAFETY STOP" Position (Refer to Exhibit A).
 - 6.4.2 Open and verify Control Power "OFF" (refer to Table 1, Exhibit G). Green Off/Red Off.
 - 6.4.3 Close breaker manually (Exhibit A) using maintenance handle while holding armature (Item 3 of Figure 1, Exhibit C) closed (i.e., in energized position).
 - 6.4.4 Place feeler gauge (0.03125" to 0.032") between armature arm and trip paddle arm.
 - 6.4.5 Slowly release armature arm until trip occurs. This assures minimum over-travel of undervoltage trip device.
 - 6.4.6 Adjust the clearance by turning Adjusting Screw (Item 20 of Figure 1, Exhibit C) and successively repeating steps 6.4.3 through 6.4.5.
 - 6.4.7 Repeat Section 6.4 for TCB's 2 through 9.
- 6.5 TRIP TORQUE VERIFICATION AND CLEANING. VERIFY ON EXHIBIT H, SHEETS 11 THROUGH 15.
 - 6.5.1 Trip Torque Measurement

NOTE

Refer to Figure 2, Exhibit D, and Maintenance Data Record Form for location of parts and verification requirements.

- 6.5.1.1 Trip breaker using manual Trip Button on breaker.
- 6.5.1.2 Place breaker in "TEST" position (refer to Exhibit A).
- 6.5.1.3 Open appropriate 125V DC Control Power Switch (refer to Table 1, Exhibit G) and verify Green Off/Red Off.
- 6.5.1.4 Attach the measuring fixture described in Figure 3, Exhibit E to the Trip Shaft (Item 8 of Figure 2).

- 6.5.1.5 Close breaker manually (refer to Exhibit A).
- 6.5.1.6 Trip breaker by rotating Trip Shaft with torque measuring fixture or suitable tool. Verify and record results on Maintenance Data Record Sheet. Should results indicate torque required to trip breaker is unacceptable (i.e., exceeds 1.5 in.-lbs.), proceed to step 6.5.2.
- 6.5.1.7 Repeat Section 6.5.1 for TCB's 2 through 9.
- 6.5.2 Cleaning Trip-Latch Surfaces
 - 6.5.2.1 Place breaker in "SAFETY-STOP" Position (refer to Exhibit A).
 - 6.5.2.2 Remove old, hardened, and excess grease and dirt using a safe solvent (Item 8, Exhibit B). Replace grease on sliding surfaces with light film of the grease listed in Item 5, Exhibit B. Latch surfaces should be left clean and dry (not lubricated). Sliding electrical contacts should have a light film of the lubricant grease listed in Item 6, Exhibit B.
 - 6.5.2.3 Check Trip-Shaft bearings and replace on any indication of loss of freedom or binding.
 - 6.5.2.4 Repeat steps 6.5.1.4 through 6.5.1.7. Should trip torque exceed 1.5 in.-lbs., replace entire Trip-Shaft assembly.
 - 6.5.2.5 Repeat Section 6.5.2 for TCB's 2 through 9.
- 6.6 CHECK TRIP LATCH ENGAGEMENT AND ADJUST. VERIFY ON EXHIBIT H, SHEETS 16 THROUGH 48.

NOTE

Check all TCB Breakers in the "OPERATE " Position, open and DC Control Power on,.

- 6.6.1 Trip Latch Check - TCB-1 (Figure 4, Exhibit F).
 - 6.6.1.1 Preparation
 - 6.6.1.1.1 Verify 2B1509 and 2B1606 "OPEN" (Table 1, Exhibit G).
 - 6.6.1.1.2 Verify TCB 1 is in "OPERATE" Position and in "TRIPPED" mode . Green On/Red Off.
 - 6.6.1.1.3 Open 2D1P103. Verify Green Off/Red Off.

NOTE

Also de-energizes TCB-5 Control Voltage.

- 6.6.1.1.4 Install test jumper between OTB1-9 and OTB1-10.
- 6.6.1.1.5 Install test jumper between OTB2-1 and OTB2-2.
- 6.6.1.1.6 Install "TEMPORARY" test switch (N.O. Momentary Contact Pushbutton) between OTB1-1 and OTB1-2.
- 6.6.1.1.7 Close 2D1P103, and verify. Green On/Red Off.
- 6.6.1.1.8 Close breaker by depressing "TEMPORARY" test switch, and verify. Green Off/Red On.
- 6.6.1.1.9 Verify breaker is closed.
- 6.6.1.1.10 Verify Auxiliary Switch contacts 3-3c "CLOSED" - (OTB4-2 and OTB4-3).
- 6.6.1.1.11 Verify Auxiliary Switch contacts 10-10c "OPEN" - (OTB5-1 and OTB5-2).
- 6.6.1.1.12 Verify Auxiliary Switch contacts 6-6c "OPEN" - (OTB5-7 and OTB5-8).
- 6.6.1.1.13 Verify Auxiliary Switch contacts 7-7c "CLOSED" - (OTB5-9 and OTB5-10).
- 6.6.1.1.14 Verify Auxiliary Switch contacts 8-8c "OPEN" - (OTB5-11 and OTB5-12).
- 6.6.1.1.15 Verify Auxiliary Switch contacts 5-5c "CLOSED" - (OTB4-7 and OTB4-8).
- 6.6.1.1.16 Verify Auxiliary Switch contacts 4-4c "OPEN" - (OTB4-1 and OTB4-3).
- 6.6.1.1.17 Verify Auxiliary Switch contacts 9-9c "CLOSED" - (OTB5-1 and OTB5-2).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.1.2 Trip test number (1) - Manual Trip Button on breaker.

- 6.6.1.2.1 Depress trip button on breaker front and verify. Green On/Red Off.
- 6.6.1.2.2 Verify Auxiliary Switch contacts 3-3c "OPEN" - (OTB4-2 and OTB4-3).
- 6.6.1.2.3 Verify Auxiliary Switch contacts 10-10c "CLOSED" - (OTB5-1 and OTB5-2).
- 6.6.1.2.4 Verify Auxiliary Switch contacts 6-6c "CLOSED" - (OTB5-7 and OTB5-8).
- 6.6.1.2.5 Verify Auxiliary Switch contacts 7-7c "OPEN" - (OTB5-9 and OTB5-10).
- 6.6.1.2.6 Verify Auxiliary Switch contacts 8-8c "CLOSED" - (OTB5-11 and OTB5-12).
- 6.6.1.2.7 Verify Auxiliary Switch contacts 5-5c "OPEN" - (OTB4-7 and OTB4-8).
- 6.6.1.2.8 Verify Auxiliary Switch contacts 4-4c "CLOSED" - (OTB4-1 and OTB4-3).
- 6.6.1.2.9 Verify Auxiliary Switch contacts 9-9c "OPEN" - (OTB5-1 and OTB5-2).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.1.2.10 Close breaker using the maintenance operating device and verify. Green Off/Red On.
- 6.6.1.2.11 Verify that breaker cannot be racked out.
- 6.6.1.3 Trip Test Number (2) - K Relay Remove Simulate
 - 6.6.1.3.1 Remove jumper between OTB1-9 and OTB1-10 (refer to step 6.6.1.1.4).
 - 6.6.1.3.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.1.3.3 Reinstall jumper between OTB1-9 and OTB1-10.
 - 6.6.1.3.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.

- 6.6.1.4 Trip Test Number (3) - MT Pushbutton Simulate.
 - 6.6.1.4.1 Remove jumper between OTB2-1 and OTB2-2 (refer to step 6.6.1.1.5).
 - 6.6.1.4.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.1.4.3 Reinstall jumper between OTB2-1 and OTB2-2.
 - 6.6.1.4.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.1.5 Trip Test Number (4) - Remote MT Pushbutton Simulate
 - 6.6.1.5.1 Momentarily jumper OTB2-3 and OTB2-4.
 - 6.6.1.5.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.1.5.3 Remove jumper completely from OTB2-3 and OTB2-4.
 - 6.6.1.5.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.1.6 Trip Test Number (5) - Remote K Relay Contact Simulate
 - 6.6.1.6.1 Momentarily jumper OTB1-3 and OTB1-4.
 - 6.6.1.6.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.1.6.3 Remove jumper completely from OTB1-3 and OTB1-4.
 - 6.6.1.6.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.1.7 Trip Test Number (6) - Emergency Trip Pushbutton
 - 6.6.1.7.1 Operate the "EMERGENCY TRIP" Pushbutton.
 - 6.6.1.7.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.1.7.3 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.1.8 Trip Test Number (7) - Local Test Trip and Close Pushbutton
 - 6.6.1.8.1 Place breaker in "TEST" Position (Exhibit A).
 - 6.6.1.8.2 Operate Test Trip Switch, and verify "OPEN". Green On/Red Off.

- 6.6.1.8.3 Operate Close Test Switch, and verify "CLOSED". Green Off/Red On.
- 6.6.1.8.4 Verify that breaker cannot be racked in.
- 6.6.1.8.5 Operate Test Trip Switch.
- 6.6.1.8.6 Verify breaker is "OPEN". Green On/Red Off.
- 6.6.1.8.7 Open 2D1P103 (also de-energizes TCB-5 Control Voltage). Verify Green Off.
- 6.6.1.8.8 Remove test jumper between OTB1-9 and OTB1-10.
- 6.6.1.8.9 Remove test jumper between OTB2-1 and OTB2-2.
- 6.6.1.8.10 Remove "TEMPORARY" test switch between OTB1-1 and OTB1-2.

NOTE

Should any Trip Test fail to operate the breaker proceed to step 6.6.10.

- 6.6.1.8.11 Reinsert breaker into "OPERATE" Position (Exhibit A).
- 6.6.2 Trip Latch Check - TCB-2 (Figure 4, Exhibit F). Verify on Exhibit H, Sheets 19 through 23.
 - 6.6.2.1 Preparation
 - 6.6.2.1.1 Verify 2B1509 and 2B1606 "OPEN" (Table 1, Exhibit G).
 - 6.6.2.1.2 Verify TCB 2 is in "OPERATE" Position and in "TRIPPED" mode . Green On/Red Off.
 - 6.6.2.1.3 Open 2D2P103. Verify Green Off/Red Off.

NOTE

Also de-energizes TCB-6 and TCB-9 Control Voltage.

- 6.6.2.1.4 Install test jumper between OTB10-9 and OTB10-10.
- 6.6.2.1.5 Install test jumper between OTB11-1 and OTB11-2.
- 6.6.2.1.6 Install "TEMPORARY" test switch (N.O. Momentary Contact Pushbutton) between OTB10-1 and OTB10-2.

- 6.6.2.1.7 Close 2D2P103, and verify. Green On/Red Off.
- 6.6.2.1.8 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.2.1.9 Verify breaker is closed.
- 6.6.2.1.10 Verify Auxiliary Switch contacts 3-3c "CLOSED" - (OTB13-2 and OTB13-3).
- 6.6.2.1.11 Verify Auxiliary Switch contacts 10-10c "OPEN" - (OTB14-1 and OTB14-2).
- 6.6.2.1.12 Verify Auxiliary Switch contacts 6-6c "OPEN" - (OTB14-7 and OTB14-8).
- 6.6.2.1.13 Verify Auxiliary Switch contacts 7-7c "CLOSED" - (OTB14-9 and OTB14-10).
- 6.6.2.1.14 Verify Auxiliary Switch contacts 8-8c "OPEN" - (OTB14-11 and OTB14-12).
- 6.6.2.1.15 Verify Auxiliary Switch contacts 5-5c "CLOSED" - (OTB13-7 and OTB13-8).
- 6.6.2.1.16 Verify Auxiliary Switch contacts 4-4c "OPEN" - (OTB13-1 and OTB13-3).
- 6.6.2.1.17 Verify Auxiliary Switch contacts 9-9c "CLOSED" - (OTB14-3 and OTB14-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.2.2 Trip test number (1) - Manual Trip Button on breaker.
- 6.6.2.2.1 Depress trip button on breaker front and verify. Green On/Red Off.
- 6.6.2.2.2 Verify Auxiliary Switch contacts 3-3c "OPEN" - (OTB13-2 and OTB13-3).
- 6.6.2.2.3 Verify Auxiliary Switch contacts 10-10c "CLOSED" - (OTB14-1 and OTB14-2).
- 6.6.2.2.4 Verify Auxiliary Switch contacts 6-6c "CLOSED" - (OTB14-7 and OTB14-8).

- 6.6.2.2.5 Verify Auxiliary Switch contacts 7-7c "OPEN" - (OTB14-9 and OTB14-10).
- 6.6.2.2.6 Verify Auxiliary Switch contacts 8-8c "CLOSED" - (OTB14-11 and OTB14-12).
- 6.6.2.2.7 Verify Auxiliary Switch contacts 5-5c "OPEN" - (OTB13-7 and OTB13-8).
- 6.6.2.2.8 Verify Auxiliary Switch contacts 4-4c "CLOSED" - (OTB13-1 and OTB13-3).
- 6.6.2.2.9 Verify Auxiliary Switch contacts 9-9c "OPEN" - (OTB14-3 and OTB14-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.2.2.10 Close breaker using the maintenance operating device and verify. Green Off/Red On.
- 6.6.2.2.11 Verify that breaker cannot be racked out.
- 6.6.2.3 Trip Test Number (2) - K Relay Simulate
 - 6.6.2.3.1 Remove jumper between OTB10-9 and OTB10-10 (refer to step 6.6.2.1.4).
 - 6.6.2.3.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.2.3.3 Reinstall jumper between OTB10-9 and OTB10-10.
 - 6.6.2.3.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.2.4 Trip Test Number (3) -MT Pushbutton Simulate.
 - 6.6.2.4.1 Remove jumper between OTB11-1 and OTB11-2 (refer to step 6.6.2.1.5).
 - 6.6.2.4.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.2.4.3 Reinstall jumper between OTB11-1 and OTB11-2.
 - 6.6.2.4.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.2.5 Trip Test Number (4) - Remote MT Pushbutton Simulate

- 6.6.2.5.1 Momentarily jumper OTB11-3 and OTB11-4.
- 6.6.2.5.2 Verify breaker "OPENS". Green On/Red Off.
- 6.6.2.5.3 Remove jumper completely from OTB11-3 and OTB11-4.
- 6.6.2.5.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.2.6 Trip Test Number (5) -- Remote K Relay Contact Simulate
- 6.6.2.6.1 Momentarily jumper OTB10-3 and OTB10-4.
- 6.6.2.6.2 Verify breaker "OPENS". Green On/Red Off.
- 6.6.2.6.3 Remove jumper completely from OTB10-3 and OTB10-4.
- 6.6.2.6.4 Close breaker by operating "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.2.7 Trip Test Number (6) - Emergency Trip Pushbutton
- 6.6.2.7.1 Operate the "EMERGENCY TRIP" Pushbutton.
- 6.6.2.7.2 Verify breaker "OPENS". Green On/Red Off.
- 6.6.2.7.3 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.2.8 Trip Test Number (7) - Local Test Trip and Close Pushbutton
- 6.6.2.8.1 Place breaker in "TEST" Position (Exhibit A).
- 6.6.2.8.2 Operate Test Trip Switch, and verify "OPEN". Green On/Red Off.
- 6.6.2.8.3 Operate Close Test Switch, and verify "CLOSED". Green Off/Red On.
- 6.6.2.8.4 Verify that breaker cannot be racked in.
- 6.6.2.8.5 Operate Test Trip Switch.
- 6.6.2.8.6 Verify breaker is "OPEN". Green On/Red Off.
- 6.6.2.8.7 Open 2D2P103 (also de-energizes TCB-6 and TCB-9 Control Voltage). Verify Green Off.
- 6.6.2.8.8 Remove test jumper between OTB10-9 and OTB10-10.

- 6.6.2.8.9 Remove test jumper between OTB11-1 and OTB11-2.
- 6.6.2.8.10 Remove "TEMPORARY" test switch between OTB10-1 and OTB10-2.

NOTE

Should any Trip Test fail to operate the breaker proceed to step 6.6.10.

- 6.6.2.8.11 Reinsert breaker into "OPERATE" Position (Exhibit A).
- 6.6.3 Trip Latch Check - TCB-3 (Figure 4, Exhibit F). Verify on Exhibit H, Sheets 23 through 26.

6.6.3.1 Preparation

- 6.6.3.1.1 Verify 2B1509 and 2B1606 "OPEN" (Table 1, Exhibit G).
- 6.6.3.1.2 Verify TCB-3 is in "OPERATE" Position and in "TRIPPED" mode . Green On/Red Off.
- 6.6.3.1.3 Open 2D3P103. Verify Green Off/Red Off.

NOTE

Also de-energizes TCB-7 Control Voltage.

- 6.6.3.1.4 Install test jumper between OTB22-9 and OTB22-10.
- 6.6.3.1.5 Install test jumper between OTB23-1 and OTB23-2.
- 6.6.3.1.6 Install "TEMPORARY" test switch (N.O. Momentary Contact Pushbutton) between OTB22-1 and OTB22-2.
- 6.6.3.1.7 Close 2D3P103, and verify. Green On/Red Off.
- 6.6.3.1.8 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.3.1.9 Verify breaker is closed.
- 6.6.3.1.10 Verify Auxiliary Switch contacts 3-3c "CLOSED" - (OTB25-2 and OTB25-3).
- 6.6.3.1.11 Verify Auxiliary Switch contacts 10-10c "OPEN" - (OTB26-1 and OTB26-2).
- 6.6.3.1.12 Verify Auxiliary Switch contacts 6-6c "OPEN" - (OTB26-7 and OTB26-8).

- 6.6.3.1.13 Verify Auxiliary Switch contacts 7-7c "CLOSED" - (OTB26-9 and OTB26-10).
- 6.6.3.1.14 Verify Auxiliary Switch contacts 8-8c "OPEN" - (OTB26-11 and OTB26-12).
- 6.6.3.1.15 Verify Auxiliary Switch contacts 5-5c "CLOSED" - (OTB25-7 and OTB25-8).
- 6.6.3.1.16 Verify Auxiliary Switch contacts 4-4c "OPEN" - (OTB25-1 and OTB25-3).
- 6.6.3.1.17 Verify Auxiliary Switch contacts 9-9c "CLOSED" - (OTB26-3 and OTB26-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.3.2 Trip test number (1) - Manual Trip Button on breaker.
- 6.6.3.2.1 Depress trip button on breaker front and verify.
Green On/Red Off.
- 6.6.3.2.2 Verify Auxiliary Switch contacts 3-3c "OPEN" - (OTB25-2 and OTB25-3).
- 6.6.3.2.3 Verify Auxiliary Switch contacts 10-10c "CLOSED" - (OTB26-1 and OTB26-2).
- 6.6.3.2.4 Verify Auxiliary Switch contacts 6-6c "CLOSED" - (OTB26-7 and OTB26-8).
- 6.6.3.2.5 Verify Auxiliary Switch contacts 7-7c "OPEN" - (OTB26-9 and OTB26-10).
- 6.6.3.2.6 Verify Auxiliary Switch contacts 8-8c "CLOSED" - (OTB26-11 and OTB26-12).
- 6.6.3.2.7 Verify Auxiliary Switch contacts 5-5c "OPEN" - (OTB25-7 and OTB25-8).
- 6.6.3.2.8 Verify Auxiliary Switch contacts 4-4c "CLOSED" - (OTB25-1 and OTB25-3).
- 6.6.3.2.9 Verify Auxiliary Switch contacts 9-9c "OPEN" - (OTB26-3 and OTB26-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.3.2.10 Close breaker using the maintenance operating device and verify. Green Off/Red On.
- 6.6.3.2.11 Verify that breaker cannot be racked out.
- 6.6.3.3 Trip Test Number (2) - K Relay Remote Simulate
 - 6.6.3.3.1 Remove jumper between OTB22-9 and OTB22-10 (refer to step 6.6.3.1.4).
 - 6.6.3.3.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.3.3.3 Reinstall jumper between OTB22-9 and OTB22-10.
 - 6.6.3.3.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.3.4 Trip Test Number (3) - MT Pushbutton Simulate.
 - 6.6.3.4.1 Remove jumper between OTB23-1 and OTB23-2 (refer to step 6.6.3.1.5).
 - 6.6.3.4.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.3.4.3 Reinstall jumper between OTB23-1 and OTB23-2.
 - 6.6.3.4.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.3.5 Trip Test Number (4) - Remote MT Pushbutton Simulate
 - 6.6.3.5.1 Momentarily jumper OTB23-3 and OTB23-4.
 - 6.6.3.5.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.3.5.3 Remove jumper completely from OTB23-3 and OTB23-4.
 - 6.6.3.5.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.3.6 Trip Test Number (5) - Remote K Relay Contact Simulate
 - 6.6.3.6.1 Momentarily jumper OTB22-3 and OTB22-4.
 - 6.6.3.6.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.3.6.3 Remove jumper completely from OTB22-3 and OTB22-4.
 - 6.6.3.6.4 Close breaker by operating "TEMPORARY" test switch and verify. Green Off/Red On.

- 6.6.3.7 Trip Test Number (6) - Emergency Trip Pushbutton
 - 6.6.3.7.1 Operate the "EMERGENCY TRIP" Pushbutton.
 - 6.6.3.7.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.3.7.3 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.3.8 Trip Test Number (7) - Local Test Trip and Close Pushbutton
 - 6.6.3.8.1 Place breaker in "TEST" Position (Exhibit A).
 - 6.6.3.8.2 Operate Test Trip Switch, and verify "OPEN". Green On/Red Off.
 - 6.6.3.8.3 Operate Close Test Switch, and verify "CLOSED". Green Off/Red On.
 - 6.6.3.8.4 Verify that breaker cannot be racked in.
 - 6.6.3.8.5 Operate Test Trip Switch.
 - 6.6.3.8.6 Verify breaker is "OPEN". Green On/Red Off.
 - 6.6.3.8.7 Open 2D3P101 (also de-energizes TCB-7 Control Voltage). Verify Green Off.
 - 6.6.3.8.8 Remove test jumper between OTB22-9 and OTB22-10.
 - 6.6.3.8.9 Remove test jumper between OTB23-1 and OTB23-2.
 - 6.6.3.8.10 Remove "TEMPORARY" test switch between OTB22-1 and OTB22-2.

NOTE

Should any Trip Test fail to operate the breaker proceed to step 6.6.10.

- 6.6.3.8.11 Reinsert breaker into "OPERATE" Position (Exhibit A).
- 6.6.4 Trip Latch Check - TCB-4. Verify on Exhibit H, Sheets 26 through 30
 - 6.6.4.1 Preparation
 - 6.6.4.1.1 Verify 2B1509 and 2B1606 "OPEN" (Table 1, Exhibit G).
 - 6.6.4.1.2 Verify TCB-4 is in "OPERATE" Position and in "TRIPPED" mode. Green On/Red Off.

6.6.4.1.3 Open 2D4P101. Verify Green Off/Red Off.

NOTE

Also de-energizes TCB-8 Control Voltage.

6.6.4.1.4 Install test jumper between OTB31-9 and OTB31-10.

6.6.4.1.5 Install test jumper between OTB32-1 and OTB32-2.

6.6.4.1.6 Install "TEMPORARY" test switch (N.O. Momentary Contact Pushbutton) between OTB31-1 and OTB31-2.

6.6.4.1.7 Close 2D4P101, and verify. Green On/Red Off.

6.6.4.1.8 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.

6.6.4.1.9 Verify breaker is closed.

6.6.4.1.10 Verify Auxiliary Switch contacts 3-3c "CLOSED" - (OTB34-2 and OTB34-3).

6.6.4.1.11 Verify Auxiliary Switch contacts 10-10c "OPEN" - (OTB35-1 and OTB35-2).

6.6.4.1.12 Verify Auxiliary Switch contacts 6-6c "OPEN" - (OTB35-7 and OTB35-8).

6.6.4.1.13 Verify Auxiliary Switch contacts 7-7c "CLOSED" - (OTB35-9 and OTB35-10).

6.6.4.1.14 Verify Auxiliary Switch contacts 8-8c "OPEN" - (OTB35-11 and OTB35-12).

6.6.4.1.15 Verify Auxiliary Switch contacts 5-5c "CLOSED" - (OTB34-7 and OTB34-8).

6.6.4.1.16 Verify Auxiliary Switch contacts 4-4c "OPEN" - (OTB34-1 and OTB34-3).

6.6.4.1.17 Verify Auxiliary Switch contacts 9-9c "CLOSED" - (OTB35-3 and OTB35-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

6.6.4.2 Trip test number (1) - Manual Trip Button on breaker.

- 6.6.4.2.1 Depress trip button on breaker front and verify. Green On/Red Off.
- 6.6.4.2.2 Verify Auxiliary Switch contacts 3-3c "OPEN" - (OTB34-2 and OTB34-3).
- 6.6.4.2.3 Verify Auxiliary Switch contacts 10-10c "CLOSED" - (OTB35-1 and OTB35-2).
- 6.6.4.2.4 Verify Auxiliary Switch contacts 6-6c "CLOSED" - (OTB35-7 and OTB35-8).
- 6.6.4.2.5 Verify Auxiliary Switch contacts 7-7c "OPEN" - (OTB35-9 and OTB35-10).
- 6.6.4.2.6 Verify Auxiliary Switch contacts 8-8c "CLOSED" - (OTB35-11 and OTB35-12).
- 6.6.4.2.7 Verify Auxiliary Switch contacts 5-5c "OPEN" - (OTB34-7 and OTB34-8).
- 6.6.4.2.8 Verify Auxiliary Switch contacts 4-4c "CLOSED" - (OTB34-1 and OTB34-3).
- 6.6.4.2.9 Verify Auxiliary Switch contacts 9-9c "OPEN" - (OTB35-3 and OTB35-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.4.2.10 Close breaker using the maintenance operating device and verify. Green Off/Red On.
- 6.6.4.2.11 Verify that breaker cannot be racked out.
- 6.6.4.3 Trip Test Number (2) - K Relay Remote Simulate
 - 6.6.4.3.1 Remove jumper between OTB31-9 and OTB31-10 (refer to step 6.6.4.1.4).
 - 6.6.4.3.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.4.3.3 Reinstall jumper between OTB31-9 and OTB31-10.
 - 6.6.4.3.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.4.4 Trip Test Number (3) -MT Pushbutton Simulate.

- 6.6.4.4.1 Remove jumper between OTB32-1 and OTB32-2 (refer to step 6.6.4.1.5).
- 6.6.4.4.2 Verify breaker "OPENS". Green On/Red Off.
- 6.6.4.4.3 Reinstall jumper between OTB32-1 and OTB32-2.
- 6.6.4.4.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.4.5 Trip Test Number (4) - Remote MT Pushbutton Simulate
 - 6.6.4.5.1 Momentarily jumper OTB32-3 and OTB32-4.
 - 6.6.4.5.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.4.5.3 Remove jumper completely from OTB32-3 and OTB32-4.
 - 6.6.4.5.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.4.6 Trip Test Number (5) - Remote K Relay Contact Simulate
 - 6.6.4.6.1 Momentarily jumper OTB31-3 and OTB31-4.
 - 6.6.4.6.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.4.6.3 Remove jumper completely from OTB31-3 and OTB31-4.
 - 6.6.4.6.4 Close breaker by operating "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.4.7 Trip Test Number (6) - Emergency Trip Pushbutton
 - 6.6.4.7.1 Operate the "EMERGENCY TRIP" Pushbutton.
 - 6.6.4.7.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.4.7.3 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.4.8 Trip Test Number (7) - Local Test Trip and Close Pushbutton
 - 6.6.4.8.1 Place breaker in "TEST" Position (Exhibit A).
 - 6.6.4.8.2 Operate Test Trip Switch, and verify "OPEN". Green On/Red Off.
 - 6.6.4.8.3 Operate Close Test Switch, and verify "CLOSED". Green Off/Red On.

- 6.6.4.8.4 Verify that breaker cannot be racked in.
- 6.6.4.8.5 Operate Test Trip Switch.
- 6.6.4.8.6 Verify breaker is "OPEN". Green On/Red Off.
- 6.6.4.8.7 Open 2D4P101 (also de-energizes TCB-8 Control Voltage). Verify Green Off.
- 6.6.4.8.8 Remove test jumper between OTB31-9 and OTB31-10.
- 6.6.4.8.9 Remove test jumper between OTB32-1 and OTB32-2.
- 6.6.4.8.10 Remove "TEMPORARY" test switch between OTB31-1 and OTB31-2.

NOTE

Should any Trip Test fail to operate the breaker proceed to step 6.6.10.

- 6.6.4.8.11 Reinsert breaker into "OPERATE" Position (Exhibit A).
- 6.6.5 Trip Latch Check - TCB-5 (Figure 4, Exhibit F). Verify on Exhibit H, Sheets 26 through 30.

6.6.5.1 Preparation

- 6.6.5.1.1 Verify 2B1509 and 2B1606 "OPEN" (Table 1, Exhibit G).
- 6.6.5.1.2 Verify TCB-5 is in "OPERATE" Position and in "TRIPPED" mode. Green On/Red Off.
- 6.6.5.1.3 Open 2D1P103. Verify Green Off/Red Off.

NOTE

Also de-energizes TCB-1 Control Voltage.

- 6.6.5.1.4 Install test jumper between OTB31-9 and OTB31-10.
- 6.6.5.1.5 Install test jumper between OTB32-1 and OTB32-2.
- 6.6.5.1.6 Install "TEMPORARY" test switch (N.O. Momentary Contact Pushbutton) between OTB3-1 and OTB3-2.
- 6.6.5.1.7 Close 2D1P103, and verify. Green On/Red Off.
- 6.6.5.1.8 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.

- 6.6.5.1.9 Verify breaker is closed.
- 6.6.5.1.10 Verify Auxiliary Switch contacts 3-3c "CLOSED" - (OTB4-5 and OTB4-6).
- 6.6.5.1.11 Verify Auxiliary Switch contacts 10-10c "OPEN" - (OTB8-1 and OTB8-2).
- 6.6.5.1.12 Verify Auxiliary Switch contacts 6-6c "OPEN" - (OTB8-7 and OTB8-8).
- 6.6.5.1.13 Verify Auxiliary Switch contacts 7-7c "CLOSED" - (OTB8-9 and OTB8-10).
- 6.6.5.1.14 Verify Auxiliary Switch contacts 8-8c "OPEN" - (OTB8-11 and OTB8-12).
- 6.6.5.1.15 Verify Auxiliary Switch contacts 5-5c "CLOSED" - (OTB4-9 and OTB4-10).
- 6.6.5.1.16 Verify Auxiliary Switch contacts 4-4c "OPEN" - (OTB4-4 and OTB4-6).
- 6.6.5.1.17 Verify Auxiliary Switch contacts 9-9c "CLOSED" - (OTB8-1 and OTB8-2).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.5.2 Trip test number (1) - Manual Trip Button on breaker.
 - 6.6.5.2.1 Depress trip button on breaker front and verify.
Green On/Red Off.
 - 6.6.5.2.2 Verify Auxiliary Switch contacts 3-3c "OPEN" - (OTB4-5 and OTB4-6).
 - 6.6.5.2.3 Verify Auxiliary Switch contacts 10-10c "CLOSED" - (OTB8-1 and OTB8-2).
 - 6.6.5.2.4 Verify Auxiliary Switch contacts 6-6c "CLOSED" - (OTB8-7 and OTB8-8).
 - 6.6.5.2.5 Verify Auxiliary Switch contacts 7-7c "OPEN" - (OTB8-9 and OTB8-10).
 - 6.6.5.2.6 Verify Auxiliary Switch contacts 8-8c "CLOSED" - (OTB8-11 and OTB8-12).

- 6.6.5.2.7 Verify Auxiliary Switch contacts 5-5c "OPEN" - (OTB4-9 and OTB4-10).
- 6.6.5.2.8 Verify Auxiliary Switch contacts 4-4c "CLOSED" - (OTB4-4 and OTB4-6).
- 6.6.5.2.9 Verify Auxiliary Switch contacts 9-9c "OPEN" - (OTB8-1 and OTB8-2).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.5.2.10 Close breaker using the maintenance operating device and verify. Green Off/Red On.
- 6.6.5.2.11 Verify that breaker cannot be racked out.
- 6.6.5.3 Trip Test Number (2) - K Relay Remote Simulate
 - 6.6.5.3.1 Remove jumper between OTB31-9 and OTB31-10 (refer to step 6.6.5.1.4).
 - 6.6.5.3.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.5.3.3 Reinstall jumper between OTB31-9 and OTB31-10.
 - 6.6.5.3.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.5.4 Trip Test Number (3) -MT Pushbutton Simulate.
 - 6.6.5.4.1 Remove jumper between OTB32-1 and OTB32-2 (refer to step 6.6.5.1.5).
 - 6.6.5.4.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.5.4.3 Reinstall jumper between OTB32-1 and OTB32-2.
 - 6.6.5.4.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.5.5 Trip Test Number (4) - Remote MT Pushbutton Simulate
 - 6.6.5.5.1 Momentarily jumper OTB2-9 and OTB2-10.
 - 6.6.5.5.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.5.5.3 Remove jumper completely from OTB2-9 and OTB2-10).

- 6.6.5.5.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.5.6 Trip Test Number (5) - Remote K Relay Contact Simulate
 - 6.6.5.6.1 Momentarily jumper OTB3-3 and OTB3-4.
 - 6.6.5.6.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.5.6.3 Remove jumper completely from OTB3-3 and OTB3-4.
 - 6.6.5.6.4 Close breaker by operating "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.5.7 Trip Test Number (6) - Emergency Trip Pushbutton
 - 6.6.5.7.1 Operate the "EMERGENCY TRIP" Pushbutton.
 - 6.6.5.7.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.5.7.3 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.5.8 Trip Test Number (7) - Local Test Trip and Close Pushbutton
 - 6.6.5.8.1 Place breaker in "TEST" Position (Exhibit A).
 - 6.6.5.8.2 Operate Test Trip Switch, and verify "OPEN". Green On/Red Off.
 - 6.6.5.8.3 Operate Close Test Switch, and verify "CLOSED". Green Off/Red On.
 - 6.6.5.8.4 Verify that breaker cannot be racked in.
 - 6.6.5.8.5 Operate Test Trip Switch.
 - 6.6.5.8.6 Verify breaker is "OPEN". Green On/Red Off.
 - 6.6.5.8.7 Open 2DIP103 (also de-energizes TCB-1 Control Voltage). Verify Green Off.
 - 6.6.5.8.8 Remove test jumper between OTB31-9 and OTB31-10.
 - 6.6.5.8.9 Remove test jumper between OTB32-1 and OTB32-2.
 - 6.6.5.8.10 Remove "TEMPORARY" test switch between OTB3-1 and OTB3-2.

NOTE

Should any Trip Test fail to operate the breaker proceed to step 6.6.10.

6.6.5.8.11 Reinsert breaker into "OPERATE" Position (Exhibit A).

6.6.6 Trip Latch Check - TCB-6. Verify on Exhibit H, Sheets 33 through 36.

6.6.6.1 Preparation

6.6.6.1.1 Verify 2B1509 and 2B1606 "OPEN" (Table 1, Exhibit G).

6.6.6.1.2 Verify TCB-6 is in "OPERATE" Position and in "TRIPPED" mode . Green On/Red Off.

6.6.6.1.3 Open 2D2P103. Verify Green Off/Red Off.

NOTE

Also de-energizes TCB-2 and TCB-9 Control Voltage.

6.6.6.1.4 Install test jumper between OTB12-9 and OTB12-10.

6.6.6.1.5 Install test jumper between OTB11-7 and OTB11-8.

6.6.6.1.6 Install "TEMPORARY" test switch (N.O. Momentary Contact Pushbutton) between OTB12-1 and OTB12-2.

6.6.6.1.7 Close 2D2P103, and verify. Green On/Red Off.

6.6.6.1.8 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.

6.6.6.1.9 Verify breaker is closed.

6.6.6.1.10 Verify Auxiliary Switch contacts 3-3c "CLOSED" - (OTB13-5 and OTB13-6).

6.6.6.1.11 Verify Auxiliary Switch contacts 10-10c "OPEN" - (OTB17-1 and OTB17-2).

6.6.6.1.12 Verify Auxiliary Switch contacts 6-6c "OPEN" - (OTB17-7 and OTB17-8).

6.6.6.1.13 Verify Auxiliary Switch contacts 7-7c "CLOSED" - (OTB17-9 and OTB17-10).

6.6.6.1.14 Verify Auxiliary Switch contacts 8-8c "OPEN" - (OTB17-11 and OTB17-12).

- 6.6.6.1.15 Verify Auxiliary Switch contacts 5-5c "CLOSED" - (OTB13-9 and OTB13-10).
- 6.6.6.1.16 Verify Auxiliary Switch contacts 4-4c "OPEN" - (OTB13-4 and OTB13-6).
- 6.6.6.1.17 Verify Auxiliary Switch contacts 9-9c "CLOSED" - (OTB17-3 and OTB17-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.6.2 Trip test number (1) - Manual Trip Button on breaker.
- 6.6.6.2.1 Depress trip button on breaker front and verify. Green On/Red Off.
- 6.6.6.2.2 Verify Auxiliary Switch contacts 3-3c "OPEN" - (OTB13-5 and OTB13-6).
- 6.6.6.2.3 Verify Auxiliary Switch contacts 10-10c "CLOSED" - (OTB17-1 and OTB17-2).
- 6.6.6.2.4 Verify Auxiliary Switch contacts 6-6c "CLOSED" - (OTB17-7 and OTB17-8).
- 6.6.6.2.5 Verify Auxiliary Switch contacts 7-7c "OPEN" - (OTB17-9 and OTB17-10).
- 6.6.6.2.6 Verify Auxiliary Switch contacts 8-8c "CLOSED" - (OTB17-11 and OTB17-12).
- 6.6.6.2.7 Verify Auxiliary Switch contacts 5-5c "OPEN" - (OTB13-9 and OTB13-10).
- 6.6.6.2.8 Verify Auxiliary Switch contacts 4-4c "CLOSED" - (OTB13-4 and OTB13-6).
- 6.6.6.2.9 Verify Auxiliary Switch contacts 9-9c "OPEN" - (OTB17-3 and OTB17-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.6.2.10 Close breaker using the maintenance operating device and verify. Green Off/Red On.
- 6.6.6.2.11 Verify that breaker cannot be racked out.

- 6.6.6.3 Trip Test Number (2) - K Relay Remote Simulate
 - 6.6.6.3.1 Remove jumper between OTB12-9 and OTB12-10 (refer to step 6.6.6.1.4).
 - 6.6.6.3.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.6.3.3 Reinstall jumper between OTB12-9 and OTB12-10.
 - 6.6.6.3.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.6.4 Trip Test Number (3) - MT Pushbutton Simulate.
 - 6.6.6.4.1 Remove jumper between OTB11-7 and OTB11-8 (refer to step 6.6.6.1.5).
 - 6.6.6.4.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.6.4.3 Reinstall jumper between OTB11-7 and OTB11-8.
 - 6.6.6.4.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.6.5 Trip Test Number (4) - Remote MT Pushbutton Simulate
 - 6.6.6.5.1 Momentarily jumper OTB11-9 and OTB11-10.
 - 6.6.6.5.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.6.5.3 Remove jumper completely from OTB11-9 and OTB11-10).
 - 6.6.6.5.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.6.6 Trip Test Number (5) - Remote K Relay Contact Simulate
 - 6.6.6.6.1 Momentarily jumper OTB12-3 and OTB12-4.
 - 6.6.6.6.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.6.6.3 Remove jumper completely from OTB12-3 and OTB12-4.
 - 6.6.6.6.4 Close breaker by operating "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.6.7 Trip Test Number (6) - Emergency Trip Pushbutton
 - 6.6.6.7.1 Operate the "EMERGENCY TRIP" Pushbutton.
 - 6.6.6.7.2 Verify breaker "OPENS". Green On/Red Off.

- 6.6.6.7.3 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.6.8 Trip Test Number (7) - Local Test Trip and Close Pushbutton
 - 6.6.6.8.1 Place breaker in "TEST" Position (Exhibit A).
 - 6.6.6.8.2 Operate Test Trip Switch, and verify "OPEN". Green On/Red Off.
 - 6.6.6.8.3 Operate Close Test Switch, and verify "CLOSED". Green Off/Red On.
 - 6.6.6.8.4 Verify that breaker cannot be racked in.
 - 6.6.6.8.5 Operate Test Trip Switch.
 - 6.6.6.8.6 Verify breaker is "OPEN". Green On/Red Off.
 - 6.6.6.8.7 Open 2D2P103 (also de-energizes TCB-2 and TCB-9 Control Voltage). Verify Green Off.
 - 6.6.6.8.8 Remove test jumper between OTB12-9 and OTB12-10.
 - 6.6.6.8.9 Remove test jumper between OTB11-7 and OTB11-8.
 - 6.6.6.8.10 Remove "TEMPORARY" test switch between OTB12-1 and OTB12-2.

NOTE

Should any Trip Test fail to operate the breaker proceed to step 6.6.10.

- 6.6.6.8.11 Reinsert breaker into "OPERATE" Position (Exhibit A).
- 6.6.7 Trip Latch Check - TCB-7. Verify on Exhibit H, Sheets 36 through 40.
 - 6.6.7.1 Preparation
 - 6.6.7.1.1 Verify 2B1509 and 2B1606 "OPEN" (Table 1, Exhibit G).
 - 6.6.7.1.2 Verify TCB-7 is in "OPERATE" Position and in "TRIPPED" mode. Green On/Red Off.
 - 6.6.7.1.3 Open 2D3P101. Verify Green Off/Red Off.

NOTE

Also de-energizes TCB-3 Control Voltage.

- 6.6.7.1.4 Install test jumper between OTB24-9 and OTB24-10.
- 6.6.7.1.5 Install test jumper between OTB23-7 and OTB23-8.
- 6.6.7.1.6 Install "TEMPORARY" test switch (N.O. Momentary Contact Pushbutton) between OTB24-1 and OTB24-2.
- 6.6.7.1.7 Close 2D3P101, and verify. Green On/Red Off.
- 6.6.7.1.8 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.7.1.9 Verify breaker is closed.
- 6.6.7.1.10 Verify Auxiliary Switch contacts 3-3c "CLOSED" - (OTB24-5 and OTB24-6).
- 6.6.7.1.11 Verify Auxiliary Switch contacts 10-10c "OPEN" - (OTB29-1 and OTB29-2).
- 6.6.7.1.12 Verify Auxiliary Switch contacts 6-6c "OPEN" - (OTB29-7 and OTB29-8).
- 6.6.7.1.13 Verify Auxiliary Switch contacts 7-7c "CLOSED" - (OTB29-9 and OTB29-10).
- 6.6.7.1.14 Verify Auxiliary Switch contacts 8-8c "OPEN" - (OTB29-11 and OTB29-12).
- 6.6.7.1.15 Verify Auxiliary Switch contacts 5-5c "CLOSED" - (OTB25-9 and OTB25-10).
- 6.6.7.1.16 Verify Auxiliary Switch contacts 4-4c "OPEN" - (OTB25-4 and OTB25-6).
- 6.6.7.1.17 Verify Auxiliary Switch contacts 9-9c "CLOSED" - (OTB29-3 and OTB29-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.7.2 Trip test number (1) - Manual Trip Button on breaker.
- 6.6.7.2.1 Depress trip button on breaker front and verify. Green On/Red Off.
- 6.6.7.2.2 Verify Auxiliary Switch contacts 3-3c "OPEN" - (OTB24-5 and OTB24-6).

- 6.6.7.2.3 Verify Auxiliary Switch contacts 10-10c "CLOSED" - (OTB29-1 and OTB29-2).
- 6.6.7.2.4 Verify Auxiliary Switch contacts 6-6c "CLOSED" - (OTB29-7 and OTB29-8).
- 6.6.7.2.5 Verify Auxiliary Switch contacts 7-7c "OPEN" - (OTB29-9 and OTB29-10).
- 6.6.7.2.6 Verify Auxiliary Switch contacts 8-8c "CLOSED" - (OTB29-11 and OTB29-12).
- 6.6.7.2.7 Verify Auxiliary Switch contacts 5-5c "OPEN" - (OTB25-9 and OTB25-10).
- 6.6.7.2.8 Verify Auxiliary Switch contacts 4-4c "CLOSED" - (OTB25-4 and OTB25-6).
- 6.6.7.2.9 Verify Auxiliary Switch contacts 9-9c "OPEN" - (OTB29-3 and OTB29-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.7.2.10 Close breaker using the maintenance operating device and verify. Green Off/Red On.
- 6.6.7.2.11 Verify that breaker cannot be racked out.
- 6.6.7.3 Trip Test Number (2) - K Relay Remote Simulate
 - 6.6.7.3.1 Remove jumper between OTB24-9 and OTB24-10 (refer to step 6.6.7.1.4).
 - 6.6.7.3.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.7.3.3 Reinstall jumper between OTB24-9 and OTB24-10.
 - 6.6.7.3.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.7.4 Trip Test Number (3) -MT Pushbutton Simulate.
 - 6.6.7.4.1 Remove jumper between OTB23-7 and OTB23-8 (refer to step 6.6.7.1.5).
 - 6.6.7.4.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.7.4.3 Reinstall jumper between OTB23-7 and OTB23-8.

- 6.6.7.4.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.7.5 Trip Test Number (4) - Remote MT Pushbutton Simulate
 - 6.6.7.5.1 Momentarily jumper OTB23-9 and OTB23-10.
 - 6.6.7.5.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.7.5.3 Remove jumper completely from OTB23-9 and OTB23-10).
 - 6.6.7.5.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.7.6 Trip Test Number (5) - Remote K Relay Contact Simulate
 - 6.6.7.6.1 Momentarily jumper OTB24-3 and OTB24-4.
 - 6.6.7.6.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.7.6.3 Remove jumper completely from OTB24-3 and OTB24-4.
 - 6.6.7.6.4 Close breaker by operating "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.7.7 Trip Test Number (6) - Emergency Trip Pushbutton
 - 6.6.7.7.1 Operate the "EMERGENCY TRIP" Pushbutton.
 - 6.6.7.7.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.7.7.3 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.7.8 Trip Test Number (7) - Local Test Trip and Close Pushbutton
 - 6.6.7.8.1 Place breaker in "TEST" Position (Exhibit A).
 - 6.6.7.8.2 Operate Test Trip Switch, and verify "OPEN". Green On/Red Off.
 - 6.6.7.8.3 Operate Close Test Switch, and verify "CLOSED". Green Off/Red On.
 - 6.6.7.8.4 Verify that breaker cannot be racked in.
 - 6.6.7.8.5 Operate Test Trip Switch.
 - 6.6.7.8.6 Verify breaker is "OPEN". Green On/Red Off.
 - 6.6.7.8.7 Open 2D3P101 (also de-energizes TCB-3 Control Voltage). Verify Green Off.

- 6.6.7.8.8 Remove test jumper between OTB24-9 and OTB24-10.
- 6.6.7.8.9 Remove test jumper between OTB23-7 and OTB23-8.
- 6.6.7.8.10 Remove "TEMPORARY" test switch between OTB24-1 and OTB24-2.

NOTE

Should any Trip Test fail to operate the breaker proceed to step 6.6.10.

- 6.6.7.8.11 Reinsert breaker into "OPERATE" Position (Exhibit A).
- 6.6.8 Trip Latch Check - TCB-8. Verify on Exhibit H, Sheets 40 through 44.

6.6.8.1 Preparation

- 6.6.8.1.1 Verify 2B1509 and 2B1606 "OPEN" (Table 1, Exhibit G).
- 6.6.8.1.2 Verify TCB-8 is in "OPERATE" Position and in "TRIPPED" mode . Green On/Red Off.
- 6.6.8.1.3 Open 2D4P101. Verify Green Off/Red Off.

NOTE

Also de-energizes TCB-4 Control Voltage.

- 6.6.8.1.4 Install test jumper between OTB33-9 and OTB33-10.
- 6.6.8.1.5 Install test jumper between OTB32-7 and OTB32-8.
- 6.6.8.1.6 Install "TEMPORARY" test switch (N.O. Momentary Contact Pushbutton) between OTB33-1 and OTB33-2.
- 6.6.8.1.7 Close 2D4P101, and verify. Green On/Red Off.
- 6.6.8.1.8 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.8.1.9 Verify breaker is closed.
- 6.6.8.1.10 Verify Auxiliary Switch contacts 3-3c "CLOSED" - (OTB34-5 and OTB34-6).
- 6.6.8.1.11 Verify Auxiliary Switch contacts 10-10c "OPEN" - (OTB38-1 and OTB38-2).
- 6.6.8.1.12 Verify Auxiliary Switch contacts 6-6c "OPEN" - (OTB38-7 and OTB38-8).

- 6.6.8.1.13 Verify Auxiliary Switch contacts 7-7c "CLOSED" - (OTB38-9 and OTB38-10).
- 6.6.8.1.14 Verify Auxiliary Switch contacts 8-8c "OPEN" - (OTB38-11 and OTB38-12).
- 6.6.8.1.15 Verify Auxiliary Switch contacts 5-5c "CLOSED" - (OTB34-9 and OTB34-10).
- 6.6.8.1.16 Verify Auxiliary Switch contacts 4-4c "OPEN" - (OTB34-4 and OTB34-6).
- 6.6.8.1.17 Verify Auxiliary Switch contacts 9-9c "CLOSED" - (OTB38-3 and OTB38-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.8.2 Trip test number (1) - Manual Trip Button on breaker.
 - 6.6.8.2.1 Depress trip button on breaker front and verify. Green On/Red Off.
 - 6.6.8.2.2 Verify Auxiliary Switch contacts 3-3c "OPEN" - (OTB34-5 and OTB34-6).
 - 6.6.8.2.3 Verify Auxiliary Switch contacts 10-10c "CLOSED" - (OTB38-1 and OTB38-2).
 - 6.6.8.2.4 Verify Auxiliary Switch contacts 6-6c "CLOSED" - (OTB38-7 and OTB38-8).
 - 6.6.8.2.5 Verify Auxiliary Switch contacts 7-7c "OPEN" - (OTB38-9 and OTB38-10).
 - 6.6.8.2.6 Verify Auxiliary Switch contacts 8-8c "CLOSED" - (OTB38-11 and OTB38-12).
 - 6.6.8.2.7 Verify Auxiliary Switch contacts 5-5c "OPEN" - (OTB34-9 and OTB34-10).
 - 6.6.8.2.8 Verify Auxiliary Switch contacts 4-4c "CLOSED" - (OTB34-4 and OTB34-6).
 - 6.6.8.2.9 Verify Auxiliary Switch contacts 9-9c "OPEN" - (OTB38-3 and OTB38-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.8.2.10 Close breaker using the maintenance operating device and verify. Green Off/Red On.
- 6.6.8.2.11 Verify that breaker cannot be racked out.
- 6.6.8.3 Trip Test Number (2) - K Relay Remote Simulate
 - 6.6.8.3.1 Remove jumper between OTB33-9 and OTB33-10 (refer to step 6.6.8.1.4).
 - 6.6.8.3.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.8.3.3 Reinstall jumper between OTB33-9 and OTB33-10.
 - 6.6.8.3.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.8.4 Trip Test Number (3) -MT Pushbutton Simulate.
 - 6.6.8.4.1 Remove jumper between OTB32-7 and OTB32-8 (refer to step 6.6.8.1.5).
 - 6.6.8.4.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.8.4.3 Reinstall jumper between OTB32-7 and OTB32-8.
 - 6.6.8.4.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.8.5 Trip Test Number (4) - Remote MT Pushbutton Simulate
 - 6.6.8.5.1 Momentarily jumper OTB32-9 and OTB32-10.
 - 6.6.8.5.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.8.5.3 Remove jumper completely from OTB32-9 and OTB32-10).
 - 6.6.8.5.4 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.8.6 Trip Test Number (5) - Remote K Relay Contact Simulate
 - 6.6.8.6.1 Momentarily jumper OTB33-3 and OTB33-4.
 - 6.6.8.6.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.8.6.3 Remove jumper completely from OTB33-3 and OTB33-4.
 - 6.6.8.6.4 Close breaker by operating "TEMPORARY" test switch and verify. Green Off/Red On.

- 6.6.8.7 Trip Test Number (6) - Emergency Trip Pushbutton
 - 6.6.8.7.1 Operate the "EMERGENCY TRIP" Pushbutton.
 - 6.6.8.7.2 Verify breaker "OPENS". Green On/Red Off.
 - 6.6.8.7.3 Close breaker by depressing "TEMPORARY" test switch and verify. Green Off/Red On.
- 6.6.8.8 Trip Test Number (7) - Local Test Trip and Close Pushbutton
 - 6.6.8.8.1 Place breaker in "TEST" Position (Exhibit A).
 - 6.6.8.8.2 Operate Test Trip Switch, and verify "OPEN". Green On/Red Off.
 - 6.6.8.8.3 Operate Close Test Switch, and verify "CLOSED". Green Off/Red On.
 - 6.6.8.8.4 Verify that breaker cannot be racked in.
 - 6.6.8.8.5 Operate Test Trip Switch.
 - 6.6.8.8.6 Verify breaker is "OPEN". Green On/Red Off.
 - 6.6.8.8.7 Open 2D4P101 (also de-energizes TCB-4 Control Voltage). Verify Green Off.
 - 6.6.8.8.8 Remove test jumper between OTB33-9 and OTB33-10.
 - 6.6.8.8.9 Remove test jumper between OTB32-7 and OTB32-8.
 - 6.6.8.8.10 Remove "TEMPORARY" test switch between OTB33-1 and OTB33-2.

NOTE

Should any Trip Test fail to operate the breaker proceed to step 6.6.10.

- 6.6.8.8.11 Reinsert breaker into "OPERATE" Position (Exhibit A).
- 6.6.9 Trip Latch Check - TCB-9. Verify on Exhibit H, Sheets 44 through 46.
 - 6.6.9.1 Preparation
 - 6.6.9.1.1 Verify 2B1509 and 2B1606 "OPEN" (Table 1, Exhibit G).
 - 6.6.9.1.2 Verify TCB-9 is in "OPERATE" Position and in "TRIPPED" mode. Green On/Red Off.

- 6.6.9.1.3 Close breaker by close button and verify. Green Off/Red On.
- 6.6.9.1.4 Verify breaker is closed.
- 6.6.9.1.5 Verify Auxiliary Switch contacts 3-3c "CLOSED" - (OTB20-2 and OTB20-3).
- 6.6.9.1.6 Verify Auxiliary Switch contacts 10-10c "OPEN" - (OTB21-1 and OTB21-2).
- 6.6.9.1.7 Verify Auxiliary Switch contacts 6-6c "OPEN" - (OTB21-7 and OTB21-8).
- 6.6.9.1.8 Verify Auxiliary Switch contacts 7-7c "CLOSED" - (OTB21-9 and OTB21-10).
- 6.6.9.1.9 Verify Auxiliary Switch contacts 8-8c "OPEN" - (OTB21-11 and OTB21-12).
- 6.6.9.1.10 Verify Auxiliary Switch contacts 5-5c "CLOSED" - (OTB20-7 and OTB20-8).
- 6.6.9.1.11 Verify Auxiliary Switch contacts 4-4c "OPEN" - (OTB20-1 and OTB20-3).
- 6.6.9.1.12 Verify Auxiliary Switch contacts 9-9c "CLOSED" - (OTB21-3 and OTB21-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.9.2 Trip test number (1) - Manual Trip Button on breaker.
- 6.6.9.2.1 Depress trip button on breaker front and verify. Green On/Red Off.
- 6.6.9.2.2 Verify Auxiliary Switch contacts 3-3c "OPEN" - (OTB20-2 and OTB20-3).
- 6.6.9.2.3 Verify Auxiliary Switch contacts 10-10c "CLOSED" - (OTB21-1 and OTB21-2).
- 6.6.9.2.4 Verify Auxiliary Switch contacts 6-6c "CLOSED" - (OTB21-7 and OTB21-8).
- 6.6.9.2.5 Verify Auxiliary Switch contacts 7-7c "OPEN" - (OTB21-9 and OTB21-10).
- 6.6.9.2.6 Verify Auxiliary Switch contacts 8-8c "CLOSED" - (OTB21-11 and OTB21-12).

- 6.6.9.2.7 Verify Auxiliary Switch contacts 5-5c "OPEN" - (OTB20-7 and OTB20-8).
- 6.6.9.2.8 Verify Auxiliary Switch contacts 4-4c "CLOSED" - (OTB20-1 and OTB20-3).
- 6.6.9.2.9 Verify Auxiliary Switch contacts 9-9c "OPEN" - (OTB21-3 and OTB21-4).

CAUTION

DO NOT TEST AUX SWITCH CONTACTS 1-1c OR 2-2c (ENERGIZED).

- 6.6.9.2.10 Close breaker using the maintenance operating device and verify. Green Off/Red On.
- 6.6.9.2.11 Verify that breaker cannot be racked out.
- 6.6.9.3 Trip Test Number (2) - Trip Coil Simulate.
 - 6.6.9.3.1 Open 2D2P103 and verify. Green Off/Red Off, TCB-2, TCB-6, and TCB-9.
 - 6.6.9.3.2 Install a jumper between BC1 and BC2 in Section 03.
 - 6.6.9.3.3 Close 2D2P103 and verify. Green On/Red Off, TCB-2, TCB-6, and TCB-9.
 - 6.6.9.3.4 Close breaker using Close Button on door of compartment B, Section 03 and verify. Green Off/Red On.
 - 6.6.9.3.5 Trip breaker using Trip Button on door of compartment B, Section 03 and verify. Green On/Red Off.
 - 6.6.9.3.6 Open 2D2P103 and verify. Green Off/Red Off.
 - 6.6.9.3.7 Remove jumper between BC1 and BC2.
- 6.6.9.4 Trip Test Number (3) - Undervoltage Device Trip Simulate.
 - 6.6.9.4.1 Remove two (2) wires on BC4 and connect them together.
 - 6.6.9.4.2 Close 2D2P103 and verify. Green On/Red Off, TCB-2, TCB-6, and TCB-9.
 - 6.6.9.4.3 Close breaker using Close Button on door of compartment B, Section 03 and verify. Green Off/Red On.
 - 6.6.9.4.4 Depress Trip Button on door and verify "OPEN". Green On/Red Off.

- 6.6.9.4.5 Open 2D2F103 and Verify. Green Off/Red Off.
- 6.6.9.4.6 Reconnect the two (2) wires on BC4 (refer to step 6.6.9.4.1).
- 6.6.9.4.7 Close 2D2P103 and verify. Green On/Red Off.
- 6.6.9.5 Trip Test Number (4) - Test Trip and Close Pushbutton.
- 6.6.9.5.1 Place breaker into "TEST" Position (refer to Exhibit A).
- 6.6.9.5.2 Operate Test Trip Button and verify "OPEN". Green On/Red Off.
- 6.6.9.5.3 Operate Test Close Button and verify "CLOSED". Green Off/Red On.
- 6.6.9.5.4 Verify that breaker cannot be racked into the "OPERATE" Position.

NOTE

Should any Trip Test fail to operate the breaker, proceed to step 6.6.10.

- 6.6.10 Trip Latch Adjustment (All Breakers) (Figure 2, Exhibit D). Verify on Exhibit H, Sheet 47.
- 6.6.10.1 Verify Control Power Off; both indicator lights, RED and GREEN OFF.
- 6.6.10.2 Trip breaker by depressing manual Trip Button on front of breaker.
- 6.6.10.3 Withdraw breaker to "TEST" Position (Exhibit A).
- 6.6.10.4 Verify that the Buffer Paddle (stops against end of latch adjustment screw) is fastened to trip shaft (Item 8 of Figure 2) by holding trip shaft and checking for relative motion of Buffer Paddle. Any motion is removed by tightening fasteners holding Buffer Paddle to trip shaft.
- 6.6.10.5 Turn latch adjusting screw, located on outer side of right-hand mechanism side frame, into the locknut, one complete turn.
- 6.6.10.6 Using the maintenance handle, close breaker (Exhibit A).
- 6.6.10.7 Trip breaker using manual Trip Button.

- 6.6.10.8 Repeat steps 6.6.10.5 through 6.6.10.7 until breaker cannot be closed.
- 6.6.10.9 Withdraw the adjusting screw from locknut 1/4 turn.
- 6.6.10.10 Attempt to close breaker using maintenance handle.
- 6.6.10.11 Trip breaker using manual Trip Button.
- 6.6.10.12 Repeat steps 6.6.10.9 through 6.6.10.11 until contacts move toward "CLOSE" before tripping occurs.

NOTE

This sequence could involve less than 1/4 turn.

- 6.6.10.13 Note position of slot in head of adjusting screw. Turn screw counter-clockwise 3-1/2 turns from this position.
- 6.6.10.14 Repeat Trip Latch Check (Section 6.6) for affected breaker. Should failure reoccur, replace entire trip mechanism.

6.6.11 Rack all breakers into the "OPERATE" Position.

6.6.12 Secure and lock all of the 2L033 cabinet doors.

6.7 RESTORATION

- 6.7.1 Release the clearance on 2B1509 and 2B1606 breakers, in accordance with the approved plant clearance procedures.
- 6.7.2 Inform the Control Operator and the cognizant System Engineer (Startup) that the system is ready for retest or verification of operability checks.

7.0 RECORDS

The Maintenance Data Record Forms and the Maintenance Activity Report Forms will be forwarded to EDMC in accordance with TI-24.

8.0 EXHIBITS

- EXHIBIT A - Withdrawing, Inserting and Closing of the AK-25 Breaker
- EXHIBIT B - Tools, Test Equipment, and Consumables
- EXHIBIT C - GEI-50299B Power Circuit Breakers Type AK-2-15 and AK-2/3-25
- EXHIBIT D - Cut Away Model of Electrically Operated AK-2 Breaker
- EXHIBIT E - Torque Measuring Fixture
- EXHIBIT F - TCB Orientation
- EXHIBIT G - Power Isolation Table
- EXHIBIT H - Maintenance Data Record Form

WITHDRAWING, INSERTING AND CLOSING OF THE AK-25 BREAKERI. Withdrawing of AK-25 Type Breaker

- A. Trip the breaker OPEN using manual Trip Button.
- B. Open Breaker cabinet (front) door.
- C. Pull the racking handle up and forward as far as it will travel, disengaging the primary disconnects.
- D. "Test" Position
 - 1) Slide the breaker out until the position stop engages in the front slot in bottom of breaker carriage.
- E. "Safety Position Stop"
 - 1) Lift the position stop handle and slide the breaker forward until position stop engages the rear slot in the bottom of the breaker carriage.

II Reinserting of AK-25 Type Breaker

- A. Push the breaker into the compartment until the stop position "STOP" engages.
- B. Release the Test Position Stop by depressing it's lever and push the breaker back into the compartment until racking pins butt against racking cam.
- C. With pawl engaged in first notch on cam, push handle down to normal position. Operate engage handle five (5) times (5th cycle is partial). Lift handle and allow to drop to normal position.
- D. Close breaker cabinet (front) door.

III. Manual Closing of Electrical Breakers

- A. Place the two (2) small hooks of the handle into the two slots located in the lower portion of the front escutcheon.
- B. Rotation of the long portion of handle downwards closes the breaker contacts.

TOOLS, TEST EQUIPMENT, AND CONSUMABLES

- 1) Multimeter (Simpson Model #260-6P) or equivalent
- 2) Variable Power Supply (0-130VDC 10 Amps Cap.)
- 3) Torque Wrench (0-2 ft-lbs)
- 4) Test Light and Leads
- 5) Lubricant (Mechanical Parts - G.E. Spec. No. D50H15 or RPM No. 5)
- 6) Lubricant (Electrical Parts - G.E. Spec. No. D50H047)
- 7) Feeler Gauges
- 8) Solvent (Kerosene or AEC Alcohol - Marsh Romack)
- 9) Test Switch (Shop stock Momentary Switch and Test Leads)

GEI-50299B Power Circuit Breakers Types AK-2-15 and AK-2/3-25

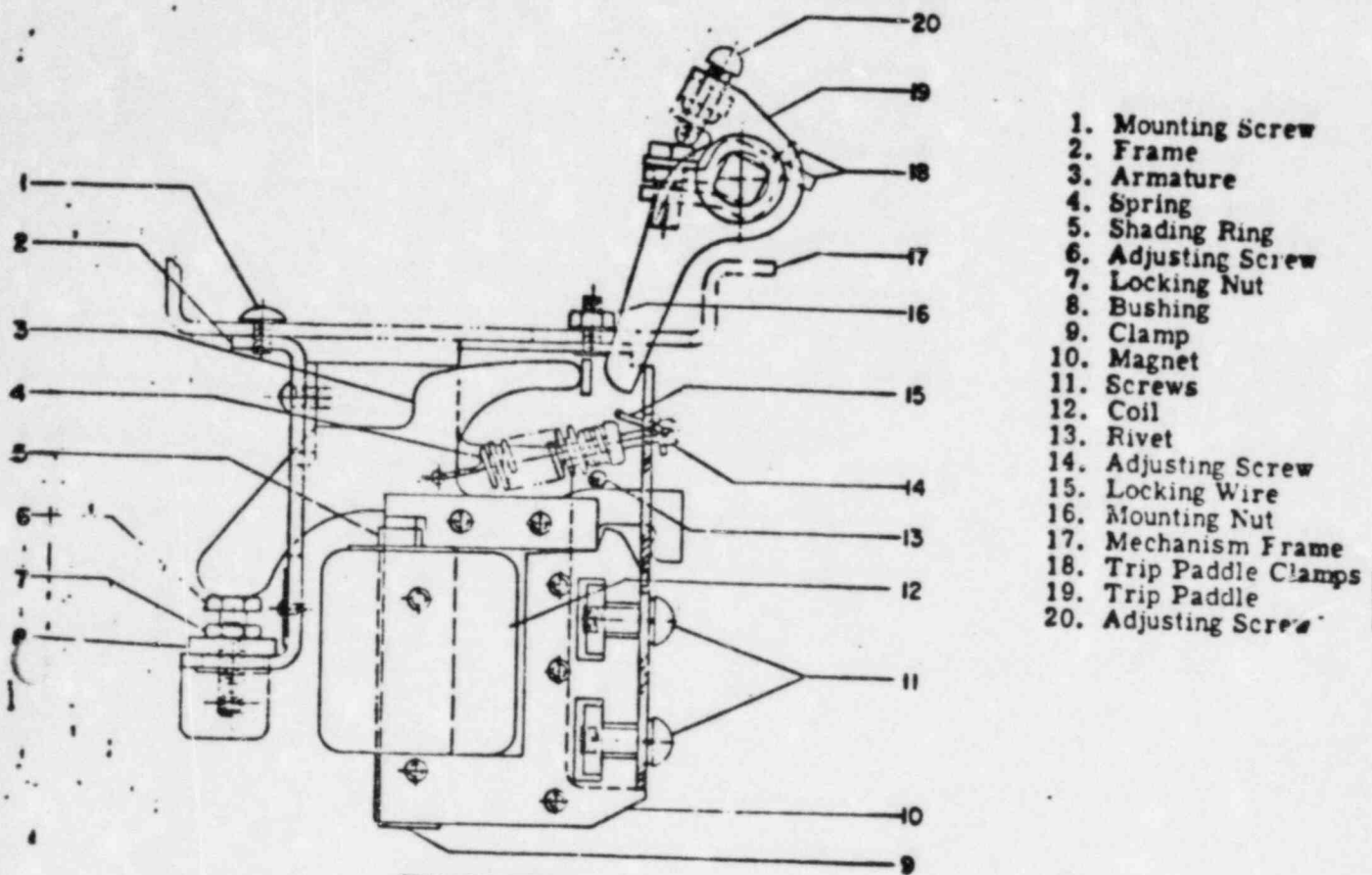


Figure 1 (0152C9206) Undervoltage Tripping Device

(FIGURE 1)

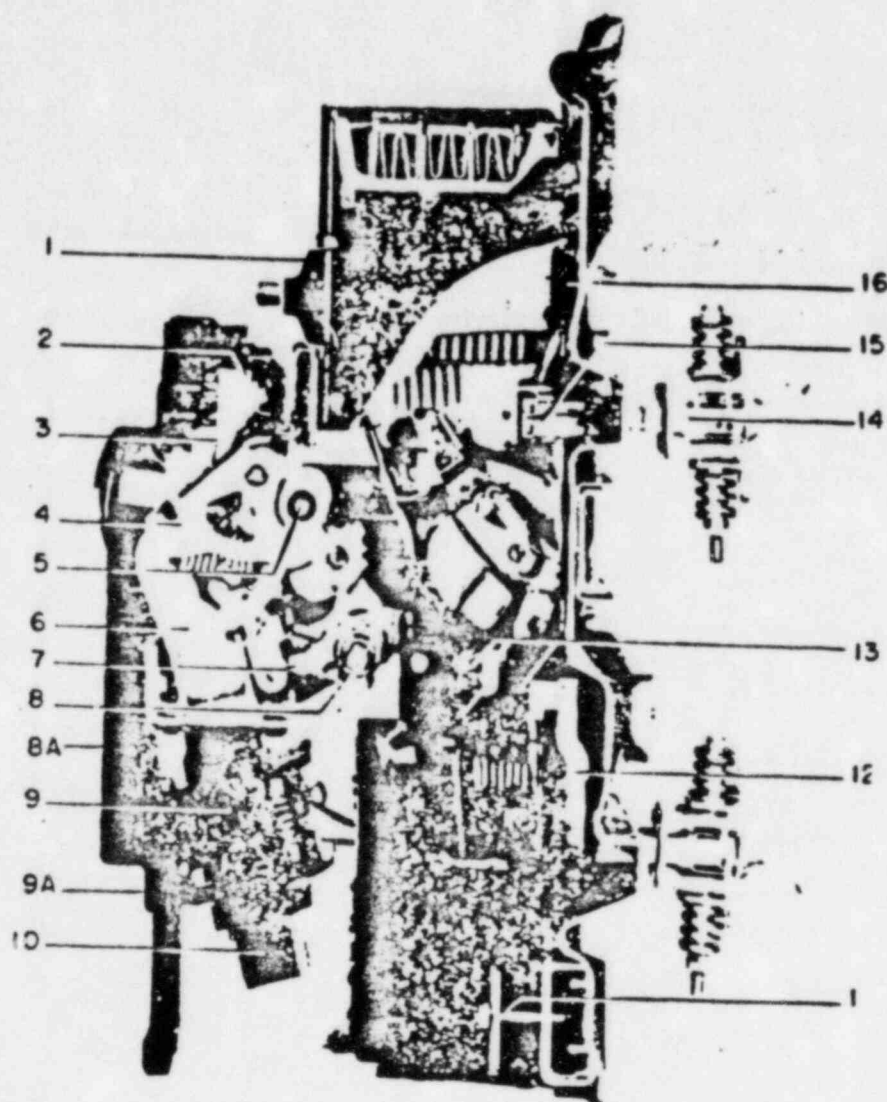


Figure 5. (8024457) Cut Away Model of Electrically Operated AK-2 Breaker

- | | | |
|----------------------------|--|-------------------------------------|
| 1. Arc Quencher Retainer | 8. Trip Shaft | 12. Lower Stud |
| 2. Cut off Switch | 8A. Front Escutcheon | 13. Socket Head Screws |
| 3. Cut off Switch Actuator | 9. Closing Solenoid | 14. Upper Stud |
| 4. Spring Carrier | 9A. Location of Slots for Maintenance Handle | 15. Stationary Contacts and Springs |
| 5. Shoulder Pin | 10. Closing Solenoid Armature | 16. Arc Runner |
| 6. Connecting Link | 11. Cover Retainer of Overload Device | |
| 7. Trip Latch Roller | | |

(FIGURE 2)

TORQUE MEASURING FIXTURE

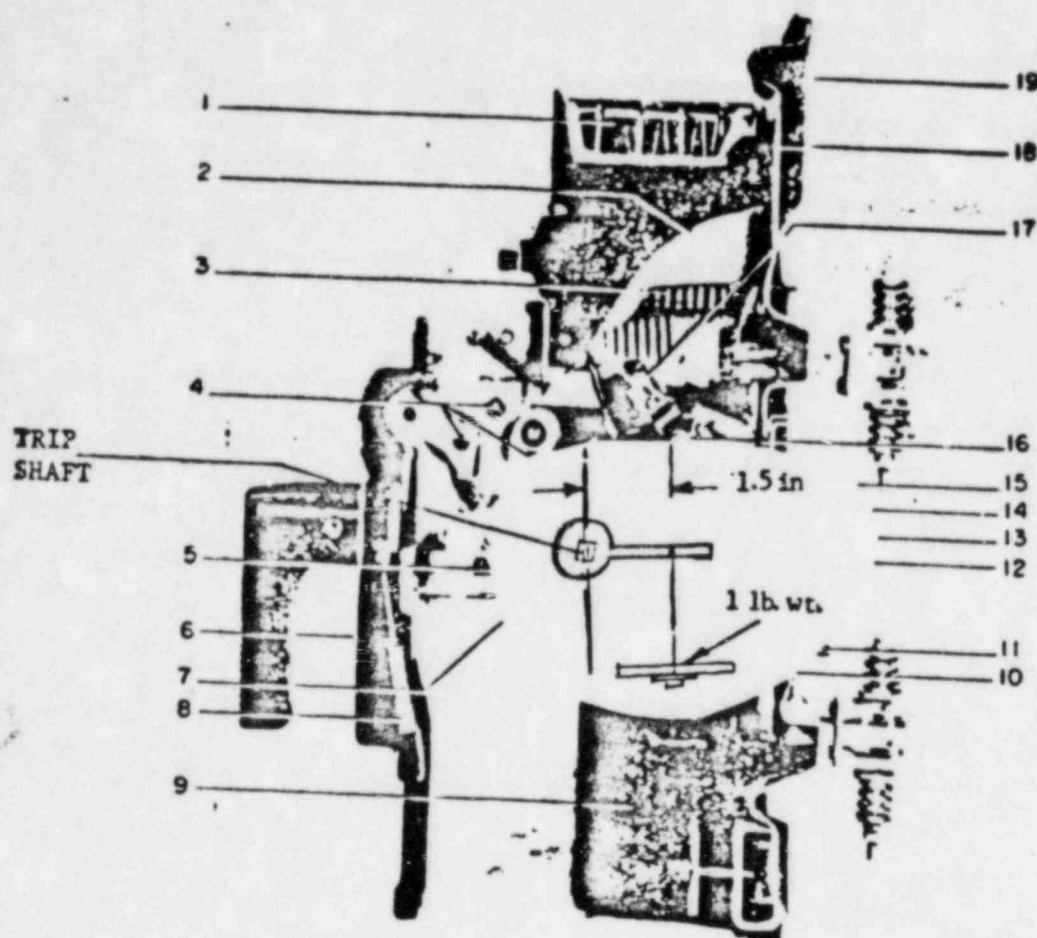


Figure 3. (8024516) Cut Away Model of Manually Operated AK-2 Breaker

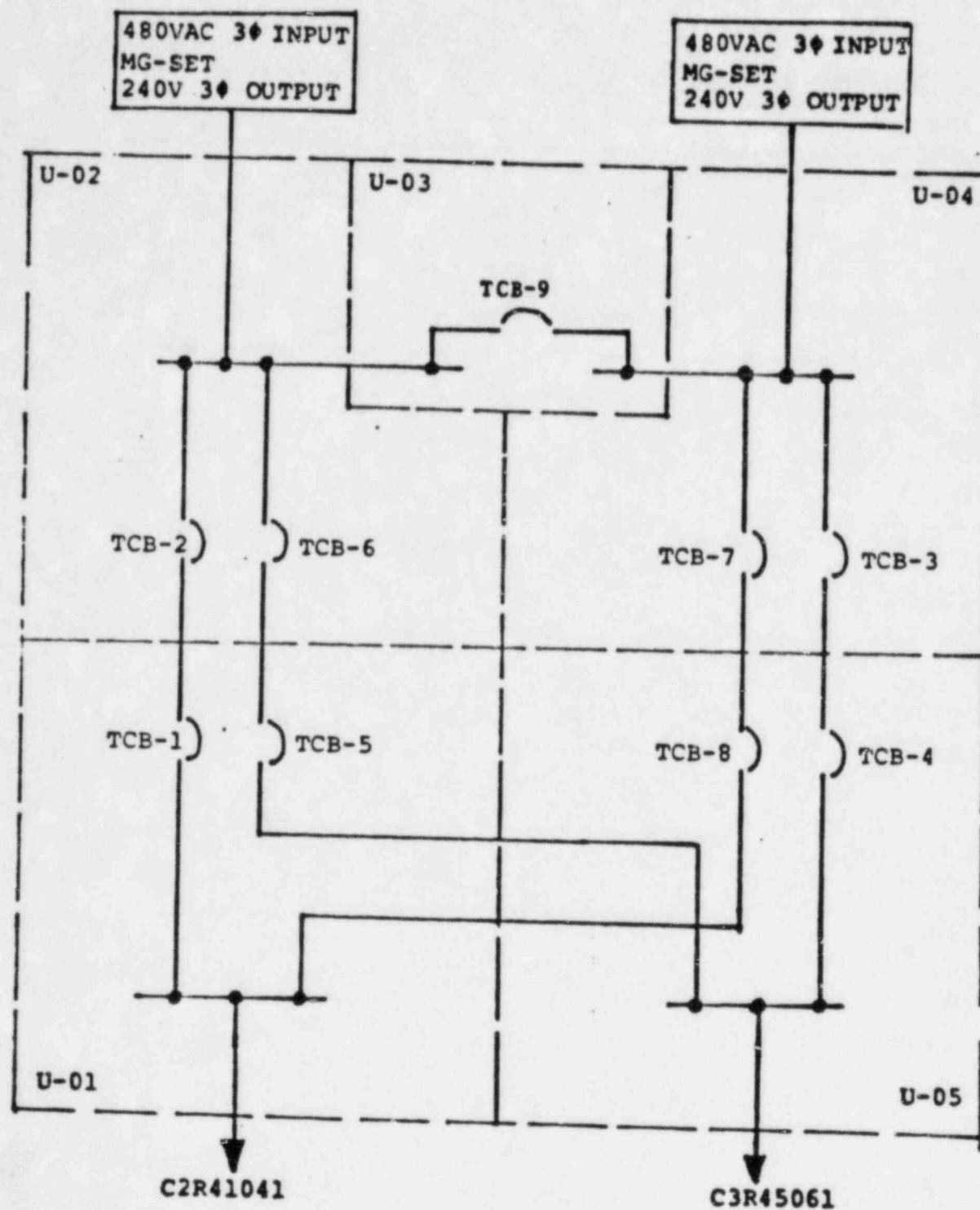
Arc Quencher Muffler
 Ceramic Side Plates
 Steel Plates
 Fixed Centers in Mechanism
 Latch Roller
 Escutcheon
 Trip Latch

8. Handle Return Spring
 9. Overload Device
 10. Series Coil of Overload Device
 11. Trip Arm of Overload Device
 12. Trip Paddle
 13. Movable Contact Pivot Support
 14. Crossbar

15. Movable Contact Pivot
 16. Contact Wipe Adjustment Pin
 17. Movable Contact
 18. Moulded Compound Bar
 19. Steel Back Plate

GEI-50299B Power Circuit Breakers Types AK-2-15 and AK-2/3-25

(FIGURE 3)

TCB ORIENTATION

(FIGURE 4)

POWER ISOLATION TABLE

POWER SOURCE	DC DIST. SW. NO.	TERM. BD. NO.	CABINET (LOAD)	BREAKER NO.
125VDC SOURCE #1	2D1P103	OTB03-11(P) OTB03-12(N)	U01 2L033	TCB-1 TCB-5
125VDC SOURCE #2	2D2P103	OTB12-11(P) OTB12-12(N)	U02 2L033	TCB-2 TCB-6 TCB-9
125VDC SOURCE #3	2D3P101	OTB24-11(P) OTB24-12(N)	U04 2L033	TCB-3 TCB-7
125VDC SOURCE #4		OTB33-11(P) OTB33-12(N)	U05 2L033	TCB-4 TCB-8
480VAC SOURCE TO MG 2B1505	-	-	2L045	MG-
480VAC SOURCE TO MG 2B1606	-	-	2L046	MG-

(TABLE 1)

MAINTENANCE DATA RECORD FORM

EQUIPMENT AND PROCEDURE IDENTIFICATION				
Equipment Description:		Startup Subsystem No.		
		Equipment No.		
Procedure Title: Maintenance for		Q-Class: I		
G.E. AK-2-25 Circuit Breaker U.V.		Location:		
Tripping Device				
Procedure No. MPES008 Rev. 0 Periodicity				
Maintenance Activity Report (MAR) Number:				
Reference:				
TEST EQUIPMENT/SPECIAL TOOLS				
Description	Control No.	Recall Date	Range	Setpoint
NONE				
MAINTENANCE DATA				
SWP No.		Clearance No.		
Place X in Blocks Where Not Applicable			Initial	Date
3.0 Prerequisites: Verified ☐				
Exceptions ☐ Log in Remarks None ☐				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.1 INITIAL TRIP TEST	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.1.1 Breaker In Operate Closed	Green _____ Red _____				
6.1.2 D.C. Control Power On:					
2D1P103 Closed	2D1P103 _____				
2D2P103 Closed	2D2P103 _____				
2D3P101 Closed	2D3P101 _____				
2D4P101 Closed	2D4P101 _____				
6.1.3 2B1509 Open	2B1509 _____				
6.1.4 2B1606 Open	2B1606 _____				
6.1.5 Open 2D1P103	2D1P103 _____				
TCB-1	Green _____ Red _____				
TCB-5	Green _____ Red _____				
6.1.6 Close 2D1P103	2D1P103 _____				
TCB-1	Green _____ Red _____				
TCB-5	Green _____ Red _____				
6.1.7 Open 2D2P103	2D2P103 _____				
TCB-2	Green _____ Red _____				
TCB-6	Green _____ Red _____				
TCB-9	Green _____ Red _____				
6.1.8 Close 2D2P103	2D2P103 _____				
TCB-2	Green _____ Red _____				
TCB-6	Green _____ Red _____				
TCB-9	Green _____ Red _____				
6.1.9 Open 2D3P101	2D3P101 _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE			MAINTENANCE		QA/QC	
6.1 INITIAL TRIP TEST	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE	
TCB-3	Green _____ Red _____					
TCB-7	Green _____ Red _____					
6.1.10 Close 2D3P101 TCB-3	2D3P101 _____ Green _____ Red _____					
TCB-7	Green _____ Red _____					
6.1.11 Open 2D4P101 TCB-4	2D4P101 _____ Green _____ Red _____					
TCB-8	Green _____ Red _____					
6.1.12 Close 2D4P101 TCB-4	2D4P101 _____ Green _____ Red _____					
TCB-3	Green _____ Red _____					

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		VERIFIED COMPLETE	MAINTENANCE		QA/QC	
6.2 ARMATURE CLEARANCE TEST	INITIAL		DATE	INITIAL	DATE	
TCB-1		TCB-1 _____				
6.2.1 Trip TCB-1		TCB-1 _____				
6.2.2 TCB-1 To Test		Green _____				
6.2.3 Open 2D1P103		Red _____				
6.2.5 Armature Clearance		Sat _____				
		Unsat* _____				
TCB-2		TCB-2 _____				
6.2.1 Trip TCB-2		TCB-2 _____				
6.2.2 TCB-2 To Test		Green _____				
6.2.3 Open 2D2P103		Red _____				
6.2.5 Armature Clearance		Sat _____				
		Unsat* _____				
TCB-3		TCB-3 _____				
6.2.1 Trip TCB-3		TCB-3 _____				
6.2.2 TCB-3 To Test		Green _____				
6.2.3 Open 2D3P101		Red _____				
6.2.5 Armature Clearance		Sat _____				
		Unsat* _____				
TCB-4		TCB-4 _____				
6.2.1 Trip TCB-4		TCB-4 _____				
6.2.2 TCB-4 To Test		Green _____				
6.2.3 Open 2D4P101		Red _____				
6.2.5 Armature Clearance		Sat _____				
		Unsat* _____				
TCB-5		TCB-5 _____				
6.2.1 Trip TCB-5		TCB-5 _____				
6.2.2 TCB-5 To Test		Green _____				
6.2.3 Open 2D1P103		Red _____				
6.2.5 Armature Clearance		Sat _____				
		Unsat* _____				
TCB-6		TCB-6 _____				
6.2.1 Trip TCB-6						

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.2 ARMATURE CLEARANCE TEST		VERIFIED COMPLETE	INITIAL	LATE	INITIAL	DATE
6.2.2	TCB-6 To Test	TCB-6 _____				
6.2.3	Open 2D2P103	Green _____ Red _____				
6.2.5	Armature Clearance	Sat _____ Unsat* _____				
TCB-7						
6.2.1	Trip TCB-7	TCB-7 _____				
6.2.2	TCB-7 To Test	TCB-7 _____				
6.2.3	Open 2D3P101	Green _____ Red _____				
6.2.5	Armature Clearance	Sat _____ Unsat* _____				
TCB-8						
6.2.1	Trip TCB-8	TCB-8 _____				
6.2.2	TCB-8 To Test	TCB-8 _____				
6.2.3	Open 2D4P101	Green _____ Red _____				
6.2.5	Armature Clearance	Sat _____ Unsat* _____				
TCB-9						
6.2.1	Trip TCB-9	TCB-9 _____				
6.2.2	TCB-9 To Test	TCB-9 _____				
6.2.3	Open 2D2P103	Green _____ Red _____				
6.2.5	Armature Clearance	Sat _____ Unsat* _____				
6.3 INSTANTANEOUS U.V. PICKUP SETTING						
TCB-1						
6.3.1	Trip TCB-1	TCB-1 _____				
6.3.2	TCB-1 To Test	TCB-1 _____				
6.3.3	Open 2D1P103	Green _____ Red _____				
6.3.4	Power Supply Connected	Yes _____ No _____				
6.3.5	Locking Wire Removed	Yes _____ No _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0		PROCEDURE	MAINTENANCE		QA/QC		
6.3		INSTANTANEOUS U.V. PICKUP SETTING	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.3.6	Power Supply Set	_____ DCV					
6.3.7	Pickup Set	_____ DCV					
6.3.8	Locking Wire	Yes _____					
	Reinstalled	No _____					
6.3.9	Power Supply	Yes _____					
	Removed	No _____					
6.3.10	TCB-1 To Operate	TCB-1 _____					
6.3.11	Close 2D1P103	Green _____					
		Red _____					
TCB-2							
6.3.1	Trip TCB-2	TCB-2 _____					
6.3.2	TCB-2 To Test	TCB-2 _____					
6.3.3	Open 2D2P103	Green _____					
		Red _____					
6.3.4	Power Supply	Yes _____					
	Connected	No _____					
6.3.5	Locking Wire	Yes _____					
	Removed	No _____					
6.3.6	Power Supply Set	_____ DCV					
6.3.7	Pickup Set	_____ DCV					
6.3.8	Locking Wire	Yes _____					
	Reinstalled	No _____					
6.3.9	Power Supply	Yes _____					
	Removed	No _____					
6.3.10	TCB-2 To Operate	TCB-2 _____					
6.3.11	Close 2D2P103	Green _____					
		Red _____					
TCB-3							
6.3.1	Trip TCB-3	TCB-3 _____					
6.3.2	TCB-3 To Test	TCB-3 _____					
6.3.3	Open 2D3P101	Green _____					
		Red _____					
6.3.4	Power Supply	Yes _____					
	Connected	No _____					
6.3.5	Locking Wire	Yes _____					
	Removed	No _____					
6.3.6	Power Supply Set	_____ DCV					
6.3.7	Pickup Set	_____ DCV					

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.3 INSTANTANESOU U.V. PICKUP SETTING						
6.3.8	Locking Wire	Yes _____				
	Reinstalled	No _____				
6.3.9	Power Supply	Yes _____				
	Removed	No _____				
6.3.10	TCB-3 To Operate	TCB-3 _____				
6.3.11	Close 2D3P101	Green _____				
		Red _____				
TCB-4						
6.3.1	Trip TCB-4	TCB-4 _____				
6.3.2	TCB-4 To Test	TCB-4 _____				
6.3.3	Open 2D4P101	Green _____				
		Red _____				
6.3.4	Power Supply	Yes _____				
	Connected	No _____				
6.3.5	Locking Wire	Yes _____				
	Removed	No _____				
6.3.6	Power Supply Set	_____ DCV				
6.3.7	Pickup Set	_____ DCV				
6.3.8	Locking Wire	Yes _____				
	Reinstalled	No _____				
6.3.9	Power Supply	Yes _____				
	Removed	No _____				
6.3.10	TCB-4 To Operate	TCB-4 _____				
6.3.11	Close 2D4P101	Green _____				
		Red _____				
TCB-5						
6.3.1	Trip TCB-5	TCB-5 _____				
6.3.2	TCB-5 To Test	TCB-5 _____				
6.3.3	Open 2D1P103	Green _____				
		Red _____				
6.3.4	Power Supply	Yes _____				
	Connected	No _____				
6.3.5	Locking Wire	Yes _____				
	Removed	No _____				
6.3.6	Power Supply Set	_____ DCV				
6.3.7	Pickup Set	_____ DCV				
6.3.8	Locking Wire	Yes _____				
	Reinstalled	No _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.3 INSTANTANEOUS U.V. PICKUP SETTING		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.3.9	Power Supply Removed	Yes _____ No _____				
6.3.10	TCB-5 To Operate	TCB-5 _____				
6.3.11	Close 2D1P103	Green _____ Red _____				
TCB-6						
6.3.1	Trip TCB-6	TCB-6 _____				
6.3.2	TCB-6 To Test	TCB-6 _____				
6.3.3	Open 2D2P103	Green _____ Red _____				
6.3.4	Power Supply Connected	Yes _____ No _____				
6.3.5	Locking Wire Reinstalled	Yes _____ No _____				
6.3.6	Power Supply Set	_____ DCV				
6.3.7	Pickup Set	_____ DCV				
6.3.8	Locking Wire Reinstalled	Yes _____ No _____				
6.3.9	Power Supply Removed	Yes _____ No _____				
6.3.10	TCB-6 To Operate	TCB-6 _____				
6.3.11	Close 2D2P103	Green _____ Red _____				
TCB-7						
6.3.1	Trip TCB-7	TCB-7 _____				
6.3.2	TCB-7 To Test	TCB-7 _____				
6.3.3	Open 2D3P101	Green _____ Red _____				
6.3.4	Power Supply Connected	Yes _____ No _____				
6.3.5	Locking Wire Removed	Yes _____ No _____				
6.3.6	Power Supply Set	_____ DCV				
6.3.7	Pickup Set	_____ DCV				
6.3.8	Locking Wire Reinstalled	Yes _____ No _____				
6.3.9	Power Supply Removed	Yes _____ No _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.3 INSTANTANEOUS U.V. PICKUP SETTING		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.3.10	TCB-7 To Operate	TCB-7 _____				
6.3.11	Close 2D3P101	Green _____ Red _____				
TCB-8						
6.3.1	Trip TCB-8	TCB-8 _____				
6.3.2	TCB-8 To Test	TCB-8 _____				
6.3.3	Open 2D4P101	Green _____ Red _____				
6.3.4	Power Supply Connected	Yes _____ No _____				
6.3.5	Locking Wire Removed	Yes _____ No _____				
6.3.6	Power Supply Set	_____ DCV				
6.3.7	Pickup Set	_____ DCV				
6.3.8	Locking Wire Reinstalled	Yes _____ No _____				
6.3.9	Power Supply Removed	Yes _____ No _____				
6.3.10	TCB-8 To Operate	TCB-8 _____				
6.3.11	Close 2D4P101	Green _____ Red _____				
TCB-9						
6.3.1	Trip TCB-9	TCB-9 _____				
6.3.2	TCB-9 To Test	TCB-9 _____				
6.3.3	Open 2D2P103	Green _____ Red _____				
6.3.4	Power Supply Connected	Yes _____ No _____				
6.3.5	Locking Wire Removed	Yes _____ No _____				
6.3.6	Power Supply Set	_____ DCV				
6.3.7	Pickup Set	_____ DCV				
6.3.8	Locking Wire Reinstalled	Yes _____ No _____				
6.3.9	Power Supply Removed	Yes _____ No _____				
6.3.10	TCB-9 To Operate	TCB-9 _____				
6.3.11	Close 2D2P103	Green _____ Red _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0		PROCEDURE	VERIFIED COMPLETE	MAINTENANCE		Q:/QC	
6.4 POSITIVE TRIP CHECK				INITIAL	DATE	INITIAL	DATE
6.4.1	TCB-1 To Safety Stop	TCB-1 _____					
6.4.2	Open 2D1P103	Green _____					
		Red _____					
6.4.3	Close TCB-1	TCB-1 _____					
6.4.5	TCB-1 Trip	_____ Inches					
6.4.6	Adjusted Trip	_____ Inches					
TCB-2							
6.4.1	TCB-2 To Safety Stop	TCB-2 _____					
6.4.2	Open 2D2P103	Green _____					
		Red _____					
6.4.3	Close TCB-2	TCB-2 _____					
6.4.5	TCB-2 Trip	_____ Inches					
6.4.6	Adjusted Trip	_____ Inches					
TCB 3							
6.4.1	TCB-3 To Safety Stop	TCB-3 _____					
6.4.2	Open 2D3P101	Green _____					
		Red _____					
6.4.3	Close TCB-3	TCB-3 _____					
6.4.5	TCB-3 Trip	_____ Inches					
6.4.6	Adjusted Trip	_____ Inches					
TCB-4							
6.4.1	TCB-4 To Safety Stop	TCB-4 _____					
6.4.2	Open 2D4P101	Green _____					
		Red _____					
6.4.3	Close TCB-4	TCB-4 _____					
6.4.5	TCB-4 Trip	_____ Inches					
6.4.6	Adjusted Trip	_____ Inches					
TCB-5							
6.4.1	TCB-5 To Safety Stop	TCB-5 _____					
6.4.2	Open 2D1P103	Green _____					
		Red _____					
6.4.3	Close TCB-5	TCB-5 _____					
6.4.5	TCB-5 Trip	_____ Inches					
6.4.6	Adjusted Trip	_____ Inches					
TCB-6							
6.4.1	TCB-6 To Safety Stop	TCB-6 _____					

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.4 POSITIVE TRIP CHECK		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.4.2	Open 2D4P101	Green _____ Red _____				
6.4.3	Close TCB-8	TCB-8 _____				
6.4.5	TCB-8 Trip	_____ Inches				
6.4.6	Adjusted Trip	_____ Inches				
TCB-9						
6.4.1	TCB-9 To Safety Stop	TCB-9 _____				
6.4.2	Open 2D2P103	Green _____ Red _____				
6.4.3	Close TCB-9	TCB-9 _____				
6.4.5	TCB-9 Trip	_____ Inches				
6.4.6	Adjusted Trip	_____ Inches				
6.5 TRIP TORQUE VERIFICATION AND CLEANING						
TCB-1						
6.5.1 VERIFICATION						
6.5.1.1	Trip TCB-1	TCB-1 _____				
6.5.1.2	TCB-1 To Test	TCB-1 _____				
6.5.1.3	Open 2D1P103	Green _____ Red _____				
6.5.1.5	Close TCB-1	TCB-1 _____				
6.5.1.6	Breaker Trip (Maximum 1.5 in-lbs)	_____ In.-lbs Sat _____ Unsat* _____				
6.5.2 CLEANING						
6.5.2.1	TCB-1 To Safety Stop	TCB-1 _____				
6.5.2.2	Trip-Shaft Bearing	Sat _____ Unsat* _____				
TCB-2						
6.5.1 VERIFICATION						
6.5.1.1	Trip TCB-2	TCB-2 _____				
6.5.1.2	TCB-2 To Test	TCB-2 _____				
6.5.1.3	Open 2D2P103	Green _____ Red _____				
6.5.1.5	Close TCB-2	TCB-2 _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0		PROCEDURE	MAINTENANCE		QA/QC	
6.5 TRIP TORQUE VERIFICATION AND CLEANING		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
	6.5.1.6 Breaker Trip (Maximum 1.5 in-lbs)	In.-lbs Sat _____ Unsat* _____				
	6.5.2 CLEANING					
	6.5.2.1 TCB-2 To Safety Stop	TCB-2 _____				
	6.5.2.3 Trip-Shaft Bearing	Sat _____ Unsat* _____				
	TCB-3					
	6.5.1 VERIFICATION					
	6.5.1.1 Trip TCB-3	TCB-3 _____				
	6.5.1.2 TCB-3 To Test	TCB-3 _____				
	6.5.1.3 Open 2D3P101	Green _____ Red _____				
	6.5.1.5 Close TCB-3	TCB-3 _____				
	6.5.1.6 Breaker Trip (Maximum 1.5 in-lbs)	In.-lbs Sat _____ Unsat* _____				
	6.5.2 CLEANING					
	6.5.2.1 TCB-3 To Safety Stop	TCB-3 _____				
	6.5.2.3 Trip-Shaft Bearing	Sat _____ Unsat* _____				
	TCB-4					
	6.5.1 VERIFICATION					
	6.5.1.1 Trip TCB-4	TCB-4 _____				
	6.5.1.2 TCB-4 To Test	TCB-4 _____				
	6.5.1.3 Open 2D4P101	Green _____ Red _____				
	6.5.1.5 Close TCB-4	TCB-4 _____				
	6.5.1.6 Breaker Trip (Maximum 1.5 in-lbs)	In.-lbs Sat _____ Unsat* _____				
	6.5.2 CLEANING					
	6.5.2.1 TCB-4 To Safety Stop	TCB-4 _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

2.0 PROCEDURE		MAINTENANCE		QA/QC		
		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.5 TRIP TORQUE VERIFICATION AND CLEANING						
6.5.2.3 Trip-Shaft Bearing		Sat _____ Unsat* _____				
TCB-5						
6.5.1 VERIFICATION						
6.5.1.1 Trip TCB-5		TCB-5 _____				
6.5.1.2 TCB-5 To Test		TCB-5 _____				
6.5.1.3 Open 2D1P103		Green _____ Red _____				
6.5.1.5 Close TCB-5		TCB-5 _____				
6.5.1.6 Breaker Trip (Maximum 1.5 in-lbs)		_____ in.-lbs Sat _____ Unsat* _____				
6.5.2 CLEANING						
6.5.2.1 TCB-5 To Safety Stop		TCB-5 _____				
6.5.2.3 Trip-Shaft Bearing		Sat _____ Unsat* _____				
TCB-6						
6.5.1 VERIFICATION						
6.5.1.1 Trip TCB-6		TCB-6 _____				
6.5.1.2 TCB-6 To Test		TCB-6 _____				
6.5.1.3 Open 2D2P103		Green _____ Red _____				
6.5.1.5 Close TCB-6		TCB-6 _____				
6.5.1.6 Breaker Trip (Maximum 1.5 in-lbs)		_____ in.-lbs Sat _____ Unsat* _____				
6.5.2 CLEANING						
6.5.2.1 TCB-6 To Safety Stop		TCB-6 _____				
6.5.2.3 Trip-Shaft Bearing		Sat _____ Unsat* _____				
TCB-7						
6.5.1 VERIFICATION						
6.5.1.1 Trip TCB-7		TCB-7 _____				
6.5.1.2 TCB-7 To Test		TCB-7 _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.2 PROCEDURE		MAINTENANCE		QA/QC		
6.5 TRIP TORQUE VERIFICATION AND CLEANING		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.5.1.3	Open 2D3P101	Green _____				
6.5.1.5	Close TCB-7	Red _____				
6.5.1.6	Breaker Trip (Maximum 1.5 in-lbs)	TCB-7 _____ In.-lbs _____ Sat _____ Unsat* _____				
6.5.2 CLEANING						
6.5.2.1	TCB-7 To Safety Stop	TCB-7 _____				
6.5.2.3	Trip-Shaft Bearing	Sat _____ Unsat* _____				
TCB-8						
6.5.1 VERIFICATION						
6.5.1.1	Trip TCB-8	TCB-8 _____				
6.5.1.2	TCB-8 To Test	TCB-8 _____				
6.5.1.3	Open 2D4P101	Green _____				
6.5.1.5	Close TCB-8	Red _____				
6.5.1.6	Breaker Trip (Maximum 1.5 in-lbs)	TCB-8 _____ In.-lbs _____ Sat _____ Unsat* _____				
6.5.2 CLEANING						
6.5.2.1	TCB-8 To Safety Stop	TCB-8 _____				
6.5.2.3	Trip-Safety Bearing	Sat _____ Unsat* _____				
TCB-9						
6.5.1 VERIFICATION						
6.5.1.1	Trip TCB-9	TCB-9 _____				
6.5.1.2	TCB-9 To Test	TCB-9 _____				
6.5.1.3	Open 2D2P103	Green _____				
6.5.1.5	Close TCB-9	Red _____				
6.5.1.6	Breaker Trip (Maximum 1.5 in-lbs)	TCB-9 _____ In.-lbs _____ Sat _____ Unsat* _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0	PROCEDURE	VERIFIED COMPLETE	MAINTENANCE		QA/QC	
			INITIAL	DATE	INITIAL	DATE
6.5	TRIP TORQUE VERIFICATION AND CLEANING					
6.5.2	CLEANING					
6.5.2.1	TCB-9 To Safety Stop	TCB-9 _____				
6.5.2.3	Trip-Shaft Bearing	Sat _____ Unsat* _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.1.1 TCB-1 PREPARATION						
6.6.1.1.1	Open 2B1509 and 2B1606	2B1509 _____ 2B1606 _____				
6.6.1.1.2	TCB-1 In Operate Position and In Tripped Mode	Green _____ Red _____				
6.6.1.1.3	Open 2D1P103	Green _____ Red _____				
6.6.1.1.4	Test Jumper Installed Between OTB1-9 & OTB1-10	Yes _____ No _____				
6.6.1.1.5	Test Jumper Installed Between OTB2-1 & OTB2-2	Yes _____ No _____				
6.6.1.1.6	Test Switch Installed Between OTB1-1 & OTB1-2	Yes _____ No _____				
6.6.1.1.7	Close 2D1P013	Green _____ Red _____				
6.6.1.1.8	Close TCB-1	Green _____ Red _____				
6.6.1.1.9	TCB-1 Closed	Yes _____ No _____				
6.6.1.1.10	Auxiliary Switch Contacts 3-3c	OTB4-2 _____ OTB4-3 _____				
6.6.1.1.11	Auxiliary Switch Contacts 10-10c	OTB5-1 _____ OTB5-2 _____				
6.6.1.1.12	Auxiliary Switch Contacts 6-6c	OTB5-7 _____ OTB5-8 _____				
6.6.1.1.13	Auxiliary Switch Contacts 7-7c	OTB5-9 _____ OTB5-10 _____				
6.6.1.1.14	Auxiliary Switch Contacts 8-8c	OTB5-11 _____ OTB5-12 _____				
6.6.1.1.15	Auxiliary Switch Contacts 5-5c	OTB4-7 _____ OTB4-8 _____				
6.6.1.1.16	Auxiliary Switch Contacts 4-4c	OTB4-1 _____ OTB4-3 _____				
6.6.1.1.17	Auxiliary Switch Contacts 9-9c	OTB5-1 _____ OTB5-2 _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.1.2 TCB-1 TRIP TEST #1					
6.6.1.2.1 Trip TCB-1	Green _____ Red _____				
6.6.1.2.2 Auxiliary Switch	OTB4-2 _____				
Contacts 3-3c	OTB4-3 _____				
6.6.1.2.3 Auxiliary Switch	OTB5-1 _____				
Contacts 10-10c	OTB5-2 _____				
6.6.1.2.4 Auxiliary Switch	OTB5-7 _____				
Contacts 6-6c	OTB5-8 _____				
6.6.1.2.5 Auxiliary Switch	OTB5-9 _____				
Contacts 7-7c	OTB5-10 _____				
6.6.1.2.6 Auxiliary Switch	OTB5-11 _____				
Contacts 8-8c	OTB5-12 _____				
6.6.1.2.7 Auxiliary Switch	OTB4-7 _____				
Contacts 5-5c	OTB4-8 _____				
6.6.1.2.8 Auxiliary Switch	OTB4-1 _____				
Contacts 4-4c	OTB4-3 _____				
6.6.1.2.9 Auxiliary Switch	OTB5-1 _____				
Contacts 9-9c	OTB5-2 _____				
6.6.1.2.10 Close TCB-1	Green _____ Red _____				
6.6.1.2.11 TCB-1 Will Rackout	Yes _____ No _____				
6.6.1.3 TCB-1 TRIP TEST #2					
6.6.1.3.1 Jumper Between OTB1-9 & OTB1-10	Yes _____ No _____				
Removed					
6.6.1.3.2 TCB-1 Open	Green _____ Red _____				
6.6.1.3.3 Jumper Between OTB1-9 & OTB1-10	Yes _____ No _____				
Connected					
6.6.1.3.4 Close TCB-1	Green _____ Red _____				
6.6.1.4 TCB-1 TRIP TEST # 3					
6.6.1.4.1 Jumper Between OTB2-1 & OTB2-2	Yes _____ No _____				
Removed					

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.1.4.2 TCB-1 Open	Green _____ Red _____				
6.6.1.4.3 Jumper Between OTB2-1 & OTB2-2 Connected	Yes _____ No _____				
6.6.1.4.4 Close TCB-1	Green _____ Red _____				
6.6.1.5 TCB-1 TRIP TEST #4					
6.6.1.5.1 Jumper Between OTB2-3 & OTB2-4	Yes _____ No _____				
6.6.1.5.2 TCB-1 Open	Green _____ Red _____				
6.6.1.5.3 Jumper Between OTB2-3 & OTB2-4 Removed	Yes _____ No _____				
6.6.1.5.4 Close TCB-1	Green _____ Red _____				
6.6.1.6 TCB-1 TRIP TEST #5					
6.6.1.6.1 Jumper Between OTB1-3 & OTB1-4	Yes _____ No _____				
6.6.1.6.2 TCB-1 Open	Green _____ Red _____				
6.6.1.6.3 Jumper Between OTB1-3 & OTB1-4 Removed	Yes _____ No _____				
6.6.1.6.4 Close TCB-1	Green _____ Red _____				
6.6.1.7 TCB-1 TRIP TEST #6					
6.6.1.7.2 TCB-1 Open	Green _____ Red _____				
6.6.1.7.3 Close TCB-1	Green _____ Red _____				
6.6.1.8 TCB-1 TRIP TEST #7					
6.6.1.8.1 TCB-1 In Test	TCB-1 _____				
6.6.1.8.2 Trip TCB-1	Green _____ Red _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.1.8.3	Close TCB-1	Green _____ Red _____				
6.6.1.8.4	TCB-1 Will Rack In	Yes _____ No _____				
6.6.1.8.6	Trip TCB-1	Green _____ Red _____				
6.6.1.8.7	Open 2D1P103	Green _____				
6.6.1.8.8	Jumper Between OTB1-9 & OTB1-10 Removed	Yes _____ No _____				
6.6.1.8.9	Jumper Between OTB2-1 & OTB2-2 Removed	Yes _____ No _____				
6.6.1.8.10	Switch Between OTB1-1 & OTB1-2 Removed	Yes _____ No _____				
6.6.1.8.11	TCB-1 To Operate	TCB-1 _____				
6.6.2.1 TCB-2 PREPARATION						
6.6.2.1.1	Open 2B1509 and 2B1606	2B1509 _____ 2B1606 _____				
6.6.2.1.2	TCB-2 In Operate Position and In Tripped Mode	Green _____ Red _____				
6.6.2.1.3	Open 2D2P103	Green _____ Red _____				
6.6.2.1.4	Test Jumper Installed Between OTB10-9 & OTB10-10	Yes _____ No _____				
6.6.2.1.5	Test Jumper Installed Between OTB11-1 & OTB11-2	Yes _____ No _____				
6.6.2.1.6	Test Switch Installed Between OTB10-1 & OTB10-2	Yes _____ No _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.2.1.7 Close 2D2P103	Green _____ Red _____				
6.6.2.1.8 Close TCB-2	Green _____ Red _____				
6.6.2.1.9 TCB-2 Closed	Yes _____ No _____				
6.6.2.1.10 Auxiliary Switch Contacts 3-3c	OTB13-2 _____ OTB13-3 _____				
6.6.2.1.11 Auxiliary Switch Contacts 10-10c	OTB14-1 _____ OTB14-2 _____				
6.6.2.1.12 Auxiliary Switch Contacts 6-6c	OTB14-7 _____ OTB14-8 _____				
6.6.2.1.13 Auxiliary Switch Contacts 7-7c	OTB14-9 _____ OTB14-10 _____				
6.6.2.1.14 Auxiliary Switch Contacts 8-8c	OTB14-11 _____ OTB14-12 _____				
6.6.2.1.15 Auxiliary Switch Contacts 5-5c	OTB13-7 _____ OTB13-8 _____				
6.6.2.1.16 Auxiliary Switch Contacts 4-4c	OTB13-1 _____ OTB13-3 _____				
6.6.2.1.17 Auxiliary Switch Contacts 9-9c	OTB14-3 _____ OTB14-4 _____				
6.6.2.2 TCB-2 TRIP TEST #1					
6.6.2.2.1 Trip TCB-2	Green _____ Red _____				
6.6.2.2.2 Auxiliary Switch Contacts 3-3c	OTB13-2 _____ OTB13-3 _____				
6.6.2.2.3 Auxiliary Switch Contacts 10-10c	OTB14-1 _____ OTB14-2 _____				
6.6.2.2.4 Auxiliary Switch Contacts 6-6c	OTB14-7 _____ OTB14-8 _____				
6.6.2.2.5 Auxiliary Switch Contacts 7-7c	OTB14-9 _____ OTB14-10 _____				
6.6.2.2.6 Auxiliary Switch Contacts 8-8c	OTB14-11 _____ OTB14-12 _____				
6.6.2.2.7 Auxiliary Switch Contacts 5-5c	OTB13-7 _____ OTB13-8 _____				
6.6.2.2.8 Auxiliary Switch Contacts 4-4c	OTB13-1 _____ OTB13-3 _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.2.2.9 Auxiliary Switch Contacts 9-9c 6.6.2.2.10 Close TCB-2 6.6.2.2.11 TCB-2 Will Rackout	OTB14-3 _____ OTB14-4 _____ Green _____ Red _____ Yes _____ No _____				
6.6.2.3 TCB-2 TRIP TEST #2 6.6.2.3.1 Jumper Between OTB10-9 & OTB10-10 Removed 6.6.2.3.2 TCB-2 Open 6.6.2.3.3 Jumper Between OTB10-9 & OTB10-10 Connected 6.6.2.3.4 Close TCB-2	Yes _____ No _____ Green _____ Red _____ Yes _____ No _____ Green _____ Red _____				
6.6.2.4 TCB-2 TRIP TEST #3 6.6.2.4.1 Jumper Between OTB11-1 & OTB11-2 Removed 6.6.2.4.2 TCB-2 Open 6.6.2.4.3 Jumper Between OTB11-1 & OTB11-2 Connected 6.6.2.4.4 Close TCB-2	Yes _____ No _____ Green _____ Red _____ Yes _____ No _____ Green _____ Red _____				
6.6.2.5 TCB-2 TRIP TEST #4 6.6.2.5.1 Jumper Between OTB11-3 & OTB11-4 6.6.2.5.2 TCB-2 Open 6.6.2.5.3 Jumper Between OTB11-3 & OTB11-4 Removed	Yes _____ No _____ Green _____ Red _____ Yes _____ No _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.2.5.4	Close TCB-2	Green _____ Red _____				
6.6.2.6	TCB-2 TRIP TEST #5					
6.6.2.6.1	Jumper Between OTB10-3 & OTB10-4	Yes _____ No _____				
6.6.2.6.2	TCB-2 Open	Green _____ Red _____				
6.6.2.6.3	Jumper Between OTB10-3 & OTB10-4	Yes _____ No _____				
6.6.2.6.4	Close TCB-2	Green _____ Red _____				
6.6.2.7	TCB-2 TRIP TEST #6					
6.6.2.7.2	TCB-2 Open	Green _____ Red _____				
6.6.2.7.3	Close TCB-2	Green _____ Red _____				
6.6.2.8	TCB-2 TRIP TEST #7					
6.6.2.8.1	TCB-2 In Test	TCB-2 _____				
6.6.2.8.2	Trip TCB-2	Green _____ Red _____				
6.6.2.8.3	Close TCB-2	Green _____ Red _____				
6.6.2.8.4	TCB-2 Will Rack In	Yes _____ No _____				
6.6.2.8.6	Trip TCB-2	Green _____ Red _____				
6.6.2.8.7	Open 2D2P103	Green _____				
6.6.2.8.8	Jumper Between OTB10-9 & OTB10-10 Removed	Yes _____ No _____				
6.6.2.8.9	Jumper Between OTB11-1 & OTB11-2 Removed	Yes _____ No _____				
6.6.2.8.10	Switch Between OTB10-1 & OTB10-2 Removed	Yes _____ No _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.2.8.11 TCB-2 To Operate					
6.6.3.1 TCB-3 PREPARATION					
6.6.3.1.1 Open 2B1509 and 2B1606	2B1509 _____ 2B1606 _____				
6.6.3.1.2 TCB-3 In Operate Position and In Tripped Mode	Green _____ Red _____				
6.6.3.1.3 Open 2D3P101	Green _____ Red _____				
6.6.3.1.4 Test Jumper Installed Between OTB22-9 & OTB22-10	Yes _____ No _____				
6.6.3.1.5 Test Jumper Installed Between OTB23-1 & OTB23-2	Yes _____ No _____				
6.6.3.1.6 Test Switch Installed Between OTB22-1 & OTB22-2	Yes _____ No _____				
6.6.3.1.7 Close 2D3P101	Green _____ Red _____				
6.6.3.1.8 Close TCB-3	Green _____ Red _____				
6.6.3.1.9 TCB-3 Closed	Yes _____ No _____				
6.6.3.1.10 Auxiliary Switch Contacts 3-3c	OTB25-2 _____ OTB25-3 _____				
6.6.3.1.11 Auxiliary Switch Contacts 10-10c	OTB26-1 _____ OTB26-2 _____				
6.6.3.1.12 Auxiliary Switch Contacts 6-6c	OTB26-7 _____ OTB26-8 _____				
6.6.3.1.13 Auxiliary Switch Contacts 7-7c	OTB26-9 _____ OTB26-10 _____				
6.6.3.1.14 Auxiliary Switch Contacts 8-8c	OTB26-11 _____ OTB26-12 _____				
6.6.3.1.15 Auxiliary Switch Contacts 5-5c	OTB25-7 _____ OTB25-8 _____				
6.6.3.1.16 Auxiliary Switch Contacts 4-4c	OTB25-1 _____ OTB25-3 _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.5 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.3.1.1 Auxiliary Switch Contacts 9-9c	OTB26-3 OTB26-4				
6.6.3.2 TCB-3 TRIP TEST #1					
6.6.3.2.1 Trip TCB-3	Green _____ Red _____				
6.6.3.2.2 Auxiliary Switch Contacts 3-3c	OTB25-2 _____ OTB25-3 _____				
6.6.3.2.3 Auxiliary Switch Contacts 10-10c	OTB26-1 _____ OTB26-2 _____				
6.6.3.2.4 Auxiliary Switch Contacts 6-6c	OTB26-7 _____ OTB26-8 _____				
6.6.3.2.5 Auxiliary Switch Contacts 7-7c	OTB26-9 _____ OTB26-10 _____				
6.6.3.2.6 Auxiliary Switch Contacts 8-8c	OTB26-11 _____ OTB26-12 _____				
6.6.3.2.7 Auxiliary Switch Contacts 5-5c	OTB25-7 _____ OTB25-8 _____				
6.6.3.2.8 Auxiliary Switch Contacts 4-4c	OTB25-1 _____ OTB25-3 _____				
6.6.3.2.9 Auxiliary Switch Contacts 9-9c	OTB26-3 _____ OTB26-4 _____				
6.6.3.2.10 Close TCB-3	Green _____ Red _____				
6.6.3.2.11 TCB-3 Will Rackout	Yes _____ No _____				
6.6.3.3 TCB-3 TRIP TEST #2					
6.6.3.3.1 Jumper Between OTB22-9 & OTB22-10 Removed	Yes _____ No _____				
6.6.3.3.2 TCB-3 Open	Green _____ Red _____				
6.6.3.3.3 Jumper Between OTB22-9 & OTB22-10	Yes _____ No _____				
6.6.3.3.4 Close TCB-3	Green _____ Red _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.3.4 TCB-3 TRIP TEST #3					
6.6.3.4.1 Jumper Between OTB23-1 & OTB23-2	Yes _____ No _____				
6.6.3.4.2 TCB-3 Open	Green _____ Red _____				
6.6.3.4.3 Jumper Between OTB23-1 & OTB23-2	Yes _____ No _____				
6.6.3.4.4 Close TCB-3	Green _____ Red _____				
6.6.3.5 TCB-3 TRIP TEST #4					
6.6.3.5.1 Jumper Between OTB23-3 & OTB23-4	Yes _____ No _____				
6.6.3.5.2 TCB-3 Open	Green _____ Red _____				
6.6.3.5.3 Jumper Between OTB23-3 & OTB23-4	Yes _____ No _____				
6.6.3.5.4 Close TCB-3	Green _____ Red _____				
6.6.3.6 TCB-3 TRIP TEST #5					
6.6.3.6.1 Jumper Between OTB22-3 & OTB22-4	Yes _____ No _____				
6.6.3.6.2 TCB-3 Open	Green _____ Red _____				
6.6.3.6.3 Jumper Between OTB22-3 & OTB22-4	Yes _____ No _____				
6.6.3.6.4 Close TCB-3	Green _____ Red _____				
6.6.3.7 TCB-3 TRIP TEST #6					
6.6.3.7.2 TCB-3 Open	Green _____ Red _____				
6.6.3.7.3 Close TCB-3	Green _____ Red _____				
6.6.3.8 TCB-3 TRIP TEST #7					
6.6.3.8.1 TCB-3 In Test	TCB-3 _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.3.8.2	Trip TCB-3	Green _____ Red _____				
6.6.3.8.3	Close TCB-3	Green _____ Red _____				
6.6.3.8.4	TCB-3 Will Rack In	Yes _____ No _____				
6.6.3.8.6	Trip TCB-3	Green _____ Red _____				
6.6.3.8.7	Open 2D3P101	Green _____				
6.6.3.8.8	Jumper Between OTB22-9 & OTB22-10 Removed	Yes _____ No _____				
6.6.3.8.9	Jumper Between OTB23-1 & OTB23-2 Removed	Yes _____ No _____				
6.6.3.8.10	Switch Between OTB22-1 & OTB22-2 Removed	Yes _____ No _____				
6.6.3.8.11	TCB-3 To Operate	TCB-3 _____				
6.6.4.1 TCB-4 PREPARATION						
6.6.4.1.1	Open 2B1509 and 2B1606	2B1509 _____ 2B1606 _____				
6.6.4.1.2	TCB-4 In Operate Position and In Tripped Mode	Green _____ Red _____				
6.6.4.1.3	Open 2D4P101	Green _____ Red _____				
6.6.4.1.4	Test Jumper Installed Between OTB31-9 & OTB31-10	Yes _____ No _____				
6.6.4.1.5	Test Jumper Installed Between OTB32-1 & OTB32-2	Yes _____ No _____				
6.6.4.1.6	Test Switch Installed Between OTB31-1 & OTB31-2	Yes _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.4.1.7	Close 2D4PI01	Green _____ Red _____				
6.6.4.1.8	Close TCB-4	Green _____ Red _____				
6.6.4.1.9	TCB-4 Closed	Yes _____ No _____				
6.6.4.1.10	Auxiliary Switch Contacts 3-3c	OTB34-2 _____ OTB34-3 _____				
6.6.4.1.11	Auxiliary Switch Contacts 10-10c	OTB35-1 _____ OTB35-2 _____				
6.6.4.1.12	Auxiliary Switch Contacts 6-6c	OTB35-7 _____ OTB35-8 _____				
6.6.4.1.13	Auxiliary Switch Contacts 7-7c	OTB35-9 _____ OTB35-10 _____				
6.6.4.1.14	Auxiliary Switch Contacts 8-8c	OTB35-11 _____ OTB35-12 _____				
6.6.4.1.15	Auxiliary Switch Contacts 5-5c	OTB34-7 _____ OTB34-8 _____				
6.6.4.1.16	Auxiliary Switch Contacts 4-4c	OTB34-1 _____ OTB34-3 _____				
6.6.4.1.17	Auxiliary Switch Contacts 9-9c	OTB35-3 _____ OTB35-4 _____				
6.6.4.2	TCB-4 TRIP TEST #1					
6.6.4.2.1	Trip TCB-4	Green _____ Red _____				
6.6.4.2.2	Auxiliary Switch Contacts 3-3c	OTB34-2 _____ OTB34-3 _____				
6.6.4.2.3	Auxiliary Switch Contacts 10-10c	OTB35-1 _____ OTB35-2 _____				
6.6.4.2.4	Auxiliary Switch Contacts 6-6c	OTB35-7 _____ OTB35-8 _____				
6.6.4.2.5	Auxiliary Switch Contacts 7-7c	OTB35-9 _____ OTB35-10 _____				
6.6.4.2.6	Auxiliary Switch Contacts 8-8c	OTB35-11 _____ OTB35-12 _____				
6.6.4.2.7	Auxiliary Switch Contacts 5-5c	OTB34-7 _____ OTB34-8 _____				
6.6.4.2.8	Auxiliary Switch Contacts 4-4c	OTB34-1 _____ OTB34-3 _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6.4.2.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.4.2.9 Auxiliary Switch Contacts 9-9c	OTB35-3 _____ OTB35-4 _____				
6.6.4.2.10 Close TCB-4	Green _____ Red _____				
6.6.4.2.11 TCB-4 Will Rackout	Yes _____ No _____				
6.6.4.3 TCB-4 TRIP TEST #2					
6.6.4.3.1 Jumper Between OTB31-9 & OTB31-10 Removed	Yes _____ No _____				
6.6.4.3.2 TCB-4 Open	Green _____ Red _____				
6.6.4.3.3 Jumper Between OTB31-9 & OTB31-10 Connected	Yes _____ No _____				
6.6.4.3.4 Close TCB-4	Green _____ Red _____				
6.6.4.4 TCB-4 TRIP TEST #3					
6.6.4.4.1 Jumper Between OTB32-1 & OTB32-2 Removed	Yes _____ No _____				
6.6.4.4.2 TCB-4 Open	Green _____ Red _____				
6.6.4.4.3 Jumper Between OTB32-1 & OTB32-2 Connected	Yes _____ No _____				
6.6.4.4.4 Close TCB-4	Green _____ Red _____				
6.6.4.5 TCB 4 TRIP TEST #4					
6.6.4.5.1 Jumper Between OTB32-3 & OTB32-4	Yes _____ No _____				
6.6.4.5.2 TCB-4 Open	Green _____ Red _____				
6.6.4.5.3 Jumper Between OTB32-3 & OTB32-4 Removed	Yes _____ No _____				

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6.0 PROCEDURE		MAINTENANCE		QA/QC		
		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6 TRIP LATCH CHECK AND ADJUSTMENT						
6.6.4.5.4	Close TCB-4	Green _____ Red _____				
6.6.4.6	TCB-4 TRIP TEST #5					
6.6.4.6.1	Jumper Between OTB31-3 & OTB31-4	Yes _____ No _____				
6.6.4.6.2	TCB-4 Open	Green _____ Red _____				
6.6.4.6.3	Jumper Between OTB31-3 & OTB31-4 Removed	Yes _____ No _____				
6.6.4.6.4	Close TCB-4	Green _____ Red _____				
6.6.4.7	TCB-4 TRIP TEST #6					
6.6.4.7.2	TCB-4 Open	Green _____ Red _____				
6.6.4.7.3	Close TCB-4	Green _____ Red _____				
6.6.4.8	TCB-4 TRIP TEST #7					
6.6.4.8.1	TCB-4 In Test	TCB-4 _____				
6.6.4.8.2	Trip TCB-4	Green _____ Red _____				
6.6.4.8.3	Close TCB-4	Green _____ Red _____				
6.6.4.8.4	TCB-4 Will Rack In	Yes _____ No _____				
6.6.4.8.6	Trip TCB-4	Green _____ Red _____				
6.6.4.8.7	Open 2D4P101	Green _____				
6.6.4.8.8	Jumper Between OTB31-9 & OTB31-10 Removed	Yes _____ No _____				
6.6.4.8.9	Jumper Between OTB32-1 & OTB32-2 Removed	Yes _____ No _____				
6.6.4.8.10	Switch Between OTB31-1 & OTB31-2 Removed	Yes _____ No _____				

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EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK - AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.4.8.11 TCB-4 To Operate		TCB-4 _____				
6.6.5.1 TCB-5 PREPARATION						
6.6.5.1.1	Open 2B1509 and 2B1606	2B1509 _____ 2B1606 _____				
6.6.5.1.2	TCB-5 In Operate Position and In Tripped Mode	Green _____ Red _____				
6.6.5.1.3	Open 2D1P103	Green _____ Red _____				
6.6.5.1.4	Test Jumper Installed Between	Yes _____				
	OTB31-9 & OTB31-10	No _____				
6.6.5.1.5	Test Jumper Installed Between	Yes _____				
	OTB32-1 & OTB32-2					
6.6.5.1.6	Test Switch Installed Between	Yes _____				
	OTB3-1 & OTB3-2	No _____				
6.6.5.1.7	Close 2D1P103	Green _____ Red _____				
6.6.5.1.8	Close TCB-5	Green _____ Red _____				
6.6.5.1.9	TCB-5 Closed	Yes _____ No _____				
6.6.5.1.10	Auxiliary Switch Contacts 3-3c	OTB4-5 _____ OTB4-6 _____				
6.6.5.1.11	Auxiliary Switch Contacts 10-10c	OTB8-1 _____ OTB8-2 _____				
6.6.5.1.12	Auxiliary Switch Contacts 6-6C	OTB8-7 _____ OTB8-8 _____				
6.6.5.1.13	Auxiliary Switch Contacts 7-7c	OTB8-9 _____ OTB8-10 _____				
6.6.5.1.14	Auxiliary Switch Contacts 8-8c	OTB8-11 _____ OTB8-12 _____				
6.6.5.1.15	Auxiliary Switch Contacts 5-5c	OTB4-9 _____ OTB4-10 _____				
6.6.5.1.16	Auxiliary Switch Contacts 4-4c	OTB4-4 _____ OTB4-6 _____				

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EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.5.1.17 Auxiliary Switch Contacts 9-9c	OTB8-1 _____ OTB8-2 _____				
6.6.5.2 TCB-5 TRIP TEST #1					
6.6.5.2.1 Trip TCB-5	Green _____ Red _____				
6.6.5.2.2 Auxiliary Switch Contacts 3-3c	OTB4-5 _____ OTB4-6 _____				
6.6.5.2.3 Auxiliary Switch Contacts 10-10c	OTB8-1 _____ OTB8-2 _____				
6.6.5.2.4 Auxiliary Switch Contacts 6-6c	OTB8-7 _____ OTB8-8 _____				
6.6.5.2.5 Auxiliary Switch Contacts 7-7c	OTB8-9 _____ OTB8-10 _____				
6.6.5.2.6 Auxiliary Switch Contacts 8-8c	OTB8-11 _____ OTB8-12 _____				
6.6.5.2.7 Auxiliary Switch Contacts 5-5c	OTB4-9 _____ OTB4-10 _____				
6.6.5.2.8 Auxiliary Switch Contacts 4-4c	OTB4-4 _____ OTB4-6 _____				
6.6.5.2.9 Auxiliary Switch Contacts 9-9c	OTB8-1 _____ OTB8-2 _____				
6.6.5.2.10 Close TCB-5	Green _____ Red _____				
6.6.5.2.11 TCB-5 Will Rackout	Yes _____ No _____				
6.6.5.3 TCB-5 TRIP TEST #2					
6.6.5.3.1 Jumper Between OTB31-9 & OTB31-10 Removed	Yes _____ No _____				
6.6.5.3.2 TCB-5 Open	Green _____ Red _____				
6.6.5.3.3 Jumper Between OTB31-9 & OTB31-10 Connected	Yes _____ No _____				
6.6.5.3.4 Close TCB-5	Green _____ Red _____				

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.5 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.5.4 TCB-5 TRIP TEST #3					
6.6.5.4.1 Jumper Between OTB32-1 & OTB32-2 Removed	Yes _____ No _____ Green _____ Red _____				
6.6.5.4.2 TCB-5 Open					
6.6.5.4.3 Jumper Between OTB32-1 & OTB32-2 Connected	Yes _____ No _____ Green _____ Red _____				
6.6.5.4.4 Close TCB-5					
6.6.5.5 TCB-5 TRIP TEST #4					
6.6.5.5.1 Jumper Between OTB2-9 & OTB2-10	Yes _____ No _____ Green _____ Red _____				
6.6.5.5.2 TCB-5 Open					
6.6.5.5.3 Jumper Between OTB2-9 & OTB2-10 Removed	Yes _____ No _____ Green _____ Red _____				
6.6.5.5.4 Close TCB-5					
6.6.5.6 TCB-5 TRIP TEST #5					
6.6.5.6.1 Jumper Between OTB3-3 & OTB3-4	Yes _____ No _____ Green _____ Red _____				
6.6.5.6.2 TCB-5 Open					
6.6.5.6.3 Jumper Between OTB3-3 & OTB3-4 Removed	Yes _____ No _____ Green _____ Red _____				
6.6.5.6.4 Close TCB-5					
6.6.5.7 TCB-5 TRIP TEST #6					
6.6.5.7.2 TCB-5 Open	Green _____ Red _____				
6.6.5.7.3 Close TCB-5	Green _____ Red _____				
6.6.5.8 TCB-5 TRIP TEST #7					
6.6.5.8.1 TCB-5 In Test	TCB-5 _____				
6.6.5.8.2 Trip TCB-5	Green _____ Red _____				
6.6.5.8.3 Close TCB-5	Green _____ Red _____				
6.6.5.8.4 TCB-5 Will Rack In	Yes _____ No _____				
6.6.5.8.6 Trip TCB-5	Green _____ Red _____				
6.6.5.8.7 Open 2DIP103	Green _____				

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6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.5.8.8 Jumper Between OTB31-9 & OTB31-10 Removed	Yes _____ No _____				
6.6.5.8.9 Jumper Between OTB32-1 & OTB32-2 Removed	Yes _____ No _____				
6.6.5.8.10 Switch Between OTB3-1 & OTB3-2 Removed	Yes _____ No _____				
6.6.5.8.11 TCB-5 To Operate	TCB-5 _____				
6.6.6.1 TCB-6 PREPARATION					
6.6.6.1.1 Open 2B1509 and 2B1606	2B1509 _____ 2B1606 _____				
6.6.6.1.2 TCB-6 In Operate Position and In Tripped Mode	Green _____ Red _____				
6.6.6.1.3 Open 2D2P103	Green _____ Red _____				
6.6.6.1.4 Test Jumper Installed Between OTB12-9 & OTB12-10	Yes _____ No _____				
6.6.6.1.5 Test Jumper Installed Between OTB11-7 & OTB11-8	Yes _____ No _____				
6.6.6.1.6 Test Switch Installed Between OTB12-1 & OTB12-2	Yes _____ No _____				
6.6.6.1.7 Close 2D2P103	Green _____ Red _____				
6.6.6.1.8 Close TCB-6	Green _____ Red _____				
6.6.6.1.9 TCB-6 Closed	Yes _____ No _____				
6.6.6.1.10 Auxiliary Switch Contacts 3-3c	OTB13-5 _____ OTB13-6 _____				
6.6.6.1.11 Auxiliary Switch Contacts 10-10c	OTB17-1 _____ OTB17-2 _____				

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6.0 PROCEDURE		MAINTENANCE		QA/QC		
1	6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
	6.6.6.1.12 Auxiliary Switch Contacts 6-6c	OTB17-7 _____ OTB17-8 _____				
	6.6.6.1.13 Auxiliary Switch Contacts 7-7c	OTB17-9 _____ OTB17-10 _____				
	6.6.6.1.14 Auxiliary Switch Contacts 8-8c	OTB17-11 _____ OTB17-12 _____				
	6.6.6.1.15 Auxiliary Switch Contacts 5-5c	OTB13-9 _____ OTB13-10 _____				
	6.6.6.1.16 Auxiliary Switch Contacts 4-4c	OTB13-4 _____ OTB13-6 _____				
	6.6.6.1.17 Auxiliary Switch Contacts 9-9c	OTB17-3 _____ OTB17-4 _____				
	6.6.6.2 TCB-6 TRIP TEST #1					
	6.6.6.2.1 Trip TCB-6	Green _____ Red _____				
	6.6.6.2.2 Auxiliary Switch Contacts 3-3c	OTB13-5 _____ OTB13-6 _____				
	6.6.6.2.3 Auxiliary Switch Contacts 10-10c	OTB17-1 _____ OTB17-2 _____				
	6.6.6.2.4 Auxiliary Switch Contacts 6-6c	OTB17-7 _____ OTB17-8 _____				
	6.6.6.2.5 Auxiliary Switch Contacts 7-7c	OTB17-9 _____ OTB17-10 _____				
	6.6.6.2.6 Auxiliary Switch Contacts 8-8c	OTB17-11 _____ OTB17-12 _____				
	6.6.6.2.7 Auxiliary Switch Contacts 5-5c	OTB13-9 _____ OTB13-10 _____				
	6.6.6.2.8 Auxiliary Switch Contacts 4-4c	OTB13-4 _____ OTB13-6 _____				
	6.6.6.2.9 Auxiliary Switch Contacts 9-9c	OTB17-3 _____ OTB17-4 _____				
	6.6.6.2.10 Close TCB-6	Green _____ Red _____				
	6.6.6.2.11 TCB-6 Will Rackout	Yes _____ No _____				
	6.6.6.3 TCB-6 TRIP TEST #2					
	6.6.6.3.1 Jumper Between OTB12-9 & OTB12-10 Removed	Yes _____ No _____				

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EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.6.3.2 TCB-6 Open	Green _____ Red _____				
6.6.6.3.3 Jumper Between OTB12-9 & OTB12-10 Connected	Yes _____ No _____				
6.6.6.3.4 Close TCB-6	Green _____ Red _____				
6.6.6.4 TCB 6 TRIP TEST #3					
6.6.6.4.1 Jumper Between OTB11-7 & OTB11-8 Removed	Yes _____ No _____				
6.6.6.4.2 TCB-6 Open	Green _____ Red _____				
6.6.6.4.3 Jumper Between OTB11-7 & OTB11-8 Connected	Yes _____ No _____				
6.6.6.4.4 Close TCB-6	Green _____ Red _____				
6.6.6.5 TCB-6 TRIP TEST #4					
6.6.6.5.1 Jumper Between OTB11-9 & OTB11-10	Yes _____ No _____				
6.6.6.5.2 TCB-6 Open	Green _____ Red _____				
6.6.6.5.3 Jumper Between OTB11-9 & OTB11-10 Removed	Yes _____ No _____				
6.6.6.5.4 Close TCB-6	Green _____ Red _____				
6.6.6.6 TCB-6 TRIP TEST #5					
6.6.6.6.1 Jumper Between OTB12-3 & OTB12-4	Yes _____ No _____				
6.6.6.6.2 TCB-6 Open	Green _____ Red _____				
6.6.6.6.3 Jumper Between OTB12-3 & OTB12-4 Removed	Yes _____ No _____				

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EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.6.6.4 Close TCB-6	Green _____ Red _____				
6.6.6.7 TCB-6 TRIP TEST #6					
6.6.6.7.2 TCB-6 Open	Green _____ Red _____				
6.6.6.7.3 Close TCB-6	Green _____ Red _____				
6.6.6.8 TCB-6 TRIP TEST #7					
6.6.6.8.1 TCB-6 In Test	TCB-6 _____				
6.6.6.8.2 Trip TCB-6	Green _____ Red _____				
6.6.6.8.3 Close TCB-6	Green _____ Red _____				
6.6.6.8.4 TCB-6 Will Rack In	Yes _____ No _____				
6.6.6.8.6 Trip TCB-6	Green _____ Red _____				
6.6.6.8.7 Open 2D2P103	Green _____				
6.6.6.8.8 Jumper Between OTB12-9 & OTB12-10 Removed	Yes _____ No _____				
6.6.6.8.9 Jumper Between OTB11-7 & OTB11-8 Removed	Yes _____ No _____				
6.6.6.8.10 Switch Between OTB12-1 & OTB12-2 Removed	Yes _____ No _____				
6.6.6.8.11 TCB-6 To Operate	TCB-6 _____				
6.6.7.1 TCB-7 PREPARATION					
6.6.7.1.1 Open 2B1509 and 2B1606	2B1509 _____ 2B1606 _____				
6.6.7.1.2 TCB-7 in Operate Position and In Tripped Mode	Green _____ Red _____				
6.6.7.1.3 Open TCB-7	Green _____ Red _____				

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EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.7.1.4 Test Jumper Installed Between OTB24-9 & OTB24-10	Yes _____ No _____				
6.6.7.1.5 Test Jumper Installed Between OTB23-7 & OTB23-8	Yes _____ No _____				
6.6.7.1.6 Test Switch Installed Between OTB24-1 & OTB24-2	Yes _____ No _____				
6.6.7.1.7 Close 2D3P101	Green _____ Red _____				
6.6.7.1.8 Close TCB-7	Green _____ Red _____				
6.6.7.1.9 TCB-7 Closed	Yes _____ No _____				
6.6.7.1.10 Auxiliary Switch Contacts 3-3c	OTB24-5 _____ OTB25-6 _____				
6.6.7.1.11 Auxiliary Switch Contacts 10-10c	OTB29-1 _____ OTB29-2 _____				
6.6.7.1.12 Auxiliary Switch Contacts 6-6c	OTB29-7 _____ OTB29-8 _____				
6.6.7.1.13 Auxiliary Switch Contacts 7-7c	OTB29-9 _____ OTB29-10 _____				
6.6.7.1.14 Auxiliary Switch Contacts 8-8c	OTB29-11 _____ OTB29-12 _____				
6.6.7.1.15 Auxiliary Switch Contacts 5-5c	OTB25-9 _____ OTB25-10 _____				
6.6.7.1.16 Auxiliary Switch Contacts 4-4c	OTB25-4 _____ OTB25-6 _____				
6.6.7.1.17 Auxiliary Switch Contacts 9-9c	OTB29-3 _____ OTB29-4 _____				
6.6.7.2 TCB-7 TRIP TEST #1					
6.6.7.2.1 Trip TCB-7	Green _____ Red _____				
6.6.7.2.2 Auxiliary Switch Contacts 3-3c	OTB24-5 _____ OTB24-6 _____				
6.6.7.2.3 Auxiliary switch Contacts 10-10c	OTB29-1 _____ OTB29-2 _____				

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EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.7.2.4	Auxiliary Switch	OTB29-7 _____				
	Contacts 6-6c	OTB29-8 _____				
6.6.7.2.5	Auxiliary Switch	OTB29-9 _____				
	Contacts 7-7c	OTB29-10 _____				
6.6.7.2.6	Auxiliary Switch	OTB29-11 _____				
	Contacts 8-8c	OTB29-12 _____				
6.6.7.2.7	Auxiliary Switch	OTB25-9 _____				
	Contacts 5-5c	OTB25-10 _____				
6.6.7.2.8	Auxiliary Switch	OTB25-4 _____				
	Contacts 4-4c	OTB25-6 _____				
6.6.7.2.9	Auxiliary Switch	OTB29-3 _____				
	Contacts 9-9c	OTB29-4 _____				
6.6.7.2.10	Close TCB-7	Green _____				
		Red _____				
6.6.7.2.11	TCB-7 Will Rackout	Yes _____				
		No _____				
6.6.7.3	TCB-7 TRIP TEST #2					
6.6.7.3.1	Jumper Between OTB24-9 & OTB24-10 Removed	Yes _____				
		No _____				
6.6.7.3.2	TCB-7 Open	Green _____				
		Red _____				
6.6.7.3.3	Jumper Between OTB24-9 & OTB24-10 Connected	Yes _____				
		No _____				
6.6.7.3.4	Close TCB-7	Green _____				
		Red _____				
6.6.7.4	TCB-7 TRIP TEST #3					
6.6.7.4.1	Jumper Between OTB23-7 & OTB23-8 Removed	Yes _____				
		No _____				
6.6.7.4.2	TCB-7 Open	Green _____				
		Red _____				
6.6.7.4.3	Jumper Between OTB23-7 & OTB23-8 Connected	Yes _____				
		No _____				

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EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.7.4.4 Close TCB-7		Green _____ Red _____				
6.6.7.5 TCB-7 TRIP TEST #4						
6.6.7.5.1 Jumper Between OTB23-9 & OTB23-10		Yes _____ No _____				
6.6.7.5.2 TCB-7 Open		Green _____ Red _____				
6.6.7.5.3 Jumper Between OTB23-9 & OTB23-10 Removed		Yes _____ No _____				
6.6.7.5.4 Close TCB-7		Green _____ Red _____				
6.6.7.6 TCB-7 TRIP TEST #5						
6.6.7.6.1 Jumper Between OTB24-3 & OTB24-4		Yes _____ No _____				
6.6.7.6.2 TCB-7 Open		Green _____ Red _____				
6.6.7.6.3 Jumper Between OTB24-3 & OTB24-4 Removed		Yes _____ No _____				
6.6.7.6.4 Close TCB-7		Green _____ Red _____				
6.6.7.7 TCB-7 TRIP TEST #6						
6.6.7.7.2 TCB-7 Open		Green _____ Red _____				
6.6.7.7.3 Close TCB-7		Green _____ Red _____				
6.6.7.8 TCB-7 TRIP TEST #7						
6.6.7.8.1 TCB-7 In Test		TCB-7 _____				
6.6.7.8.2 Trip TCB-7		Green _____ Red _____				
6.6.7.8.3 Close TCB-7		Green _____ Red _____				
6.6.7.8.4 TCB-7 Will Rack In		Yes _____ No _____				

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EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.7.8.6	Trip TCB-7	Green _____ Red _____				
6.6.7.8.7	Open 2D3P101	Green _____				
6.6.7.8.8	Jumper Between OTB24-9 & OTB24-10 Removed	Yes _____ No _____				
6.6.7.8.9	Jumper Between OTB23-7 & OTB23-8 Removed	Yes _____ No _____				
6.6.7.8.10	Switch Between OTB24-1 & OTB24-2 Removed	Yes _____ No _____				
6.6.7.8.11	TCB-7 To Operate	TCB-7 _____				
6.6.8.1 TCB-8 PREPARATION						
6.6.8.1.1	Open 2B1509 and 2B1606	2B1509 _____ 2B1606 _____				
6.6.8.1.2	TCB-8 In Operate Position and In Tripped Mode	Green _____ Red _____				
6.6.8.1.3	Open 2D4P101	Green _____ Red _____				
6.6.8.1.4	Test Jumper Installed Between OTB33-9 & OTB33-10	Yes _____				
6.6.8.1.5	Test Jumper Installed Between OTB32-7 & OTB32-8	Yes _____ No _____				
6.6.8.1.6	Test Switch Installed Between OTB33-1 & OTB33-2	Yes _____ No _____				
6.6.8.1.7	Close 2D4P101	Green _____ Red _____				
6.6.8.1.8	Close TCB-8	Green _____ Red _____				

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6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.8.1.9	TCB-8 Closed	Yes _____ No _____				
6.6.8.1.10	Auxiliary Switch Contacts 3-3c	OTB34-5 _____ OTB34-6 _____				
6.6.8.1.11	Auxiliary Switch Contacts 10-10c	OTB38-1 _____ OTB38-2 _____				
6.6.7.1.12	Auxiliary Switch Contacts 6-6c	OTB38-7 _____ OTB38-8 _____				
6.6.8.1.13	Auxiliary Switch Contacts 7-7c	OTB38-9 _____ OTB38-10 _____				
6.6.8.1.14	Auxiliary Switch Contacts 8-8c	OTB38-11 _____ OTB38-12 _____				
6.6.8.1.15	Auxiliary Switch Contacts 5-5c	OTB34-9 _____ OTB34-10 _____				
6.6.8.1.16	Auxiliary Switch Contacts 4-4c	OTB34-4 _____ OTB34-6 _____				
6.6.8.1.17	Auxiliary Switch Contacts 9-9c	OTB38-3 _____ OTB38-4 _____				
6.6.8.2	TCB-8 TRIP TEST #1					
6.6.8.2.1	Trip TCB-8	Green _____ Red _____				
6.6.8.2.2	Auxiliary Switch Contacts 3-3c	OTB34-5 _____ OTB34-6 _____				
6.6.8.2.3	Auxiliary Switch Contacts 10-10c	OTB38-1 _____ OTB38-2 _____				
6.6.8.2.4	Auxiliary Switch Contacts 6-6c	OTB38-7 _____ OTB38-8 _____				
6.6.8.2.5	Auxiliary Switch Contacts 7-7c	OTB38-9 _____ OTB38-10 _____				
6.6.8.2.6	Auxiliary Switch Contacts 8-8c	OTB38-11 _____ OTB38-12 _____				
6.6.8.2.7	Auxiliary Switch Contacts 5-5c	OTB34-9 _____ OTB34-10 _____				
6.6.8.2.8	Auxiliary Switch Contacts 4-4c	OTB34-4 _____ OTB34-6 _____				
6.6.8.2.9	Auxiliary Switch Contacts 9-9c	OTB38-3 _____ OTB38-4 _____				
6.6.8.2.10	Close TCB-8	Green _____ Red _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.8.2.11 TCB-8 Will Rackout	Yes _____ No _____				
6.6.8.3 TCB-8 TRIP TEST #2					
6.6.8.3.1 Jumper Between OTB33-9 & OTB33-10 Removed	Yes _____ No _____				
6.6.8.3.2 TCB-8 Open	Green _____ Red _____				
6.6.8.3.3 Jumper Between OTB33-9 & OTB33-10 Connected	Yes _____ No _____				
6.6.8.3.4 Close TCB-8	Green _____ Red _____				
6.6.8.4 TCB-8 TRIP TEST #3					
6.6.8.4.1 Jumper Between OTB32-7 & OTB32-8 Removed	Yes _____ No _____				
6.6.8.4.2 TCB-8 Open	Green _____ Red _____				
6.6.8.4.3 Jumper Between OTB32-7 & OTB32-8 Connected	Yes _____ No _____				
6.6.8.4.4 Close TCB-8	Green _____ Red _____				
6.6.8.5 TCB-8 TRIP TEST #4					
6.6.8.5.1 Jumper Between OTB32-9 & OTB32-10	Yes _____ No _____				
6.6.8.5.2 TCB-8 Open	Green _____ Red _____				
6.6.8.5.3 Jumper Between OTB32-9 & OTB32-10 Removed	Yes _____ No _____				
6.6.8.5.4 Close TCB-8	Green _____ Red _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.8.6 TCB-8 TRIP TEST #5						
6.6.8.6.1 Jumper Between OTB33-3 & OTB33-4		Yes _____ No _____				
6.6.8.6.2 TCB-8 Open		Green _____ Red _____				
6.6.8.6.3 Jumper Between OTB33-3 & OTB33-4 Removed		Yes _____ No _____				
6.6.8.6.4 Close TCB-8		Green _____ Red _____				
6.6.8.7 TCB-8 TRIP TEST #6						
6.6.8.7.2 TCB-8 Open		Green _____ Red _____				
6.6.8.7.3 Close TCB-8		Green _____ Red _____				
6.6.8.8 TCB-8 TRIP TEST #7						
6.6.8.8.1 TCB-8 In Test		TCB-8 _____				
6.6.8.8.2 Trip TCB-8		Green _____ Red _____				
6.6.8.8.3 Close TCB-8		Green _____ Red _____				
6.6.8.8.4 TCB-8 Will Rack In		Yes _____ No _____				
6.6.8.8.6 Trip TCB-8		Green _____ Red _____				
6.6.8.8.7 Open 2D4P101		Green _____				
6.6.8.8.8 Jumper Between OTB33-9 & OTB33-10 Removed		Yes _____ No _____				
6.6.8.8.9 Jumper Between OTB32-7 & OTB32-8 Removed		Yes _____ No _____				
6.6.8.8.10 Switch Between OTB33-1 & OTB33-2 Removed		Yes _____ No _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC		
6.6 TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.8.8.11 TCP-8 To Operate						
6.6.9.1 TCB-9 PREPARATION						
6.6.9.1.1	Open 2B1509 and 2B1606	2B1509 _____ 2B1606 _____				
6.6.9.1.2	TCB-9 In Operate Position and In Tripped Mode	Green _____ Red _____				
6.6.9.1.3	Close TCB-9	Green _____ Red _____				
6.6.9.1.4	TCB-9 Closed	Yes _____ No _____				
6.6.9.1.5	Auxiliary Switch Contacts 3-3c	OTB20-2 _____ OTB20-3 _____				
6.6.9.1.6	Auxiliary Switch Contacts 10-10c	OTB21-1 _____ OTB21-2 _____				
6.6.9.1.7	Auxiliary Switch Contacts 6-6c	OTB21-7 _____ OTB21-8 _____				
6.6.9.1.8	Auxiliary Switch Contacts 7-7c	OTB21-9 _____ OTB21-10 _____				
6.6.9.1.9	Auxiliary Switch Contacts 8-8C	OTB21-11 _____ OTB21-12 _____				
6.6.9.1.10	Auxiliary Switch Contacts 5-5c	OTB20-7 _____ OTB20-8 _____				
6.6.9.1.11	Auxiliary Switch Contacts 4-4c	OTB20-1 _____ OTB20-3 _____				
6.6.9.1.12	Auxiliary Switch Contacts 9-9c	OTB21-3 _____ OTB21-4 _____				
6.6.9.2 TCB-9 TRIP TEST #1						
6.6.9.2.1	Trip TCB-9	Green _____ Red _____				
6.6.9.2.2	Auxiliary Switch Contacts 3-3c	OTB20-2 _____ OTB20-3 _____				
6.6.9.2.3	Auxiliary Switch Contacts 10-10c	OTB21-1 _____ OTB21-2 _____				
6.6.9.2.4	Auxiliary Switch Contacts 6-6c	OTB21-7 _____ OTB21-8 _____				
6.6.9.2.5	Auxiliary Switch Contacts 7-7c	OTB21-9 _____ OTB21-10 _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0		PROCEDURE	MAINTENANCE	QA/QC		
6.6 * TRIP LATCH CHECK AND ADJUSTMENT		VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.9.2.6	Auxiliary Switch	OTB21-11				
	Contacts 8-8c	OTB21-12				
6.6.9.2.7	Auxiliary Switch	OTB20-7				
	Contacts 5-5c	OTB20-8				
6.6.9.2.8	Auxiliary Switch	OTB20-1				
	Contacts 4-4c	OTB20-3				
6.6.9.2.8	Auxiliary Switch	OTB21-3				
	Contacts 9-9c	OTB21-4				
6.6.9.2.10	Close TCB-9	Green _____				
		Red _____				
6.6.9.2.11	TCB-9 Will Rackout	Yes _____				
		No _____				
6.6.9.3	TCB-9 TRIP TEST #2					
6.6.9.3.1	Open 2D2P103					
	TCB-2	Green _____				
		Red _____				
	TCB-6	Green _____				
		Red _____				
	TCB-9	Green _____				
		Red _____				
6.6.9.3.2	Jumper Between BC1 & BC2 Installed	Yes _____				
		No _____				
6.6.9.3.3	Close 2D2P103					
	TCB-2	Green _____				
		Red _____				
	TCB-6	Green _____				
		Red _____				
	TCB-9	Green _____				
		Red _____				
6.6.9.3.4	Close TCB-9	Green _____				
		Red _____				
6.6.9.3.5	Trip TCB-9	Green _____				
		Red _____				
6.6.9.3.6	Open 2D2P103	Green _____				
		Red _____				
6.6.9.3.7	Jumper Between BC1 & BC2 Removed	Yes _____				
		No _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0	PROCEDURE	VERIFIED COMPLETE	MAINTENANCE		QA/QC	
			INITIAL	DATE	INITIAL	DATE
6.6	TRIP LATCH CHECK AND ADJUSTMENT					
6.6.9.4	TCB-9 TRIP TEST #3					
6.6.9.4.1	Two Wires On BC4 Connected Together	Yes _____ No _____				
6.6.9.4.2	Close 2D2P103					
	TCB-2	Green _____ Red _____				
	TCB-6	Green _____ Red _____				
	TCB-9	Green _____ Red _____				
6.6.9.4.3	Close TCB-9	Green _____ Red _____				
6.6.9.4.4	Trip TCB-9	Green _____ Red _____				
6.6.9.4.5	Open 2D2P103	Green _____ Red _____				
6.6.9.4.6	Two Wires On BC4 Connected	Yes _____ No _____				
6.6.9.4.7	Close 2D2P103	Green _____ Red _____				
6.6.9.5	TCB-9 TRIP TEST #4					
6.6.9.5.1	TCB-9 To Test	TCB-9 _____				
6.6.9.5.2	Trip TCB-9	Green _____ Red _____				
6.6.9.5.3	Close TCB-9	Green _____ Red _____				
6.6.9.5.4	TCB-9 Will Rack In	Yes _____ No _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO. _____

6.0 PROCEDURE		MAINTENANCE		QA/QC	
6.6 TRIP LATCH CHECK AND ADJUSTMENT	VERIFIED COMPLETE	INITIAL	DATE	INITIAL	DATE
6.6.10 TRIP LATCH ADJUSTMENT ALL BREAKERS					
6.6.10.1 Control Power Off	Green _____ Red _____				
6.6.10.2 Trip Breaker	TCB- _____				
6.6.10.3 Breaker To Test	TCB- _____				
6.6.10.4 Buffer Paddle	Yes _____ No _____				
6.6.10.6 Close Breaker	TCB- _____				
6.6.10.7 Trip Breaker	TCB- _____				
6.6.10.8 Breaker Will Close	Yes _____ No _____				
6.6.10.10 Breaker Will Close	Yes _____ No _____				
6.6.10.11 Trip Breaker	TCB- _____				
6.6.10.12 Contacts Move Towards Close	Yes _____ No _____				
6.6.10.13 Position Of Slot Noted	Yes _____ No _____				
6.6.10.14 Latch Trip Check	Sat _____ Unsat* _____				

MAINTENANCE DATA RECORD FORM

EQUIPMENT NO.

[illegible]

Notes to MPES-008 review:

The documentation trail does not precisely exist for MPES-008 on unit 3. The operation of unit 2 has had maintenance tests MPES008 performed. This however, does not rule out the possibility of - some unit 2 breakers going to unit 3 and unit 2 breakers being moved in an uncolled fashion from unit 3 to unit 2.

UNIT 2

7/20/81 VENDOR PERFORMED

MAINTENANCE -

7/21/81 NCR 5023-563

MPES-008

(Breaker - Serial Number

MASTER

PM OF Day List

10/07/81

2/12/81

256 A 400 2 - 656 - 3

WO 10451

7/14/82

256 A 400 2 656 - 29

256 A 400 2 656 - 12

256 A 400 2 656 - 24

256 A 400 2 656 - 02

(256 A 400 2 656 - 08

256 A 400 2 656 - 45

256 A 400 2 656 - 14

256 A 400 2 656 - 7

7/14/82

10/7/81

2/12/81

UNIT 3

VENDOR Performance
50-23-999-352

Breaker - Serial Number	W.O.	No MPESA
256A 4002-656-05.	12286 8/19/82	—
256A 4002-656-34	12286 8/19/82	—
256A 4002-656-25	12286 8/18/82	—
256A 4002-656-17	12286 8/18/82	—
AK23827 type AK 2-25	12279 8/20/82	—
AK25482 type AK 2-25	12281 8/24/82	—
AK23876 type AK 2-25	12280/12282 8/20/82	—
AK 25481 type AK 2-25	12280/12278 8/20/82	—
256A 4002-656-26	12286 8/19/82	—

AK 25512 is in Maintenance Shop

EQUIPMENT DESCRIPTION

SERIAL NUMBER

DATE	DESCRIPTION OF WORK	REFERENCES
4/12/79	Letter from Engelken to Moore Take action on IEB 79-09	
4/20/79	Letter from Nunn to J.G. Higgins Take action on IEB 79-09	
1/2/80	Memo for file: NCE 154 and present Plans are to replace breakers	
4/27/79	JM Current from Lt. L. O'Hosm Subject IE Bulletin 79-09	
6/13/77	Engelken from K.P. Besten IE- Bulletin 79-09	
6/14/79	G.T. McLand v. d. L. from Ck Bailey	

EQUIPMENT DESCRIPTION

SERIAL NUMBER

DATE	DESCRIPTION OF WORK	REFERENCES
10/26/79	F-NRC-154 MPES 008 has been developed.	
5/22/81	Papay from B.H. Faulkenberry IE Bulletin 79-09 closed	
	SWP 13267 to 13275	
12/31/80	Perform routine Maintenance on UV Trip devices TCB-1 through TCB-9 Unit 2 MPES-008	
3/31/81	Maintenance data records on Unit 2 MPES-008	
Through 7/21/81		
4/15/81	maintenance procedure SO-2 MPES-008 rev D	

EQUIPMENT DESCRIPTION

SERIAL NUMBER

DATE	DESCRIPTION OF WORK	REFERENCES
	Maintenance procedures E-Data	
	6/10/82 - SO23-I-4.36	revo
	4/20/82 - SO2 - MPES008-	revo
	3/09/81 - MPES-008 - rev1	
	6/13/80 - MPES-008 - revo	
3-16-83	Memo for file - Dulbrund	
	Past Maintenance work	
7-14-82	WO - 10451 13 pages	
7-22-82	WO - 11106 CANCELLED	
	WO - 12278 NCR SE-F-1103	
	12279 SE-F-1104	
	12280 SE-F-1105	
	12281 SE-F-1106	
	12282 SE-F-1102	
	12286 - SE-F-1101	

EQUIPMENT DESCRIPTION

SERIAL NUMBER

DATE	DESCRIPTION OF WORK	REFERENCES
7/12/82	NCR 511	
	WO 10305 work performed according to NCR SO 23 P-511	
7/12/82	SE-F-NCR 0998. TRR-0630	
7/22/82	SO - 23 - P-563 ref: MPES 008 requirement can not be obtained	
7/15/76	SO23-944 - 352 Instruction Manual	

1.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V

SUITE 202, WALNUT CREEK PLAZA
1990 N. CALIFORNIA BOULEVARD
WALNUT CREEK, CALIFORNIA 94596

April 17, 1979

Docket Nos. 50-361
50-362

Southern California Edison Company
P. O. Box 800
2244 Walnut Grove Avenue
Rosemead, California 91770

Attention: Mr. J. B. Moore
Vice President

Gentlemen:

Enclosed is IE Bulletin No. 79-09 which requires action by you with regard to your power reactor facility(ies) with an operating license or a construction permit.

Should you have questions regarding this Bulletin or the actions required of you, please contact this office.

Sincerely,

R. H. Engelken
Director

Enclosure:
IE Bulletin No. 79-09
with enclosures

cc w/enclosure:
J. H. Drake, SCE

7905030296

(18-8)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

April 17, 1979

IE Bulletin No. 79-09

FAILURES OF GE TYPE AK-2 CIRCUIT BREAKER IN SAFETY RELATED SYSTEMS

Description of Circumstances:

Twelve failures of General Electric (GE) type AK-2 (i.e., AK-2A-15, 25, 50, 75, or 100) Circuit Breakers installed in safety-related systems have been reported since 1975. The failures occurred at the following facilities:

Date	Facility	System
1. 9/16/78	Arkansas-1	Control Rod Drive System
2. 9/25/78	Arkansas-1	Control Rod Drive System
3. 10/17/78	Arkansas-1	Control Rod Drive System
4. 1/22/78	Crystal River-3	Control Rod Drive System
5. 8/7/75	Oconee Unit-3	Control Rod Drive System
6. 1/18/79	Oconee Unit-3	Control Rod Drive System
7. 1/22/79	Oconee Unit-1	Control Rod Drive System
8. 1/31/79	Oconee Unit-1	Control Rod Drive System
9. 4/25/75	TMI/1	Control Rod Drive System
10. 11/26/78	Oyster Creek-1	Containment Spray Pump
11. 11/30/78	Oyster Creek-1	Service Water Pump No. 1
12. 11/30/78	Oyster Creek-1	Service Water Pump No. 2

It is significant to note that during a loss-of-off-site power test on November 30, 1978, at Oyster Creek, both service water pump circuit breakers failed to trip, as required. The undervoltage relays which monitor voltage level on each emergency bus functioned properly but could not actuate the trip mechanism via the undervoltage trip device within each circuit breaker. These failures, in turn, created a potential overload condition on each emergency diesel generator unit by allowing simultaneous starting of multiple high horse power motors during the sequential loading phase of the test.

The causes for failure were attributed to either binding within the linkage mechanism of the undervoltage (UV) trip device and trip shaft assembly or out-of-adjustment conditions in the same linkage mechanism. Babcock and Wilcox (B&W) and GE determined that the binding and out-of-adjustment resulted from inadequate preventive maintenance programs

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at the affected operating facilities. In each case listed above, cleaning and relubricating the trip shaft mechanism within the circuit breaker was required to correct the problem.

The enclosed GE Service Advice Letter (SAL) 175(CPDD) 9.3 is being sent to all power reactor facilities notifying them of the potential problems. The SAL identifies the causes for failure and provides their recommended corrective action. Similar notification of the problem has been issued by B&W to all specific B&W designed facilities.

Action to be Taken by Licensees:

For all power reactor facilities with an operating license or construction permit:

1. Determine whether or not GE type AK-2 breakers are used or planned for use in safety-related systems at your facility(ies).
2. If such circuit breakers are used or planned for use, identify the safety system involved and provide in written form your plans for developing a preventive maintenance program which will assure design performance with the GE type AK-2 circuit breaker.
3. The program shall include as a minimum but not be limited to the following:
 - a. Establish and adhere to a preventive maintenance schedule regarding the subject circuit breakers.
 - b. Have the maintenance performed by qualified personnel. The GE power circuit breaker instruction manual should be used as guidance in setting up the maintenance procedures.
 - c. During the preventive maintenance, perform the recommended corrective actions described in the enclosed GE Service Alert Letter No. 175(CPDD) 9.3, dated April 2, 1979. A copy of this letter is enclosed for your information and appropriate use.
4. For facilities with an operating license, a written report of the above actions, including the date(s) when they will be completed, shall be submitted within 30 days of receipt of this Bulletin.
5. For facilities with a construction permit, a written report of the above actions, including the date(s) when they will be completed, shall be submitted within 60 days of receipt of this Bulletin.

Reports should be submitted to the Director of the appropriate NRC Regional Office. A copy of your report should be sent to the U.S. Nuclear Regulatory Commission, Office of Inspection and Enforcement, Division of Reactor Operations Inspection, Washington, D.C. 20555.

Approved by GAO, B180225 (R0072); clearance expires 7/31/80. Approval was given under a blanket clearance specifically for identified generic problems.

Enclosures:

1. Copy of Text of General
Electric Service Advice
Letter (SAL) No. 175(CPDD)
9.3
2. List of IE Bulletins
Issued in Last
Twelve Months

EXTRACT OF GE SERVICE ADVICE LETTER
NO. 175(CPPD)9.3

An undervoltage device is used on some AK type breakers to trip the breaker when loss of voltage occurs on the undervoltage device coil. The undervoltage device is an optional accessory for tripping the breaker and is used in some circuits in place of a shunt trip device because of the inference that it "fails safe" i.e., it trips the breaker when all normal sources of control voltage have become unavailable for shunt trip type operations. Because of the many constraints imposed on the undervoltage device, such as the need to withstand rated voltage continuously, to pick-up at 80 percent or rated voltage (industry standards now require pick-up at 85 percent of rated voltage) and to drop out at 30 percent to 60 percent of rated voltage, both the undervoltage device and breaker must be maintained at a high level of performance to provide the assurance the breaker will trip when voltage is removed from the undervoltage device coil. The following is recommended and except where the breaker is in warranty, should be performed at the customer's expense.

Refer To Figure 1

- MPES 008
REV 2
DATE 4-20-82
1. Check the undervoltage trip device to assure there is not excessive clearance between the armature and the rivet and that there are no binds as the armature moves through its travel when manually operated. If excessive clearance or binding exists, it should be adjusted by loosening screws (11) and moving the magnet (10) up or down as necessary to obtain the proper freedom of the armature (3) with respect to its pivot on magnet (10) and the guide provided by pivot (13). 6.15
 2. Check (and adjust if necessary) the trip latch engagement. This adjustment is described in the maintenance manual for that particular breaker. 6.6
 3. Check (and adjust if necessary) the pick-up setting of the instantaneous undervoltage device. In some instances, the standards for nominal voltage ratings and pick-up settings have been raised since the breakers were shipped from the factory. The new nominal voltages and pick-up settings deviate substantially from these values, the device should be readjusted while it is on the breaker. 6.3

Nominal Voltage

Pick-up Setting

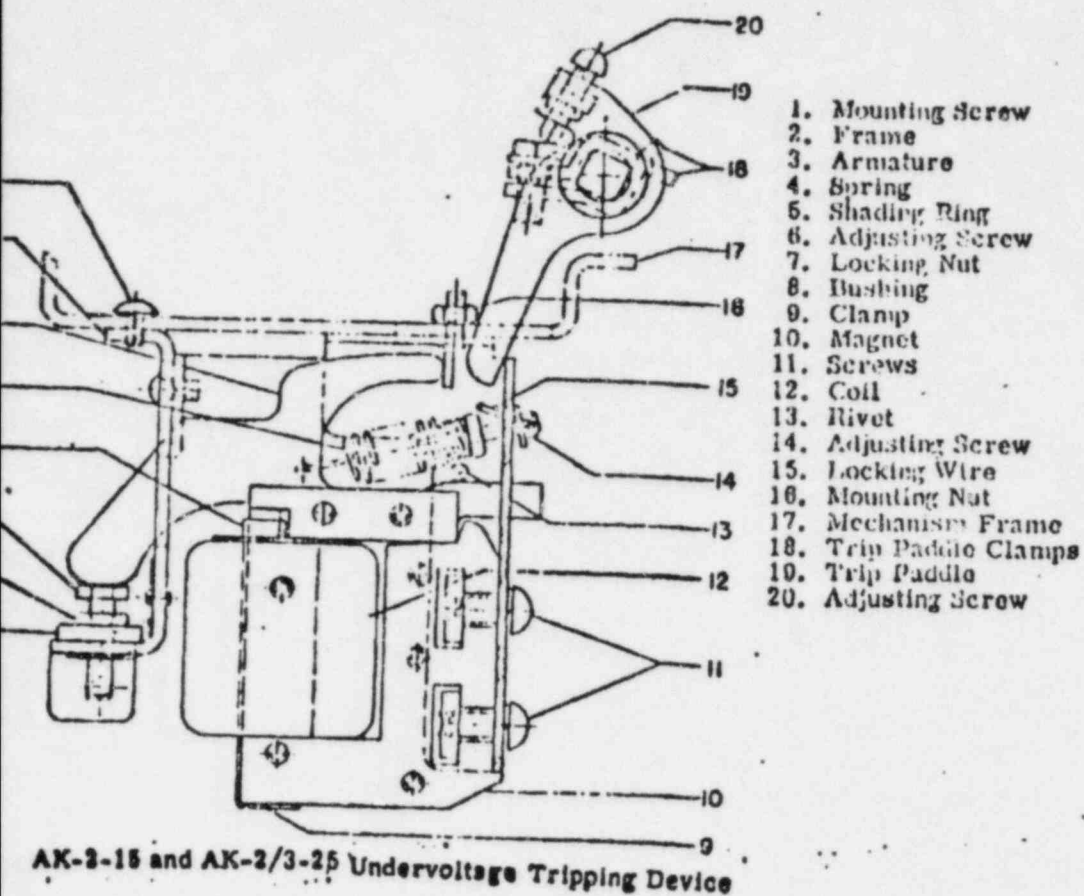
125V DC	106
250V DC	213
120V AC	102
240V AC	204

To adjust the pick-up of the instantaneous undervoltage trip device, remove the Locking Wire (15) and turn the adjusting screw (14) clockwise to raise the pick-up to the desired setting. A suitable voltmeter and adjustable voltage source should be connected to the undervoltage device coil leads at the terminal board for stationary breakers or the secondary disconnects for drawout type breakers. On AC devices, the pick-up voltage should be read immediately before the armature closes its air gap. After the pick-up is adjusted, locking wire (15) should be installed.

No adjustment is necessary on time-delay undervoltage devices, since the undervoltage device coil is switched by a relay in the time-delay unit.

4. The torque required on the trip shaft to trip a closed breaker should not exceed 1.5 pounds-inches. This may be checked with the equivalent of an open-end wrench fabricated from a piece of sheet metal to which a spring scale can be fastened approximately 1 inch from the trip shaft centerline. Where the torque required to trip the breaker exceeds 1.5 pound-inches, hardened grease in the trip shaft bearings and/or latch bearing may be suspected or dirt may have accumulated on the trip latch surface. Hardened grease must be replaced or revitalized with a suitable solvent such as WD-40 or CRC 5-56 or the bearings must be replaced. Excessive grease and dirt should be removed from the trip latch surface.
5. The adjustment between the undervoltage trip device and the trip paddle on the trip shaft should be checked to assure the required positive trip is maintained (positive trip exists when approximately 1/32 inch additional travel of the armature occurs after the undervoltage device trips the breaker.) This adjustment is made with adjusting screw (20).
6. The frequency of inspection of the involved breakers should be increased until it can be verified that the revitalization of the grease is effective for the normal maintenance interval. Thereafter the grease in the bearing should be revitalized at normal maintenance intervals.

Attachment:
Figure 1



1. Mounting Screw
2. Frame
3. Armature
4. Spring
5. Shading Ring
6. Adjusting Screw
7. Locking Nut
8. Bushing
9. Clamp
10. Magnet
11. Screws
12. Coil
13. Rivet
14. Adjusting Screw
15. Locking Wire
16. Mounting Nut
17. Mechanism Frame
18. Trip Paddle Clamps
19. Trip Paddle
20. Adjusting Screw

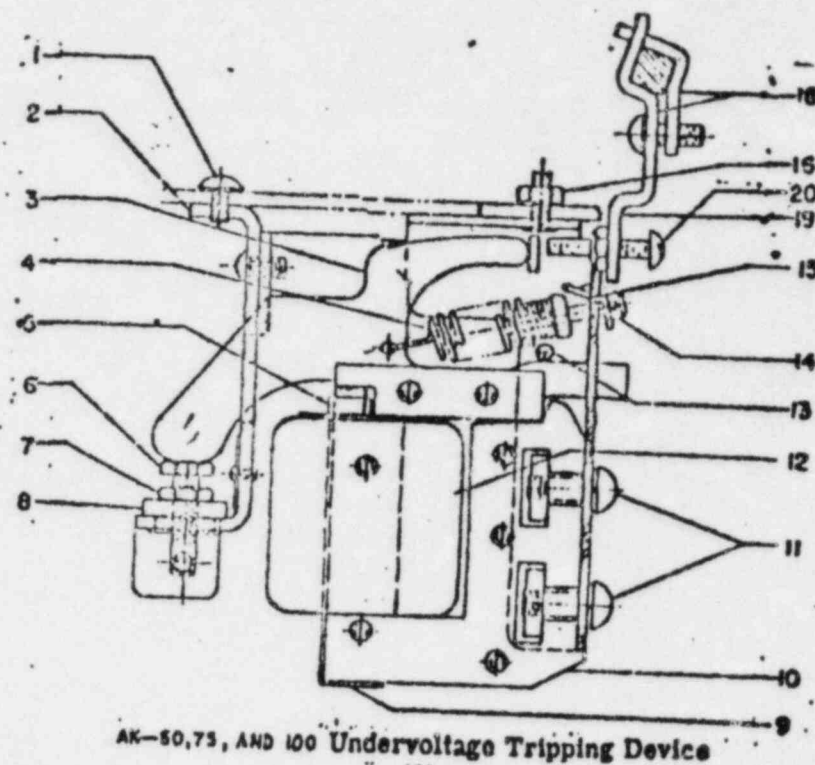


FIGURE 1

LISTING OF IE BULLETINS
ISSUED IN LAST TWELVE MONTHS

Bulletin No.	Subject	Date Issued	Issued To
78-05	Malfunctioning of Circuit Breaker Auxiliary Contact Mechanism-General Model CR105X	4/14/78	All Power Reactor Facilities with an OL or CP
78-06	Defective Cutler- Hammer, Type M Relays With DC Coils	5/31/78	All Power Reactor Facilities with an OL or CP
78-07	Protection afforded by Air-Line Respirators and Supplied-Air Hoods	6/12/78	All Power Reactor Facilities with an OL, all class E and F Research Reactors with an OL, all Fuel Cycle Facilities with an OL, and all Priority 1 Material Licensees
78-08	Radiation Levels from Fuel Element Transfer Tubes	6/12/78	All Power and Research Reactor Facilities with a Fuel Element transfer tube and an OL
78-09	BWR Drywell Leakage Paths Associated with Inadequate Drywell Closures	6/14/79	All BWR Power Reactor Facilities with an OL or CP
78-10	Bergen-Paterson Hydraulic Shock Suppressor Accumulator Spring Coils	6/27/78	All BWR Power Reactor Facilities with an OL or CP
78-11	Examination of Mark I Containment Torus Welds	7/21/78	BWR Power Reactor Facilities for action: Peach Bottom 2 and 3, Quad Cities 1 and 2, Hatch 1, Monti- cello and Vermont Yankee

LISTING OF IE BULLETINS
ISSUED IN LAST TWELVE MONTHS

Bulletin	Subject	Date Issued	Issued To
78-12	Atypical Weld Material in Reactor Pressure Vessel Welds	9/29/78	All Power Reactor Facilities with an OL or CP
78-12A	Atypical Weld Material in Reactor Pressure Vessel Welds	11/24/78	All Power Reactor Facilities with an OL or CP
78-12B	Atypical Weld Material in Reactor Pressure Vessel Welds	3/19/79	All Power Reactor Facilities with an OL or CP
78-13	Failures In Source Heads of Kay-Ray, Inc., Gauges Models 7050, 7050B, 7051, 7051B, 7060, 7060B, 7061 and 7061B	10/27/78	All general and specific licensees with the subject Kay-Ray, Inc. gauges
78-14	Deterioration of Buna-N Components In ASCO Solenoids	12/19/78	All GE BWR facilities with an OL or CP
79-01	Environmental Qualifica- tion of Class IE Equipment	2/8/79	All Power Reactor Facilities with an OL or CP
79-02	Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts	3/2/79	All Power Reactor Facilities with an OL or CP
79-03	Longitudinal Weld Defects In ASME SA-312 Type 304 Stainless Steel Pipe Spools Manufactured By Youngstown Welding and Engineering Co.	3/12/79	All Power Reactor Facilities with an OL or CP
79-04	Incorrect Weights for Swing Check Valves Manufactured by Velan Engineering Corporation	3/30/79	All Power Reactor Facilities with an OL or CP

LISTING OF IE BULLETINS
ISSUED IN LAST TWELVE MONTHS

Bulletin No.	Subject	Date Issued	Issued To
79-05	Nuclear Incident at Three Mile Island	4/2/79	All Power Reactor Facilities with an OL and CP
79-05A	Nuclear Incident at Three Mile Island	4/5/79	All B&W Power Reactor Facilities with an OL
79-06	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	4/11/79	All Pressurized Water Power Reactors with an OL License except B&W facilities
79-06A	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	4/14/79	All Pressurized Water Power Reactor Facilities of Westinghouse Design with an Operating License
79-06B	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	4/14/79	All Combustion Engineering Designed Pressurized Water Power Reactor Facilities with an Operating License
79-07	Seismic Stress Analysis of Safety-Related Piping	4/14/79	All Power Reactor Facilities with an OL or CP
79-08	Events Relevant to BWR Reactors Identified During Three Mile Island Incident	4/14/79	All BWR Power Reactor Facilities with an OL
79-09	Failures of GE Type AK-2 Circuit Breaker in Safety Related Systems	4/16/79	All Power Reactor Facilities with an OL or CP

2.

FILE
cc: PRK
DBS
Schwab
PORTANOVA
PRB

for your WFO
PA Croy

RECEIVED
APR 24 1979

AD12-QL
SONGS 2&3

SCE - QA
SONGS 2 & 3

April 20, 1979

MR. J. G. HAYNES

SUBJECT: NRC IE Bulletin No. 79-09
San Onofre Nuclear Generating Station, Units 2 and 3

The attached NRC IE Bulletin 79-09 concerning failures of GE Type AK-2 circuit breakers in safety related systems requires a written response by June 19, 1979 for San Onofre Units 2 and 3.

DEAN
D. E. NUNN

DEN:fm
Attachment

cc: D. E. Nunn
L. L. Seyler
P. R. Belhumeur
P. A. Croy
W. C. Moody
D. F. Pilmer
H. L. Ottoson
J. A. Beoletto
C. C. Coppin
D. M. Barron
QA Files
EDMC

MEMORANDUM FOR FILE

January 2, 1980

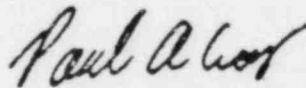
SUBJECT: Implementation of NRC IE Bulletin 79-09
San Onofre Nuclear Generating Station, Units 2&3

Reference: a) IE Bulletin 79-09, "Failure of GE Type AK-2
Circuit Breakers"

b) NRC Inspection Report 50-361/79-28 dated
December 12, 1979

Reference b addresses reference a and states the following:

"SCE issued a letter to NRC dated 6/13/79 identifying the
switchgear using Type AK-2 circuit breakers and stating that
the present plans are to replace the circuit breakers."



PAUL A. CROY

PAC:mpc

cc: File No. F-NRC-154

Southern California Edison Company
QUALITY ASSURANCE
NRC ACTION ITEM REPORT

NRC AIR Number F-NRC-154
 Date of Original Issue 10-26-79
 Revision Number _____
 Date of Revision _____

ACTION ITEM DESCRIPTION (Include pertinent specification, QA Program requirement; identify reference documents and actions). IAE Bulletin 79-09 - G-E Type AK-2 Breakers

By letter from K. P. Baskin to R. H. Engelken (NRC) dated 6-13-79, two options were presented to resolve the conditions described in the Bulletin. These options are: (1) Replacement of Reactor Trip Switchgear as part of ATWS design change thereby eliminating use of the subject breakers or (2) development of preventative maintenance program in accordance with item 3 of the Bulletin prior to plant operation if item (1) is not implemented by this time. Reference SCE NCR 5023-F-216 and BPC NCR N-551.

REQUIRED ACTION (Identify organization and individual responsible for taking action or providing information for answer to NRC question or concern. Give target date for completion of action).

SCE Startup Maintenance (R. Gray) to assure that preventative maintenance program is established for the breakers based on the disposition of the above NCR (option 2 above).

J. K. Huey
 ASSIGNED GAB

Paul A. Gray
 P. A. Gray
 QA / QC SUPERVISOR

31 Oct 79
 DATE

RESOLUTION (Describe actions, list reports, meeting, agreements, letters).

Preventive Maintenance Procedure No. MPES-008 has been developed. This item was closed by NRC Inspection Report No. 50-361/81-07.

B. I. Sanano
 B. I. Sanano
 ASSIGNED GAB

6/30/81
 DATE

D. C. Stonecipher
 D. C. Stonecipher
 QA / QC SUPERVISOR

7-1-81
 DATE

NRC ACTION

- ☐ Infraction
- ☐ Deficiency
- ☐ Deviation
- ☐ Open Item
- ☐ Unresolved item
- ☒ Inquiry/concern
- ☐ NA

PROJECT ACTION

- ☐ 10CFR50.55(a)
- ☐ 10CFR21
- ☐ SAR dev/chg
- ☒ NA

10CFR50 APP B CRITERIA

- General: ☒
- Specific: ☒

DISTRIBUTION

J. J. Wambold	D. B. Schone	L. L. Seyler	R. L. Rogers
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H. L. Richter	C. R. Horton	MTS	CDMC (Orig. when closed)
H. E. Morgan	<u>B. I. Sanano</u>		

3.

April 27, 1979

J. M. Curran, Plant Manager
San Onofre Nuclear Generating Station

*Please Place
response
by 5-8-79*

IE Bulletin 79-09

RECEIVED	
APR 30 '79	
SAN ONOFRE NUCLEAR STATION	
UNIT 1	UNIT 2&3 ACTION
SECURITY	
SPW	
SFI	
SPC/R	
COPY TO	BLC
RET: N 79	

Copies of the subject bulletin, Failures of GE Type AK-2 Circuit Breaker in Safety Related Systems, for Docket Nos. 50-206, 50-361 and 50-362 are forwarded. Copies were also transmitted directly to the station.

Pursuant to the directions in the bulletin and in Division Order D-N-1, you are requested to propose a response for Docket No. 50-206 (Unit 1) by May 8, 1979. Response for Docket Nos. 50-361 and 50-362 (Units 2 and 3) will be provided by Nuclear Engineering.

Should you require assistance or further information, please contact this office.

H. L. Ottoson
H. L. Ottoson

GTM/k

Attachments

cc: B. L. Curtis
G. T. McLandrich (w/o attachment)

RECEIVED	
APR 30 '79	
SAN ONOFRE NUCLEAR STATION	
UNIT 1	UNIT 2&3 ACTION
PLT MGR	
SUPT	
ENGR	
SECURITY	
ADM	
SFO	
SPW	
SFI	
SPC/R	
COPY TO	
RET: N 79	

→ FILE

4)

June 13, 1979

U. S. Nuclear Regulatory Commission
 Region V
 Suite 202, Walnut Creek Plaza
 1990 N. California Boulevard
 Walnut Creek, California 95596

RECEIVED
 JUN 21 1979

SCE - QA
 SONGS 2 & 3

Attention: Mr. R. H. Engelken, Director

Gentlemen:

Subject: IE Bulletin 79-09
 Docket No's 50-361 and 50-362
 San Onofre Nuclear Generating Station
 Units 2 and 3

Reference: McGill, P.O. (CE) to Rusche, B. C. (NRC),
Anticipated Transients Without SCRAM,
 Combustion Engineering letter dated
 June 30, 1976

Your letter of April 17, 1979 forwards IE Bulletin 79-09, "Failures of GE Type AK-2 Circuit Breakers in Safety Related Systems" and requests identification of those systems, if any, that utilize the subject breakers and plans for developing a preventative maintenance program to assure breaker design performance.

Following a review by both our NSSS supplier (CE) and our A/E (Bechtel), it has been determined that GE Type AK-2 breakers are utilized only in the Reactor Trip Switchgear. However, as stated in Section 15.2 of the San Onofre Units 2 & 3 FSAK, it is SCE's intent to implement a design change for ATWS similar to that described in the referenced letter. As part of that change the Reactor Trip Switchgear would be replaced and, therefore, none of the subject breakers would be utilized at San Onofre Units 2 and 3.

QA DISTRIB

P. BELHUMEUR

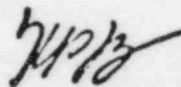
P. CAPOY ✓

7908070739

Should those proposed modifications pertaining to the Reactor Trip Switchgear not be implemented for some reason, SCE will develop an appropriate preventive maintenance program (structured in accordance with the requirements of item 3 of the subject bulletin) prior to plant operation.

Should you have any questions or require further clarification, please contact me.

Very truly yours,



K. P. Baskin
Manager, Generation Engineering

CKBalog:ldm

cc: U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Division of Reactor Operations Inspection
Washington, D. C. 20555

bcc: Jack B. Moore
D. R. Pigott (Chickering & Gregory)
D. W. Gilman (SDG&E)
D. E. Nunn
H. B. Ray/D. F. Martin/S. V. Tashjian
H. L. Ottoson
J. M. Curran
J. A. Beoletto
W. C. Moody
M. O. Medford
C. K. Balog
D. F. Pilmer/W. G. Zintl
B. Katz/J. Silvio (2)
G. T. McLandrich
NE Files
NRC Files
EDM Files
B.L. Curtis

Correspondence			
Date:		3/11/79-09	
	Original	Initials	Date
	Mgt. EDO		
✓	Mgt. GES		
✓	Chief, Nucl.	✓	11/1/79
✓	Supv. Lic.	✓	11/1/79
✓	Lic. Gr. Ldr.	✓	11/1/79
	Proj. Mgt.		
✓	Proj. Eng.	✓	11/1/79
✓	Stk. Sup.	✓	11/1/79
✓	Law	✓	11/1/79
	Port.	✓	11/1/79
	Quic.		
	Fr.		
✓	Proj. G.L.	✓	11/1/79
✓	Inst. G.L.	✓	11/1/79
✓	Org.	✓	11/1/79

5.
June 14, 1979

MR. G. T. McLANDRICH

Subject: IE Bulletin 79-09
San Onofre Nuclear Generating Station
Units 2 and 3

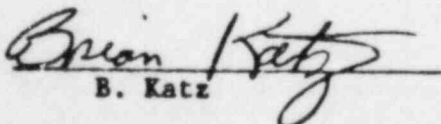
Reference: A. Letter K. P. Baskin to R. H. Engelken (NRC)
dated June 13, 1979, same subject (attached)

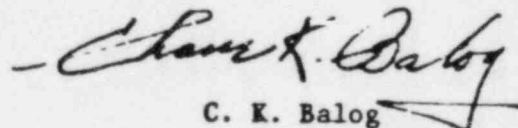
B. IE Bulletin 79-09 (attached)

IE Bulletin 79-09, "Failures of GE Type AK-2 Circuit Breakers in Safety Related Systems" requests identification of those systems, if any, that utilize the subject breakers and plans for developing a preventative maintenance program to assure breaker design performance.

The referenced letter informs the NRC that the subject breakers are utilized only in the Reactor Trip Switchgear (RTS) at San Onofre Units 2 and 3. Further, based on the information contained in FSAR Section 15.8, it is SCE's intent to implement certain design changes for ATWS considerations which include replacing the existing RTS (including the subject breakers); thus, SO23 will no longer utilize the type AK-2 breakers and no further action in regard to this bulletin will be required. These modifications will be made providing NRC approval of Combustion Engineering's proposed ATWS modifications. However, should the proposed modifications not be implemented for some reason, Steam Generation should develop an appropriate preventative maintenance program (structured in accordance with the requirements of item 3 of Reference B) prior to plant operation. We will apprise you of the status of this concern when the NRC provides some indication of their position on the proposed ATWS modifications.

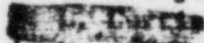
Should you have any questions or require further clarification, please contact me.


B. Katz


C. K. Balog

CKB:js

cc: S. V. Tashjian/D. F. Martin


A. Marr
C. G. Moore
D. F. Pilmer/W. G. Zintl (w/o att.)
C. K. Balog (w/o att.)
B. Katz/J. Silvio (2) (w/o att.)
NE File (w/o att.)
EDM Files (w/o att.)

9-3-81 905

6.

Southern California Edison Company
QUALITY ASSURANCE
NRC ACTION ITEM REPORT

C791026G

105-1

AD12-RA
AC30-RA

NRCAIR Number F-NRC-154
Date of Original Issue 10-26-79
Revision Number
Date of Revision

5023

ACTION ITEM DESCRIPTION (Include pertinent specification, QA Program requirement, identify reference documents and actions)

IAE Bulletin 79-09 - G-E Type AK-2 Breakers

By letter from K.P. Baskin to R.H. Engelken (NRC) dated 6-13-79, two options were presented to resolve the conditions described in the Bulletin. These options are: (1) Replacement of Reactor Trip Switchgear as part of ATWS design change thereby eliminating use of the subject breakers or (2) development of preventative maintenance program in accordance with item 3 of the Bulletin prior to plant operation if item (1) is not implemented by this time. Reference SCE NCR 5023-F-216 and BPC NCR N-551.

REQUIRED ACTION (Identify organization and individual responsible for taking action or providing information for answer to NRC question or concern. Give target date for completion of action).

SCE Startup Maintenance (R. Gray) to assure that preventative maintenance program is established for the breakers based on the disposition of the above NCR (option 2 above).

J.K. Hines

P.A. Gray

31 Oct 79

RESOLUTION (Describe actions, list reports, meeting, agreements, letters).

Preventive Maintenance Procedure No. MPES-508 has been developed. This item was closed by NRC Inspection Report No. 50-361/81-07.

B.I. Sanano

6/30/81

D.C. Stonecipher

RECEIVED
DM/EO
7-1-81

NRC ACTION

Initiation
Definition
Evaluation

Open item
Unresolved item
EC
NA

PROJECT ACTION

10CFR50.55(a)
10CFR21
SAR drafting
etc.

10CFR50 APP B CRITERIA

General
Specific

DISTRIBUTION

J. J. Winkold
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D. B. Schore
T. O. Gray
D. C. Stonecipher
D. E. Burton

L. L. Bayler
C. E. Balog
L. A. Hessler
MIS

E. L. Rogers
SQAF (Orig. when issued)
(Copy when closed)
CANC (Orig. when closed)

C.I. Sanano



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
1990 N. CALIFORNIA BOULEVARD
SUITE 202, WALNUT CREEK PLAZA
WALNUT CREEK, CALIFORNIA 94596

RECEIVED

MAY 22 1981

MAY 20 1981

L. T. PAPAY

Docket Nos. 50-361, 50-362

Southern California Edison Company
P. O. Box 800
2244 Walnut Grove Avenue
Rosemead, California 91770

Attention: Dr. L. T. Papay, Vice President
Advanced Engineering

Gentlemen:

Subject: NRC Inspection at San Onofre Units 2/3

This refers to the inspection conducted by Messrs. J. H. Eckhardt and J. F. Burdoin of this office on April 7-10, 1981 of activities authorized by NRC Construction Permit Nos. CPPR-97 and 98, and to the discussions of their findings held with Mr. D. E. Nunn and members of your staff on April 10, 1981.

Areas examined during this inspection are described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

No items of noncompliance with NRC requirements were identified within the scope of this inspection.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you believe to be exempt from disclosure under 10 CFR 9.5(a)(4), it is necessary that you (a) notify this office by telephone within ten (10) days from the date of this letter of your intention to file a request for withholding; and (b) submit within 25 days from the date of this letter a written application to this office to withhold such information.

8105270337

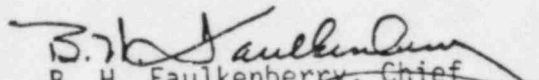
(44-1)

MAY 22 1981

If your receipt of this letter has been delayed such that less than seven (7) days are available for your review, please notify this office promptly so that a new due date may be established. Consistent with section 2.790(b)(1), any such application must be accompanied by an affidavit executed by the owner of the information which identifies the document or part sought to be withheld, and which contains a full statement of the reasons on the basis which it is claimed that the information should be withheld from public disclosure. This section further requires the statement to address with specificity the considerations listed in 10 CFR 2.790(b)(4). The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified periods noted above, the report will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

Sincerely,


B. H. Faulkenberry, Chief
Reactor Construction Projects Branch

Enclosure:

IE Inspection Report

Nos. 50-361/81-07

50-362/81-02

cc w/o enclosure:

R. Dietch, Vice President

Nuclear Engineering & Operations, SCE

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION V

Report No. 50-361/81-07
50-362/81-02

Docket No. 50-361/362 License No. CPPR-97/98 Safeguards Group _____

Licensee: Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, California 91770

Facility Name: San Onofre Units 2 and 3

Inspection at: Construction Site, San Diego County, California

Inspection conducted: April 7-10, 1981

Inspectors: J. H. Eckhardt, Reactor Inspector 5/22/81
Date Signed
J. F. Burdoin, Reactor Inspector 5/22/81
Date Signed

Approved By: D. F. Kirsch 5-22-81
Date Signed
D. F. Kirsch, Acting Chief, Reactor Projects Section 1

Summary:

Inspection on April 7-10, 1981 (Report No. 50-361/81-07 and 50-362/81-02)

Areas Inspected: Routine, unannounced inspection by regional based inspectors of construction activities involving licensee action on previous inspection findings, 50.55(e) reports, and IE Bulletins and Circulars. The inspection involved 44 onsite inspection hours by two NRC inspectors.

Results: No items of noncompliance or deviations were identified.

810527034

DETAILS

1. Individuals Contacted

a. Southern California Edison Company (SCE)

- *D. E. Nunn, Manager, Quality Assurance
- *P. A. Croy, Project QA Supervisor
- *T. O. Gray, Construction Lead QA Engineer
- N. Ferris, QA Engineer
- R. Williams, QA Engineer
- *L. A. Pfandler, QA Engineer Trainee
- S. Balog, Engineer
- *C. R. Horton, Startup QA Supervisor
- *J. J. Wambold, Project Manager

b. Bechtel Power Corporation (Bechtel)

- *H. F. McCluskey, Project Manager
- *J. E. Geiger, Project QA Manager
- *E. Moenar, Field Construction Manager
- R. Cook, QC Engineer
- *W. D. Nichols, Project Field Engineer
- *L. W. Hurst, Project QA Supervisor
- E. Luder, QA Engineer

*Denotes those attending exit interview.

2. Licensee Action on Previous Inspection Findings.

The inspector examined the action taken by the licensee on the following item.

(Closed) Noncompliance (50-361/79-26/01) Failure to Properly Calibrate Position Indication Devices on Reactor Pressure Vessel Examination Tool

Ultrasonic examinations had been conducted on both Unit No. 2 reactor vessel hot leg nozzles with ultrasonic search units that had not been position calibrated. A system of periodic position calibration to ensure search unit position accuracy had not been established for the nozzle bore examination rotator, nozzle bore examination boom extension, vessel-to-nozzle examination traversing arm and the vessel bottom head examination pivot boom.

The licensee responded to this item of noncompliance in a letter dated January 2, 1980. Corrective actions included engineering change notices which require position calibration of the affected equipment. Examinations conducted prior to November 8, 1979 with the nozzle bore examination rotator were voided and repeated utilizing the revised position check calibration procedure. Other examination devices were checked and position calibration was found to be within specifications. The inspector examined the engineering change notices and documentation of the position calibration checks and considers them satisfactory.

This item is closed.

3. Licensee Action on 50.55(e) Item

The licensee submitted a final 50.55(e) report on April 9, 1979 (amended on August 6, 1979) dealing with improper staking of lock nuts on Limitorque valve operators. The improperly staked lock nuts could cause the lock nut to back out and allow the stem to become disengaged from the splines resulting in a loss of drive to the valve stem. The licensee identified all valve operators with this condition and has completed proper staking and inspection. The inspector reviewed the nonconformance reports associated with these valves to assure all valves were inspected and examined six valves in Unit 3 containment to assure proper staking. This item is closed.

4. Licensee Action on IE Bulletins and Circulars

The following IE Bulletins and Circulars were reviewed by the inspector to determine the promptness and thoroughness of licensee actions to correct or avoid those known or potential deficiencies:

a. Bulletin 79-09, Failure of GE Type AK-2 Circuit Breaker in Safety Related Systems

3720-154
The failure to trip of some GE type AK-2 circuit breakers on undervoltage (UV) was traced to either binding within the linkage mechanism of the UV trip device and trip shaft assembly or out-of-adjustment conditions in the same linkage mechanism. The licensee has developed, for San Onofre Units 2 and 3, preventive maintenance procedure Number MPES008 to assure design performance of the GE type AK-2 circuit breakers. This item is ~~closed~~.

b. Bulletin 79-28, Possible Malfunction of NAMCO Model EA180 Limit Switches at Elevated Temperatures

The licensee has identified where NAMCO Model EA180 stem mounted limit switches are used in safety-related applications.

Top cover replacement gaskets have been provided and installed on NAMCO EA 180 limit switches which utilized inferior quality gaskets from the specified production lot. These modifications were completed February 10, 1981.

This item is ~~closed~~.

c. Bulletin 80-06, Engineered Safety Features (ESF) Reset Controls

It had been found at North Anna Plant that re-setting of ESF resulted in changing position of safety-related equipment from emergency mode to normal mode. Both the NSSS supplier and A&E has stated that this cannot occur at SONGS 2 and 3 because of uniqueness of the design. Verification that re-setting of ESF signals does not result in changing position of safety-related equipment from emergency mode to normal mode will be required during pre-operational testing or during start-up through system line-up tests. This item ~~will remain open pending~~ confirmation of this action.

d. Bulletin 80-08, Examination of Containment Liner Penetration Welds

An NRC inspection at Nine Mile Point Unit 2, identified that certain nondestructive examinations performed on containment penetration welds did not satisfy the applicable ASME Boiler and Pressure Vessel (B&PV) Code requirements. The welds in question were the primary piping containment penetration flued head (integral fitting) to outer sleeve welds which form a part of the containment pressure boundary.

The licensee has determined that San Onofre Units 2 and 3 utilize flued head design for penetration connections. All of the above mentioned connection welds are inspected in accordance with the 1974 Edition through Summer 1974 Addenda of the ASME B&PV Code and Regulatory Guide 1.19 which requires a radiographic examination (RT). Initial RT's that revealed indications outside the Code specified limits resulted from lack of fusion, slag and incomplete penetration. Welds that were found to be unacceptable by the initial RT were repaired and re-radiographed until the ASME Code criteria was met.

This item is closed.

e. Bulletin 80-09, Hydramotor Actuator Deficiencies

ITT General Controls reported the use of springs having incorrect material installed in Models AH-90 and NH-90 series hydra-motor actuators. The licensee's NSSS vendor (CE) identified that two of said actuators are used in the spray chemical addition system. This item ~~remains outstanding receipt and~~ review of a submittal on this subject presently being prepared by the licensee.

f. Bulletin 80-11, Masonry Wall Design

It was determined at an operating plant that a concrete masonry wall with questionable structural integrity was used to support seismic category I piping. The licensee reviewed the design of SONGS 2 and 3 and has determined that no masonry walls are used for Category I structures. This item is closed.

g. Bulletin 80-16, Potential Misapplication of Rosemount Inc. Models 1151 and 1152 Pressure Transmitters With Either "A" or "D" Output Codes

The licensee had determined that no Rosemount, Inc. Models 1151 and 1152 transmitters are used for control, protection, or indication in safety related systems at San Onofre Units 2 and 3. Six Model 1152 transmitters associated with the control room emergency air conditioning and ventilation system function to initiate annunciator/alarms in the control room. In the safety analysis, no credit is taken for the annunciator and alarm system. This item is closed.

- h. Bulletin 80-19, Failures of Mercury-Wetted Matrix Relays in Reactor Protective Systems of Operating Nuclear Power Plants Designed by Combustion Engineering

The licensee determined that mercury-wetted matrix type relays are not used in the reactor protective systems at San Onofre Units 2 and 3. This item is closed.

- i. Bulletin 80-20, Failures of Westinghouse Type W-2 Spring Return to Neutral Control Switches

The licensee determined that Westinghouse Type W-2 control switches are not used in safety system design at San Onofre Units 2 and 3. This item is closed.

- j. Bulletin 80-21, Valve Yokes Supplied by MALCOLM Foundry Company, Inc.

The licensee determined that no active valves with yokes manufactured by MALCOLM Foundry Inc. were supplied or are due to be supplied for use in safety related systems at San Onofre Units 2 and 3. This item is closed.

- k. Circular 79-18, Proper Installation of Target Rock Safety-Relief Valves

The licensee determined that no Target Rock safety relief valves are used at San Onofre Units 2 and 3. However, steps have been taken to be assure that the Dresser Industries safety valves supplied for the pressurizer will be insulated in strict accordance with the manufactures instructions. This item will ~~remain open~~ pending completion of this work.

- l. Circular 79-23, Motor Starters and Contactors Failed to Operate

The Gould, Inc., Electrical Products Group, reported to the NRC on September 11, 1979 potential defects in certain NEMA Size 3, starters and contactors. The faulty units manufactured between June 1, 1978 and August 30, 1979 are code dated 7822 to 7935. The licensee reviewed his records and determined that eight (8) NEMA size 3 starters could possibly fall into this category. Replacement kits were obtained from Limitorque Corporation and the modifications to the eight starters were completed October 1979. This item is closed.

- m. Circular 80-09, Problems With Plant Internal Communications Systems

Two plants (Kewaunee and Davis-Besse) experienced degradation of some plant communication systems following loss of offsite power. The degraded systems were energized from non-safety buses. The

licensee's review of the design for San Onofre Units 2 and 3 has identified that the PABX telephone and NRC Emergency Notification System are powered from the 16-hour telecommunications battery. The key telephone exchange, which services five key telephone sets in the technical support center, is supplied from a 120 volt AC uninterruptible power supply. A second issue which grew out of the problem at Kewaunee was the inducement of false signals in electronics equipment when two-way portable radios were used as a substitute for the plant communication system. Start-up procedure, No. 2AC-483-01, includes testing to determine the extent of this influence on electronics equipment. ~~This item will remain open pending completion of the test.~~

n. Circular 80-10, Failure to Maintain Environmental Qualification of Equipment

The wrong class of insulating material had been used in reconnecting motor leads following maintenance at the H. B. Robinson Nuclear Plant. This resulted in degrading the environmental qualification of the motor. The licensee stated that adequate administrative controls will be instituted, maintenance procedures prepared and training of maintenance personnel conducted to ensure proper environmental qualification of equipment is maintained. ~~This item will remain open.~~

o. Circular 80-12, Valve-Shaft-to-Actuator Key May Fall Out of Place When Mounted Below Horizontal Axis

It has been determined that improper orientation of Pratt butterfly valves has caused the valve-shaft-to-actuator key to fall out of place. This in turn resulted in valve inoperability. The licensee has inspected the orientation of all Pratt butterfly valves and determined that none were found to be susceptible to the failure mode described in subject circular. This item is closed.

p. Circular 80-16, Operational Deficiencies in Rosemount Model 510DU Analog Trip Units and Model 1152 Pressure Transmitters

The NRC has recently been advised through a 10 CFR 21 report that operational deficiencies exist in Rosemount Model 510DU trip units and Model 1152 pressure transmitters. The Model 1152 pressure transmitters have a capacitor common mode failure when the transmitter operating environmental temperature is greater than 175°F, and when the damping potentiometer is rotated clockwise. The licensee has reviewed his design and determined that no Rosemount Model No. 1151 and 1152 pressure transmitters and 510DU trip units are used for control, protection, or indication in safety related systems at San Onofre Units 2 and 3. Six Model 1152 transmitters associated with the control room emergency air conditioning and ventilation system function to initiate annunciator/alarms in the control room. In the safety analysis, no credit is taken for the annunciator and alarm system. This item is closed.

- q. Circular 80-17, Fuel Pin Damage Due to Water Jet from Baffle Plate Corner

The licensee has concluded that due to the differences in design between the Westinghouse and the CE reactor internals, fuel pin damage due to water jet impingement is precluded at San Onofre Units 2 and 3. This item is closed.

- r. Circular 80-22, Confirmation of Employee Qualification

The licensee's and Bechtel's employment procedures both require, as a condition of employment, that an individual's technical and educational qualifications be verified. This item is closed.

- s. Circular 80-23, Potential Defects in Beloit Power Systems Emergency Generators

The licensee has determined that no generators manufactured by Beloit Power Systems are used in either Class I or non-Class I application at San Onofre Units 2 and 3. This item is closed.

5. Management Interview

The inspectors met with licensee representatives (denoted in paragraph 1) on April 10, 1981. The scope of the inspection and the inspectors' findings, as noted in this report, were discussed.

117D7-1-E

8)

1981

281-1 Phelps

SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3			
STARTUP WORK PERMIT			
JOB NO 10079		NCI4NA-419-US 50243	
1 UNIT NUMBER 2	31 AREA CODE P2	2 SWP NO 13267	
3 SUBSYSTEM DESIGNATOR TITLE SBA / Reactor Protect Sys	4 COMPONENT UV TRIP DEVICE TCB-1	5 PRIORITY CODE 9.0	
6 REFERENCE DRAWING 30129, 30130 30173, 34587	7 REQUIRED START DATE / ESTIMATED COMPLETION DATE 01-05-81 / 03-31-81	8 REQUIRED TIME LIMITS NA	
9 DESCRIPTION OF WORK QC PRE RES PREV MAINT PERFORM ROUTINE MAINT PER MPES 008 "UV TRIP DEVICE OF GE AX-255 CRC BARS"		10 INITIATOR DATE Pm Conklin 12/31/80	
		11 RESPONSIBLE WORK ORG BPC SPM MAINT PRE RES-ELECT	
		12 WORK QC REQUIRED ☐ YES ☒ NO Shiller 1/5/81	
13 RETESTING REQUIREMENTS QC N/A		14 RETEST PER N/A	
RECEIVED APR 14 1981 EDM SITE			
15 SUBCLEANNESS PERMIT (T.I. 14) NO NA	16 QUALITY CLASS ☐ I ☐ III ☐ ASME III ☒ II ☐ IV ☐ HVAC FIRE PROT	17 RETEST QC REQUIRED ☐ YES ☒ NO Shiller 1/5/81	
18 CHARGE TO SEC 21 ☐ CONST ☐ STARTUP ☒ OTHER SPM MAINT	19 IMPLEMENTATION APPROVAL MA Avert 0102-81	20 APPROVAL TO START WORK 2.0 Miller 1/5/81	
21 CLEARANCE			
COMPONENT	CRAFT	TAG NO	STATUS
22 WORK COMPLETE DATE 3/31/81	23 WORK QA/QC APPROVAL ☐ PARTIAL ☐ TOTAL N/A	24 STARTUP RETEST QA/QC COMPLETE DATE N/A	
25 RETEST RESULTS APPROVAL/DATE NA	26 SWP CLOSED DATE KEO Connor 4-3-81	27 STARTUP QA REVIEW/DATE 4-8-81	
28 COMMENTS MAR # P-009084 EDM CODE 5 9.0 E		29 EDM CENTER-SEL PAGE 1 OF 1	

Alvin L. Brumie (1205) 838

AS-2513-320-1



SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3

STARTUP WORK PERMIT

NC14NA-056-005

JOB NO 10079

50213

1 UNIT NUMBER 2		31 AREA CODE P2		2 SWF NO SWP 13268	
3 SUBSYSTEM DESIGNATION SBA REACTOR PROTECT		4 COMPONENT TRIP DEVICE TC8-2		5 PRIORITY CODE 90	
6 REFERENCE DRAWING 30129, 30130 30134, 30587		7 REQUIRED START DATE ESTIMATED COMPLETION DATE 03-31-81 01-05-81		8 REQUIRED TIME LIMITS NA	
9 DESCRIPTION OF WORK QC PRE REC PREV MAINT		9A PIPE SUPPORTS AFFECTED ☐ YES ☒ NO		10 INITIATOR DATE Pry Conklin 12/31/80	
PERFORM ROUTINE MAINT PER MPES 008 "LV TRIP DEVICE OF GE AN-2-25 CIR. BREAK" 4 ACTION TAKEN (1) TO WORKS MAINT FOR TRIP.		11 RESPONSIBLE WORK ORG BPC S/U MAINT PRE REC-ELECT		12 WORK QC REQUIRED ☒ YES ☐ NO E. Hall 1/5/81	
		13 RETESTING REQUIREMENTS QC		14 RETEST PER 2/2	
15 SUCLEANNESS PERMIT (T-14) NO		16 QUALITY CLASS ☐ I ☐ III ☐ ASME III ☒ II ☐ IV ☐ HVAC FIRE PROT		17 RETEST QC REQUIRED ☐ YES ☒ NO E. Hall 1/5/81	
18 CHARGE TO S/U ☐ CONST ☐ STARTUP ☒ OTHER S/U MAINT		19 IMPLEMENTATION APPROVAL C. A. Swett 01-02-80 DATE		20 APPROVAL TO START WORK E. Hall 1/5/81 DATE	
21 CLEARANCE		22 WORK COMPLETE DATE 1/5/81		23 WORK QC APPROVAL ☒ PARTIAL ☐ TOTAL OFF 01/03/81 DATE	
24 STARTUP RETEST COMPLETE DATE 1/5/81		25 STARTUP RETEST QA QC COMPLETE DATE N/A		26 SWF CLOSED DATE 1/28/81	
26 RETEST RESULTS APPROVAL DATE 1/5/81		27 STARTUP QA REVIEW DATE 1/6/81		30 EDM CENTER USE	
28 COMMENTS MMA 8 DILL CODE 5 MCDI		29		PAGE 1 of 1	

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SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3			
STARTUP WORK PERMIT			
JOB NO. 10079		NCHNA-419-US	
1. UNIT NUMBER 2	31. AREA CODE P2	2. SWP NO 502-3 SWP 13269	
3. S/U SYSTEM DESIGNATOR TITLE SBA REACTOR PROTECT SYS		4. COMPONENT 2 L0 33 UV TRIP DEVICE TCB-3	5. PRIORITY CODE 9.0
6. REFERENCE DRAWING 30127 28130 30175 34587	7. REQUIRED START DATE ESTIMATED COMPLETION DATE 02-21-81 01-05-81		8. REQUIRED TIME LIMITS NA
9. DESCRIPTION OF WORK QC TRF REP TRAV MAINT PERFORM ROUTINE MAINT PER MPES 008 "UV TRIP DEVICE FOR GE AX-2-26 CIRC BREAKERS"		10. INITIATOR/DATE Pm Conklin 4/3/80	
		11. RESPONSIBLE WORK ORG BPC S/U MAINT TRF REP-ELECT	
		12. WORK QC REQUIRED ☐ YES ☒ NO Sheller 4/3/81 DATE	
13. RETESTING REQUIREMENTS QC		14. RETEST PER	
RECEIVED APR 16 1981 EDM SITE			
15. S/U CLEANNESS PERMIT (T.I. 14) NO	16. QUALITY CLASS ☐ I ☐ III ☐ ASME III ☒ II ☐ IV ☐ HVAC/FIRE PROT		17. RETEST QC REQUIRED ☐ YES ☒ NO Sheller 4/5/81 DATE
18. CHARGE TO S/U ☐ CONST ☐ STARTUP ☒ OTHER S/U MAINT	19. IMPLEMENTATION APPROVAL Sheller 01-02-80 DATE		20. APPROVAL TO START WORK Sheller 4/5/81 DATE
21. CLEARANCE			
COMPONENT ELECTRICIAN	CRAFT A 06084	TAG NO A 06084	STATUS OPEN
22. WORK COMPLETE DATE Sheller 4/3/81 DATE			
23. STARTUP RETEST COMPLETE DATE NA		24. STARTUP RETEST QA/QC COMPLETE/DATE NA	
25. RETEST RESULTS APPROVAL/DATE NA		26. SWP CLOSED DATE K. G. O'Connell 4-10-81	
27. COMMENTS P. 10352 MAR 4 664044 SWP 10079 N.O.D.S.		28. STARTUP QA REVIEW DATE Sheller 4/13/81	
		29. EDM CENTER USE PAGE 1 OF 1	



PF 2778 (10078) 880

Ann B. Burre (1275) 838

ASC 12313 317 -1

SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3

STARTUP WORK PERMIT NC14NA-036-115

JOB NO 10079

54213

1 UNIT NUMBER 2		31 AREA CODE P2		2 SWP NO SWP 13271	
3 SU SYSTEM DESIGNATOR TITLE SBA REACTOR PROTECT -SYS		4 COMPONENT UV TRIP DEVICE TCBS		5 PRIORITY CODE 90	
6 REFERENCE DRAWING 30123-30130		7 REQUIRED START DATE ESTIMATED COMPLETION DATE 03-31-81		8 REQUIRED TIME LIMITS NA	
9 DESCRIPTION OF WORK QC PRE RES PREV MAINT		10 PIPE SUPPORTS AFFECTED ☒ YES ☐ NO		10 INITIATOR DATE 12/1/80	
PERFORM ROUTINE MAINT PER INPES 090 "UV TRIP DEVICE FOR GE-AR-2-25 CAL DARS"		11 RESPONSIBLE WORKING BRK SU MAINT		12 MAINT QC REQUIRED ☐ YES ☒ NO 1/1/81	
		14 RETEST PER NA			
13 RETESTING REQUIREMENTS QC NA		16 QUALITY CLASS ☐ I ☐ III ☐ ASME III ☒ II ☐ IV ☐ HVAC FIRE PROT		17 RETEST QC REQUIRED ☐ YES ☒ NO	
15 SU CLEANNESS PERMIT (T1 14) NO		19 IMPLEMENTATION APPROVAL 01-02-80		20 APPROVAL TO START WORK 5/1/81	
18 CHARGE TO SU 21 ☐ CONST ☐ STARTUP ☒ OTHER SU MAINT					
21 CLEARANCE					
COMPONENT ALL CTO		CRAFT		TAG NO	
STATUS					
22 WORK COMPLETE DATE 5/1/81		23 WORK QA QC APPROVAL ☐ PARTIAL ☐ TOTAL NA			
24 STARTUP RETEST COMPLETE DATE NA		25 STARTUP RETEST QA-QC COMPLETE DATE NA			
26 RETEST RESULTS APPROVAL DATE NA		27 SWP CLOSED DATE 5/1/81			
28 COMMENTS SPIC 5 NO. 25		29 STARTUP QA REVIEW DATE 6/1/81			
30 CENTER USE				PAGE 1 OF 1	

Allen & Brumie (1205) 838

45012317-318

-1

SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3			
STARTUP WORK PERMIT NCI4NA-C36-CL3			
JOB NO 10079			
50213			
1 UNIT NUMBER 2	31 AREA CODE P2	2 SWP NO SWP 13272	
3 SUBSYSTEM DESIGNATOR TITLE SBA REACTOR PROTECT SYS	4 COMPONENT 240 33 UV TRIP DEVICE TCB G	5 PRIORITY CODE 9.0	
6 REFERENCE DRAWING 20129-31-30 SC174-34587	7 REQUIRED START DATE ESTIMATED COMPLETION DATE 02-31-81 01-05-81	8 REQUIRED TIME LIMITS NA	
9 DESCRIPTION OF WORK QC PRE REG PREV MAINT PERFORM ROUTINE MAINT PER MPE'S 008 "UV TRIP DEVICE FOR GE AK-2-25 CIR CIRBPS"		10 INITIATOR DATE m Conklin 11/6/80	
		11 RESPONSIBLE WORK ORG BPC S/U MAINT PRE REG-ELECT	
		12 WORK QC REQUIRED ☐ YES ☒ NO J. Hille 1/5/81 DATE	
13 RETESTING REQUIREMENTS QC		14 RETEST PER	
RECEIVED JUN 11 1981			
15 CLEANLINESS PERMIT (T 14) NO	16 QUALITY CLASS ☐ I ☐ III ☐ ASME III ☒ II ☐ IV ☐ HVAC FIRE PROT	17 RETEST QC REQUIRED ☐ YES ☒ NO J. Hille 1/5/81 DATE	
18 CHANGE TO S U 2/ ☐ CONST ☐ STARTUP ☒ OTHER S/U MAINT	19 IMPLEMENTATION APPROVAL J. Hille 01-02-80 DATE	20 APPROVAL TO START WORK J. Hille 1/5/81 DATE	
21 CLEARANCE			
COMPONENT 240 33	CRAFT ELECTRICIAN	TAG NO 406015	STATUS OPEN
22 WORK COMPLETE DATE 5/27/81 J. Hille		23 WORK QA/QC APPROVAL ☐ PARTIAL ☐ TOTAL NA DATE	
24 STARTUP RETEST COMPLETE DATE NA		25 STARTUP RETEST QC COMPLETE DATE NA	
26 RETEST RESULTS APPROVAL DATE NA		27 SWP CLOSED DATE 5/28/81 J. Hille	
28 COMMENTS MPE SWP CODE 5 N.C. & I.		29 STARTUP QA REVIEW J. Hille 6/1/81	
30 EOM		PAGE 1 OF 1	

Ann L Brumie (1375) 8:38

ASS 15317-317 -1



SAN ONO FRE NUCLEAR GENERATING STATION UNITS 2 & 3

STARTUP WORK PERMIT

JOB NO 10079

NC14NA-036-02

50213

1 UNIT NUMBER 2		31 AREA CODE P2		2 SWP NO SWP 13273	
3 SUBSYSTEM DESIGNATOR TITLE SBA REACTOR PROTECT SYS		4 COMPONENT LV TRIP DEVICE TCB7		5 PRIORITY CODE 9.0	
6 REFERENCE DRAWING 30129 30130 30175 34587		7 REQUIRED START DATE ESTIMATED COMPLETION DATE 02 31 81 01-05-81 00-02-81		8 REQUIRED TIME LIMITS NA	
9 DESCRIPTION OF WORK QC PRE REG PREV MAINT PERFORM ROUTINE MAINT PER MPES 008 "LV TRIP DEVICE FOR GE AK-2-25 CIRC BARS"		10 INITIATOR DATE PPM Cont'n 12/31/80		11 RESPONSIBLE WORK ORG BMC S/M MAINT TRF REG-ELECT	
12 WORK QC REQUIRED ☐ YES ☒ NO		13 RETESTING REQUIREMENTS QC N/A		14 RETEST PER N/A	
15 CLEANLINESS PERMIT (T.I. 14) NO N/A		16 QUALITY CLASS ☐ I ☐ III ☐ ASME III ☒ II ☐ IV ☐ HVAC FIRE PROT		17 RETEST QC REQUIRED ☐ YES ☒ NO	
18 CHARGE TO S/M ☐ CONST ☐ STARTUP ☒ OTHER S/M MAINT		19 IMPLEMENTATION APPROVAL G.A. Annet 01-02-81 DATE		20 APPROVAL TO START WORK J. Cull 1/2/81 DATE	
21 CLEARANCE COMPONENT 21033		CRAFT ELECTRICIAN		TAG NO A06-086	
				STATUS OPEN	
22 WORK COMPLETE DATE 5/24/81		23 WORK QA QC APPROVAL GCE NA DATE		24 STARTUP RETEST QA QC COMPLETE DATE NA	
25 RETEST RESULTS APPROVAL DATE NA		26 SWP CLOSED DATE J. Cull 5/29/81		27 STARTUP QA REVIEW DATE NA	
28 COMMENTS SBA 1234 5/2/81 SBA 1234 5/2/81		29 EDM CENTER - SE		PAGE 1 OF 1	

Allen & Burris (12-5) 838

ASC 12-5-13 322



SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3

STARTUP WORK PERMIT

JOB NO 10079

NO 44NA-C36-CLP

50213

1 UNIT NUMBER 2		31 AREA CODE P2		2 SWP NO 13274	
3 SUBSYSTEM DESIGNATOR TITLE SRV REACTOR PROTECT SYS		4 COMPONENT UV TRIP DEVICE TCR B		5 PRIORITY CODE 90	
6 REFERENCE DRAWING 30123 30130 30176 34587		7 REQUIRED START DATE ESTIMATED 03-31-81		8 REQUIRED TIME LIMITS NA	
9 DESCRIPTION OF WORK QC PERFORM ROUTINE MAINT PER PIPES 008 "UV TRIP DEVICE FOR GE AK-2-25 SIM BARS"		9A PIPE SUPPORTS AFFECTED ☐ YES ☒ NO		10 INITIATOR DATE PM Cooklin 12/31/80	
13 RETESTING REQUIREMENTS QC N/A		11 RESPONSIBLE WORK ORG. BPC S/W MAINT PRE REQ - ELECT			
		12 WORK QC REQUIRED ☐ YES ☒ NO DATE			
15 CLEANNESS PERMIT (T 1 14) NO N/A		16 QUALITY CLASS ☐ I ☐ III ☐ ASME III ☒ II ☐ IV ☐ HVAC FIRE PROT		17 RETEST QC REQUIRED ☐ YES ☒ NO	
18 CHARGE TO S/W 21 ☐ CONST ☐ STARTUP ☒ OTHER S/W MAINT		19 IMPLEMENTATION APPROVAL GRB Gmst 01-02-80 DATE		20 APPROVAL TO START WORK E. Gmst 1/5/81 DATE	
21 CLEARANCE COMPONENT A. 133		CRAFT 111 TRVIAN		TAG NO AC 5120	
				STATUS OPEN	
22 WORK COMPLETE DATE 5/28/81		23 WORK QA QC APPROVAL ☐ PARTIAL ☒ TOTAL N/A DATE			
24 STARTUP RETEST COMPLETE DATE N/A		25 STARTUP RETEST QA QC COMPLETE DATE N/A			
26 RETEST RESULTS APPROVAL DATE N/A		27 SWP CLOSED DATE J. D. Gmst 5/29/81			
28 COMMENTS MAINT 111304 SPEL LOD 5 N.O.D.I		29 STARTUP QA REVIEW DATE 6/1/81			
		30 EDM CENTER USE		PAGE 1 OF 1	

Alvin & Bonnie (1205) 8:38

45112 131-151

SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3			
STARTUP WORK PERMIT			
JOB NO 10079			
1 UNIT NUMBER 2		31 AREA CODE P2	
3 SUBSYSTEM DESIGNATOR TITLE SBA REACTOR PROTECT SYS		4 COMPONENT 26033	
5 PRIORITY CODE 9.0		2 SWF NO 13275	
6 REFERENCE DRAWING 30125, 30120 30175, 744-4-3		7 REQUIRED START DATE ESTIMATED COMPLETION DATE 03-31-81 01-05-81	
8 REQUIRED TIME LIMITS NA		9 DESCRIPTION OF WORK QC PRE REQ PREV MAINT	
10 INITIATOR DATE Per Cont'n 12/3/80		11 RESPONSIBLE WORK ORG BPC S&E	
12 WORK QC REQUIRED ☐ YES ☒ NO 1/5/81		13 RETESTING REQUIREMENTS/QC NA	
14 RETEST PER NA		15 SUCLEANNESS PERMIT (T.I. 14) NO N/A	
16 QUALITY CLASS ☒ I ☐ II ☐ III ☐ IV ☐ ASME III ☐ HVAC/FIRE PROT		17 RETEST QC REQUIRED ☐ YES ☒ NO 1/5/81	
18 CHARGE TO S/U ☐ CONST ☐ STARTUP ☒ OTHER S/U MAINT		19 IMPLEMENTATION APPROVAL J. J. Smith 01-02-80	
20 APPROVAL TO START WORK J. J. Smith 1/5/81		21 CLEARANCE COMPONENT 26033 CRAFT ELECTRICIAN TAG NO 06084 STATUS OPEN	
22 WORK COMPLETE DATE 5/28/81		23 WORK QA APPROVAL ☐ PARTIAL ☐ TOTAL NA	
24 STARTUP RETEST COMPLETE DATE NA		25 STARTUP RETEST QA/QC COMPLETE DATE NA	
26 RETEST RESULTS APPROVAL DATE NA		27 SWF CLOSED DATE 5/28/81	
28 COMMENTS SWF COM 5 N.O.D.I.		29 STARTUP QA REVIEW DATE 6/1/81	
30 EDM CENTER USE		PAGE 1 OF 1	

MEMORANDUM TO FILE
MARCH 16, 1983

SUBJECT: REVIEW OF PAST MAINTENANCE WORK
FOR LUBRICATION DOCUMENTATION

Attached is a synopsis of review of
past maintenance activity regarding the Units
2/3 Reactor Trip Breakers. This was provided
by B. Gray / B. Crewler.

Eiland E. Gulbrand

TRIP BREAKER

SWP's

<u>#</u>	<u>CRAFT</u>	<u>TITLE & EQUIP ID#</u>	<u>DATE</u>
12012	CE & ELECTRO MECH	WIRING MODIFICATION PER CE LETTER & ELECTRO-MECHANICS Bull # FM-6747-2 - ALL BREAKERS - UNIT # 2	11/80
13267	BPC-SUMA	{ PM PER MPES DOB (REVO) GREASED PER STEP 6.5.2.2 GREASE USED: GE SPEC # D50H15 OR RPM #5 GE SPEC # D50H047 ALL BREAKERS UNIT # 2 12/31/80 (DATED)	
13268	2 TB1		
13269	2 TB2		
13270	2 TB3		
13271	2 TB4		
13272	2 TB5		
13273	2 TB6		
13274	2 TB7		
13275	2 TB8		

19064 BPC CON ELE

BPC NC ~~103J~~
WIRE MISSING (JUMPER)
ON TBOT A1, TBOT A2,
TBOT B1, TBOT B2, TBOT B3
& TBOT B5.

8/81

Rx TRIP BREAKERS

<u>#</u>	<u>Unit 2</u> <u>CRAFT</u>	<u>WO's</u> <u>TOPIC</u>	<u>DATE</u>
4832	ET	2TBC4/2TBC6 / 2TBC7/2TBC8 NCR 1P-152	4/82
9135	IPC	2LO91 COKE PROTECTION CALCULATORS DCP-49CE REWIRE TARGET FIDS	7/82
10451	ELE	TCB1 → TCB9 SUPPORT FACTORY REP IN CALIBRATION OF RX TRIP BREAKERS SO 23-IT-11, 161 ON BREAKERS	8/82
10616	ET	2TB7 - UV CAL BROKEN IN LINE SPLICE <u>QC WAVED INSP</u>	7/82
10925	ELE	2TB-4 NCR SO23-P-553 REV 0 RING LUG TERMINATION BROKEN WIRE REPAIRED	7/82
15643	N/A	CANCELED ANNUNCIATOR 56A-19 VERIFY TCB PER DWG	10/82

KX TRIP BREAKERS

U-3 WO's

<u>#</u>	<u>CRAFT</u>	<u>TOPIC</u>	<u>DATE</u>
5120	ET	DIODE REPLACEMENT 3L033 DCP-3-6-CE	4/82
8215	ELE	3TCB-2 NCR SE-F-0785	4/82
9230	ELE	3TCB-8 NCR-SEF-0727	4/82
12142	ELE	(CANCELLED IN LIEU OF WO'S 12281 → 12286 & 14191 3TCB 6 & 3TCB 9 NCR SE-F-0998	8/82
12277	ELE	{ 3TCB GEAK 25512 NCR SE-F-1101 -CANCELLED-	8/82
12278	ELE	* 3TCB-8 AK 25481 NCR-SE-F-1103	8/82
12279	ELE	* 3TCB-5 AK 23827 NCR SE-F-1104	8/82
12280	ELE	* 3TCB-7 AK 23826 NCR SE-F-1105	8/82
12281	ELE	* 3TCB-6 AK 25482 NCR SE-F-1106	8/82
12282	ELE	{ 3TCB7 3TCB8 NCR SE F 1102 AK 23826 AK 25481 RE ALIGN AUX TO STATIONARY CONTACTS	8/82
12286	ELE	{ 3TCB1 → 3TCB9 SUPPLY MEN TO ASSIST IN CALIBRATION & TEST OF ALL U-3 RX BREAKERS. INSPECT & ADJUST IAW 5023-944-352	8/82
13680	ELECT	CANCELLED 3TCB1 NCR-SE-F-1170	9/82
14191	<u>OTHER</u> <u>STRONG</u>	3TCB1 - 3TCB9 VERIFY BLS INSTALLED PER SUPPLEMENT & RECORD.	9/82
15813	ELE	INDICATOR LIGHT 3TCB1 NCR-SE-F-1170 RWO	9/82
16612	ET	3TCB9 DCP-3-404-E	12/82
11106	EL	CANCELLED SEE WO'S 12278 - 12282 & 12286	

* REPLACED UV TRIP DEVICE

SCE

SAN ONOFRE 283 WORK ORDER

WO 10451

S. Seymour/ESS TEST 7-14-82

SYSTEM I.D. - 1222 COMPONENT I.D. - 1222

WMPONENT DESCRIP REACTOR TRIP BREAKERS

DATE N/A TIME N/A MAINT TAG NO. N/A

PLANT COND. 4

QUALITY CLASS II

DESCRIPTION OF PROBLEM

PROVIDE SUPPORT & PERSONNEL &
MATERIAL TO ASSIST FACTORY REPR. ON CALIBRATION
OF REACTOR TRIP BREAKERS

- ☐ SECURITY
☐ ASME III
☐ ASME XI
☐ HVAC/FIRE PROT.
☐ SEPARATION CRITERIA AFFECTED
☐ ENVIRONMENTAL QUALIFICATIONS

PERSONNEL SAFETY EMERG ☐ POTENT ☐
PLANT DAMAGE N/A ☐CLEANLINESS REQUIREMENTS PER CVCN A ☐ N/A C ☐

TECH SPEC SECTION 3.3.2 IMPACT DATE N/A TIME N/A

PREREQUISITES	YES NO	INIT.	PLANNER: S. Seymour 7/14/82	DATE 7/14/82
EQUIPMENT OUTAGE	Y	SLS	QC WORK REQUIRED	CRAFT No. EST. MH.
CLEANLINESS PERMIT NO.	N	SLS	JOB SEC. 1	
RAD EXP. PERMIT NO.	N	SLS	2	
WELD/BURN PERMIT NO.	N	SLS	3	
CLEARANCE NO.	N	SLS	4	
RELATED DOCUMENTS	N	SLS	FOUND NOT LISTED	
			DOCUMENT ALL ACTION TAKEN	

PROCEDURES/DWG Nos. -

MPES008

SPECIAL INSTRUCTIONS & HOLDPOINTS:

EST DUR 3 TOTAL 7.5

3X587

31542 & 31543

DOCUMENT ALL ACTIONS TAKEN ON MDRF M.R.

NOTIFY NGL, EXT. 57423, PRIOR TO JOB SQ 283

DEFERRED REASON M E Y O U R DATE N/A RESP N/A RELEASE DATE N/A

RETEST YES ☐ REQ'D NO. 8/3/82RETEST YES ☐ QC-REQ'D NO. 8-6-82

RETEST PROCEDURE

RETEST COMPLETED

COMPLETED BY N/A DATE

APPROVED BY N/A DATE

RETEST QC COMPLETE DATE

MAINT. TYPE CM ASSIGN ET FUNCT NO N/A

ASSIGNED TO N/A

IMPLEMENTATION APPROVAL

APPROVAL TO START WORK

PSUE / TOB

DATE

STEP

DATE

PAGE 1 OF 2

13264303 OUT OF ADJUSTMENT

FILE COPY

TEST EQUIPMENT/SPECIAL TOOLS

DESCRIPTION

TO NO

RANGE

ACCURACY

RECALIBRATION DATE

NA

ACTION TAKEN

Surveillance check 1611 7/21/82 JUB NAC - Working on HV trip

SURVEILLANCE check 7/21/82 JUB NAC WORKING AG# 6574 TRIP

SURVEILLANCE check 7/21/82 JUB NAC WORKING AG# TRIP 4597/14

PERFORMED SURVEILLANCE TEST S023-II-11.161 ON BREAKERS SAT. 7/21/82 Substation 77500000 (TECH.)

ME

CRAFTS USED

NO

MF

MATERIALS USED

QTY

Elect

4 34

NA

ET

2 6

TOTAL

DURATION

R.E. Kinger

7-22-82

7/20/82

1/22/82

7/20/82

7/22/82

WORK ORDER APPROVAL

☐ PARTIAL

☒ TOTAL

QCE

QA REVIEW / DATE

DATE 7-21-82

8/9/82

WORK ORDER REVIEW / DATE

WORK ORDER APPROVAL / DATE

W.C. NUMBER

10,451

REMARKS

ATTACHMENT (10p)

3.E

SUPPLEMENT TO WORK ORDER

WO 10,451

Component ID#

FILE COPY

2 LC33

TRIP CKT BKR CABINET

2 LC34

" " " "

656-18

CHECK CONTACTS, COIL RES, LI. PICKUP, & DISCONNECT - & CURRENT TRIP
METER READINGS, MEASURED, MAIN CONTACT WIRE

Page 20/2

TYPE AK-2A-25
AK-2A-505

Station SONGS Unit #2 Date 7-21-82
 Equipment # 656-45 Cell No. — Serviced By JALAF, A / BARNAS
KRUEGER
 Volts 600 Amps 600

Microhm (L-R Rear)

A 102B 114C 109

Megger (L-R Rear)

A-B ∞ A-Gr. ∞ A-C ∞ B-Gr. ∞ B-C ∞ C-Gr. ∞

Coil Readings

Close 3.0 Ω Trip 60 Ω X 115 Ω Y 3500 Ω

Main Contact Wipe (3/32 - 5/32)

A $\frac{1}{8}$ B $\frac{1}{8}$ C $\frac{1}{8}$ U.V. TRIP COIL 1200 Ω

CONTACT SPRINGS Compression

A. N/AB. N/AC. N/ALatch Engagement N/ACut-Off Switch CHECKEDRemarks: 1ST TEST U.V. COIL P.U. 110 D.O. 462ND TEST U.V. COIL P.U. 111 D.O. 483RD TEST U.V. COIL P.U. 110 D.O. 484TH TEST U.V. COIL P.U. 110 D.O. 465TH TEST U.V. COIL P.U. D.O.CURRENT TRIP TEST 3000A A ϕ 54.21 B ϕ 57.53^{REF} C ϕ 53.73 Mfg Range 20-70 SECSigned R. F. Krueger

TYPE AK-2A-25
AK-2A-50SStation SON'95Unit # 2Date 7-20-82Equipment 656-24Cell No. —Serviced By HILDEBRAND
GRAHAMVolts 600VAmps 600A

Microhm (L-R Rear):

Megger (L-R Rear)

A 101A-B ∞ A-Gr. ∞ B 100A-C ∞ B-Gr. ∞ C 105B-C ∞ C-Gr. ∞

Coil Readings

Main Contact Wipe (3/32 - 5/32)

Close 2.8 Ω A $\frac{1}{8}$ Trip 60 Ω B $\frac{1}{8}$ X 120 Ω C $\frac{1}{8}$ Y 3300 Ω 2.V. TRIP COIL 1700 Ω

CONTACT SPRINGS Compression

Latch Engagement N/AA. N.A.Cut-Off Switch CheckedB. N.A.C. N.A.Remarks: 1ST. TEST 2.V. COIL P.U. 108 D.O. 472ND. TEST 2.V. COIL P.U. 109 D.O. 483RD. TEST 2.V. COIL P.U. 109 D.O. 484TH. TEST 2.V. COIL P.U. 109 D.O. 485TH. TEST 2.V. COIL P.U. 107 D.O. 47CURRENT TRIP TEST 3000A A 64.52 B 57.62 C 47.53 Mfg Range 20-70 SECSigned R. E. Kinsinger

480 VOLT ACB

TYPE AK-2A-25
AK-2A-50SStation SONGSUnit #2Date 7/20/82Equipment 656-29Cell No. -Serviced By KEUEGER-PAWES
SALAFIAVolts 600Amps 600

Microhm (L-R Rear)

A 120 Ω B 102 Ω C 100 Ω

Megger (L-R Rear)

A-B ∞ A-Gr. ∞ A-C ∞ B-Gr. ∞ B-C ∞ C-Gr. ∞

Coil Readings

Close 24 Ω Trip 55 Ω X 100 Ω Y 3100 Ω

Main Contact Wipe (3/32 - 5/32)

A 1/8B 1/8C 1/8U.V. TRIP COIL 1650 Ω Latch Engagement N/ACut-Off Switch CHECKER

CONTACT SPRINGS Compression

A. N/AB. N/AC. N/ARemarks: 1ST. TEST 2. V. COIL P. U. 116 D.O. 332ND. TEST 2. V. COIL P. U. 115 D.O. 333RD. TEST 2. V. COIL P. U. 115 D.O. 334TH TEST 2. V. COIL P. U. 117 D.O. 345TH TEST 2. V. COIL P. U. 117 D.O. 35CURRENT TRIP TEST 3000A A ϕ 52.74 B ϕ 48.64 C ϕ 49.99 Avg. Range 20-70 secSigned R. F. Kueger

480 VOLT ACB

TYPE AK-2A-25
AK-2A-50S

Station SCN95 F Unit #2 Date 7-22-82
 Equipment # 656-18 Cell No. — Serviced By KRUGER
ELLIOTT
 Volts 600 V Amps 600 A

Microhm (L-R Rear)

A .115B .113C .118

Megger (L-R Rear)

A-B ∞ A-Gr. ∞ A-C ∞ B-Gr. ∞ B-C ∞ C-Gr. ∞

Coil Readings

Close 2.7 Ω Trip 58. Ω X 110 Ω Y ~~2680~~^{RSK} 2680 Ω U.V. TRIP COIL 1680 Ω

Main Contact Wipe (3/32 - 5/32)

A $\frac{1}{8}$ B $\frac{1}{8}$ C $\frac{1}{8}$

CONTACT SPRINGS Compression Latch Engagement N/A
 A. N/A
 B. N/A
 C. N/A
 Cut-Off Switch Checked

Remarks: 1ST TEST U.V. COIL P.U. 106 D.O. 48
2ND TEST U.V. COIL P.U. 108 D.O. 47
3RD TEST U.V. COIL P.U. 107 D.O. 47
4TH TEST U.V. COIL P.U. 107 D.O. 46
5TH TEST U.V. COIL P.U. 106 D.O. 47

CURRENT TRIP TEST 3000A A ϕ 45.57 B ϕ 56.41 C ϕ 48.65 Avg. Range 20-70 SECSigned Grant Elliott

TYPE AK-2A-25
AK-2A-50SStation SCN 95Unit # 2Date 7-20-82Equipment # 656-14Cell No. —Serviced By SALAFIA-BARNES
KRUEGERVolts 600Amps 600

Microhm (L-R Rear)

A 112B 105C 126

Megger (L-R Rear)

A-B ∞ A-Gr. ∞ A-C ∞ B-Gr. ∞ B-C ∞ C-Gr. ∞

Coil Readings

Close 2.8 Ω Trip 55 Ω X 110 Ω Y 3100 Ω

Main Contact Wipe (3/32 - 5/32)

A $\frac{1}{8}$ B $\frac{1}{8}$ C $\frac{1}{8}$ 24V. TRIP COIL 1700 Ω CONTACT SPRINGS Compression Latch Engagement N/AA. N/AB. N/AC. N/ACut-Off Switch CHECKEDRemarks: 1ST. TEST 24V. COIL P.U. 94.8 D.O. 402ND. TEST 24V. COIL P.U. 98.4 D.O. 41.23RD. TEST 24V. COIL P.U. 96 D.O. 394TH TEST 24V. COIL P.U. 96 D.O. 39.65TH TEST 24V. COIL P.U. 98.5 D.O. 38.8CURRENT TRIP TEST 3000A A ϕ 49.66 B ϕ 40.66 C ϕ 56.72 Avg. Range 20-70 SECSigned R. F. Krueger

TYPE AK-2A-25
AK-2A-50SStation SONGSUnit 2Date 7/20/82Equipment 656-12Cell No. —Serviced By HILDEBRAND
GRAHAMVolts 600Amps 600

Microhm (L-R Rear)

A 113 Ω B 102 Ω C 110 Ω

Megger (L-R Rear)

A-B ∞ A-Gr. ∞ A-C ∞ B-Gr. ∞ B-C ∞ C-Gr. ∞

Coil Readings

Close 1.8 Ω Trip 60 Ω X 120 Ω Y 3200 Ω

Main Contact Wipe (3/32 - 5/32)

A 1/8B 1/8C 1/8U.V. TRIP COIL 1640 Ω

CONTACT SPRINGS Compression

A. N/AB. N/AC. N/ALatch Engagement N/ACut-Off Switch CHECKEDRemarks: 1ST TEST U.V. COIL P.U. 101 D.O. 392ND TEST U.V. COIL P.U. 101 D.O. 403RD TEST U.V. COIL P.U. 102 D.O. 384TH TEST U.V. COIL P.U. 100 D.O. 455TH TEST U.V. COIL P.U. 102 D.O. 37CURRENT TRIP TEST 3000A A ϕ 56.66 B ϕ 60.56 C ϕ 55.43 Avg. Page 20-70 $\times$ cSigned R.F. King

TYPE AK-2A-25
AK-2A-505Station SONGSUnit #2Date 7/21/82Equipment 656-8Cell No. TCB-6Serviced By MAGEE & GRINICHVolts 600Amps 600Microhm (L-R Rear)A 120B 104C 101Megger (L-R Rear)A-B INF. A-Gr. INF.A-C INF. B-Gr. INF.B-C INF. C-Gr. INF.Coil ReadingsClose 3.0~Trip 60~X 125~Y 3500~Main Contact Wipe (3/32 - 5/32)A 1/8B 1/8C 1/8U.V. TRIP COIL 1200~

CONTACT SPRINGS Compression

A. NAB. NAC. NALatch Engagement N/ACut-Off Switch CHECKEDRemarks: 1ST TEST U.V. COIL P.U. 110 D.O. 312ND TEST U.V. COIL P.U. 110 D.O. 323RD TEST U.V. COIL P.U. 110 D.O. 324TH TEST U.V. COIL P.U. 111 D.O. 325TH TEST U.V. COIL P.U. 111 D.O. 31CURRENT TRIP TEST 3000A Aφ 69.63 Bφ 43.61 Cφ 56.58 Mfg Range 20-70 SECSigned R.F. Kneizer

TYPE AK-2A-25
AK-2A-50SStation ScngsUnit #2Date 7-21-82Equipment # 656-7Cell No. —Serviced By SALAFIA/KruegerVolts 600VAmps 600A

Microhm (L-R Rear)

A 112B 104C 113

Megger (L-R Rear)

A-B ∞ A-Gr. ∞ A-C ∞ B-Gr. ∞ B-C ∞ C-Gr. ∞

Coil Readings

Close 3.6 Ω Trip 60 Ω X 110 Ω Y 3500 Ω

2. V. TRIP COIL

Main Contact Wipe (3/32 - 5/32)

A $\frac{1}{8}$ B $\frac{1}{8}$ C $\frac{1}{8}$ 1150 Ω

CONTACT SPRINGS Compression

Latch Engagement N/AA. N/AB. N/AC. N/ACut-Off Switch CheckedRemarks: 1ST. TEST 2. V. COIL P.U. 110 D.O. 45.62ND. TEST 2. V. COIL P.U. 109 D.O. 453RD. TEST 2. V. COIL P.U. 110 D.O. 454TH. TEST 2. V. COIL P.U. 109 D.O. 455TH. TEST 2. V. COIL P.U. 110 D.O. 40CURRENT TRIP TEST 3000A A ϕ 46.50 B ϕ 48.83 C ϕ 49.18 MFG Page 20-7052Signed R.F. Krueger

480 VOLT ACB

TYPE AK-2A-25
AK-2A-505Station SONGSUnit #2Date 7/20/82Equipment 636-3

Cell No. _____

Serviced By KUEGER-BANKS
SALAFIAVolts 600Amps 600

Microhm (L-R Rear)

A 105 Ω B 122 Ω C 130 Ω

Megger (L-R Rear)

A-B ∞ A-Gr. ∞ A-C ∞ B-Gr. ∞ B-C ∞ C-Gr. ∞

Coil Readings

Close 2.4 Ω Trip 55 Ω X 100 Ω Y 3100 Ω

Main Contact Wipe (3/32 - 5/32)

A 1/8B 1/8C 1/8U.V. Trip coil 1700 Ω

CONTACT SPRINGS Compression

A. N/AB. N/AC. N/ALatch Engagement N/ACut-Off Switch CHECKEDRemarks: 1ST TEST U.V. COIL P.U. 119 D.O. 392ND TEST U.V. COIL P.U. 112 D.O. 393RD TEST U.V. COIL P.U. 116 D.O. 394TH TEST U.V. COIL P.U. 116 D.O. 395TH TEST U.V. COIL P.U. 116 D.O. 39CURRENT TRIP TEST 3000A A 56.32 B 56.32 C 51.36 AFg Page 20-70 SSigned R.F. Kueger

480 VOLT ACB

TYPE AK-2A-25
AK-2A-505Station SEABASUnit #2Date 7/21/82Equipment 656-2Cell No. TCB-6Serviced By MAGEE
GRUNICHVolts 600Amps 600

Microhm (L-R Rear)

A 128 Ω B 124 Ω C 139 Ω

Megger (L-R Rear)

A-B ∞ A-Gr. ∞ A-C ∞ B-Gr. ∞ B-C ∞ C-Gr. ∞

Coil Readings

Close 2.8 Ω Trip 58 Ω X 110 Ω Y 5000 Ω

Main Contact Wipe (3/32 - 5/32)

A 1/8B 9/64 9/64C 1/8

CONTACT SPRINGS Compression

A. N/AB. N/AC. N/AU V TRIP COIL 1175 Ω Latch Engagement N/ACut-Off Switch CHECKED

Remarks:

1ST TEST 2 U.V. COIL P.U. 106 D.O. 42

2ND TEST 2 U.V. COIL P.U. 104 D.O. 42

3RD TEST 2 U.V. COIL P.U. 102 D.O. 38

4TH TEST 2 U.V. COIL P.U. 100 D.O. 36

5TH TEST 2 U.V. COIL P.U. 102 D.O. 39

CURRENT TRIP TEST 3000A 43.15 46.48 49.49 A/Fg Range 20-70 sec

Signed

P. E. Knight

SCE

P.m

SAN JOFRE 283 WORK ORDER

WO 11106

S. M. EL HANEY ELE. TEST 7/22/82 1700 897 UNIT 3 RADWASTE 37' CEDMS N/A

ITEM I.D.	3SBA	COMPONENT I.D.	TCB1-TCB9+SPARE	PRIORITY	1.7				
COMPONENT DESCRIP.	REACTOR TRIP BREAKERS				PLANT COND.	6			
% FWR REDUCT	N/A	DATE	N/A	TIME	N/A	MAINT. TAG NO.	N/A	QUALITY CLASS	II

DESCRIPTION OF PROBLEM: SUPPORT G.E. FACTORY REP. WITH CALIBRATION OF REACTOR TRIP CIRCUIT BREAKERS; ALSO THE NEW SPARE BREAKERS. (SEA. AT AWS)

PERSONNEL SAFETY EMERG ☐ PLANT DAMAGE ☐ CLEANLINESS REQUIREMENTS A ☐ NA C ☐ PER CYCM B ☐ D ☐

TECH. SPEC. SECTION NA IMPACT DATE NA TIME NA

PREREQUISITES	YES NO	INIT.	PLANNER:	X796	DATE:	7/30/82		
EQUIPMENT OUTAGE	N	11	QC WORK REQUIRED * YES		CRAFT NO.		EST. MH	
CLEANLINESS PERMIT NO.	N	11	JOB SEQ	TASK DESCRIPTION				
RAD EXP. PERMIT NO.	N	11	1	PERFORM SETUP OF GE BARS ELEC 2				
WELD/BURN PERMIT NO.	N	11		per MPES008 Rev. 1				
CLEARANCE NO.	Y	11		AS NECESSARY, MPEG025 8-3+2				
ATED DOCUMENTS	Y	11	2	IF NCR condition FOUND				
			3	INITIATE AN NCR				
				IF NO NONCONFORMANCE EXISTS				

PROCEDURES/DWG. NOS. -

MPES008 Rev. 1 SPECIAL INSTRUCTIONS & HOLDPOINTS: EST. DUR 40.0 TOTAL 80.0

MPEG025 Rev. 0 * PREPARE TO ASSIGN WITNESS POINTS

ON BEHALF OF CONTRACTOR * CONTACT BPC TEST RC (X813/X814) TO

MSX CC X722/699/758 * WITNESS STEP 1 FOR TCB1, 4, AND 7.

DOCUMENT ALL AS FOUND AND AS IS, AFTER CALIBRATION VALUES OF PICK-UP AND DROP-OUT VOLTAGES OF UNDER VOLTAGE TRIP RELAYS PER SERIAL NUMBER OF BREAKERS, AND OVER CURRENT TRIP VALUES DOCUMENT ALSO.

DEFERRED REASON M E V O U R DATE RESP RELEASE DATE

RETEST YES ☐ REQ'D NO ☐ TOB/COO DATE

RETEST PROCEDURE

RETEST COMPLETED COMPLETED BY DATE

APPROVED BY DATE

RETEST QC COMPLETE DATE

MAINT. TYPE CM ASSIGN. ELEC FUNCT. NO. ASSIGNED TO: PAGE 1

IMPLEMENTATION APPROVAL DATE 7/30/82 STE 1 OF 1

Tr.

TEST EQUIPMENT/SPECIAL TOOLS

RECEIVED

ACCURACY

CANCELLED

Reference Work Orders

12278

12279

12280

12281

12282

12286

MATERIALS USED

QTY

TOTAL

DURATION

WORK COMPLETE/DATE

WORK QC APPROVAL

☐ PARTIAL ☐ TOTAL

DATE _____

WORK ORDER REVIEW / DATE

10/4/82

WORK ORDER APPROVAL / DATE

10-5-82

✓ NUMBER

11156

QA REVIEW / DATE

REMARKS

SCE NONCONFORMANCE REPORT (NCR)Project **SONGS 2 & 3**1. NUMBER
SE-F-1101-PREV.
0Priority Code: **5.0**Due Date: **8/24/82**

2. UNIT 3	3. ITEM DESCRIPTION Reactor Trip Breaker	4. "Q" CLASS II	5. ASME CODE CLASS N/A	6. DATE 8/10/82
7. LOT/HEAT/SERIAL NO. GE #AK 25512	8. ITEM LOCATION Maintenance Clean Room	9. CONTRACTOR/SUPPLIER CE/GE		
10. P.O./SPECIFICATION NO. S023-944-352	11. DRAWING NO. & REV. S023-944-328 to 336	12. SYSTEM SBA	13. ASME AUTH. INSPECTION REQUIRED ☐ YES ☒ NO	

14. DESCRIPTION OF NONCONFORMANCE

1. Winding on undervoltage coil is broken.
2. Missing parts on U.V. Device: Adjusting screw, locking nut and bushing.
3. U.V. device does not operate.

Hold Tag Affixed: Yes ☒ No ☐SU Ctg. Engr: **F. Core**Reported by: **G. Grunning**H.D. Parrish 8/11/82
15. QA ENGINEER

DATE

H.D. Parrish 8/11/82

16. APPARENT CAUSE

Manufacturing error.

18. CORRECTIVE ACTION TO PREVENT RECURRENCE

Copy of this NCR forwarded to Vendor for information.

17. SIGNATURE

TITLE

DATE

Boyd Patterson **TOS** **8-13-82**

19. SIGNATURE

TITLE

DATE

Boyd Patterson **TOS** **8-13-82**

20. DISPOSITION/COMMENTS

1. Replace U.V. device.
2. Retest per CE instruction Manual S023-944-352-0.

FIELD DISPOSITION

☐

REJECT

☒

REWORK

ERS DISPOSITION

☐

REPAIR

☐

ACCEPT "AS IS"

21. DISPOSITION APPROVALS / SIGNATURE, TITLE, DATE

James C. Wiedemann **QA** **8/13/82**

Boyd Patterson **TOS** **8-13-82**

Boyd Patterson **QA** **8/13/82**

22. CONCURRENCE

AUTHORIZED INSPECTOR

DATE

23. VERIFICATION DISPOSITION ACTIVITY COMPLETE

QA ENGINEER

DATE

AUTHORIZED INSPECTOR

DATE

24. IPDR NO.

25. QC FINAL REVIEW (NCR CLOSED)

QA SUPERVISOR

DATE

26. DISTRIBUTION

J.H. McCarty-BPC **H.L. Richter**

L.K. Fossum-BPC **E.D. Prabhu**

G.A. Chavez **D.B. Schone**

D.E. Nunn **L. Wiedemann**

L.L. Seyler **C.R. Horton-SU**

A.P. King **G. O'Dell-BPC**

27. FOR DOCUMENTATION CONTROL CENTER USE

QA Specialist/QA File

MTS

CDMC

Cindy Williams

R. Bockhorst

WO 12286

PAGE 1
OF 2

DATE OF COMPLETION

COMPLETED

8/21/82

FILE NO.

MX

N/A

TEST EQUIPMENT/SPECIAL TOOLS

DESCRIPTION	ID No.	RANGE	ACCURACY	RECALIBRATION DATE
MULTI/AMP TRIP TESTER	EM 4099			1-22-83
Megger	EM 7500			11-7-82
MILLI OHMETER	SU-492			12-28-82
MULTIMETER/ELNKE	EM 2611			11-21-82

ACTION TAKEN

ADJUSTED MOVABLE SECONDARY DISCONNECTS ON ALL FOUR (TCB 5, 6, 7 & 8) REAR TRIP BREAKS TO FIT CELLS. L. MAJE & D. ESPERANCA 8-20-82 SW. CHECKED AFTER READING MEG. MICRO. SET OVERLOADS TCB 5. HILGORD AND

ALL BREAKERS WERE INSPECTED AND ADJUSTED IN ACCORDANCE WITH THE VENDOR MANUAL # 5023-944-352

CRAFTS USED NO. MH MATERIALS USED QTY.

Elect 2 8.0 HILGORD AND

TOTAL 8.0

DURATION

HILGORD AND

8/21/82

WORK COMPLETE/DATE

James Manning 8/21/82

WORK QC APPROVAL

☐ PARTIAL

☐ TOTAL

W. J. O'Brien

DATE 8-24-82

WORK ORDER REVIEW/DATE

Sam L. Seymour 8/24/82

QA REVIEW/DATE

H. J. O'Brien

8/25/82

WORK ORDER REVIEW/DATE

J. C. W. 8-25-82

WORK NUMBER

12286

COMPONENT I.D.

RTB 1 CDB 8-15-82 RPK 8-19-82
RTB 2 CDB 8-19-82 RPK 8-19-82
RTB 3 CDB 8-18-82 RPK 8-18-82
RTB 4 CDB 8-18-82 G.M. 8-18-82
RTB 5 CDB 8-18-82 M.H. 8/20/82
RTB 6 CDB 8-18-82 RPK 8/20/82
RTB 7 CDB 8-20-82 RPK 8/20/82
RTB 8 CDB 8-20-82 RPK 8-20-82
RTB 9 CDB 8-19-82 RPK 8-19-82

TCB-1

SAN ONOFRE UNITS 2 AND 3 of 12286
 COMBUSTION ENGINEERING INC. NCR# N/A
 REACTOR TRIP CIRCUIT BREAKER SWITCHGEAR
 GE TYPE AK-2-25
 REFERENCE: UNIT 2 5023-999-352 } AND PUBLICATION
 UNIT 3 5023-999-351 } CONTAINED WITH
 UNIT 3 DATE 8-19-82
 BREAKER SERIAL NO 2-56A4002-654-5 CELL NO. TCB-1

- NOTE: 1. CONSIDER ABC LEFT TO RIGHT FACING REAR OF BREAKER
 2. IF ADJUSTMENTS OR PART REPLACEMENT DOES NOT BRING THE AS LEFT VALUES TO WITHIN THE ACCEPTANCE CRITERIA LISTED HEREIN A NON CONFORMANCE EXISTS AND WORK MUST STOP AND THE EQUIPMENT NOT PLACED INTO SERVICE UNTIL THE NON CONFORMANCE IS DISPOSITIONED.
 3. THESE TESTS NEED NOT BE PERFORMED IN THE ORDER

MICROHM LISTED EXCEPT U.V. & O.I.'S MUST BE DONE LAST.

AS FOUND / AS LEFT
 A 93 / 90
 B 111 / 93
 C 96 / 86

ACCEPT LESS THAN 120 μ A
 AND EACH PHASE BALANCED
 WITHIN 10%

A	R
✓	
✓	
✓	

MEGGER

AS FOUND / AS LEFT AS FOUND / AS LEFT
 A - 6500 M Ω / INF. A - G2 600 M Ω / INF.
 A - C800 M Ω / INF. B - G2 600 M Ω / INF.
 B - C800 M Ω / INF. C - G2 600 M Ω / INF.

A	R
✓	
✓	
✓	

COIL READINGS

AS FOUND / AS LEFT EXPECTED
 CLOSE 5.1 / 2.7 2-5
 TRIP 59.9 / 59.9 50-60
 X 114 / 114 100-130
 Y 5.060 / 5.060 2500-3200
 U.V. 166.0 / 166.0 1200-1700

A	R
✓	
✓	
✓	
✓	

MINI OPEN AND CLOSE. ACCEPT 93 VOLTS OR LESS.

RECORD ACTUAL CLOSE AND OPEN VALUES

NOTE: IF BREAKER AS FOUND DOES NOT

COMPLY SEE GEI 50299B, 5.6 "LUBRICATION"

AS FOUND / AS LEFT
 CLOSE 84V / 84V
 OPEN 29V / 29V

A	R
✓	
✓	

BREAKER S/N SLP 4002-556-5CELL NO. T2B-1DATE 8-19-82W.D. # 12286NCR # NAINSTANTANEOUS UNDERVOLTAGE TRIPPING DEVICE

SEE GEI-50299B pg. 34

INSPECT U.V. DEVICE SPLICES AT THE COIL

NOTE: PULL EACH COIL LEAD ON EITHER SIDE OF THE SPlice TO
VERIFY A PROPER SPliceU.V. DEVICE PICK-UP
DROP-OUT

AS FOUND / AS LEFT	
84.2	1 106.5
38.7	1 43.6

A	R
✓	
A	R
✓	
✓	

NOTE:

ACCEPT 90-116V ON PICK-UP (LOWER IS BETTER, 100V IDEAL)

ACCEPT 30-75V ON DROP OUT (HIGHER IS BETTER, 38V IDEAL)

REMARKS _____

SERIES OVERLOADS

TYPE EC-2 GEI 50299B pg 20, 21, 22

NOTE: M.T. IS THE MINIMUM TRIP SET POINT AND IS DETER-
MINED AS THAT POINT AT WHICH THE MOVABLE NUT
(INDEX POINTER) fig 11 pg 21 of GEI 50299B, STARTS
TO MOVE WHEN THE DESIRED M.T. CURRENT IS APPLIED.AS FOUND / AS LEFT

M.T. AD	555	1	591
BD	583	1	583
CD	550	1	579

ACCEPT. M.T. OF 600A
± 30 A

A	R
✓	
✓	
✓	

CAUTION: ALLOW 10 MINUTES BETWEEN TIMED TESTS
ON THE SAME PHASE.

AS FOUND / AS LEFT	
TIME AD	67.3 74.34 / 52.40
BD	62.13 / 62.13
CD	67.31 / 67.31

ACCEPT A TIME
OF 20 TO 70 SEC.
AT 3000A. 50 SEC.
± 10 SEC IS IDEAL.

A	R
✓	
✓	
✓	

REMARKS _____

BREAKER SERIAL NO. 2-56040.2-VSL'S CELL NO. TCB 1 of
DATE 8-19-82 W.D.# 13286
NCR# N/A

CONTACT ADJUSTMENT

MAIN CONTACT WIPE SEE GEI-50299B pg 8, 9

AS FOUND / AS LEFT

AD 1/8 1 1/4

BD 1/8 1 1/8

CD 1/8 1 1/8

ACCEPT $1/8" \pm 1/32"$ OR
 $3/32" \text{ TO } 5/32"$

A	R
✓	
✓	
✓	

REMARKS _____

SECONDARY DISCONNECTS

SEE GEI-50299B pg 7

INSPECT AND CLEAN AS REQUIRED

CONTACT TIP, HOLLOW TUBE, INSULATING BLOCK.

INSURE SNAPPY SPRING ACTION OF FINGER CONTACTS

SEE GEK-7302 pg 5 fig. 2 FOR DISCONNECT LOCATIONS.

DISCONNECT ASSY. # { A -
B -
C -
D -

REMARKS _____

A	R
✓	
✓	
✓	
✓	

CONTACT SPRINGS

(STATIONARY MAIN) GEI-50299B pg 12

ACCEPT 75 < 9 POUND

REMARKS GAUGE NOT AVAILABLE - N/A PHASE

A	R

TRIP LATCH ADJUSTMENT

SEE GEI 50299B pg 12, 13, 19 "LATCH ADJUSTMENT -
ELECTRICAL BREAKER".

PERFORM STEPS 1 TO 4.

R. KRUEGER
Wb 10/19/82
TRIP LATCH SET; DATE
VERIFIED BY

TCB-2

of
W.O.# 12286
NCR# NA

SAN ONOFRE UNITS 2 AND 3
COMBUSTION ENGINEERING INC.
REACTOR TRIP CIRCUIT BREAKER SWITCHGEAR
GE TYPE AK-2-25

REFERENCE: UNIT 2 5023-999-352 } AND PUBLICATION
UNIT 3 5023-999-351 } CONTAINED WITHIN
UNIT 3 DATE 8-19-82
BREAKER SERIAL NO 256A4002-656-34 CELL NO. TCB2

- NOTE: 1. CONSIDER ABC LEFT TO RIGHT FACING REAR OF BREAKER
2. IF ADJUSTMENTS OR PART REPLACEMENT DOES NOT BRING THE AS LEFT VALUES TO WITHIN THE ACCEPTANCE CRITERIA LISTED HEREIN A NON CONFORMANCE EXISTS AND WORK MUST STOP AND THE EQUIPMENT NOT PLACED INTO SERVICE UNTIL THE NON CONFORMANCE IS DISPOSITIONED
3. THESE TESTS NEED NOT BE PERFORMED IN THE ORDER

MICROHM LISTED EXCEPT U.V. #0,1,3 MUST BE DONE LAST.

AS FOUND / AS LEFT

ACCEPT LESS THAN 120 μ A
AND EACH PHASE BALANCED
WITHIN 10%

(2 A ϕ 101 / 101
B ϕ 106 / 107
C ϕ 100 / 107

A	R
L	
L	
L	

MEGGER

AS FOUND / AS LEFT

AS FOUND / AS LEFT

A-B 900m Ω / INF.

A-GR 500m Ω / 2000m Ω .

A-C 1000m Ω / INF.

B-GR 500m Ω / INF.

B-C 1000m Ω / INF.

C-GR 500m Ω / INF.

A	R
L	
L	
L	

COIL READINGS

AS FOUND / AS LEFT

EXPECT Ω

CLOSE 2.7 Ω / 2.7

2-5

TRIP 60 Ω / 60

50-60

X 112 Ω / 112

100-130

Y 4910 Ω / 4910

2500-3200

U.V. 1650 Ω / 1650

1200-1700

A	R
L	
L	
L	
L	
L	

MINI OPEN AND CLOSE. ACCEPT 93 VOLTS OR LESS.

RECORD ACTUAL CLOSE AND OPEN VALUES

NOTE: IF BREAKER AS FOUND DOES NOT

CLOSE 89.4V / 89.0V

COMPLY SEE GEZ 50299B, 5, 6 "LUBRICATION"

OPEN 26.5V / 26.5V

A	R
L	
L	

BREAKER S/N 656-34 CELL NO. TCB2
 DATE 8-19-82 W.O. # 12286
 NCR# NA

INSTANTANEOUS UNDERVOLTAGE TRIPPING DEVICE

SEE GEI-50299B pg. 34

INSPECT U.V. DEVICE SPLICES AT THE COIL

NOTE: PULL EACH COIL LEAD ON EITHER SIDE OF THE SPLICE TO VERIFY A PROPER SPLICE

	<u>AS FOUND / AS LEFT</u>	
U.V. DEVICE PICK-UP	<u>96.5</u>	<u>1 96.5</u>
DROP-OUT	<u>44.4</u>	<u>1 44.4</u>

A	R
✓	
A	R
✓	
L	

NOTE:

ACCEPT 90-116V ON PICK-UP (LOWER IS BETTER, 100V IDEAL)
 ACCEPT 30-75V ON DROP-OUT (HIGHER IS BETTER, 38V IDEAL)

REMARKS _____

SERIES OVERLOADS

TYPE EC-2 GEI 50299B pg. 20, 21, 22

NOTE: M.T. IS THE MINIMUM TRIP SET POINT AND IS DETERMINED AS THAT POINT AT WHICH THE MOVABLE NUT (INDEX POINTER) fig 11 pg 21 of GEI 50299B, STARTS TO MOVE WHEN THE DESIRED M.T. CURRENT IS APPLIED.

<u>AS FOUND / AS LEFT</u>		
M.T. AD	<u>550 / 578</u>	ACCEPT. M.T. OF 600A ± 30A
BD	<u>540 / 577</u>	
CD	<u>520 / 600</u>	

A	R
✓	
✓	
✓	

CAUTION: ALLOW 10 MINUTES BETWEEN TIMED TESTS ON THE SAME PHASE.

<u>AS FOUND / AS LEFT</u>		<u>ACCEPT A TIME</u>
TIME AD NO TRIP	<u>/ 53.44</u>	<u>OR 20 TO 70 SEC.</u>
BD	<u>69.16 / 69.16</u>	<u>AT 3000A. 50 SEC.</u>
CD	<u>74.58 / 43.07</u>	<u>± 10 SEC IS IDEAL.</u>

A	R
✓	
✓	
✓	

REMARKS _____

BREAKER SERIAL NO. 656-3UCELL NO. TCD 2DATE 8-19-82W.D.# 12286NCR# NA.CONTACT ADJUSTMENT

MAIN CONTACT WIPE SEE GEI-50299B pg 8, 9

AS FOUND / AS LEFTAD 1/8" / 1/8"BD 1/8" / 1/8"CD 1/8" / 1/8"ACCEPT $1/8" \pm 1/32"$ OR
3/32" TO 5/32"

A	R
✓	
✓	
✓	

REMARKS _____

SECONDARY DISCONNECTS

SEE GEI-50299B pg 7

INSPECT AND CLEAN AS REQUIRED

CONTACT TIP, HOLLOW TUBE, INSULATING BLOCK.

INSURE SNAPPY SPRING ACTION OF FINGER CONTACTS

SEE GEK-7302 pg 5 fig. 2 FOR DISCONNECT LOCATIONS.

DISCONNECT ASSY. F

REMARKS _____

A	—
B	—
C	—
D	—

A	R
✓	
✓	
✓	
✓	

CONTACT SPRINGS

(STATIONARY MAIN) GEI-50299B pg. 12

ACCEPT 75 < 9 POUNDS

REMARKS GAUGE NOT AVAILABLE - N/A PHASE

A	
B	
C	

A	R

TRIP LATCH ADJUSTMENT

SEE GEI 50299B pg 12, 13, 19 LATCH ADJUSTMENT.

ELECTRICAL BREAKER.

PERFORM STEPS 1 TO 4.

R. KRUEGER

1/2-1/4-52
TRIP LATCH SET; DATE
VERIFIED BY

INSTANTANEOUS UNDERVOLTAGE TRIPPING DEVICE

SEE GEI-50299B pg. 34

INSPECT U.V. DEVICE SPLICES AT THE COIL

NOTE: PULL EACH COIL LEAD ON EITHER SIDE OF THE SPLICE TO
VERIFY A PROPER SPLICE

U.V. DEVICE PICK-UP

DROP-OUT

AS FOUND / AS LEFT106 V / 106 V~~38.8 V~~ / 38.8 V
38.8 V

A	R
✓	
A	R
✓	
✓	

NOTE:

ACCEPT 90-116V ON PICK-UP (LOWER IS BETTER, 100V IDEAL)

ACCEPT 30-75V ON DROPOUT (HIGHER IS BETTER, 38V IDEAL)

REMARKS _____

SERIES OVERLOADS

TYPE EC-2 GEI 50299B pg. 20, 21, 22

NOTE: M.T. IS THE MINIMUM TRIP SET POINT AND IS DETER-
MINED AS THAT POINT AT WHICH THE MOVABLE NUT
(INDEX POINTER) fig 11 pg 21 of GEI 50299B, STARTS
TO MOVE WHEN THE DESIRED M.T. CURRENT IS APPLIED.AS FOUND / AS LEFTM.T. A0 565 A / 583AB0 557A / 585AC0 560A / 580AACCEPT. M.T. OF 600A
± 30 A

A	R
✓	
✓	
✓	

CAUTION: ALLOW 10 MINUTES BETWEEN TIMED TESTS
ON THE SAME PHASE.AS FOUND / AS LEFTTIME A0 67.27 / 67.27B0 53.19 / 53.19C0 49.82 / 49.82

ACCEPT A TIME

OF 20 TO 70 SEC.

AT 3000A. 50 SEC.

± 10 SEC IS IDEAL.

A	R
✓	
✓	
✓	

REMARKS _____

DATE 8-18-82 W.D.# 12286NCR# N/ACONTACT ADJUSTMENT

MAIN CONTACT WIPE SEE GEI-50299B pg 8,9

AS FOUND / AS LEFTAD 1/8 1 1/8BD 1/8 1 1/8CD 1/8 1 1/8ACCEPT $1/8" \pm 1/32"$ OR
 $3/32" \text{ TO } 5/32"$

A	R
✓	
✓	
✓	

REMARKS _____

SECONDARY DISCONNECTS

SEE GEI-50299B pg 7

INSPECT AND CLEAN AS REQUIRED

CONTACT TIP, HOLLOW TUBE, INSULATING BLOCK.

INSURE SNAPPY SPRING ACTION OF FINGER CONTACTS

SEE GEK-7302 pg 5 fig. 2 FOR DISCONNECT LOCATIONS.

DISCONNECT ASSY. F

REMARKS _____

A	—
B	—
C	—
D	—

A	R
✓	
✓	
✓	
✓	

CONTACT SPRINGS

(STATIONARY MAIN) GEI-50299B pg. 12

ACCEPT 75 < 9 POUNDS

REMARKS GAUGE NOT AVAILABLE PHASEN/A

A	R
✓	
✓	
✓	

TRIP LATCH ADJUSTMENT

SEE GEI 50299B pg 12, 13, 19 "LATCH ADJUSTMENT."

ELECTRICAL BREAKER.

PERFORM STEPS 1 TO 4.

R. KRUEGER

10/2 N/A / F-12-1
TRIP LATCH SET; DATE
VERIFIED BY

TCB-4

SAN ONOFRE UNITS 2 AND 3 ^{of} W.O.# 12286
 COMBUSTION-ENGINEERING INC. NCR# N/A
 REACTOR TRIP CIRCUIT BREAKER SWITCHGEAR
 GE TYPE AK-2-25

REFERENCE: UNIT 2 5023-999-352 } AND PUBLICATION:
 UNIT 3 5023-999-351 } CONTAINED WITHIN
 UNIT ~~TCB 4~~ ³ DATE 8/18/82
 BREAKER SERIAL NO 256A4002-656 CELL NO. TCB 4

- NOTE: 1. CONSIDER ABC LEFT TO RIGHT FACING REAR OF BREAKER
 2. IF ADJUSTMENTS OR PART REPLACEMENT DOES NOT BRING THE AS LEFT VALUES TO WITHIN THE ACCEPTANCE CRITERIA LISTED HEREIN A NON CONFORMANCE EXISTS AND WORK MUST STOP AND THE EQUIPMENT NOT PLACED INTO SERVICE UNTIL THE NON CONFORMANCE IS DISPOSITIONED.
 3. THESE TESTS NEED NOT BE PERFORMED IN THE ORDER

MICROHM LISTED EXCEPT U.V. & O.I.'S MUST BE DONE LAST.

AS FOUND / AS LEFT
 A-110 / 97
 B-186 / 107
 C-102 / 105

ACCEPT LESS THAN 120 μ A
 AND EACH PHASE BALANCED
 WITHIN 10%

A	R
☒	
☒	
☒	

MEGGER

AS FOUND / AS LEFT AS FOUND / AS LEFT
 A-B INFINITY / 100 A-G INFINITY / 100
 A-C INFINITY / 100 B-G INFINITY / 100
 B-C INFINITY / 100 C-G INFINITY / 100

A	R
☒	
☒	
☒	

COIL READINGS

AS FOUND / AS LEFT EXPECTED
 CLOSE 2.7 / 2.7 2-5
 TRIP 60.8 / 61.9 50-60
 X 112 / 115 100-130
 Y 5010 / 5012 2500-3200
 U.V. 1678 / 1708 1200-1700

A	R
☒	
☒	
☒	
☒	

MINI OPEN AND CLOSE. ACCEPT 93 VOLTS OR LESS.

RECORD ACTUAL CLOSE AND OPEN VALUES

NOTE: IF BREAKER AS FOUND DOES NOT

COMPLY SEE GEZ 50299B₁ 5.6 "LUBRICATION"

AS FOUND / AS LEFT
 CLOSE 88 / 1.88
 OPEN 26 / 26

A	R
☒	
☒	

CREAKER S/N 256A4002-156-17

CELL No. TC64

DATE 8/18/82

W.D. # 12286

NGR # _____

INSTANTANEOUS UNDERVOLTAGE TRIPPING DEVICE

SEE GEI-50299B pg. 34

INSPECT U.V. DEVICE SPLICES AT THE COIL

NOTE: PULL EACH COIL LEAD ON EITHER SIDE OF THE SPICE TO VERIFY A PROPER SPICE

	AS FOUND / AS LEFT	
U.V. DEVICE PICK-UP	<u>99.6</u>	<u>99.6</u>
DROP-OUT	<u>44.1</u>	<u>44.1</u>

	A	R
✓		
	A	R
✓		
✓		

NOTE:

ACCEPT 90-116V ON PICK-UP (LOWER IS BETTER, 100V IDEAL)

ACCEPT 30-75V ON DROP OUT (HIGHER IS BETTER, 58V IDEAL)

REMARKS _____

SERIES OVERLOADS

TYPE EC-2 GEI 50299B pg 20, 21, 22

NOTE: M.T. IS THE MINIMUM TRIP SET POINT AND IS DETERMINED AS THAT POINT AT WHICH THE MOVABLE NUT (INDEX POINTER) fig 11 pg 21 of GEI 50299B, STARTS TO MOVE WHEN THE DESIRED M.T. CURRENT IS APPLIED.

AS FOUND / AS LEFT		
M.T. A0	<u>581</u> / <u>585</u>	ACCEPT. M.T. OF 600A ± 30A
B0	<u>618</u> / <u>576</u>	
C0	<u>517</u> / <u>575</u>	

	A	R
✓		
✓		
✓		

CAUTION: ALLOW 10 MINUTES BETWEEN TIMED TESTS ON THE SAME PHASE.

AS FOUND / AS LEFT		ACCEPT A TIME
TIME A0	<u>59.00</u>	OF 20 TO 70 SEC.
B0	<u>65.74</u>	AT 3000A. 50 SEC.
C0	<u>51.74</u>	± 10 SEC IS IDEAL.

	A	R
✓		
✓		
✓		

REMARKS _____

BREAKER SERIAL NO 2564712 CELL NO. TC64 of
 DATE 8/15/82 W.D.# 12286
 NCR# N/A

CONTACT ADJUSTMENT

MAIN CONTACT WIPE SEE GEI-50299B pg 8,9

AS FOUND / AS LEFT

AD 1/8 / 1/8
 BD 1/8 / 1/8
 CD 1/8 / 1/8

ACCEPT $1/8" \pm 1/32"$ OR
 $3/32"$ TO $5/32"$

A	R
☒	☒
☒	☒
☒	☒

REMARKS _____

SECONDARY DISCONNECTS

SEE GEI-50299B pg 7

INSPECT AND CLEAN AS REQUIRED

CONTACT TIP, HOLLOW TUBE, INSULATING BLOCK.

INSURE SNAPPY SPRING ACTION OF FINGER CONTACTS

SEE GEK-7302 pg 5 fig. 2 FOR DISCONNECT LOCATIONS.

DISCONNECT ASSY. # { A -
 B -
 C -
 D -

REMARKS _____

A	R
☒	☒
☒	☒
☒	☒
☒	☒

CONTACT SPRINGS

(STATIONARY MAIN) GEI-50299B pg. 12

ACCEPT 75 TO 9 POUNDS

REMARKS GAUGE NOT AVAILABLE - N/A PHASE

A	R
☒	☒
☒	☒
☒	☒

TRIP LATCH ADJUSTMENT

SEE GEI 50299B pg 12, 13, 14 "LATCH ADJUSTMENT -
 ELECTRICAL BREAKER".

PERFORM STEPS 1 TO 4.

SMCCOY
8/15/82
 TRIP LATCH SET; DATE
 VERIFIED BY

TCB-3

SAN ONOFRE UNITS 2 AND 3 of 12286
 COMBUSTION ENGINEERING INC. NCR# NA.
 REACTOR TRIP CIRCUIT BREAKER SWITCHGEAR
 GE TYPE AK-2-25
 REFERENCE: UNIT 2 5023-999-352 } AND PUBLICATION
 UNIT 3 5023-999-351 } CONTAINED WITH
 UNIT 3 DATE 8-18-82
 BREAKER SERIAL NO 256A4662-656-25 CELL NO. TCB3

- NOTE: 1. CONSIDER ABC LEFT TO RIGHT FACING REAR OF BREAKER
 2. IF ADJUSTMENTS OR PART REPLACEMENT DOES NOT BRING THE AS LEFT VALUES TO WITHIN THE ACCEPTANCE CRITERIA LISTED HEREIN A NON CONFORMANCE EXISTS AND WORK MUST STOP AND THE EQUIPMENT NOT PLACED INTO SERVICE UNTIL THE NON CONFORMANCE IS DISPOSITIONED.
 3. THESE TESTS NEED NOT BE PERFORMED IN THE ORDER

MICROHM LISTED EXCEPT U.V. & O.I.'S MUST BE DONE LAST.

AS FOUND / AS LEFT
 A-G .134 / 110
 C-G .103 / 108
 C-G .115 / 106

ACCEPT LESS THAN 120 μ A
 AND EACH PHASE BALANCED
 WITHIN 10%

A	R
✓	
✓	
✓	

MEGGER

AS FOUND / AS LEFT AS FOUND / AS LEFT
 A-B INF. / INF. A-GR INF. / INF.
 A-C INF. / INF. B-GR INF. / INF.
 B-C INF. / INF. C-GR INF. / INF.

A	R
✓	
✓	
✓	

COIL READINGS

AS FOUND / AS LEFT EXPECT Ω
 CLOSE 2.8 / 2.8 2-5
 TRIP 59.9 / 59.9 50-60
 X 115 / 115 100-130
 Y 4930 / 4930 2500-3200
 U.V. 1656 / 1656 1200-1700

A	R
✓	
✓	
✓	
✓	
✓	

MINI OPEN AND CLOSE. ACCEPT 93 VOLTS OR LESS.

RECORD ACTUAL CLOSE AND OPEN VALUES

NOTE: IF BREAKER AS FOUND DOES NOT CLOSE 89V / 89V
 COMPLY SEE GEI 50299B, 5, 6 "LUBRICATION" OPEN 25V / 25V

A	R
✓	
✓	

TCB-9

SAN ONOFRE UNITS 2 AND 3 ^{of} W.D.# 12286
 COMBUSTION ENGINEERING INC. NCR# .NA.
 REACTOR TRIP CIRCUIT BREAKER SWITCHGEAR
 GE TYPE AK-2-25
 REFERENCE: UNIT 2 5023-999-352 } AND PUBLICATION:
 UNIT 3 5023-999-351 } CONTAINED WITHIN
 UNIT 3 DATE 8-19-82
 BREAKER SERIAL NO 5644002456-26 CELL NO. TCB9

- NOTE: 1. CONSIDER ALL LEFT TO RIGHT FACING REAR OF BREAKER
 2. IF ADJUSTMENTS OR PART REPLACEMENT DOES NOT BRING THE AS LEFT VALUES TO WITHIN THE ACCEPTANCE CRITERIA LISTED HEREIN A NON CONFORMANCE EXISTS AND WORK MUST STOP AND THE EQUIPMENT NOT PLACED INTO SERVICE UNTIL THE NON CONFORMANCE IS DISPOSITIONED.
 3. THESE TESTS NEED NOT BE PERFORMED IN THE ORDER

MICROHM LISTED EXCEPT U.V. & O.I.'s MUST BE DONE LAST.

AS FOUND / AS LEFT
 AG 94 / 97
 CG 96 / 102
 CD 102 / 97

ACCEPT LESS THAN 120 μ A
 AND EACH PHASE BALANCED
 WITHIN 10%

A	R
✓	
✓	
✓	

MEGGER

AS FOUND / AS LEFT AS FOUND / AS LEFT
 A-B 800m. Ω / 2000m. Ω A-G 1000m. Ω / 800m. Ω
 A-C 1000m. Ω / 2000m. Ω B-G 600m. Ω / 800m. Ω
 B-C 1000m. Ω / 2000m. Ω C-G 800m. Ω / 1000m. Ω

A	R
✓	
✓	
✓	

COIL READINGS

AS FOUND / AS LEFT EXPECTED
 CLOSE 2.7 / 2.7 2-5
 TRIP 60.3 / 60.3 50-60
 X 114 / 114 100-130
 Y 4910 / 4910 2500-3200
 U.V. 1663 / 1663 1200-1700

A	R
✓	
✓	
✓	
✓	
✓	

MINI OPEN AND CLOSE. ACCEPT 93 VOLTS OR LESS.

RECORD ACTUAL CLOSE AND OPEN VALUES

NOTE: IF BREAKER AS FOUND DOES NOT COMPLY SEE GEZ 503998X.5.6 "LUBRICATION"

AS FOUND / AS LEFT
 CLOSE 63.9V / 63.9V
 OPEN 25V / 25V

A	R
✓	
✓	

BREAKER S/N 656-26CELL No. TCB9DATE 8-19-82W.D. # 12286NCR # DAINSTANTANEOUS UNDERVOLTAGE TRIPPING DEVICE

SEE GEI-50299B pg. 34

INSPECT U.V. DEVICE SPLICES AT THE COIL

NOTE: PULL EACH COIL LEAD ON EITHER SIDE OF THE SPICE TO
VERIFY A PROPER SPICE

U.V. DEVICE PICK-UP

DROP-OUT

AS FOUND / AS LEFT

129.6 / 104.439.2 / 38.5

A	R
✓	
A	R
L	
L	

NOTE:

ACCEPT 90-116V ON PICK-UP (LOWER IS BETTER, 100V IDEAL)

ACCEPT 30-75V ON DROP OUT (HIGHER IS BETTER, 38V IDEAL)

REMARKS _____

SERIES OVERLOADS

TYPE EC-2 GEI 50299B pg 20, 21, 22

NOTE: M.T. IS THE MINIMUM TRIP SET POINT AND IS DETER-
MINED AS THAT POINT AT WHICH THE MOVABLE NUT
(INDEX POINTER) fig 11 pg 21 of GEI 50299B, STARTS
TO MOVE WHEN THE DESIRED M.T. CURRENT IS APPLIED.

AS FOUND / AS LEFT

M.T. A# ⁸⁵⁵ 552 / 586B# 508 / 578C# 575 / 575

ACCEPT. M.T. OF 600A

± 30 A

A	R
L	
✓	
✓	

CAUTION: ALLOW 10 MINUTES BETWEEN TIMED TESTS
ON THE SAME PHASE.

AS FOUND / AS LEFT

TIME A# 62.76 / 62.76B# 71.93 / 49.93C# 70.39 / 50.92

ACCEPT A TIME

OF 20 TO 70 SEC.

AT 3000A. 50 SEC.

± 10 SEC IS IDEAL.

A	R
L	
L	
L	

REMARKS _____

BREAKER SERIAL NO. 656-26 CELL NO. 1CB9 of
DATE 8-19-82 W.D.# 12286
NCR# NA

CONTACT ADJUSTMENT

MAIN CONTACT WIPE SEE GEI-50299B pg 8,9

AS FOUND / AS LEFT

AD 9/32 1 9/32

BD 9/32 1 9/32

CD 9/32 1 9/32

ACCEPT $\frac{1}{8}'' \pm \frac{1}{32}''$ OR
 $\frac{3}{32}''$ TO $\frac{5}{32}''$

A	R
✓	
✓	
✓	

REMARKS _____

SECONDARY DISCONNECTS

SEE GEI-50299B pg 7

INSPECT AND CLEAN AS REQUIRED

CONTACT TIP, HOLLOW TUBE, INSULATING BLOCK.

INSURE SNAPPY SPRING ACTION OF FINGER CONTACTS

SEE GEK-7302 pg 5 fig. 2 FOR DISCONNECT LOCATIONS.

DISCONNECT ASSY. F { A -
B -
C -
D -

REMARKS _____

A	R
✓	
✓	
✓	
✓	

CONTACT SPRINGS

(STATIONARY MAIN) GEI-50299B pg. 12

ACCEPT 75 < 9 POUNDS

REMARKS GAUGE NOT AVAILABLE - N/A PHASE

A	R

TRIP LATCH ADJUSTMENT

SEE GEI 50299B pg 12, 13, 19 "LATCH ADJUSTMENT -
ELECTRICAL BREAKER".

PERFORM STEPS 1 TO 4.

S. MCCOY
18-AEL
TRIP LATCH SET; I-E
VERIFIED BY

SC NONCONFORMANCE REPORT (NCR)

Project **SONGS 2 & 3**
 1. NUMBER
SE-E-1102
 REV. 0
Priority Code: **5.0** Due Date: **8/29/82**

2. UNIT 3	3. ITEM DESCRIPTION Reactor Trip Switchgear	4. "Q" CLASS II	5. ASME CODE CLASS N/A	6. DATE 8/10/82
7. LOT/HEAT/SERIAL NO. RTB7, RTB8	8. ITEM LOCATION 37 Radwaste	9. CONTRACTOR/SUPPLIER CE/GE		
10. P.O./SPECIFICATION NO. S023-944-352	11. DRAWING NO. & REV. S023-944-328 to 336	12. SYSTEM SBA	13. ASME AUTH. INSPECTION REQUIRED ☐ YES ☒ NO	

14. DESCRIPTION OF NONCONFORMANCE

Auxiliary Contact Failures:

When racking RTB7, and RTB8 into their cells the auxiliary contact fingers do not engage the stationary contacts assembly properly. That is at the point of engagement, undue stress is created which causes failure of the auxiliary fingers (bending) and their assemblies (cracking and breakage).

Hold Tag Affixed: Yes (☒) No ()SU Cog. Engr: **F. Core**Reported by: **F. Core**
 15. QA ENGINEER
H.D. Parrish 8/11/82
 DATE

16. APPARENT CAUSE Misalignment of auxiliary to stationary contacts.	18. CORRECTIVE ACTION TO PREVENT RECURRENCE Alignment of auxiliary contact finger to stationary contact.
17. SIGNATURE Ally Pakerton	19. SIGNATURE Ally Pakerton
TITLE TOS	TITLE TOS
DATE 8-13-82	DATE 8-13-82

20. DISPOSITION/COMMENTS Realign auxiliary to stationary contacts, with CE assistance.	FIELD DISPOSITION ☐ REJECT ☒ REWORK END DISPOSITION ☐ REPAIR ☐ ACCEPT "AS IS"
--	---

21. DISPOSITION APPROVALS — SIGNATURE, TITLE, DATE James C. Winslow CE/GE 8/13/82 Ally Pakerton TOS 8-13-82 Pakerton SUQA 8/13/82	22. CONCURRENCE N/A AUTHORIZED INSPECTOR DATE
---	---

23. REPLICATION DISPOSITION ACTIVITY COMPLETE H.D. Parrish 8/26/82 QA ENGINEER DATE	24. IPOR NO. N.O. 12282
--	---------------------------------------

25. QA FINAL REVIEW (NOT CLOSED) C.R. Horton QA SUPERVISOR 8/26/82 DATE	26. DISTRIBUTION J.H. McCarty-BPC L.K. Fossum-BPC G.A. Chavez D.E. Nunn L.L. Seyler A.P. King	27. FOR DOCUMENTATION CONTROL CENTER USE H.L. Richter E.D. Prabhu D.B. Schone L. Wiedemann C.R. Horton-SU G. O'Dell-BPC QA Specialist/QA File MPS CDMC Cindy Williams R. Bockhorst
---	---	--

S

SAN ONOFRE 283 WORK ORDER

WO 12282

5 SEYMOUR / ELEC TEST 5/13/82 1706 846 897 UNIT 3 RADWASTE 1 37 N/A / N/A
 OPERATOR DEPT DATE TIME EXT. PLANT NO. LBY. ROOM PENETRATION

SYSTEM I.D. 3SBA COMPONENT I.D. SEE SUPD PRIORITY: 5.0
 COMPONENT DESCRIP. REACTOR TRIP SWITCHGEAR PLANT COND: 6
 % PWR REDUCT. N/A DATE N/A TIME N/A MAINT TAG NO. N/A QUALITY CLASS: II

DESCRIPTION OF PROBLEM

IMPLEMENT DISPOSITION OF NCR SE-F-1102

- ☐ SECURITY
☒ ASME III H
☐ ASME XI
☐ HVAC/FIRE PROT.
☒ SEPARATION CRITERIA AFFECTED H
☒ ENVIRONMENTAL QUALIFICATIONS H

PERSONNEL SAFETY EMERG ☐ POTENT ☐ CLEANLINESS REQUIREMENTS A ☐ C ☐
 PLANT DAMAGE N/A PER CYCM N/A B ☐ D ☐

TECH SPEC. SECTION N/A IMPACT DATE N/A TIME N/A

PREREQUISITES	YES NO	INIT.	PLANNER: S. SEYMOUR X897	DATE: 8/14/82
EQUIPMENT OUTAGE	Y	SLS	QC WORK REQUIRED * YES <i>[Signature]</i> NO ☐ SIGNATURE	EST. MH.
CLEANLINESS PERMIT NO.	N	SLS	JOB TASK DESCRIPTION	
RAD EXP. PERMIT NO.	N	SLS	① OBTAIN WORK AUTHORIZATION	ET 1 1.0
WELD/BURN PERMIT NO.	N	SLS	② INITIATE NCR C/ANY NON-COMFORMANCE FOUND	ET 1 1.0
CLEARANCE NO. APPROVAL	Y	SLS	③ IMPLEMENT DISPOSITION OF NCR SE-F-1102	ET 1 4.0
RELATED COMMENTS NCR SE-F-1102	Y	SLS	④ DOCUMENT ALL ACTION TAKEN	ET 1 1.0

PROCEDURES/DWG Nos -

NA

SPECIAL INSTRUCTIONS: EST DUR 7.0 TOTAL 7.0
 * BREC to witness NCR SE-F-1102 disposition & rework.

DEFERRED REASON M E V O U R DATE N/A RESP. N/A RELEASE DATE N/A
 RETEST YES ☐ REQ'D NO. TOS/COG *[Signature]* 8/25/82 RETEST YES ☐ QC-REQ'D NO. *[Signature]* 8/25/82
 RETEST PROCEDURE N/A RETEST COMPLETED N/A
 COMPLETED BY N/A DATE
 APPROVED BY N/A DATE
 RETEST QC COMPLETE DATE

MAINT. TYPE CM ASSIGN. ET FUNCT. NO. N/A ASSIGNED TO: N/A
 IMPLEMENTATION APPROVAL *[Signature]* 8-16-82 APPROVAL TO START WORK *[Signature]* 8/16/82
 PSUE/TOS DATE STE DATE
 PAGE 1 OF 2

CAUSE OF PROBLEM

COMPLETED

082082

AVAILABLE
FOR SERVICE

CE2

1500

SECONDARY DISCONNECTS ON TCB-7 AND TCB-8
BREAKERS OUT OF ADJUSTMENT.

TEST EQUIPMENT/SPECIAL TOOLS

DESCRIPTION

I.D. No.

RANGE

ACCURACY

RECALIBRATION
DATE~~NA~~

ACTION TAKEN

~~NO ACTION TAKEN UNDER THIS W.C.~~ THE PROBLEM
WAS CORRECTED UNDER W.C. 12280 FOR TCB-7 AND
W.C. 12278 FOR TCB-8. 8-25-82
REALIGNED AUXILIARY TO STATIONARY CONTACTS
WITH CE ASSISTANCE.

CRAFTS USED

No.

MH

MATERIALS USED

QTY

~~NA~~~~NA~~

TOTAL

DURATION

~~NA~~

R. KRUEGER

8/20/82

WORK COMPLETE/DATE

George Downing 8/20/82

WORK QC APPROVAL

☐ PARTIAL☒ TOTAL

QCE

J. Bower

DATE

8/25/82

WORK ORDER REVIEW/DATE

Gene L. Seymour 8/24/82

QA REVIEW/DATE

H. Parnell

8/25/82

WORK ORDER APPROVAL/DATE

J. Parnell

8-26-82

REMARKS

W.O. NUMBER

12282



SUPPLEMENT TO WORK ORDER

WO 12282

COMPONENT ID : RTB7 GE # AK23826

RTB8 GE # AK25491

SCE

NONCONFORMANCE REPORT (NCR)

1. NUMBER
SE-F-1103

REV.

0

Project SONGS 2 & 3

Priority Code: 5.0

Due Date: 8/24/82

2. UNIT 3	3. ITEM DESCRIPTION Reactor Trip Switchgear	4. "Q" CLASS II	5. ASME CODE CLASS N/A	6. DATE 8/10/82
7. LOT/HEAT/SERIAL NO. #AK25481 TCB8	8. ITEM LOCATION 37' Radwaste	9. CONTRACTOR/SUPPLIER CE/GE		
10. P.O./SPECIFICATION NO. S023-944-352	11. DRAWING NO. & REV. S023-944-328 to 336	12. SYSTEM SBA	13. ASME AUTH. INSPECTION REQUIRED ☐ YES ☒ NO	

14. DESCRIPTION OF NONCONFORMANCE

1. Missing U.V. Hardware: Adjusting screw, Locknut and bushing.
2. U.V. device does not work.
3. Breaker would not close until 96% or 120 VDC was applied - 70% is acceptable.

Hold Tag Affixed: Yes (✓) No ()

SU Coq. Engr: F. Core

Reported by: G. Grunning

H.D. Parrish 8/11/82

16. APPARANT CAUSE

Manufacturing error.

18. CORRECTIVE ACTION TO PREVENT RECURRENCE

Copy of NCR forwarded to Vendor for information.

17. SIGNATURE

TITLE

DATE

H.D. Parrish TOS 8-13-82

19. SIGNATURE

TITLE

DATE

H.D. Parrish TOS 8-13-82

20. DISPOSITION/COMMENTS

1. Replace U.V. device.
2. Retest per CE instruction manual S023-944-352-0.

FIELD DISPOSITION

☐ REJECT ☒ REWORK

ERD DISPOSITION

☐ REPAIR ☐ ACCEPT "AS IS"

21. DISPOSITION APPROVALS SIGNATURE, TITLE, DATE

J. H. Richter CE/SU 8/13/82
 H.D. Parrish TOS 8/13/82
 J. H. Richter SQA 8/13/82

22. CONCURRENCE

N/A

AUTHORIZED INSPECTOR

DATE

23. VERIFICATION DISPOSITION ACTIVITY COMPLETE

H.D. Parrish 8/25/82

QA ENGINEER

DATE

N/A

AUTHORIZED INSPECTOR

DATE

24. IPDR NO.

WO 12278

25. A FINAL REVIEW (NCR CLOSED)

C. R. Horton
 8/26/82
 DATE

26. DISTRIBUTION

J.H. McCarty-BPC
 L.K. Fossum-BPC
 G.A. Chavez
 D.E. Nunn
 L.L. Seyler
 A.P. King

H.L. Richter
 E.D. Prabhu
 D.B. Schone
 L. Wiedemann
 C.R. Horton-SU
 G. O'Dell-BPC

27. FOR DOCUMENTATION CONTROL CENTER USE

QA Specialist/QA File
 MTS
 CDMC
 Cindy Williams
 R. Bockhorst

SCE

SAN ONOFRE 283 WORK ORDER

WO 12278

S. SCHMIDT/ELECT 8/1/82 940 57-816

UNIT 3

RAOWASTE

37

N/A / N/A

SYSTEM I.D.	358A	COMPONENT I.D.	TCB5	AK25481	PRIORITY: 5.0
MPONENT DESCRIP	REACTOR	TRIP SWITCHGEAR			PLANT COND: 6
% PWR REDUCT	NA	DATE	1/1	TIME	1/1
		MAINT. TAG NO.	NA		QUALITY CLASS: II

DESCRIPTION OF PROBLEM

IMPLEMENT DISPOSITION OF NCR SC-F-1103

- ☐ SECURITY
☐ ASME III H
☐ ASME XI
☐ HVAC/FIRE PROT.
☐ SEPARATION CRITERIA H
☐ ENVIRONMENTAL H
☐ QUALIFICATIONS

PERSONNEL SAFETY ☐ EMERG ☐ POTENT. ☐
 PLANT DAMAGE ☐ CLEANLINESS REQUIREMENTS A ☐ C ☐
 PER CVM B ☐ D ☐

TECH SPEC. SECTION NA IMPACT DATE 1/1 TIME 1/1

PREREQUISITES	YES NO	INIT.	PLANNER: S. L. Schmitt	DATE: 8/1/82	CRAFT NO.	EST. MH.
EQUIPMENT OUTAGE	Y	SL	QC WORK REQUIRED	NO		
CLEANLINESS PERMIT No.	N	SV	JOB SEQ			
RAD. EXP. PERMIT No.	Y	SL	TASK DESCRIPTION			
WELD/BURN PERMIT No.	Y	SL	① OBTAIN WORK AUTHORIZATION	ET	1	1.0
CLEARANCE No. APPROV	Y	SL	② INITIATE NCR ON ANY NCR - CONFIRMANCE	ET	1	1.0
RELATED DOCUMENTS NCR SC-F-1103	Y	SL	③ IMPLEMENT DISPOSITION OF NCR SC-F-1103	ET	1	4.0
			④ DOCUMENT ALL ACTION TAKEN	ET	1	1.0

PROCEDURES/DWG. Nos. -

NA

SPECIAL INSTRUCTIONS & HOLDPOINTS:

EST DUR

7.0 TOTAL

7.0

* NCR TO WITNESS WORK X 424

DEFERRED REASON M E V O U R DATE NA RESP. NA RELEASE DATE NA

RETEST YES ☐ REQ'D NO ☒ TOS/COG FA Phillips DATE 8/16/82

RETEST PROCEDURE NA

RETEST COMPLETED COMPLETED BY NA DATE

APPROVED BY NA DATE

RETEST QC COMPLETE DATE

MAINT TYPE CM ASSIGN ET FUNCT NO NA ASSIGNED TO: NA

IMPLEMENTATION APPROVAL

APPROVAL TO START WORK

DATE 8-16-82 DATE 8/16/82

CAUSE OF PROBLEM

COMPLETED

082082

082082 2PM

IMPROPER ^{RSK} TRIP U.V. Device

TEST EQUIPMENT/SPECIAL TOOLS

DESCRIPTION	I.D. No.	RANGE	ACCURACY	RECALIBRATION DATE
MULTI AMP TRIP tester	EM 4099			1-22-83
Megger	EM 2500			11-7-82
MILLI OHMmeter	SH-492			12-28-82
MULTIMETER-FLUKE	EM-2611			11-21-82

ACTION TAKEN

REPLACED U.V. Device Assembly
 tested U.V. Device FOR PROPER OPERATION
 tested BREAKER FOR PROPER CLOSING & OPENING
 ADJUSTED SECONDARY CONTACT BRACKET TO SOLVE
 PROBLEM STATED IN NCR# SE-E-1102-7.C. 7/25/82

CRAFTS USED	No.	MH	MATERIALS USED	QTY
Elect	25		U.V. Device	1
TOTAL				
DURATION	10		R.F. Kuzner	8-20-82

WORK COMPLETE/DATE

George Manning 8/20/82

WORK QC APPROVAL

☐ PARTIAL☒ TOTAL

DATE 8/20/82

WORK ORDER REVIEW/DATE

Sam J. Serran 8/25/82

QA REVIEW

8/25/82

WORK ORDER APPROVAL/DATE

J.M.C. 8-25-82

WORK NUMBER

12278

TCB-B

SAN ONOFRE UNITS 2 AND 3
COMBUSTION ENGINEERING INC. U.O.# 12278
REACTOR TRIP CIRCUIT BREAKER SWITCHGEAR NCR# SE-F-1103
GE TYPE AK-2-25

REFERENCE: UNIT 2 5023-999-352 } AND PUBLICATIONS
UNIT 3 5023-999-351 } CONTAINED WITHIN
UNIT 3 DATE 8-20-82
BREAKER SERIAL NO AK25481 CELL NO. TCB8

- NOTE: 1. CONSIDER ABC LEFT TO RIGHT FACING REAR OF BREAKER.
2. IF ADJUSTMENTS OR PART REPLACEMENT DOES NOT BRING THE AS LEFT VALUES TO WITHIN THE ACCEPTANCE CRITERIA LISTED HEREIN A NON CONFORMANCE EXISTS AND WORK MUST STOP AND THE EQUIPMENT NOT PLACED INTO SERVICE UNTIL THE NON CONFORMANCE IS DISPOSITIONED.
3. THESE TESTS NEED NOT BE PERFORMED IN THE ORDER

MICROHM LISTED EXCEPT U.V. & O.I. MUST BE DONE LAST.

AS FOUND / AS LEFT
A-119 / 123
B-100 / 116
C-103 / 109

ACCEPT LESS THAN 120 μ A
AND EACH PHASE BALANCED
WITHIN 10%

A	R
✓	
✓	
✓	

MEGGER

AS FOUND / AS LEFT
A-B 1000 / 1500 M Ω A-GR 2000 / 2000 M Ω
A-C 2000 / 2000 M Ω B-GR 2000 / 2000 M Ω
B-C 2000 / 2000 M Ω C-GR 2000 / 2000 M Ω

A	R
✓	
✓	
✓	

COIL READINGS

AS FOUND / AS LEFT EXPECTED
CLOSE 2.4 / 2.4 2-5
TRIP 60.1 / 60.1 50-60
X 88.1 / 88.1 100-130
Y 3100 / 3100 2500-3200
U.V. 1480 / 1480 1200-1700

A	R
✓	
✓	
✓	
✓	
✓	

MINI OPEN AND CLOSE. ACCEPT 93 VOLTS OR LESS.

RECORD ACTUAL CLOSE AND OPEN VALUES

NOTE: IF BREAKER AS FOUND DOES NOT COMPLY SEE GEI 50299B, 5, 6 "LUBRICATION"

AS FOUND / AS LEFT
CLOSE 83V / 83V
OPEN 23V / 23V

A	R
✓	
✓	

BREAKER S/NAK 25481

CELL No. 7CB8

DATE 8-20-82

W.O. # 1227

NCR # SE-F-11C

INSTANTANEOUS UNDERVOLTAGE TRIPPING DEVICE

SEE GEI-50299B pg. 34

INSPECT U.V. DEVICE SPLICES AT THE COIL

NOTE: PULL EACH COIL LEAD ON EITHER SIDE OF THE SPlice TO
VERIFY A PROPER SPliceU.V. DEVICE PICK-UP
DROP-OUTAS FOUND / AS LEFT115.5V / 110.5V5.1V / 4.3V

A	R
✓	
A	R
✓	
✓	

NOTE:

ACCEPT 90-116V ON PICK-UP (LOWER IS BETTER, 100V IDEAL)

ACCEPT 30-75V ON DROP-OUT (HIGHER IS BETTER, 38V IDEAL)

REMARKS

SERIES OVERLOADS

TYPE EC-2 GEI 50299B pg. 20, 21, 22

NOTE: M.T. IS THE MINIMUM TRIP SET POINT AND IS DETER-
MINED AS THAT POINT AT WHICH THE MOVABLE NUT
(INDEX POINTER) fig 11 pg 21 of GEI 50299B, STARTS
TO MOVE WHEN THE DESIRED M.T. CURRENT IS APPLIED.AS FOUND / AS LEFTM.T. AØ 558 / 583BØ 614 / 614CØ 580A / 580AACCEPT. M.T. OF 600A
± 30A

A	R
✓	
✓	
✓	

CAUTION: ALLOW 10 MINUTES BETWEEN TIMED TESTS
ON THE SAME PHASE.AS FOUND / AS LEFTTIME AØ 26.63 / 26.63BØ 16.80 / 23.91CØ 27.59 / 27.59

ACCEPT A TIME

OF 20 TO 70 SEC.

AT 3000A. 50 SEC.

± 10 SEC IS IDEAL.

A	R
✓	
✓	
✓	

REMARKS

BREAKER SERIAL NO. AK25481 CELL NO. TCB8

DATE 8-20-82

W.D. # 12278

NCR # SE-F-1103

CONTACT ADJUSTMENT

MAIN CONTACT WIPE SEE GEI-50299B pg 8, 9

AS FOUND / AS LEFT

AD 1/8 1 1/8
 BD 1/8 1 1/8
 CD 1/8 1 1/8

ACCEPT $1/8" \pm 1/32"$ OR
 $3/32"$ TO $5/32"$

A	R
✓	
✓	
✓	

REMARKS _____

SECONDARY DISCONNECTS

SEE GEI-50299B pg 7

INSPECT AND CLEAN AS REQUIRED

CONTACT TIP, HOLLOW TUBE, INSULATING BLOCK.

INSURE SNAPPY SPRING ACTION OF FINGER CONTACTS

SEE GEK-7302 pg 5 fig. 2 FOR DISCONNECT LOCATIONS.

DISCONNECT ASSY. # { A -
 B -
 C -
 D -

A	R
✓	
✓	
✓	
✓	

REMARKS SECONDARY DISCONNECT BRACKETS

HAD TO BE BENT TO AN ANGLE OF 90° TO

ALLOW THE BREAKER TO BE RACKED INTO ITS

CELL. THIS ACTION CORRECTED THE PROBLEM

STATED IN NCR # SE-F-1102, NO FURTHER ACTION

CONTACT SPRINGS ^{WAS} REQUIRED.

(STATIONARY MAIN) GEI-50299B pg. 12

ACCEPT 75 < 9 POUNDS

REMARKS GAUGE NOT AVAILABLE - N/A PHASE

A	R

TRIP LATCH ADJUSTMENT

SEE GEI 50299B pg 12, 13, 19 "LATCH ADJUSTMENT."

ELECTRICAL BREAKER.

PERFORM STEPS 1 TO 4.

W. R. KRUEGER
NA 8/20/82
 TRIP LATCH SET; DATE
 VERIFIED BY

SCE NONCONFORMANCE REPORT (NCR)

Project SONGS 2 & 31 NUMBER
SE-F-1104

REV.

0

Priority Code: 5.0Due Date: 8/24/82

4. UNIT 3	3. ITEM DESCRIPTION Reactor Trip Switchgear	4. "Q" CLASS II	5. ASME CODE CLASS N/A	6. DATE 8/10/82
7. LOT/HEAT/SERIAL NO. GE #AK23827 TCB5	8. ITEM LOCATION 37' Radwaste	9. CONTRACTOR/SUPPLIER CE/GE		
10. P.O./SPECIFICATION NO. S023-944-352	11. DRAWING NO. & REV. S023-944-328 to 336	12. SYSTEM SBA	13. ASME AUTH. INSPECTION REQUIRED ☐ YES ☒ NO	

14. DESCRIPTION OF NONCONFORMANCE

1. Missing hardware on J.V. device: adjusting screw, locknut.
2. U.V. device does not operate.

Hold Tag Affixed: Yes (☒) No ()SU Coq. Engr: F. CoreReported by: G. Grunning

H.D. Parrish

DATE

H.D. Parrish 8/11/82

15. APPARENT CAUSE

Manufacturing error.

16. CORRECTIVE ACTION TO PREVENT RECURRENCE

Copy of NCR forwarded to Vendor for information.

17. SIGNATURE

TITLE

DATE

Allyl Patterson TOS 8-13-82

18. SIGNATURE

TITLE

DATE

Allyl Patterson TOS 8-13-82

20. DISPOSITION/COMMENTS

1. Replace U.V. device.
2. Retest per CE instruction Manual S023-944-352-0.

FIELD DISPOSITION

☐ REJECT ☒ REWORK

ERW DISPOSITION

☐ REPAIR ☐ ACCEPT "AS IS"

21. DISPOSITION APPROVALS SIGNATURE, TITLE, DATE

James C. Henderson 8/11/82
Allyl Patterson TOS 8-13-82
Patterson SU QA 8/18/82

22. CONCURRENCE

N/A

AUTHORIZED INSPECTOR

DATE

23. VERIFICATION DISPOSITION ACTIVITY COMPLETE

H.D. Parrish 8/25/82

QA ENGINEER

DATE

N/A

AUTHORIZED INSPECTOR

DATE

24. IPDR NO.

W.O. 12279

25. FINAL REVIEW (NCR CLOSED)

C.R. Horton
8/26/82

QA SUPERVISOR

DATE

26. DISTRIBUTION

J.H. McCarty-BPC
 L.K. Fossum-BPC
 G.A. Chavez
 D.E. Nunn
 L.L. Seyler
 A.P. King

H.L. Richter
 E.D. Prabhu
 D.B. Schone
 L. Wiedemann
 C.R. Horton-SU
 G. O'Dell-BPC

27. FOR DOCUMENTATION, CONTROL CENTER USE

QA Specialist/QA File
 MTS
 CDMC
 Cindy Williams
 R. Bockhorst

WO 12279

PF-85.3.2 (10079) 4/90

DATE OF PROBLEM

COMPLETED 082182 082182 0900

IMPROPER Z.V. Device

TEST EQUIPMENT/SPECIAL TOOLS

DESCRIPTION	ID No.	RANGE	ACCURACY	RECALIBRATION DATE
METER	DM 7503			3-22-82
MULTI/AMP TRIP TESTER	EM 4099			1-22-83
M-994R	EM 2500			11-7-82
MULTIMETER	34-492			12-28-82
MULTI-METER/FLUKE	EM 260			11-21-82
ACTION TAKEN				

Replaced Z.V. Device Assembly
 tested Z.V. Device for proper operation
 tested BREAKER for proper closing & opening
 REPLACED SHUNT TRIP COILS - F.C. 8-25-82

CRAFTS USED	No.	MR.	MATERIALS USED	QTY.
ELECT	25	MA		
"	13			
TOTAL				
DURATION	10			

HILDEBRAND

8-25-82

WORK COMPLETE/DATE

Major Downing 8/21/82

WORK QC APPROVAL

☐ PARTIAL ☒ TOTAL

QCE E R Dai

DATE 8/21/82

WORK ORDER REVIEW/DATE

Sam L. Lynn 9/25/82

QA REVIEW/DATE

H. L. Paul 8/25/82

WORK ORDER APPROVAL/DATE

J. C. W. C. 8-25-82

REMARKS

WORK NUMBER

12279

TCB-5

SAN JOSE UNITS 2 AND 3 of
CONSTRUCTION ENGINEERING INC. U.O.# 12279
REACTOR TRIP CIRCUIT BREAKER SWITCHGEAR NCR# SE-F-1104

GE TYPE AK-2-25

REFERENCE: UNIT 2 5023-999-352 } AND PUBLICATION
UNIT 3 5023-999-351 } CONTAINED WITHIN

UNIT 3DATE 8-20-82BREAKER SERIAL NO AK23827CELL NO. TCB5

- NOTE: 1. CONSIDER ABC LEFT TO RIGHT FACING REAR OF BREAKER
2. IF ADJUSTMENTS OR PART REPLACEMENT DOES NOT BRING THE AS LEFT VALUES TO WITHIN THE ACCEPTANCE CRITERIA LISTED HEREIN A NON CONFORMANCE EXISTS AND WORK MUST STOP AND THE EQUIPMENT NOT PLACED INTO SERVICE UNTIL THE NON CONFORMANCE IS DISPOSITIONED
3. THESE TESTS NEED NOT BE PERFORMED IN THE ORDER

MICROHM LISTED EXCEPT U.V. & O.I.'S MUST BE DONE LAST.

AS FOUND / AS LEFT
117
~~AS FOUND~~ / 110
CO 112 / H5 115
CO 364 / 114

ACCEPT LESS THAN 120 μ A
AND EACH PHASE BALANCED
WITHIN 10%

A	R
✓	
✓	
✓	

MEGGER

AS FOUND / AS LEFT AS FOUND / AS LEFT
A-B 1000 μ m / 2000 μ m A-G 800 μ m / 1000 μ m
A-C 1000 μ m / 2000 μ m B-G 700 μ m / 1000 μ m
B-C 800 μ m / 2000 μ m C-G 800 μ m / 1000 μ m

A	R
✓	
✓	
✓	

COIL READINGS

AS FOUND / AS LEFT EXPECTED
CLOSE 2.4 / 2.4 2-5
TRIP 61.6 / 61.6 50-60
X 90.2 / 90.2 100-130
Y 3110 / 3110 2500-3200
U.V. 1531 / 1531 1200-1700

A	R
✓	
✓	
✓	
✓	

MINI OPEN AND CLOSE. ACCEPT 93 VOLTS OR LESS.

RECORD ACTUAL CLOSE AND OPEN VALUES

NOTE: IF BREAKER AS FOUND DOES NOT

COMPLY SEE GE 50299B, 5, 6 "LUBRICATION"

CLOSE 86.2 V / 86.2 VOPEN 21.5 V / 21.5 V

A	R
✓	
✓	

ENTER S/N AK23827

CELL No. TCB5

DATE 8-20-82

W.O. # 12279

NCR # SE-F-110

INSTANTANEOUS UNDERVOLTAGE TRIPPING DEVICE

SEE GEI-50299B pg. 34

INSPECT U.V. DEVICE SPLICES AT THE COIL

NOTE: PULL EACH COIL LEAD ON EITHER SIDE OF THE SPLICE TO
VERIFY A PROPER SPLICE

U.V. DEVICE PICK-UP
DROP-OUT

AS FOUND / AS LEFT

122.8 / 102.3
7.7 / 44.1

A	R
✓	
A	R
✓	
✓	

NOTE:

ACCEPT 90-116V ON PICK-UP (LOWER IS BETTER, 100V IDEAL)
ACCEPT 30-75V ON DROP-OUT (HIGHER IS BETTER, 38V IDEAL)

REMARKS _____

SERIES OVERLOADS

TYPE EC-2 GEI 50299B pg. 20, 21, 22

NOTE: M.T. IS THE MINIMUM TRIP SET POINT AND IS DETER-
MINED AS THAT POINT AT WHICH THE MOVABLE NUT
(INDEX POINTER) fig 11 pg 21 of GEI 50299B, STARTS
TO MOVE WHEN THE DESIRED M.T. CURRENT IS APPLIED.

AS FOUND / AS LEFT

M.T. A0 600 / 600
B0 600 / 600
C0 600 / 600

ACCEPT M.T. OF 600A
± 30 A

A	R
✓	
✓	
✓	

CAUTION: ALLOW 10 MINUTES BETWEEN TIMED TESTS
ON THE SAME PHASE.

AS FOUND / AS LEFT

TIME A0 41.63 / 41.63
B0 22.15 / 22.15
C0 27.99 / 27.44

ACCEPT A TIME
OF 20 TO 70 SEC.
AT 3000A. 50 SEC.
± 10 SEC IS IDEAL.

A	R
✓	
✓	
✓	

REMARKS _____

BREAKER SERIAL NO. A123527CELL NO. TCB5

of

DATE 8-20-82 W.D.# 12279NCR# SE-F-1104CONTACT ADJUSTMENT

MAIN CONTACT WIPE SEE GEI-502998 pg 8, 9

AS FOUND / AS LEFTAD 1/8 1 1/8BD 1/8 1 1/8CD 1/8 1 1/8ACCEPT $1/8" \pm 1/32"$ OR
3/32" TO 5/32"

A	R
☒	☒
☒	☒
☒	☒

REMARKS _____

SECONDARY DISCONNECTS

SEE GEI-502998 pg 7

INSPECT AND CLEAN AS REQUIRED

CONTACT TIP, HOLLOW TUBE, INSULATING BLOCK.

INSURE SNAPPY SPRING ACTION OF FINGER CONTACTS

SEE GEK-7302 pg 5 fig. 2 FOR DISCONNECT LOCATIONS.

DISCONNECT ASSY. F { A —
B —
C —
D —

REMARKS _____

A	R
☒	☒
☒	☒
☒	☒
☒	☒

CONTACT SPRINGS

(STATIONARY MAIN) GEI-502998 pg. 12

ACCEPT 75 TO 9 POUNDS

REMARKS GAUGE NOT AVAILABLE — N/A PHASE

A	R
☒	☒
☒	☒
☒	☒

TRIP LATCH ADJUSTMENT

SEE GEI 502998 pg 12, 13, 19 "LATCH ADJUSTMENT."

ELECTRICAL BREAKER.

PERFORM STEPS 1 TO 4.

R. KRUEGER
h2 ~~NA~~ 8/20/82
TRIP LATCH SET, DFE
VERIFIED BY

SCE NONCONFORMANCE REPORT (NCR)Project **SONGS 2 & 3**1. NUMBER
SE-F-1105REV. **0**Priority Code: **5.0**Due Date: **8/24/82**

2. UNIT 3	3. ITEM DESCRIPTION Reactor Trip Switchgear	4. "Q" CLASS II	5. ASME CODE CLASS N/A	6. DATE 8/10/82
7. LOT/HEAT/SERIAL NO. GE #AK23826 TCB7	8. ITEM LOCATION 37' Radwaste	9. CONTRACTOR/SUPPLIER CE/GE		
10. P.O./SPECIFICATION NO. S023-944-352	11. DRAWING NO. & REV. S023-944-328 to 336	12. SYSTEM SBA	13. ASME AUTH. INSPECTION REQUIRED ☐ YES ☒ NO	

14. DESCRIPTION OF NONCONFORMANCE

1. Missing hardware on U.V. device: Screw, locknut, and bushing.
2. U.V. device will not operate.

Hold Tag Affixed: Yes (☒) No ()SU Cog. Engr: **F. Core**Reported by: **G. Grunning**

15. QA ENGINEER

H.D. Parrish 8/11/82**16. APPARENT CAUSE**

Manufacturing error.

18. CORRECTIVE ACTION TO PREVENT RECURRENT

Copy of NCR forwarded to Vendor for information.

17. SIGNATURE

TITLE

DATE

Alfred Pothner TOS 8-13-82**19. SIGNATURE**

TITLE

DATE

Alfred Pothner TOS 8-13-82**20. DISPOSITION/COMMENTS**

1. Replace U.V. device.
2. Retest per CE instruction manual S023-944-352-0.

FIELD DISPOSITION☐ REJECT ☒ REWORK**SRB DISPOSITION**☐ REPAIR ☐ ACCEPT "AS IS"**21. DISPOSITION APPROVALS: SIGNATURE, TITLE, DATE****James M. Wiedemann** 8/13/82**Alfred Pothner** TOS 8-13-82**James M. Wiedemann** SBA QA 8/13/82**22. CONCURRENCE****N/A**

AUTHORIZED INSPECTOR

DATE

23. VERIFICATION DISPOSITION ACTIVITY COMPLETE**H.D. Parrish** 8/15/82

QA ENGINEER

DATE

N/A

AUTHORIZED INSPECTOR

DATE

24. IPDR NO.**W.O. 12280****25. QA FINAL REVIEW (NUMBERED)****C.R. Horton**

QA SUPERVISOR

8/26/82

DATE

26. DISTRIBUTION

J.H. McCarty-BPC
L.K. Fossum-BPC
G.A. Chavez
D.E. Nunn
L.L. Seyler
A.P. King

H.L. Richter
E.D. Prabhu
D.B. Schone
L. Wiedemann
C.R. Horton-SU
C. O'Dell-BPC

27. FOR DOCUMENTATION CONTROL CENTER USE

QA Specialist/QA File

MPS

CDMC

Cindy Williams

R. Bockhorst

WO 12280

OF 2

TRIPPER L.V. Device

TEST EQUIPMENT/SPECIAL TOOLS

DESCRIPTION	ID No	RANGE	ACCURACY	RECALIBRATION DATE
MULTIMETER/FLUKE	EM 2611			11-21-82
WATT/AMP TRIP TESTER	EM 4099			1-22-83
Megger	EM 2500			11-7-82
MILLIAMMETER	54 492			12-28-82

ACTION TAKEN

REPLACED L.V. DEVICE ASSEMBLY
 TESTED L.V. DEVICE FOR PROPER OPERATION
 TESTED BREAKER FOR PROPER CLOSING & OPENING
 ADJUSTED SECONDARY CONTACT BRACKETS TO SOLVE

PROBLEM STATED IN NCR # SE-F-1102
 8/25/82

CRAFTS USED	No	M-	MATERIALS USED	QTY
ELECT	25	TR		
TOTAL				
DURATION	10		R.F.K. Jr	8-20-82

WORK COMPLETE/DATE

George J. Seymour 8/20/82

WORK ORDER REVIEW/DATE

Sam L. Seymour 8/25/82

WORK ORDER APPROVAL/DATE

George J. Seymour 8-25-82

WORK ORDER NUMBER

12280

WORK QC APPROVAL

☐ PARTIAL ☒ TOTAL

Joe Bevens 8/20/82

8/25/82

TCB-7

of 12280
U.O. # ~~12286~~ RSK
NCR # SE-F-1105

SAN ONDRE UNITS 2 AND 3
COMBUSTION ENGINEERING INC.
REACTOR TRIP CIRCUIT BREAKER SWITCHGEAR
GE TYPE AK-2-25

REFERENCE: UNIT 2 5023-999-352 } AND PUBLICATIONS
UNIT 3 5023-999-351 } CONTAINED WITHIN
UNIT 3 DATE 8.20.82
BREAKER SERIAL NO AK23826 CELL NO. TCB7

- NOTE: 1. CONSIDER ABC LEFT TO RIGHT FACING REAR OF BREAKER.
2. IF ADJUSTMENTS OR PART REPLACEMENT DOES NOT BRING THE AS LEFT VALUES TO WITHIN THE ACCEPTANCE CRITERIA LISTED HEREIN A NON CONFORMANCE EXISTS AND WORK MUST STOP AND THE EQUIPMENT NOT PLACED INTO SERVICE UNTIL THE NON CONFORMANCE IS DISPOSITIONED.
3. THESE TESTS NEED NOT BE PERFORMED IN THE ORDER

MICROMH LISTED EXCEPT U.V. & O.I.'S MUST BE DONE LAST.

AS FOUND / AS LEFT

AC	98	/	76
CD	102	/	94
CE	113	/	93

ACCEPT LESS THAN 120 μ A
AND EACH PHASE BALANCED
WITHIN 10%

A	R
✓	
✓	
✓	

MEGGER

AS FOUND / AS LEFT	AS FOUND / AS LEFT
A-B 800 M Ω / 250 M Ω	A-GR 800 M Ω / 300 M Ω
A-C 800 M Ω / 250 M Ω	B-GR 800 M Ω / 350 M Ω
B-C 800 M Ω / 220 M Ω	C-GR 800 M Ω / 300 M Ω

A	R
✓	
✓	
✓	

COIL READINGS

AS FOUND / AS LEFT	EXPECTED
CLOSE 2.5 / 2.5	2-5
TRIP 59.2 / 59.2	50-60
X 90.1 / 90.1	100-130
Y 3080 / 3080	2500-3200
U.V. 1545 / 1545	1200-1700

A	R
✓	
✓	
✓	
✓	
✓	

MINI OPEN AND CLOSE. ACCEPT 93 VOLTS OR LESS.

RECORD ACTUAL CLOSE AND OPEN VALUES

NOTE: IF BREAKER AS FOUND DOES NOT

COMPLY SEE GE 2 50239B, 5.6 "LUBRICATION"

CLOSE 75.8 / 75.8

OPEN 24 / 24

A	R
✓	
✓	

BREAKER S/N AK23821CELL No. TCB7DATE 8-20-82W.O. # 12282NCR # SE-F-1101INSTANTANEOUS UNDERVOLTAGE TRIPPING DEVICE

SEE GEI-50299B pg. 34

INSPECT U.V. DEVICE SPLICES AT THE COIL

NOTE: PULL EACH COIL LEAD ON EITHER SIDE OF THE SPLICE TO
VERIFY A PROPER SPLICEU.V. DEVICE PICK-UP
DROP-OUTAS FOUND / AS LEFT124 V / 1049 V / 42.5

A	R
✓	
A	R
✓	
✓	

NOTE:

ACCEPT 90-116V ON PICK-UP (LOWER IS BETTER, 100V IDEAL)

ACCEPT 20-75V ON DROP-OUT (HIGHER IS BETTER, 38V IDEAL)

REMARKS _____

SERIES OVERLOADS

TYPE EC-2 GEI 50299B pg. 20, 21, 22

NOTE: M.T. IS THE MINIMUM TRIP SET POINT AND IS DETER-
MINED AS THAT POINT AT WHICH THE MOVABLE NUT
(INDEX POINTER) fig 11 pg 21 of GEI 50299B, STARTS
TO MOVE WHEN THE DESIRED M.T. CURRENT IS APPLIED.AS FOUND / AS LEFTM.T. AØ 612 / 612BØ 620 / 620CØ 536 / 583ACCEPT. M.T. OF 600A
± 30 A

A	R
✓	
✓	
✓	

CAUTION: ALLOW 10 MINUTES BETWEEN TIMED TESTS
ON THE SAME PHASE.AS FOUND / AS LEFTTIME AØ 27.65 / 27.65BØ 24.62 / 24.62CØ 20.30 / 24.88ACCEPT A TIME
OF 20 TO 70 SEC.
AT 3000A. 50 SEC.
± 10 SEC IS IDEAL.

A	R
✓	
✓	
✓	

REMARKS _____

BREAKER SERIAL NO. AK23826 CELL NO. TCB7 of 12280
DATE 8-20-82 W.O.# 12286R
CONTACT ADJUSTMENT NCR# SE-F-1105

MAIN CONTACT WIPE SEE GEI-50299B pg 8,9

AS FOUND / AS LEFT

AD 1/8 1 1/8
BD 1/8 1 1/8
CD 1/8 1 1/8

ACCEPT $1/8" \pm 1/32"$ OR
 $3/32" \text{ TO } 5/32"$

A	R
☒	☐
☒	☐
☒	☐

REMARKS _____

SECONDARY DISCONNECTS

SEE GEI-50299B pg 7

INSPECT AND CLEAN AS REQUIRED

CONTACT TIP, HOLLOW TUBE, INSULATING BLOCK.

INSURE SNAPPY SPRING ACTION OF FINGER CONTACTS

SEE GEK-7302 pg 5 fig. 2 FOR DISCONNECT LOCATIONS.

DISCONNECT ASSY. F { A -
B -
C -
D -

REMARKS SECONDARY DISCONNECT BRACKETS

HAD TO BE BENT TO AN ANGLE OF 90° TO ALLOW THE

BREAKER TO BE RACKED INTO ITS CELL. THIS ACTION
CORRECTED THE PROBLEM STATED IN NCR# SE-F-1102.
NO FURTHER ACTION IS REQUIRED.

CONTACT SPRINGS

(STATIONARY MAIN) GEI-50299B pg. 12

ACCEPT 75 < 9 POUNDS

REMARKS GAUGE NOT AVAILABLE - N/A PHASE

A	R
☐	☐
☐	☐
☐	☐

TRIP LATCH ADJUSTMENT

SEE GEI 50299B pg 12, 13, 19 "LATCH ADJUSTMENT -

ELECTRICAL BREAKER".

PERFORM STEPS 1 TO 4.

R. KRUEGER

W2 HA 8/26/82
TRIP LATCH SET; LA-E
VERIFIED BY

SCE NONCONFORMANCE REPORT (NCR)

Project SONGS 2 & 3I. NUMBER
SE-F-1106REV
0Priority Code: 5.0Due Date: 8/24/82

2. UNIT <u>3</u>	3. ITEM DESCRIPTION <u>Reactor Trip Switchgear</u>	4. "Q" CLASS <u>II</u>	5. ASME CODE CLASS <u>N/A</u>	6. DATE <u>8/10/82</u>
7. LOT/HEAT/SERIAL NO. <u>TCB 6 GE #AK25482</u>	8. ITEM LOCATION <u>37' Radwaste</u>	9. CONTRACTOR/SUPPLIER <u>CE/GE</u>		
10. P.O./SPECIFICATION NO. <u>S023-944-352</u>	11. DRAWING NO. & REV. <u>S023-944-328 to 336</u>	12. SYSTEM <u>SBA</u>	13. ASME AUTH. INSPECTION REQUIRED ☐ YES ☒ NO	

14. DESCRIPTION OF NONCONFORMANCE

1. Adjusting screw and locking nut missing.
 2. Material other than the clamp was used to make a tight fit on the magnet.
 3. U.V. device does not operate.
- (These discrepancies are "as received condition of reactor trip switchgear" after vendor repairs)

Hold Tag Affixed: Yes (☒) No (☐)SU Cog. Engr: E. CoreReported by: G. GrunningH.D. Parrish 8/11/82

H.D. Parrish
QA ENGINEER
DATE

15. APPARENT CAUSE

Manufacturing error.

16. CORRECTIVE ACTION TO PREVENT RECURRENCE

Copy of this NCR forwarded to Vendor for information.

17. SIGNATURE	TITLE	DATE	18. SIGNATURE	TITLE	DATE
<i>Blay Patterson</i>	<u>TOS</u>	<u>8-13-82</u>	<i>Blay Patterson</i>	<u>TOS</u>	<u>8-13-82</u>

20. DISPOSITION/COMMENTS

1. Replace U.V. device.
2. Retest breaker per CE instruction manual S023-944-352-0.

FIELD DISPOSITION

☐ REJECT ☒ REWORK

EAB DISPOSITION

☐ REPAIR ☐ ACCEPT "AS IS"

21. DISPOSITION APPROVALS / SIGNATURE, TITLE, DATE

James C. Plunkard 8/13/82
Blay Patterson TOS 8-13-82
Patterson QA 8/13/82

22. CONCURRENCE

N/A

AUTHORIZED INSPECTOR

DATE

23. VERIFICATION DISPOSITION ACTIVITY COMPLETE

H.D. Parrish 8/25/82
QA ENGINEER DATE

N/A

AUTHORIZED INSPECTOR

DATE

24. IPDR NO.

N.O. 12281

25. QA FINAL REVIEW (N/C CLOSED)

C.R. Horton
QA SUPERVISOR
8/26/82
DATE

26. DISTRIBUTION

J.H. McCarty-BPC
L.K. Fossum-BPC
G.A. Chavez
D.E. Nunn
L.L. Seyler
A.P. King

H.L. Richter
E.D. Prabhu
D.B. Schone
L. Wiedemann
C.R. Horton-SU
G. O'Dell-BPC

27. FOR DOCUMENTATION CONTROL CENTER USE

QA Specialist/QA File
MIS
CDMC
Cindy Williams
R. Bockhorst

SCE

SAN ONOFRE 2&3 WORK ORDER

WO 12281

J. SEYMOUR / AIR TEST		5/14/82 900 57-896		UNIT 3	RADWASTE		37' N/A / N/A	
SYSTEM I.D. 350A		COMPONENT I.D. TC8 6		6.0 25452		PRIORITY: 5.0		
COMPONENT DESCRIP REACTOR TRIP SWITCHGEAR		PLANT COND: 6		QUALITY CLASS: H				
PWR. REDUCT N/A		DATE N/A		TIME N/A		MAINT TAG NO. N/A		
DESCRIPTION OF PROBLEM							☐ SECURITY H	
IMPLEMENT DISPOSITION OF NCR SE-F-1106							☐ ASME III H	
							☐ ASME XI	
							☐ HVAC/FIRE PROT.	
							☐ SEPARATION CRITERIA AFFECTED H	
							☐ ENVIRONMENTAL QUALIFICATIONS H	
PERSONNEL SAFETY EMERG ☐ POTENT ☐		CLEANLINESS REQUIREMENTS A ☐ C ☐		B ☐ D ☐				
PLANT DAMAGE N/A		PER CYCM N/A						
TECH. SPEC. SECTION N/A		IMPACT DATE N/A		TIME N/A				
PREREQUISITES		YES NO	INIT.	PLANNER: S. SEYMOUR		DATE 5/14/82		
EQUIPMENT OUTAGE		Y	SL5	QC WORK REQUIRED * YES X		DATE 5/10/82		
CLEANLINESS PERMIT NO.		N	SL5	JOB SEQ		TASK DESCRIPTION		
RAD EXP PERMIT NO.		N	SL5	1		OBTAIN WORK AUTHORIZATION ET 1 1.0		
WELD/BURN PERMIT NO.		N	SL5	2		INITIATE NRC ON ANY NON-COMFORMANCE FOUND ET 1 1.0		
CLEARANCE NO. APPROVAL		Y	SL5	3		IMPLEMENT DISPOSITION OF NCR SE-F-1106 CT 1 4.0		
RELATED DOCUMENTS NCR SE-F-1106		Y	SL5	4		DOCUMENT ALL ACTION TAKEN ET 1 1.0		
PROCEDURES/DWG. Nos. -				SPECIAL INSTRUCTIONS & HOLDPOINTS:		EST. DUR 7.0		TOTAL 7.0
NA				* BAC QC to witness NCR SE-F-1106 disposition and rework				
DEFERRED		REASON M E V O U R		DATE NA		RESP. NA		RELEASE DATE NA
RETEST YES ☐		REQ'D NO X		TOS/COG J.A. Phillips		DATE 8/25/82		RETEST YES ☐
RETEST PROCEDURE		N/A		QC-REQ'D N/A		DATE 8/25/82		RETEST COMPLETED
				COMPLETED BY N/A		DATE		
				APPROVED BY N/A		DATE		
				RETEST QC COMPLETE		DATE		
MAINT TYPE CM		ASSIGN ET		FUNCT NO NA		ASSIGNED TO NA		
IMPLEMENTATION APPROVAL		8-10-82		APPROVAL TO START WORK		8/16/82		PAGE 1
J. SEYMOUR		DATE		J.A. Phillips		DATE		OF 1

IMPROPER 2.1. Device

TEST EQUIPMENT / SPECIAL TOOLS

DESCRIPTION	IC NO	RANGE	ACCURACY	REL. CAL. DATE
MULTI/AMP TRIP TESTER EM 4099				1-22-83
Megger EN 2500				11-7-82
MILLIAMMETER SU 492				12-28-82
MULTIMETER / FLUKE EM 2611				11-21-82
ACTION TAKEN				

REPLACE 2.1. DEVICE ASSEMBLY
 TESTED 2.1. DEVICE FOR PROPER OPERATION
 TESTED BRAKES FOR PROPER CLOSING & OPENING

CRAFTS USED	NO	MH	MATERIALS USED	QTY
Elect.	25		NA	
TOTAL				
DURATION	15		R. KRUEGER	8/20/82

WORK COMPLETE / DATE Major Training 8/20/82	WORK QC APPROVAL J.A. Hamley 8/20/82 ☐ PARTIAL ☒ TOTAL
WORK ORDER REVIEW / DATE Sam L. Seymour 8/25/82	QA REVIEW / DATE H.R. Parnell 8/25/82
WORK ORDER APPROVAL / DATE J.A. Hamley 8-25-82	REMARKS NRC Reviewed Test data sheet and verified NCR work. J.A.H. 8-20-82
U. NUMBER 12281	

TCB-6

SAN ONDRE UNITS 2 AND 3
 COMBUSTION ENGINEERING INC. U.O.# 12281
 REACTOR TRIP CIRCUIT BREAKER SWITCHGEAR NCR # SE-F-1106
 GE TYPE AK-2-25
 REFERENCE: UNIT 2 5023-999-352 } AND PUBLICATIONS
 UNIT 3 5023-999-351 } CONTAINED WITHIN
 UNIT 3 DATE 8-20-82
 BREAKER SERIAL NO AK25482 CELL NO. TCB6

- NOTE: 1. CONSIDER ARC LEFT TO RIGHT FACING REAR OF BREAKER.
 2. IF ADJUSTMENTS OR PART REPLACEMENT DOES NOT BRING THE AS LEFT VALUES TO WITHIN THE ACCEPTANCE CRITERIA LISTED HEREIN A NON CONFORMANCE EXISTS AND WORK MUST STOP AND THE EQUIPMENT NOT PLACED INTO SERVICE UNTIL THE NON CONFORMANCE IS DISPOSITIONED.
 3. THESE TESTS NEED NOT BE PERFORMED IN THE ORDER

MICROMH LISTED EXCEPT U.V. & O.I.'s MUST BE DONE LAST.

AS FOUND / AS LEFT

A-Ø 124 / 90
 C-Ø 124 / 77
 C-Ø 107 / 115

ACCEPT LESS THAN 120µA
 AND EACH PHASE BALANCED
 WITHIN 10%

A	R
✓	
✓	
✓	

MEGGER

AS FOUND / AS LEFT

A-B 2000 MΩ / 1000 MΩ

A-C 2000 MΩ / 2000 MΩ

B-C 2000 MΩ / 1000 MΩ

AS FOUND / AS LEFT

A-G R 1000 MΩ / 1000 MΩ

B-G R 1000 MΩ / 1000 MΩ

C-G R 1000 MΩ / 1000 MΩ

A	R
✓	
✓	
✓	

COIL READINGS

AS FOUND / AS LEFT

CLOSE 2.5 / 2.5

TRIP 60.3 / 60.3

X 87.5 / 87.5

Y 3070 / 3070

U.V. 1660 / 1660

EXPECT

2-5

50-60

100-130

2500-3200

1200-1700

A	R
L	
L	
L	
L	
✓	

MINI OPEN AND CLOSE. ACCEPT 93 VOLTS OR LESS.

RECORD ACTUAL CLOSE AND OPEN VALUES

NOTE: IF BREAKER AS FOUND DOES NOT

COMPLY SEE GEI 50299B, 5, 6 "LUBRICATION"

CLOSE 87 V / 87 V

OPEN 32.6 V / 22.6 V

A	R
✓	
✓	

BREAKER S/N AK 25482CELL No. TCB6DATE 8-20-82W.D. # 12281NCR # SE-F-1106INSTANTANEOUS UNDERVOLTAGE TRIPPING DEVICE

SEE GEI-50299B pg. 34

INSPECT U.V. DEVICE SPLICES AT THE COIL

NOTE: PULL EACH COIL LEAD ON EITHER SIDE OF THE SPLICE TO
VERIFY A PROPER SPLICE

U.V. DEVICE PICK-UP

DROP-OUT

AS FOUND / AS LEFT132.6 / 106.83.4 / 43.5

A	R
✓	
A	R
✓	
✓	

NOTE:

ACCEPT 90-116V ON PICK-UP (LOWER IS BETTER, 100V IDEAL)

ACCEPT 30-75V ON DROP-OUT (HIGHER IS BETTER, 38V IDEAL)

REMARKS _____

SERIES OVERLOADS

TYPE EC-2 GEI 50299B pg. 20, 21, 22

NOTE: M.T. IS THE MINIMUM TRIP SET POINT AND IS DETERMINED AS THAT POINT AT WHICH THE MOVABLE NUT (INDEX POINTER) fig 11 pg. 21 of GEI 50299B, STARTS TO MOVE WHEN THE DESIRED M.T. CURRENT IS APPLIED.

AS FOUND / AS LEFTM.T. A0 607 / 607B0 606 / 606C0 665 / 595

ACCEPT. M.T. OF 600A

± 30 A

A	R
✓	
✓	
✓	

CAUTION: ALLOW 10 MINUTES BETWEEN TIMED TESTS
ON THE SAME PHASE.AS FOUND / AS LEFTTIME A0 23.35 / 23.35B0 18.05 / 23.11C0 19.52 / 27.68

ACCEPT A TIME

OF 20 TO 70 SEC.

AT 3000A. 50 SEC.

± 10 SEC IS IDEAL.

A	R
✓	
✓	
✓	

REMARKS _____

BREAKER SERIAL NO. AK 25482 CELL NO. ICB6 of 12281
DATE 8-20-82 W.D.# 12281
NCR# SE-F-1106

CONTACT ADJUSTMENT

MAIN CONTACT WIPE SEE GEI-50299B pg 8, 9

AS FOUND / AS LEFT

AD 1/8 / 1/8

BD 1/8 / 1/8

CD 1/8 / 1/8

ACCEPT $1/8" \pm 1/32"$ OR
 $3/32"$ TO $5/32"$

A	R
L	
L	
L	

REMARKS _____

SECONDARY DISCONNECTS

SEE GEI-50299B pg 7

INSPECT AND CLEAN AS REQUIRED

CONTACT TIP, HOLLOW TUBE, INSULATING BLOCK.

INSURE SNAPPY SPRING ACTION OF FINGER CONTACTS

SEE GEK-7302 pg 5 fig. 2 FOR DISCONNECT LOCATIONS.

REMARKS _____

DISCONNECT ASSY. F

A -
B -
C -
D -

A	R
L	
L	
L	
L	

CONTACT SPRINGS

(STATIONARY MAIN) GEI-50299B pg. 12

ACCEPT 75 - 9 POUNDS

REMARKS N/A - GAUGE NOT AVAILABLE PHASE

A
B
C

A	R

TRIP LATCH ADJUSTMENT

SEE GEI 50299B pg 12, 13, 19 "LATCH ADJUSTMENT -
ELECTRICAL BREAKER".

PERFORM STEPS 1 TO 4.

R. KRUEGER

JK

HA

18-20-82

TRIP LATCH SET; IFE
VERIFIED BY

SCE NONCONFORMANCE REPORT (NCR)

1. NUMBER
S023 P-511

Project San Onofre Nuclear Generating Station, Units 2 & 3

2. UNIT 2	3. ITEM DESCRIPTION Reactor Trip Breakers 4/7	4. "G" CLASS II	5. ASME CODE CLASS N	6. DATE 7/12/82
7. LOT/HEAT/SERIAL NO. 256A4002-656-26 & 27	8. ITEM LOCATION 2L033	9. CONTRACTOR/SUPPLIER CE & GE		
10. P.O./SPECIFICATION NO. 944-352	11. DRAWING NO. & REV. S023-944-352	12. SYSTEM 2SBA	13. ASME AUTH INSPECTION REQUIRED ☐ YES ☒ NO	

14. DESCRIPTION OF NONCONFORMANCE

When undervoltage device is set to pickup at 105 Vdc, neither breakers UV device would trip breaker upon loss of control voltage as per S023-II-11.161.

NCR SE-F-0998

HOLD TAG HUNG YES () NO (X)/REPORTED BY: M. Lankheim ext 876

15. QA ENGINEER DATE
B. Kaplan 7/12/82

REPORTABLE YES () NO ()/OPERABLE YES () NO () STA. REP:

EQUIPMENT CONTROL NOTIFIED - NAME:

DATE:

16. APPARENT CAUSE Apparently due to binding of trip shaft in breaker.	18. CORRECTIVE ACTION TO PREVENT RECURRENCE Perform breaker adjust and alignments
17. SIGNATURE <i>Stallan</i>	19. SIGNATURE <i>Stallan</i>
TITLE TOS	TITLE TOS
DATE 7-12-82	DATE 7-12-82

20. DISPOSITION/COMMENTS 1. Remove TCB's 4 and 7 from Unit 3 per TRR #0630. 2. Verify/perform S023-944-352 adjustments on above replaced breakers. 3. Perform S023-II-11.161 for TCB 4 and 7.	FIELD DISPOSITION ☐ REJECT ☒ REWORK ERS DISPOSITION ☐ REPAIR ☐ ACCEPT "AS IS" DER Recommendation No (), Yes ()/# Design Document Change No (), Yes ()/#
21. DISPOSITION APPROVALS - SIGNATURE, TITLE, DATE <i>Stallan</i> TOS 7-12-82 PER TELECON Approval from B. KATZ, STA TECH Mgr 7/12/82 <i>Don P. Schane</i> PQAS 7/12/82 Telecon Approval from M. MERLO 7/12/82 Telecon Approval from B. Katz 7/12/82 Telecon Approval from D. Schane 7/12/82	22. CONCURRENCE AUTHORIZED INSPECTOR DATE NA 7/17/82

23. VERIFICATION DISPOSITION ACTIVITY COMPLETE <i>J. Lewis</i> 7-17-82 QA ENGINEER DATE AUTHORIZED INSPECTOR DATE NA 7/17/82	24. IPDR NO. WO 10305
--	--------------------------

25. DISTRIBUTION See Page Two	27. FOR DOCUMENTATION CONTROL CENTER USE
----------------------------------	--

PP-44-22 (10079) 6/60

TEST EQUIPMENT/SPECIAL TOOLS

DESCRIPTION	ID. No.	RANGE	ACCURACY	RECALIBRATION DATE
MULTIMETER	SU 105	250VDC	11FC9	8/22/02

ACTION TAKEN

Received TCP's 6 T 9 from UNIT #3

PERFORMED 3023-144-352 ADJUSTMENTS

105 ROLVED TRIS 4+7 FROM UNIT # 2

INSTALLED TRA'S FROM UNIT #3 IN UNIT #2

PERFORMED SO 23- II - 11.161

S/N 256A 4002-656-7 PV = 28 A = 45 PV = 45 C = 45

1) 25E49002.62.12 A=32 B=4C A=100 D=-48

CRAFTS USED	N _G	MH	MATERIALS USED	QTY.
EZ. 2	1.5		NONE	
TOTAL	8.0			

DURATION

WORK COMPLETE DATE

~~Field~~ Core - 7/13/82

WORK ORDER REVIEW / DATE 7/13/92

ORDER APPROVAL DATE
 [Signature] 7/19/82

NO. NUMBER - 10305

WORK QC APPROVAL

☐ PARTIAL ☒ TOTAL

QCE Dr. Farlin NOC DATE 7-13-82

QA REVIEW DATE: 7/17/82

REMARKS



SAN ONOFRE NUCLEAR GENERATING STATION UNITS 2 & 3
TRANSFER AND REPLACEMENT REQUEST
JOB NO. 10079

TRR# 0630

DISCIPLINE
INITIATOR RM LANKHEIM STARTUP NSSS S/U DATE 7-12-82 ^{W.O.} SWP NO. 10305
PHONE NO. 57-876 CONSTR. STARTUP PRIORITY CODE 70

REMOVED ITEM DESCRIPTION REACTOR TRIP CIRCUIT BREAKER 6 AND 9
S/U SYSTEM: FROM 3SBA TO 2SBA
JURISDICTION: SU ☒ CONST ☐ STA ☐ VENDOR CE-GE TAG NO. TB 6/9
SERIAL NO. 256A4002-656-1 PURCHASE SPEC. NO. N/A
QUALITY CLASS II PROJECT CLASS N/A
FROM UNIT NO. 3 TO UNIT NO. 2 STARTUP AREA CODE 2P3
TO BE ORDERED BY: CONST ☐ OR STARTUP ☒ S/U NCR NO. SE-F-0948 SPR NO. N/A
(SEE PART 11)

REASON FOR TRANSFER TRIP SHIFT BINDING IN RX TRIP CKT BKR
NO SPARES AVAILABLE
SCHEDULE IMPACT PREP ON UNIT III PPS.
DISPOSITION/LOCATION OF REMOVED ITEM INSTALLED IN UNIT II 2L033

APPROVED BY: PSE N/A DATE _____
PSES M. D. Munk DATE 7/12/82
SUPERINTENDENT N/A DATE _____
BPC/SCE SU QA DOC REVIEW Don B. Schong DATE 7/12/82
WORK ACTIVITY COMPLETE Michael J. McChary DATE 7-13-82

REPLACEMENT INFORMATION

REPAIR ☒ REORDER ☐ DESCRIPTION: REACTOR TRIP CIRCUIT BREAKER 6 & 9
CIDR REVISED: YES ☐ NO ☐
DATE REQUIRED 8-4-82 EST. DELIVERY DATE N/A
NCR NO. 5023 ^{SE-F-0799} 5023 HOLD TAG NO. N/A FMR/P.O. NO. N/A
WARRANTY: YES ☐ NO ☒ SWP NO. FOR REPLACEMENT 4012281, 12286, 14191
REPLACEMENT, REPAIR OR INSTALLATION COMPLETE: JA Phillip DATE 9/30/82
TRR CLOSED: JA Phillip DATE 9/30/82
BPC/SCE SU QA DOC REVIEW Phillip DATE 11/12/82

SCE NONCONFORMANCE REPORT (NCR)

Project San Onofre Nuclear Generating Station, Units 2 & 3

1. NUMBER
S023 P-563

REV. 0

2. UNIT 2	3. ITEM DESCRIPTION Reactor Trip SWGR	4. "G" CLASS II	5. ASME CODE CLASS NA	6. DATE 7/22/82
7. LOT/HEAT/SERIAL NO. See Attached	8. ITEM LOCATION 37' Radwaste	9. CONTRACTOR/SUPPLIER CE		
10. P.O./SPECIFICATION NO. S023-944-352	11. DRAWING NO. & REV. S023-944-328 to 336	12. SYSTEM 2SBA	13. ASME AUTH. INSPECTION REQUIRED. ☐ YES ☒ NO	

14. DESCRIPTION OF NONCONFORMANCE

After reactor trip breakers TCB1 to TCB9 plus ^{SAME} ~~space~~, see attached for serial numbers and values, were adjusted by factory representative to properly trip. The requirements of maintenance procedure MPES 008, page 5, para. 6.3.6 cannot be attained in all cases.

HOLD TAG HUNG YES () NO (X) / REPORTED BY: R. L. Cantrell
 REPORTABLE YES () NO () / OPERABLE YES () NO () STA. REP: M. Eppley 7/22/82
 EQUIPMENT CONTROL NOTIFIED - NAME: Tony Walsh DATE: 7-23-82

15. APPARENT CAUSE

Under voltage trip devices were adjusted (optimized) to satisfy under voltage trip requirements as well as acceptable pick-up values.

16. CORRECTIVE ACTION TO PREVENT RECURRENCE

Rework MPES-008 Maintenance Procedure shall be revised to reflect pick-up values adequate to support proper breaker operation.

17. SIGNATURE <i>Don Schwa</i>	TITLE TOS Acting	DATE 7/23/82	18. SIGNATURE <i>Don Schwa</i>	TITLE TOS Acting	DATE 7/23/82
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19. DISPOSITION/COMMENTS

Use As Is. Breaker settings have been optimized to satisfy acceptable pick-up for applied Bus Voltages.

FIELD DISPOSITION

☐ REJECT ☐ REWORK

END DISPOSITION

☐ REPAIR ☒ ACCEPT "AS IS"

DER Recommendation

No (), Yes () / #

Design Document Change

No (), Yes () / #

20. DISPOSITION APPROVALS - SIGNATURE, TITLE, DATE

Bevan Katz STM 7-23-82
 Don Schwa Naint 7/23/82
 R. L. Cantrell SAE 7/23/82

21. CONCURRENCE

N/A RYC 7/23/82
 AUTHORIZED INSPECTOR

DATE

22. VERIFICATION & DISPOSITION ACTIVITY COMPLETE

R. L. Cantrell 7/23/82
 DATE

AUTHORIZED INSPECTOR

DATE

23. IPDR NO.

24. QUALITY REVIEW (IF CLOSED)

25. DISTRIBUTION

26. FOR DOCUMENTATION CONTROL CENTER USE

Don B. Schwa
 7/23/82
 DATE

See Page Two-- Six

Test purpose: Testing and calibration of the under voltage device on AK-1
 circuit breakers - Each breaker was tested 5 times after mechanical check-out and V.V. adjustment. Coil condition: WARM

Test No. 1 : Date 7/20/82

TCB-1 Circuit Breaker serial no. 256A4002-656-3

	Pick Up Voltage D.C.	Drop out Voltage D.C.	Tripping Device
Initial Setting (As Found)	115	17	O.K.
a,	119	39	O.K.
b,	112	39	O.K.
c,	116	39	O.K.
d,	116	39	O.K.
e,	116	39	O.K.

note: Mr. Vernon R. Gazner, Southern Cal Edison, assisted in recording the data.

Test No. 2 : Date 7/20/82

TCB-2 Circuit Breaker S/N: 256A4002-656-29

	Pick Up Voltage D.C.	Drop out Voltage D.C.	Tripping Device
Initial Setting (As Found)	140	41	O.K.
a	116	33	O.K.
b)	115	33	O.K.
c)	115	33	O.K.
d)	117	34	O.K.
e)	117	35	O.K.

note: Mr. Vernon R. Gazner, Southern California Edison, assisted in recording the data.

Test No. 3

TCB-4

NCR-P563
Circuit Breaker S/N 256A4002-656-24

Pick Up Voltage
D.C.

Dropout Voltage
D.C.

Tripping Dev.
Function

Initial Setting (As Found)

108

47

O.K.

a)

108

47

O.K.

b)

109

48

O.K.

c)

109

48

O.K.

d)

109

48

O.K.

e)

107

47

O.K.

Performed By Glen Coro

Test No. 4

TCB-3

Circuit Breaker S/N 256A4002-656-12

Pick Up Voltage
D.C.

Dropout Voltage
D.C.

Tripping Dev.
Function

(Initial Setting (As Found)

120

50

O.K.

a)

101

39

O.K.

b)

101

40

O.K.

c)

102

38

O.K.

d)

102

45

O.K.

e)

102

37

O.K.

Performed By Glen Coro

Test No. 5

TCB-5

Circuit Breaker S/N 256A4002-656-2

Pick up Voltage
D.C.

Dropout voltage
D.C.

Tripping Dev.
Function

Initial Settings (As Found)

102

28

O.K.

a)

106

42

O.K.

b)

104

42

O.K.

c)

102

38

O.K.

d)

100

36

O.K.

e)

102

39

O.K.

Test No. 6

TCB-6

NCR-P563
Circuit Breaker S/N 256A4002-656-8

Pick Up Voltage D.C. Dropout Voltage D.C. Tripping D Function

Initial Setting (As Found)	111	31	O.K.
a)	110	31	O.K.
b)	110	32	O.K.
c)	110	32	O.K.
d)	111	32	O.K.
e)	111	31	O.K.

Test No. 7

TCB-7

Circuit Breaker S/N 256A4002-656-45

Pick Up Voltage D.C. Dropout Voltage D.C. Tripping D Function

Initial Setting (As Found)	109	417	O.K.
a)	110	46	O.K.
b)	111	48	O.K.
c)	110	48	O.K.
d)	110	46	O.K.
e)	111	48	O.K.

Test No. 8

TCB-9

Circuit Breaker S/N 256A4002-656-7

Pick up Voltage D.C. Dropout voltage D.C. Tripping Dev Function

Initial Settings (As Found)	old / $\frac{98}{109}$	40 / 45	O.K. / O.K.
a)	110	45.6	O.K.
b)	109	45	O.K.
c)	110	45	O.K.
d)	109	45	O.K.
e)	110	45	O.K.

Test No. 9

Circuit Breaker S/N 256A4002-656-14

P. 58-5 June 7/2
NCR-P 563

TCB-8

Pick Up Voltage
D.C.

Dropout Voltage
D.C.

Tripping
Function

Initial Setting (As Found)

94.8

39.8

O.K.

a)

94.8

40

O.K.

b)

98.4

41.2

O.K.

c)

96

39

O.K.

d)

96

39.6

O.K.

e)

98.5

38.8

O.K.

Test No. 10

Circuit Breaker S/N 256A4002-656-18

SPARE

Pick Up Voltage
D.C.

Dropout Voltage
D.C.

Tripping
Function

Initial Setting (As Found)

98

—

Failed

a)

106

48

O.K.

b)

108

47

O.K.

c)

107

47

O.K.

d)

107

46

O.K.

e)

106

47

O.K.

The above tests
performed by



(213) 572-5179

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