

Appalachian Power Company Policy No.: 9
Working Primary Underground and URD Facilities

1) Statement of Policy

Electrical facilities that include buried cables present unique safety challenges to those working on them, therefore special precautions must be taken when performing maintenance and operations work on them.

Specifically, crewmembers working or assisting on a crew where an underground enclosure containing energized primary or secondary cables is open shall wear insulating rubber footwear until that enclosure is closed and secured. Other company employees and members of the general public at the job site shall be kept a minimum of 20ft. from exposed enclosures.

Only qualified Line Mechanics may move or switch URD cables. Cables may only be manipulated with a live line tool. Employees using a live line tool to manipulate a cable or elbow shall maintain minimum approach distance between their hands and the elbow. If minimum approach distance cannot be maintained, the employee operating the tool must wear both insulating gloves and sleeves rated for the primary voltage nominally on the underground cable.

All primary underground cables that have been energized or could become energized from any source shall be considered as energized until the cables are de-energized, tested, and grounded.

Before any test leads are connected to a URD cable, the cable must first be de-energized, tested and grounded.

2) Discussion

With the increase of both new and old underground primary cables a safe and reliable method of de-energizing underground cable is critical. All underground cables and equipment that are energized or could become energized from any source shall be considered energized until the cables or equipment are de-energized, tested, and grounded. There are several steps that must be followed to accomplish this goal.

- a) Identify the proper circuit to be worked on and appropriate switching points to be used when isolating a cable section. This can be accomplished by using maps, one-line diagrams, and cable identification records. Verify that cable identification tags correspond with maps, one-lines, or cable records. Any discrepancies shall be further investigated and resolved before proceeding with any further work on that equipment.

- b) Before starting work on isolated URD cables, all switching procedures must be followed including the installation of proper HOLD tags placed at both ends of the cable with the name of the individual responsible for the switching on the tag. If an URD cable is left in an abnormal state due to a fault or other circumstance, the cable shall be tagged at both ends for the DDC; when repairs are made, the repair crew shall work with the DDC to transfer control of the cable and tag it for the person in charge of the repair work. The responsible individual is the only person who can direct any work on the cables including grounding, removal of the tags and, after securing permission from the DDC, re-energization of the cable.
- c) Only cables terminated with elbows designed and approved for load break use or a 'load break' fuse shall be used to disconnect energized cables. Only insulated live line tools approved for pulling elbows shall be used to install and/or remove elbow connectors, whether energized or not. Before installing temporary appliances, such as feed-thru bushings, grounding elbows or insulating caps, check those devices to be sure they are clean and in good operating condition.
- d) For dead-front applications, before closing and leaving an enclosure, insulating caps shall be installed on any open bushing which is or may become energized.
- e) A de-energized test shall be made using an approved voltage-sensing device. (i.e. – Salisbury tester with URD sensing features) As a final check before grounding, a de-energized test must be made using a device that makes direct contact with the interior of the feed-through bushing where the cable to be grounded is parked. Once cables are confirmed de-energized, grounds shall be installed.
- f) Before cutting any underground cable that has been energized, it shall be spiked using an approved cable spiker, or it shall be guillotined using a tool approved for this purpose.
- g) Before attaching any test cables to a URD cable, the URD cable must first be de-energized, tested and grounded. If possible, the test cables should be attached while the remote end of the cable to be tested is grounded, the grounds can then be removed from the remote end and then re-applied once testing is completed and before the test cables are removed.
- h) Before removing a section of metallic shield or concentric neutral wire from cables, a minimum #2 copper shunt shall be placed across the shield or concentric neutral to be removed.

- 3) Definitions
- 4) Attachments
- 5) OSHA / Safety Manual References

Safety Manual:

G 4.01 - Tools/equipment shall be inspected prior to use and used only if they are appropriate for the task and in good working order. Defective tools/equipment shall be removed from service, until properly repaired.

G4.10 - Only approved equipment shall be used in phasing out circuits and transformers and in testing for potential.

G5.14 - Before entering a confined/enclosed space, for any reason, it shall be assessed for hazards, a work plan devised, necessary clearance obtained, and the atmosphere tested, in compliance with the *AEP Confined/Enclosed Space Policy*.

E2.43 - Rubber gloves rated for the appropriate primary voltage shall be worn when opening any primary underground enclosure such as a pad mount transformer. Rubber sleeves shall be added if the enclosure is known to be of the “live front” type.

OSHA Regulations:

1926.956(c)(5) When multiple cables exist in an excavation, the cable to be worked on shall be identified by electrical means unless its identity is obvious by reason of distinctive appearance.

1926.956(c)(6) Before cutting into a cable or opening a splice, the cable shall be identified and verified to be the proper cable.

1926.956(c)(7) When working on buried cable or on cable in manholes, metallic sheath continuity shall be maintained by bonding across the opening or by equivalent means.

Date Adopted: March 7, 2006

