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

STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS

TITLE
REMOVE/REPLACE
OVERHEAD ELECTRICAL CONDUCTORS

PROCEDURE NUMBER
WC 624 HVE 024

DISTR:
601A
610
620
WC 624

SIGNED: _____
(DATE)

APPROVED: _____
(DATE)

SAFETY PROFESSIONAL: _____
(DATE)

MANAGEMENT OFFICIAL: _____
(DATE)

DATE: _____ **REVISION DATE:** _____

REMOVE/REPLACE ELECTRICAL OVERHEAD CONDUCTORS

Purpose:

Procedure to remove, or to remove and replace, overhead electrical conductors.

Potential Energy Sources:

1. Energized circuits in close proximity of work.
2. Deenergized circuits which are not included in the work and have not been grounded.

Tools and PPE:

Tools: Bucket truck, hand line, hot hoist, wire grips, rubber hoses, rubber blankets. PPE: Nomex coveralls, Nomex hood, insulating rubber gloves, insulating rubber sleeves, hard hat, safety shoes, work gloves, safety glasses, orange vest, safety harness, 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. SOP WC 624 HVE 001, Set Up and Secure Bucket/Auger Truck
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. Electrical Transmission and Distribution Safety Manual, P-1060
7. The Lineman's and Cableman's Handbook, 5th ED
8. SOP WC 622 HVE 013, Deenergization, Lockout, Tagout

Procedures:

1. Qualified operations personnel will deenergize the circuit to be worked, and all other circuits which can be deenergized, as per the following SOPs:
 - WC 622 HVE 007, Switchout and Switchback Energized Circuit
 - WC 622 HVE 013, Deenergization, Lockout, Tagout

REMOVE/REPLACE ELECTRICAL OVERHEAD CONDUCTORS

2. Set up bucket truck. Refer to SOP WC 624 HVE 001, Set Up and Secure Bucket/Auger truck for details. Note - The job may require several bucket truck set ups. Refer to SOP WC 624 HVE 001 each time.
3. When operating a bucket truck the following safety rules will be followed.
 - a) Only an authorized person, one with a current government license to operate an aerial lift, will operate the bucket.
 - b) Do not use the bucket truck if winds exceed the truck manufacture's specified limit.

c) When working on or around energized conductors or equipment in wet weather insure personnel performing work are properly trained and use the proper PPE.

d) Personnel in bucket will wear a safety harness with a lanyard attached to the boom or bucket.

e) Do not exceed the bucket's weight limitations.

f) Stand firmly on the floor of the bucket with both feet. Do not sit on the bucket's edge or use planks, ladders, or other such devices.

4. Insulate energized conductors within 3 feet of the work area. Insulate deenergized overhead circuits within 3 feet of the work area which are not included in the work and have not been grounded as per Lockout and Tagout procedures. Personnel in the bucket shall wear Nomex coveralls, Nomex hood, safety glasses, safety shoes, insulating rubber gloves and sleeves, and hard hat.

5. The following rules will apply to job.

a) Bucket personnel working poles which have energized circuits or circuits which have not been properly grounded, insulated per Step 3, will wear Nomex coveralls, safety glasses, safety shoes, hard hat, safety harness, insulating rubber gloves insulating rubber sleeves, and a back brace if required to wear.

b) Bucket personnel working poles which have all other high voltage circuits deenergized and properly grounded, or no other circuits on the poles, will wear hard hats, work gloves, safety shoes, safety harness, safety glasses when required, and a back brace if required to wear.

c) Personnel in the bucket will carry a hand line aloft with them.

d) Ground personnel will wear hard hats, safety shoes, work gloves, and safety glasses.

e) Ground personnel will wear orange vests if working adjacent to a road or in a parking lot.

REMOVE/REPLACE ELECTRICAL OVERHEAD CONDUCTORS

f) Ground personnel not involved with the work will watch the personnel working aloft.

g) Ground personnel will stay clear of area underneath the bucket unless the work dictates.

h) If ground personnel are present, then at least one of them will have been trained to operate the bucket in an emergency situation where the bucket personnel are no longer able to operate the bucket controls.

6. Using a high voltage tester test the circuit to be worked on to verify it is deenergized. Before the circuit conductors are checked, test the high voltage tester on a known energized circuit to verify the tester is working. Test each deenergized circuit conductors 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 circuit deenergized. If no voltage is indicated, retest the high voltage tester to re-verify it is working properly. Wear listed Nomex coveralls, Nomex hood, safety glasses, safety shoes, insulating rubber gloves and sleeves, and hard hat.

7. Remove the tie wires from the conductors on the poles between the dead ends. When each tie wire is removed, lift the conductor off the insulator and lower it to the cross arm. This will eliminate the conductors inadvertently falling to the ground before they can be safely lowered.

8. Remove and lower the conductors from one of the dead end poles - Secure one end of a hot hoist, or slack blocks, to cross arm, or bell type insulators, with a nylon strap. Attach the other end of the hot hoist to the conductor with a wire grip. Secure a hand line to the crossarm and, using a wire grip, attach the hook to the conductor. Take up the hoist or blocks to release the tension on the conductor till the ground personnel can handle the conductor with the hand line. After the ground personnel have control of the conductor, remove the hoist, or blocks, and wire grip from the conductor so the ground personnel can lower the wire to the ground. Repeat this step till all conductors are lowered to the ground.

9. Remove and lower the wires from pole at opposite dead end. Repeat step 8 if necessary. It may be possible to remove and lower the conductors using only a hand line and wire grip. Step 8 should relieve

REMOVE/REPLACE ELECTRICAL OVERHEAD CONDUCTORS

much of the tension on the wires. The conductor weight will be the major determining factor in deciding to use a hot hoist or slack blocks.

10. Lower the conductors off all poles between the dead end poles. The wires will be lowered by the ground personnel using hand lines. The bucket personnel will secure the hand line to the crossarm and, using a wire grip, attach the hook to the conductor so the ground people can drop the wire. Conductors may have to be cut if other conductors on tap off poles, span guys, cable TV cables, or telephone line interfere with lowering the conductors.

11. Roll up or cut the conductors on the ground. Ground personnel should add safety glasses to their PPE when cutting the wire. Old wire should be loaded onto a truck and taken to a proper disposal area.

Note - If the job is to just remove overhead conductors skip steps 12 and 13 and the final step will be to secure the bucket truck. Refer to SOP WC 624 HVE 001, Set Up and Secure Bucket/Auger Truck, for details.

12. Change out any material as required and insure all proper clearances will be met. This involves changing crossarms, pole top pins, insulators, arm pins, crossarm braces, and any other hardware. It also covers obtaining proper clearances between phases, between phases and a ground or neutral, distances between crossarms, distances for hanging transformers or any other hardware required. Refer to attached LANTDIVENGCOM Pole Line Plates for further information. Refer to the applicable SOPs when performing these tasks.

13. Install new conductors. Refer to SOP WC 624 HVE 023, Install Overhead Electrical Conductors.