
NAVY PUBLIC WORKS CENTER
NORFOLK, VIRGINIA
UTILITIES DEPARTMENT

STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS

TITLE

INSTALL/REPLACE SAFETY SWITCH

PROCEDURE NUMBER

WC 624 HVE 080

SIGNED:_____
(DATE)

APPROVED:_____
(DATE)

SAFETY PROFESSIONAL:_____
(DATE)

MANAGEMENT OFFICIAL:_____
(DATE)

REVISION A

DISTRIBUTION

CODE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE	REV/DATE
601.C3							
620							
622							
610.E1							
622.3							

REVISIONS

REV	DESCRIPTION	SIGNATURE	DATE
A	Initial Issue.		

INSTALL/REPLACE SAFETY SWITCH

Purpose:
Procedure to install or replace a safety switch rated 600 volts or less.

Potential Energy Sources:
1. Secondary service conductors, 600 volts or less in work area.
2. Exposed, energized, 34.5/11.5/4.16 kv conductors within work area.
3. Generators or alternate sources of power for circuit the safety switch is connected to.

Tools and PPE:
Tools: Hand tools, electric drills, rotor hammers, voltage tester, phase rotation meter, and cable cutters. PPE: Nomex coveralls, Nomex hood, insulating rubber gloves, insulating rubber sleeves, hard hat, safety shoes, work gloves, safety glasses. The class of rubber gloves and sleeves will depend on the exposure voltage as per the following: Class 0 - up to 1,000 volts, Class 1 - up to 7,500 volts, Class 2 - up to 17,000 volts, Class 3 - up to 26,500 volts, Class 4 - up to 36,000 volts.

References:
1. PWC Occupational Safety and Health Program Manual, PWCNORVAINST 5100.33E
2. Occupational Safety and Health Standards for General Industry (29 CFR PART 1910): Subpart I, Personnel Protective Equipment; Subpart R, Electrical Power Generation / Transmission / Distribution; Subpart S, Electrical
3. NFPA 70 E approach distances to exposed, energized, electrical conductors and circuit parts.
4. SOP WC 622 HVE 013, Deenergization, Lockout, Tagout
5. SOP WC 624 HVE 031, Voltage & Phase Rotation Checks - Circuits 480 Volts Or Less.

Procedures:
1. If the job is to replace a safety switch, and the switch is a three phase device, then check, and note, the phase rotation at the switch. Refer to SOP WC 624 HVE 031, Voltage & Phase Rotation Checks - Circuits 480 Volts Or Less.

2. Deenergize the circuit feeding the switch per SOP WC 622 HVE 013, Hazardous Energy Control(Lockout/Tagout). Test the circuit's voltage to verify it is deenergized. If the circuit's voltage is less than 300 volts, wear Nomex coveralls, safety shoes, and hard hat, and avoid contact with energized components while testing the voltage. If the facility's voltage is greater than 300 volts, wear Nomex coveralls, Nomex hood, safety glasses, safety shoes, hard hat, and insulating rubber gloves.

3. Mark, using phasing tape, all line and load side phase conductors, neutral conductors, and ground conductors connected to the switch. Disconnect, and remove if possible, the conductors after they have been marked.

4. Remove the bushings and locknuts on all conduits connected to the switch.

5. Hold the switch in place and remove all fasteners securing switch to mounting position. Remove the switch, taking care that the insulation of the conductors, not pulled back through the conduits, is cut or damaged. If the insulation is damaged, repair it.

Note - Steps 3-5 pertain to a switch change out job.

6. Prepare the new safety switch.
   a) Check that the switch's voltage rating is correct for the service required.
   b) Remove the necessary pre-fabricated knock-outs from the new safety switch, or, use an electric drill and knock-out set to create the necessary holes.
   c) If the switch is to be installed outdoors, and if the safety switch will have conduit entering from above, then a water tight hub will be required. Some switch are already equipped with a water tight hub. If not then a meyers hub will have to mounted on the switch. All unused hubs will be blanked off with a pipe plug or the hub will be removed and the hole covered with a blanking cap.
   d) Safety switches not equipped with a ground lug will require a hole drilled and a ground lug secured to the switch.

7. Mount the safety switch and secure it.
   a) New installations will require marking and drilling the necessary mounting holes for the applicable fasteners.
   b) Switch replacements will use the same holes and fasteners.

8. Connect conduits to the switch.
   a) New installations will require the conduits connected to the switch using locknuts. Bushings will be installed to protect the conductors.
   b) When replacing a switch, for all conductors not pulled back through the conduits, carefully feed the conductors through the knockout holes, locknuts, and bushings and then secure the conduits using the locknuts. Install the bushings to protect the conductors.

9. Make all phase, neutral, and ground cable connections. Pay attention to all cable markings, made per Step 3, when replacing a switch. Leave the switch in the open position at this point.

10. Energize the circuit feeding the switch per SOP WC 622 HVE 013, Hazardous Energy Control(Lockout/Tagout). Test the switch's line side voltage to verify it is correct. If the circuit's voltage is less than 300 volts, wear Nomex coveralls, safety shoes, and hard hat, and avoid contact with energized components while testing the voltage. If the facility's voltage is greater than 300 volts, wear Nomex coveralls, Nomex hood, safety glasses, safety shoes, hard hat, and insulating rubber gloves.

11. If the job is to replace a safety switch, and the switch is a three phase device, then check phase rotation of the switch. Refer to SOP WC 624 HVE 031, Voltage & Phase Rotation Checks - Circuits 480 Volts Or Less.

12. If the switch's voltage and phase rotation are correct then close the switch. Before leaving the work site, ensure the equipment fed from the switch is working properly.

END