
NAVY PUBLIC WORKS CENTER

NORFOLK, VIRGINIA

UTILITIES DEPARTMENT

STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS

TITLE

REGAS SF6 HIGH VOLTAGE CIRCUIT BREAKER

PROCEDURE NUMBER

WC 622 HVE 005

DISTR:
601A
610
620
WC 622
WC 624

SIGNED:_____
(DATE)

APPROVED:_____
(DATE)

SAFETY PROFESSIONAL:_____
(DATE)

MANAGEMENT OFFICIAL:_____
(DATE)

DATE:_____ **REVISION DATE:**_____

Purpose:
Add SF6 gas to a SF6 gas insulated circuit breaker.

Potential Energy Sources:
1. 34.5 kv outdoor bus, isolation switches, and underground cables.
2. Circuit breaker pneumatic operating mechanism.
3. Circuit breaker 120/240 AC power.
4. Circuit breaker 125 DC power.

Tools and PPE:
Tools: SF6 gas cylinder, fill/charge hose assembly with fittings, and hand tools.
PPE: Work gloves, safety shoes, safety glasses.

References:
1. PWC Occupational Safety and Health Program Manual, PWCNORVAINST 5100.33E
2. SOP# 600 HVE 6, PWC Switching Or Breaker Operation
3. 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
4. NFPA 70 E, Approach Distances To Exposed Energized Electrical Conductors and Circuit Parts
5. ANSI C2-1987, National Electrical Safety Code
6. PWC, Code 600, Lockout and Tagout Procedure
7. Siemens Instruction Book PB 3468-05

Procedures:
1. Perform switching operations to shift breaker load to alternate circuits. Refer to SOP# HVE 6, PWC Switching Or Breaker Operation, for procedure and PPE required.

2. Open, lock, and tag circuit breaker isolation switches as per Lockout and Tagout Procedure. Refer to SOP# HVE 6, PWC Switching Or Breaker Operation, for procedure and PPE required.

3. Open SF6 circuit breaker. Refer to SOP# HVE 6, PWC Switching Or Breaker Operation, for procedure and PPE required. Test line and load circuit breaker bushings are deenergized. Test high voltage tester on an energized circuit to verify tester is operating correctly. Test each bushing

separately. If tester indicates no voltage present, retest the tester to verify it is properly operating. (s) performing this task will continue to wear HVE 6 PPE till testing is complete and all bushings test deenergized.

4. Once Steps 1-3 are complete, personnel will wear listed PPE to charge breaker.

5. Open all control blades in breaker control cabinet. Test, with a voltmeter, that the load side of these switches is dead. Avoid contact with electrically energized parts and be careful not to touch moving parts of compressor while switching. Wear listed PPE.

6. Position SF6 gas cylinder, remove fill line cap, and connect hose assembly. Purge air from hoses. Wear listed PPE.

7. Add SF6 gas to circuit breaker to manufacturer specifications. Crack open cylinder valve slowly and observe pressure gauge rate of rise. The final pressure attained will depend on the ambient temperature. For normal fill pressure use the following formula:

$P = .2T + 66$ P - pressure gauge reading
T - temperature in fahrenheit

Final pressure can be +/- 1 of pressure calculated above. Do not over pressurize the breaker.

8. Once desired pressure is attained, close cylinder valve, disconnect hoses, and put fill line cap back on.

9. Remove all tools, and replace all covers.

10. Close all control blades in breaker control cabinet. Avoid contact with electrically energized parts and be careful not to touch moving parts of compressor while switching.

11. Operate breaker, close then open, while breaker is still deenergized. Observe pressure gauge for 5 minutes to insure pressure stability.

12. Close circuit breaker isolation switches as per Lockout and Tagout Procedure. Refer to SOP# HVE 6, PWC Switching Or Breaker Operation, for procedure and PPE required.

13. Close SF6 circuit breaker. Refer to SOP# HVE 6, PWC Switching Or Breaker Operation, for procedure and PPE required.

14. Perform switching operations to shift load from alternate circuits to circuit breaker. Refer to SOP# HVE 6, PWC Switching Or Breaker Operation, for procedure and PPE required.