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

STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS

TITLE

**TROUBLESHOOT/REPLACE FUSE(S) TO
OPERATION TRANSFORMER - TYPE: OPEN AIR**

PROCEDURE NUMBER

WC 622 HVE 026

SIGNED: _____ (DATE)

APPROVED: _____ (DATE)

SAFETY PROFESSIONAL: _____ (DATE)

MANAGEMENT OFFICIAL: _____ (DATE)

REVISION

A

TROUBLESHOOT/REPLACE FUSE(S) TO
OPERATION TRANSFORMER - TYPE: OPEN AIR

Purpose:

Procedure to check and/or replace a fuse(s) to an operating transformer installed on an outdoor, open air, 34.5 kv bus.

Potential Energy Sources:

1. 34.5 kv outdoor, open air bus
2. 120/240 volt switchboard AC power

Tools and PPE:

Tools: Assorted hand tools, calibrated multimeter, high voltage tester, and shotgun stick. PPE: Nomex coveralls, Nomex hood, insulating rubber gloves, insulating rubber sleeves, hard hat, safety shoes, safety glasses, and back brace if required to 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. ANSI C2-1987, National Electrical Safety Code
5. PWC SOP# 600 HVE 6, PWC Switching or Breaker Operation
6. SOP WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)

Procedures:

1. Assess the conditions at the operating transformer. Wear Nomex coveralls, safety shoes, and hard hat.
2. Using a calibrated multimeter, measure the AC voltage at the station's distribution power panel located in the station's control house. Avoid contact with energized parts while performing the voltage check.
3. Open, lock and tag the station distribution panel's main breaker per SOP WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout).

Wear listed PPE for Steps 4-7 and 9-11.

4. Using a calibrated multimeter, measure the AC voltage at the station operating transformer's secondary bushings.
5. Test line side of operating transformer fuse(s) with a high voltage tester. Before the conductors are checked, test the

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high voltage tester on a known energized circuit to verify the tester is working. Test each circuit conductors separately, taking care not to cross phase during test. After the voltage check, retest the high voltage tester to re-verify it is working properly.

6. Using a shotgun stick, open the operating transformer's fused cut outs.

7. Using a shotgun stick, remove the fuses from the open cut outs.

8. Test the fuses with a calibrated multimeter. Wearing Nomex coveralls, safety shoes, and hard hat while checking fuses.

9. If a fuse tests defective, obtain a replacement with the same voltage and amperage rating. Using a shotgun stick, reinstall replacements, or existing fuses which tested good, back into the cut out.

10. Close the fused cut outs.

11. Using a calibrated multimeter, re-measure the AC voltage at the stations operating transformer's secondary bushings.

12. Remove the lock and tag on the station distribution panel's main breaker and close the breaker per SOP WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout). Avoid contact with energized parts while closing breaker.

13. Using a calibrated multimeter, measure the AC voltage at the station's distribution power panel. Avoid contact with energized parts while performing the voltage check.

END