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

STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS

TITLE
INSTALL A NITROGEN BLANKET

PROCEDURE NUMBER
WC 624 HVE 083

SIGNED: _____
(DATE)

APPROVED: _____
(DATE)

SAFETY PROFESSIONAL: _____
(DATE)

MANAGEMENT OFFICIAL: _____
(DATE)

REVISION

A

INSTALL A NITROGEN BLANKET

Purpose:

Procedure to place a Nitrogen gas blanket over a transformer's or switch's insulating oil.

Potential Energy Sources:

1. 34.5/11.5/4.16 kv cables connected to an oil switch.
2. 34.5/11.5/4.16 kv cables connected to a transformer.
3. Generators if connected to facilities to supply temporary power.

Tools and PPE:

Tools: High voltage tester, hoses and connectors, vacuum pump, Nitrogen bottle regulating valve.
PPE: Nomex coveralls, Nomex hood, insulating rubber gloves, insulating rubber sleeves, hard hat, safety shoes(oil resistant), 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;
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

Procedures:

1. Operations 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)

Operations personnel will ensure that the facility's emergency generator or temporary power generator, if present, is isolated and will not back feed to the equipment being serviced.

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 operations personnel that the circuit is still energized, (b) wait for operations personnel to correct the problem, (c) perform the deenergization verification test once again after operations 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.

If the primary circuit's cables can not be accessed, then go to another transformer site on the same circuit, which has accessible conductors, and perform the deenergization verification test there.

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3. Tighten all flange and terminator bolts.
4. Apply vacuum to tank.
 - a) Using hoses, connect vacuum pump to transformer's or switch's schrader valve.
 - b) Start vacuum pump and run till there is a 5 psig vacuum in the device's oil tank.
 - c) Check for leaks. If the job is to just place a Nitrogen blanket, then let the transformer or switch stand for 5 minutes. If placing the Nitrogen blanket is part of a larger job then follow the appropriate SOP's waiting period requirement.
 - d) Correct all leaks detected by replacing gaskets or resealing with gasket cement(Permatex).
5. Install Nitrogen blanket.
 - a) Using hoses, connect Nitrogen bottle to transformer's or switch's schrader valve.
 - b) Place Nitrogen in tank till pressure is 3 psig.
6. Operations personnel will energize the primary circuits per SOPs
 - a) WC 622 HVE 007, Switchout and Switchback Energized Circuit
 - b) WC 622 HVE 013, Hazardous Energy Control(Lockout, Tagout)

END