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

STANDARD OPERATING PROCEDURE / JOB HAZARD ANALYSIS

TITLE
INSTALL/REPLACE
SURGE ARRESTER ON A UTILITY POLE

PROCEDURE NUMBER
WC 624 HVE 014

DISTR:
601A
610
620
WC 624

SIGNED: _____
(DATE)

APPROVED: _____
(DATE)

SAFETY PROFESSIONAL: _____
(DATE)

MANAGEMENT OFFICIAL: _____
(DATE)

DATE: _____

REVISION DATE: _____

INSTALL/REPLACE SURGE ARRESTER ON A UTILITY POLE

Purpose:

Procedure to install a new surge arrester or replace a damaged arrester.

Potential Energy Sources:

1. Energized conductors within close proximity.
2. Deenergized conductors which have not been properly grounded.

Tools and PPE:

Tools: Bucket truck, rubber line hoses, insulating blankets, insulator hoods, meggar (voltage depends on arrester voltage), ground tester, shotgun stick, hand line. PPE: Insulating rubber gloves, insulating rubber sleeves, Nomex coveralls, Nomex hood, hard hat, safety glasses, safety shoes, safety harness, orange vest, 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. NETA MTS-1993, Maintenance Testing Specifications
7. Electrical Transmission and Distribution Safety Manual, P-1060
8. The Lineman's and Cableman's Handbook, 5th ED

Procedures:

1. Set up bucket truck. Refer to SOP WC 624 HVE 001, Set Up and Secure Bucket/Auger truck for details.
2. 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) Do not perform energized work in wet weather, unless an emergency.

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 - 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.

3. Insulate all energized overhead circuits which are within 3 feet of work area. Insulate any deenergized overhead circuits that have not been properly grounded per Lockout and Tagout procedures. Note, the circuit the arrester is on, or being placed, may fall in either of these categories. Personnel in the bucket shall wear Nomex coveralls, Nomex hood, safety glasses, safety shoes, insulating rubber gloves and sleeves, and hard hat.

4. In order to install/replace a surge arrester personnel in the bucket will wear Nomex coveralls, safety glasses, safety shoes, insulating rubber gloves and sleeves, and hard hat. Ground personnel will wear hard hats, safety shoes, gloves, and orange vests if work is adjacent to a road or in a parking lot. Personnel in the bucket will carry a hand line aloft with them.

5. Remove old arrester if replacing a blown surge arrester; install new arrester bracket if placing a new arrester. When replacing a damaged arrester remove the primary and ground wires if still attached.

6. The new arrester will be selected from the following table:

Arrester Selection	
34.5 kv System	Rating - 27 kv
(MCOV - 22 kv)	Type - MOV Class - Intermediate
11.5 kv System	Rating - 12 kv (MCOV - 10.2) Type - MOV Class - Distribution when used for transformer protection. Intermediate for all others
4.16 kv System	Rating - 3 kv (MCOV - 2.54) Type - MOV Class - Distribution when used for transformer protection. Intermediate for all others

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7. Inspect new arrester's porcelain carefully. There should be no chips or cracks. Perform an insulation resistance test as per attached table from NETA Maintenance and Testing Specifications. Use 25 kv values for 27 kv rated arrester.

8. Install new surge arrester. Connect ground wire first, then, using a shot gun stick, connect the primary lead. Bucket personnel will put on Nomex hood prior to making primary connections. Ground personnel will wear safety glasses in addition to PPE listed in Step 4.

9. Remove insulating material from overhead conductors wearing PPE as per Step 3. Remove material in reverse order of placement.

10. Test surge arrester ground. Ground should test 2 OHMs or less. If greater then may have to drive new rod or add an additional rod. Refer to appropriate SOP for proper method to install ground rod.

11. Secure bucket truck. Refer to SOP WC 624 HVE 001, Set Up and Secure Bucket/Auger Truck, for details.