

DISCLAIMER: These Standard Operating Procedures (SOP's) are for the exclusive use of Navy Public Works Center (PWC) Norfolk. They are promulgated as guidance for their NAVFAC Commands. If intended to be used by other activities, they must be tailored to each activity's particular requirements and must be reviewed/approved by the activity's safety professionals prior to use.

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

**STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS**

**TITLE**

**SWITCHBACK REPAIRED HIGH VOLTAGE CIRCUIT**

**PROCEDURE NUMBER  
WC 622 HVE 010**

**DISTR:  
601A  
610  
620  
WC 622  
WC 624**

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

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

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

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

**DATE: \_\_\_\_\_ REVISION DATE: \_\_\_\_\_  
SWITCHBACK REPAIRED HIGH VOLTAGE CIRCUIT**

**Purpose:**

Procedure for reenergizing a high voltage circuit after a fault on the circuit has been repaired.

**Potential Energy Sources:**

1. 34.5 kv equipment and cables.
2. 11.5 kv equipment and cables.
3. 4.16 kv equipment and cables.

**Tools and PPE:**

Tools: Shotgun stick. PPE: Nomex coveralls, Nomex hood, insulating rubber gloves, insulating rubber sleeves, hard hat, safety shoes, 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. ANSI C2-1987, National Electrical Safety Code
5. Electrical Transmission and Distribution Safety Manual, NAVFAC P-1060
6. US Corps of Engineers Safety and Health Requirements Manual
7. PWC, Code 600, Lockout and Tagout Procedure
8. PWC SOP# 600 HVE 6, PWC Switching or Breaker Operation

**Procedures:**

1. Prior to initiating switchback operations, operations personnel will obtain, in writing, the electrical tests performed after the completion all repair work. Refer to the pertinent repair work SOPs for the required tests.
2. Receive from maintenance personnel all Lockout Tag stubs/keys and Ground Tag stubs.

SWITCHBACK REPAIRED HIGH VOLTAGE CIRCUIT

3. Reconnect all lightning arresters disconnected during fault locating and replace all PT fuses pulled.
4. Remove all safety grounds placed during fault locating and/or repair work, refer to PWC, Code 600, Lockout and Tagout Procedure. Use shotgun stick to remove the grounds. Remove the ground end attached to the circuit first.
5. Replace all equipment covers removed opened during fault locating and/or repair work.
6. Reclose all transformer primary switches opened during fault locating and/or repair work. Wear listed PPE.

7. Operations control personnel will direct the repaired circuit to be reenergized. Refer to SOP# 600 HVE 6, PWC Switching or Breaker Operation for procedure to close the switches or breakers. Inform operations control personnel of the time the circuit is reenergized. Wear listed PPE.

8. All facilities on the reenergized circuit will be checked by the duty electrician to insure each building has had proper three or single phase power restored. The duty electrician will perform secondary voltage tests, or confirm secondary voltage tests were done, at each facility.

9. All circuit meters in affected substations will be observed for stable, balanced load and proper voltage indications.

10. As per operations control personnel, the distribution will be restored to the normal, pre-outage, switching arrangement. Refer to SOP# 600 HVE 6, PWC Switching or Breaker Operation for procedure to open/close the switches or breakers.