

Appalachian Power Company Policy / Procedure No. 23:
Procedures for Gloving Lines operated above 15 Kv

1) Statement of policy:

Special care shall be used when working on conductors or equipment energized between 15Kv and 34.5 Kv phase-to-phase or 8.7 Kv and 19.9Kv phase to ground. This work may be done using Class 3 and/or Class 4 gloves and sleeves as defined in this procedure.

2) Discussion:

Relevant sections of this procedure shall be discussed as a part of the Job Briefing for any job involving gloving lines operating above 15 Kv. The following procedures shall be employed when working by the insulating glove method on conductors or equipment operating at this voltage level:

1. Close control of gloves, sleeves and cover up materials shall be maintained at all times insuring that employees only use the applicable class gloves, sleeves and cover up material.
2. The class of gloves and sleeves shall be determined and communicated to all employees as a part of the job briefing. Class 4 cover up material shall be used for all work on conductors and equipment operating above 15 Kv phase to phase or phase to ground.
 - a. Class 4 gloves and sleeves will be required when working on multi-phase installations operating above 25 Kv when clearances between phases are inadequate to allow cover up without exposure to phase-to-phase voltages.
 - b. A minimum of Class 3 gloves and sleeves will be required for multi phase installations operating above 25 Kv where cover up can be accomplished without exposure to phase-to-phase voltages.
 - c. A minimum of Class 3 gloves and sleeves will be required for single-phase installations operating over 15Kv.
 - d. Only Class 4 gloves and sleeves may be worn for energized work on 34.5 Kv delta systems such as sub-transmission lines.
3. Worker(s) performing energized work shall remove all hand and wrist jewelry (rings, watches, and bracelets) to prevent corona cutting and physical damage to gloves.
4. Work on conductors and equipment energized at these levels shall be performed only from an approved aerial lift device.
5. When the work is to be done in a congested area or is of a complicated nature, protective devices shall be placed in non-reclose (controls placed "manual" or "off" positions).

Cover-up and minimum clearances:

Except for the conductor or equipment being worked on, all other conductors and equipment shall be covered or the worker shall maintain proper clearance. The minimum approach distance as listed in Safety Manual Rule E2.03 for nominal system voltage of 34.5 Kv is 2 feet 4 inches phase to ground and 2 feet 7 inches phase-to-phase.

Cover-up and work procedures:

- a. All guys, static wires, neutrals and ground wires should be removed from the work area if possible. Where removal is not practical, insulating line guards, pole guards, and other approved insulating material (rated at 40 Kv or above) shall be used to cover any of these wires that are within the extended reach of the workers.
- b. When working on 3 phase wye delta transformer banks, the grounding switch shall be closed.
- c. Remove capacitors from service before working on conductors or associated equipment at capacitor banks
- d. Temporary conductor supports shall have an insulator between the support and wire holder. Temporary jumper holding supports and link sticks excluded.
- e. In many cases, it may be advisable to move a conductor in the clear or use temporary mechanical jumpers to get adequate working clearance. It is very important to insulate and isolate. There may be times when the work cannot be isolated. Therefore it is imperative to do a comprehensive cover-up job.

3) Definitions:

4) Attachments:

5) OSHA / Safety Manual References:

Safety Manual E 1.03:

When an employee is required to go, reach, or take any conductive object within the minimum approach distances from any energized conductor or equipment, the employee shall be properly protected. Reference Electrical Table 1.03

Electrical Table 1.03

Nominal System kV (Phase-to-Phase)	Minimum Approach Distance	
	Phase-to-Ground Feet-Inches	Phase-to-Phase Feet-Inches
0.05 – 1.0	Avoid Contact	Avoid Contact
1.1 - 15	2 - 1	2 - 2
15.1 - 36	2 - 4	2 - 7
36.1 - 46	2 - 7	2 - 10
46.1 – 72.5	3 - 0	3 - 6
72.6 - 121	3 - 2	4 - 3
138 - 145	3 - 7	4 - 11
161 - 169	4 - 0	5 - 8
230 - 242	5 - 3	7 - 6
345 - 362	8 - 6	12 - 6
500 - 550	11 - 3	18 - 1
765 - 800	14 - 11	26 - 0

Safety Manual E 2.02:

The class of rubber gloves and sleeves to be used (unless specifically stated otherwise in this manual) shall be determined by the voltage level at which the circuit is energized as shown below. A higher class of insulated protective equipment may be used if they are available.

Electrical Table 2.02

Glove/Sleeve Class	Glove/Sleeve MAX Use Volts
00	500
0	1000
2	17,000
3	26,500
4	36,000

NOTES:

1. If system design is delta, only phase-to-phase voltage will be used in conjunction with Electrical Table 2.02 to determine the appropriate class of gloves and sleeves required.
2. If no multi-phase exposure exists or is removed on a grounded Wye circuit through the use of work procedures and proper cover-up, then the phase-to-ground voltage of the circuit can be used in conjunction with Electrical Table 2.02 to determine the class of rubber gloves and sleeves required.

6) Date Adopted: June 1, 2007.