07-260-91

OPERATIONS DEPARTMENT INSTRUCTION

N2-ODI-5.11
Rev. 00
(TCN-2)

4.16 AND 13.8 KV BREAKERS

Approved: [signature] 8/15/89

FOR INFORMATION ONLY

1.0 PURPOSE

To provide uniformity in installing and removing General Electric Magne-Blast Circuit Breakers for voltages of 4.16 and 13.8 KV.

2.0 DISCUSSION

This ODI will provide the instructions necessary for the safe installation and removal of GE 4.16 and 13.8 KV breakers.

3.0 INSTRUCTION

3.1 Safety Precautions

3.1.1 Shock hazards exist from the range of 13.8 KV down to 120 VAC.

3.1.2 Breaker control circuits are 125 VDC, relays on cubicle doors and internal terminal strips remain energized during most conditions.

3.1.3 Stored energy is present in all springs until discharged.

3.1.4 Remove all loose personal items, (flashlights, Mini-Rads, etc.), prior to stepping into a cubicle.

3.1.5 NEVER attempt to rack a breaker in or out with the breaker CLOSED!

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3.1.6 Whenever working inside a cubicle of an energized bus, the buddy system is to be used.

3.2 Safety Equipment

3.2.1 Hard hat

3.2.2 Rubber gloves with leather protectors

3.2.2.1 Test gloves prior to use.

3.2.2.2 Remove rings and watches.

3.2.3 Safety glasses and/or face shield when raising or lowering breakers.

3.3 Racking out a breaker (electrically)

3.3.1 Contact the Control Room and verify the control switch for the breaker in question is in Pull-to-Lock.

3.3.2 Verify the correct breaker is selected.

3.3.3 Verify the breaker is OPEN by:

3.3.3.1 Green light lit on front of cubicle.

3.3.3.2 Amp meter, if equipped, indicates zero.

3.3.4 Open the cubicle door and latch the door in the full open position.

NOTE: On some switchgear it may be necessary to open an adjacent cubicle slightly to allow a door to latch in the full open position.

3.3.5 Verify the mechanical breaker position indicator displays OPEN.

3.3.6 Control Fuses

3.3.6.1 Remove the Close fuses.

3.3.6.2 Remove the Trip fuses.

NOTE: Both sets of fuses are pulled to prevent arc-over on the stabs of the secondary coupler.

NOTE: If electrical motor is not available or cannot be used, refer to Section 3.7. | TCN-2

3.3.7 Elevator Motor

3.3.7.1 Install motor on mounting bracket and latch securely in place.

3.3.7.2 Turn motor drive by hand until the drive coupling will mate with the elevator drive coupling.

3.3.7.3 Verify the motor direction control switch is in the middle position and then plug the power cord into the proper receptacle.

3.3.7.4 Place the motor direction control switch in "LOWER".

3.3.7.5 Stand to the side of the open cubicle and pull the elevator clutch handle forward, hold the handle forward until the breaker is completely lowered and the motor stops.

3.3.7.6 Place the motor direction control switch in the middle position, unplug and remove the motor from the cubicle.

3.3.8 Stored energy

3.3.8.1 The stored energy in the springs will discharge when the breaker is fully lowered.

3.3.8.2 When the springs discharge it will produce a loud bang and the spring charge indicator on the breaker will display DISCHARGED.

3.4 Placing a Breaker in the TEST Position

3.4.1 Contact the Control Room and verify the control switch for the breaker in question is in Pull-to-Lock.

3.4.2 Verify the correct breaker is selected.

3.4.3 Open the cubicle door and latch the door in the full open position.

NOTE: On some switchgear it may be necessary to open an adjacent cubicle slightly to allow a door to latch in the full open position.

3.4.4 Verify the breaker is open and in the fully lowered position.

3.4.4.1 Use the mechanical position indicator to verify the breaker is OPEN.

3.4.5 Withdraw the breaker approximately 2 1/4" (until the spring discharge cam drops into the notch and releases the breaker interlock).

3.4.5.1 The wheels of the breaker should be blocked to prevent breaker movement during testing.

3.4.6 Attach the stationary auxiliary switch test position link, (dogbone/church key), if required.

3.4.6.1 Adjust the link to make up for the space between the plunger on the breaker and the switch, proper clearance should be no more than a 1/8" gap.

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CAUTION

Do not over/under adjust the clearance or damage could result.

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3.4.7 Install test coupler (umbilical cord).

3.4.8 Install trip fuses.

3.4.9 Install close fuses.

NOTE: The charging spring motor will operate when the close fuses are installed.

3.5 Removal of a Breaker From its Cubicle

3.5.1 Verify the correct breaker is selected.

3.5.2 Open the cubicle door and latch the door in the full open position.

NOTE: On some switch gear it may be necessary to open an adjacent cubicle slightly to allow a door to latch in the full open position.

3.5.3 Verify the breaker is open and in the fully lowered position and its springs are discharged.

3.5.3.1 Use the mechanical position and charge indicators on the breaker.

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CAUTION

When removing breakers do so slowly while observing that no wires or relays are damaged.

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3.5.4 Carefully pull the breaker from the cubicle.

3.5.5 Verify the shutters have closed covering the high voltage bushings.

3.5.6 Close and latch any doors previously opened.

NOTE: To meet seismic qualification requirements, ensure cubicle doors are fully dogged down, if so equipped.

3.6 Installing a Breaker Into a Cubicle

3.6.1 Verify correct breaker and cubicle are selected.

3.6.2 Verify the breaker is open and springs are discharged.

3.6.2.1 Use the mechanical position and charge indicators on the breaker.

3.6.3 Open the cubicle door and latch the door in the full open position.

NOTE: On some switchgear it may be necessary to open an adjacent cubicle slightly to allow a door to latch in the full open position.

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CAUTION

When installing breakers do so slowly while observing that no wires or relays are damaged.

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3.6.4 Carefully push breaker into cubicle until the breaker stops.

3.6.4.1 When the breaker is properly positioned in the cubicle, the elevator clutch handle will be free to operate.

NOTE: If electrical motor is not available or cannot be used, refer to Section 3.7. | TCN-2

3.6.5 Elevator motor

3.6.5.1 Install motor on mounting bracket and latch securely in place.

3.6.5.2 Turn motor drive by hand until the drive coupling will mate with the elevator drive coupling.

3.6.5.3 Verify the motor direction control switch is in the middle position and then plug the power cord into the proper receptacle.

3.6.5.4 Place the motor direction control switch in "RAISE".

3.6.5.5 Stand to the side of the open cubicle and pull the elevator clutch handle forward, hold the handle forward until the breaker is completely raised and the motor stops.

NOTE: As breaker rises verify high voltage bushing shutters open.

3.6.5.6 Place the motor direction control switch in the middle position, unplug and remove the motor from the cubicle.

3.6.6 Secondary Coupler (Auxiliary stabs)

3.6.6.1 Verify that secondary coupler (electrical connection for breaker control) is completely connected.

3.6.6.2 If coupler is not completely made up, tap coupler with hand to seat connection.

3.6.7 Positive interlock roller and switch

3.6.7.1 Verify that the interlock roller is centered in the upper "VEE" of the elevator clutch mechanism, (upper right side of cubicle).

3.6.7.2 Verify positive interlock switch is depressed by the interlock roller cam (upper left front of breaker).

3.6.8 Control Fuses

3.6.8.1 Pull the elevator clutch handle forward and hold.

3.6.8.2 Install the trip fuses.

3.6.8.3 Install the close fuses.

3.6.8.4 Stand to side of cubicle and release the elevator clutch handle, the spring charging motor will operate and charge the close springs.

3.6.8.5 Verify the spring charge indicator displays CHARGED.

3.6.9 Close cubicle door(s)

3.6.9.1 Carefully close cubicle doors, (slamming may cause relays to actuate).

NOTE: To meet seismic qualification requirements, ensure cubicle doors are fully dogged down, if so equipped. *

3.6.9.2 Check/reset relay targets.

3.6.9.3 Inform CSO that task is complete.

3.7 Manual Operation of Elevator

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CAUTION

When it is required to use the manual crank to raise/lower breakers, extra care should be exercised while working directly in front of the breaker while it is in motion.

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NOTE: Obtain appropriate manual crank for the applicable switchgear.

3.7.1 Install manual crank on motor mounting bracket and latch securely in place.

3.7.2 Turn the manual crank until the drive coupling will mate with the elevate drive coupling.

3.7.3 Pull the clutch handle forward to engage the drive. TCN-2

NOTE: For raising breakers perform Steps 3.7.4 and 3.7.4.1. For lowering breakers perform Step 3.7.5.

3.7.4 To raise breaker turn handle clockwise until breaker is completely raised.

3.7.4.1 As breaker rises verify high voltage bushing shutter opens.

3.7.5 To lower breaker turn handle counter-clockwise until breaker is completely lowered.

3.7.6 Unlatch clutch handle and manual crank catch and remove manual crank.

3.7.7 Continue at Step 3.3.8 or 3.6.6 as appropriate.