

## Appalachian Power Company Policy / Procedure No. 27: Station Circuit Breaker Operation

### 1) Statement of policy:

Care must be taken when either opening or closing station type circuit breakers to provide the switch person with adequate separation from that equipment in the event a catastrophic failure of the circuit breaker were to occur. If a failure were to occur while switching on this equipment, burns due to the high temperature of associated electrical arcs, burning or hot insulating oil sprayed from the circuit breaker or shrapnel expelled at a high rate of speed could result in severe injury to the switch person. An AEP task force evaluating recent failures of distribution circuit breakers, concluded that “distance is our friend”.

### 2) Discussion:

In recent years the American Electric Power System has experienced a number of violent failures of distribution circuit breakers. As a result of these failures and the desire to maximize the safety of personnel operating this equipment, an AEP task force was assembled to look at this issue. Based on the recommendations of this task force, the following methods of operating distribution circuit breakers are to be followed within Appalachian Power Company. These procedures are recorded here in the preferred order in which they are to be used.

- Where possible, distribution circuit breakers are to be operated remotely from the station control house. Within Appalachian Power Company, the controls to most distribution circuit breakers are mounted on the circuit breakers and this is not a viable option in many locations.
- The Distribution Dispatch Center will operate the distribution circuit breaker by supervisory control when this mode of operation is available.
- New installations of the Schweitzer electronic relays (SEL) are programmed with a 10 second delay on both opening and closing of distribution circuit breakers. This delay provides time for the switch person to move away from the equipment after executing the open or close command. Reprogramming of existing SEL controls is underway across the Appalachian Power service area and is scheduled for completion by the end of 2008. SEL controls programmed with a time delay are labeled as having this feature.
- The distribution circuit breaker shall be operated with an insulated hot stick using either the push button or pistol grip attachment. These attachments are stored in a PVC canister attached to the fence near the entry gate to each station.

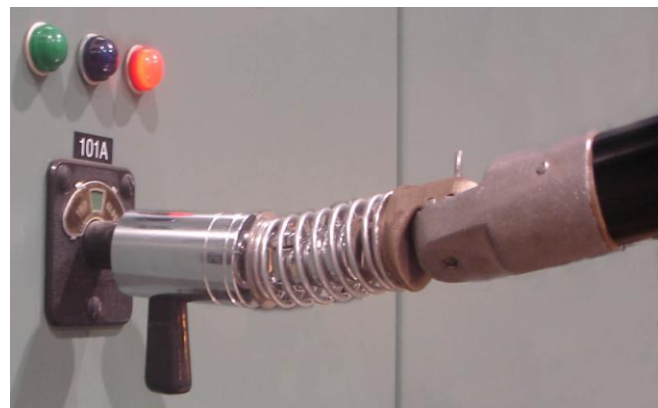
- Arc flash suits have been provided at those stations where metal clad switchgear is in service. This PPE equipment shall be used to protect the operator when opening, closing or racking out these type distribution circuit breakers.
- A few locations have been identified in the Company, where SCADA or a SEL relay package do not exist, and there is not physical room to operate the station recloser with a switch stick. The Roanoke DDC will maintain a listing of these locations. In the event of an outage of one of these station reclosers, the DDC **shall** dispatch both a line and a qualified station employee on the outage. The station employee, after making a thorough inspection of the equipment for damage and determining the equipment is safe to operate, will perform switching of the station recloser while wearing the appropriate PPE. Station personnel are more knowledgeable of this equipment and can more readily determine if the recloser is safe to switch. **When it is determined that the recloser is not safe to switch, the dispatcher, switch person and TDC will work together to determine what must be done to make this operation safe and proceed on that course.** There may be some locations where a small number of customers are served from a station with this type of station recloser where it would be reasonable to interrupt the transmission feed to the station, close the breaker while de-energized and then restore the station. This may be the preferred option in locations where station personnel are not readily available or when no other options are available to perform the switching safely. This decision will be at the discretion of the dispatcher, in consultation with the TDC and the line servicer.

3) Definitions: none

4) Attachments:



Storage canister for hot stick attachments attached to station fence in all stations.



Flexible hot stick attachment for use on pistol grip type 101 control switches



Push button hot stick attachment to be used on push button type control switches that do not have time delay trip and closing.



Push button hot stick attachment placed at an angle to give more leverage. Can be used on smaller type 101 control switches.



Arc flash suit to be used when operating or racking metal clad type switchgear.

## 5) OSHA / Safety Manual References

Safety Manual: Safety Policy of the Company: “No aspect of operations is more important than the health and safety of people.” “Our customers’ needs are met in harmony with environmental protection.”

G4.01: 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

AEP Switching and Tagging Procedures: Switch-Person Responsibilities 5.C.2.f Check for defective or abnormal equipment that could prevent the switching from being performed safely or properly.

6) Date Adopted: 11/5/08