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**NAVY PUBLIC WORKS CENTER  
NORFOLK, VIRGINIA  
UTILITIES DEPARTMENT**

**STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS**

**TITLE**  
**REPAIR PRIMARY AIR SWITCH OPERATING**  
**MECHANISM**

**PROCEDURE NUMBER**  
**WC 624 HVE 063**

**SIGNED:** \_\_\_\_\_  
**(DATE)**

**APPROVED:** \_\_\_\_\_  
**(DATE)**

**SAFETY PROFESSIONAL:** \_\_\_\_\_  
**(DATE)**

**MANAGEMENT OFFICIAL:** \_\_\_\_\_  
**(DATE)**

**REVISION**

**A**





## REPAIR PRIMARY AIR SWITCH OPERATING MECHANISM

**Purpose:**

Procedure to replace a three phase, 34.4/11.5/4.16 kv, fused air switch.

**Potential Energy Sources:**

1. 34.5/11.5/4.16 kv cables and equipment.
2. Generators if installed at facilities to provide temporary power during the transformer change out.

**Tools and PPE:**

Tools: Hand tools, high voltage tester, Multimeter. PPE: Nomex coveralls, Nomex hood, insulating rubber gloves, insulating rubber sleeves, hard hat, safety shoes, work gloves, safety glasses, and back brace if required by back injury prevention and control program. 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, Hazardous Energy Control(Lockout, Tagout)
5. SOP WC 622 HVE 007, Switchout And Switchback Energized Circuit

**Procedures:**

1. WC 622 personnel will deenergize the primary circuit per SOPs
  - a) WC 622 HVE 007, Switchout and Switchback Energized Circuit
  - b) WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)

WC 622 personnel will ensure that the facility's emergency generator or temporary power generator, if present, is isolated and will not back feed to the transformer.

2. Using a high voltage tester test the primary circuit's cables to verify they are deenergized. Before the conductors are checked, test the high voltage tester on a known energized circuit to verify the tester is working. Test each deenergized conductor separately, taking care not to cross phase during test. If voltage is detected, stop the test and (a) notify WC 622 personnel that the circuit is still energized, (b) wait for WC 622 personnel to correct the problem, (c) perform the deenergization verification test once again after WC 622 personnel finish switching operations and declare the cables deenergized. If no voltage is indicated, retest the high voltage tester to re-verify it is working properly. Wear Nomex coveralls, Nomex hood, safety glasses, safety shoes, insulating rubber gloves and sleeves, and hard hat while testing.

REPAIR PRIMARY AIR SWITCH OPERATING MECHANISM

3. The PPE to perform the repair work will be Work gloves, safety glasses, safety shoes, and a hard hat.
4. Remove the switch access covers and panels.
5. Clean all mechanical devices, interlocks. Lubricate as required.
6. Inspect for broken, damaged, loose, or out of alignment parts. If any broken or damaged parts are found, note the switch manufacture, the switch type, the switch serial number, and the part number or catalog number, if available. Use the recorded information to order replacement parts. The Utilities machine shop can be contacted to fabricate a new part if possible. All out of alignment parts will be adjusted.
7. After damaged parts are replaced, out of alignment parts are adjusted, and/or loose parts tightened, operate the switch to verify the operating mechanism works properly. Ensure the contacts are aligned and make good contact.
8. WC 622 personnel will energize the primary circuit and transformer per SOPs
  - a) WC 622 HVE 007, Switchout and Switchback Energized Circuit
  - b) WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)
9. After power has been restored check the facility's voltage. If the facility's power voltage is less than 300 volts, wear Nomex coveralls, safety shoes, and hard hat, and avoid contact with energized components while measuring 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.

END