

**Safety Bulletin 23D GUIDELINES FOR WORKING WITH PORTABLE POWER DISTRIBUTION SYSTEMS AND OTHER ELECTRICAL EQUIPMENT. ADDENDUM D – COMMON MOTION-PICTURE/TELEVISION TASKS AND ASSOCIATED PERSONAL PROTECTIVE EQUIPMENT**

The information in this safety bulletin does not qualify a person to perform work involving potential electrical hazards.

<b>Table 1. Voltage-Rated PPE Requirements by Task</b>	
Work performed by a qualified person on energized AC Systems supplied by utility or generator.	
<b>Task</b>	<b>Voltage-Rated Gloves w/ Leather Protectors</b>
Plugging/unplugging flexible cord with dry hands, dry cord, and connectors	No
Metering receptacles and connectors (conductors enclosed) using a properly rated meter (0-250 V)	
Metering test jacks using a properly rated meter (0-480 V)	
Metering single-conductor connectors using a properly rated meter (480/277 V)	Yes
Working on exposed, energized electrical conductors and circuit parts, including voltage testing and performing a tie-in	
For circuits 150 V or less, tasks for which it may not be possible to avoid contact by hands or tools	
For circuits 151-750 V, tasks for which body parts or conductive objects being held could come within one foot of energized parts	
Inserting or removing a dimmer module from a rack where there may be a risk of accidental contact with energized parts	
No = voltage-rated PPE not required, Yes = voltage-rated PPE required.	

<b>Table 2. Arc Rated PPE Requirements by Task</b>	
Work performed by a qualified person on energized AC Systems supplied by utility or generator.	
<b>Task</b>	<b>Arc Flash Protection</b>
Normal operation of a circuit breaker, switch, contactor or starter (Must be properly maintained and installed. See note 3.)	No
Metering receptacles, test jacks, or connectors using a properly rated meter (conductors enclosed)	
Inserting or removing a dimmer module from a rack (0 – 240V)	
Working on exposed, energized electrical conductors and circuit parts, including voltage testing	Yes (See Table 3 and note 2a)
Performing a tie-in of a portable distribution system to utility-fed service or exposing energized conductors by opening or removing covers	
Connecting/disconnecting single-conductor cable while energized (0-250 V) (listed, insulated type connectors)	
Connecting/disconnecting single-conductor cable while energized (480/277 V) (listed, insulated type connectors)	Prohibited

No = arc flash PPE not required, Yes = arc flash PPE required. Prohibited = prohibited practice.

Where arc flash protection is required, follow the PPE requirements marked on the equipment’s electrical hazard warning label. If the information is not provided on an equipment label, PPE may be determined using Table 3. Equipment must fall within the parameters shown in note 2 below. Verify this with the employer.

<b>Table 3. Arc Flash Categories and Required Personal Protective Equipment</b>		
Requirements for working on exposed, energized conductors or circuit parts, including circuit testing.		
	<b>Category 1</b> Arc-rated 4 cal/cm <sup>2</sup>	<b>Category 2</b> Arc-rated 8 cal/cm <sup>2</sup>
<b>Arc-Rated PPE</b>	<b>Systems up to 240 V</b>	<b>480/277 V Systems</b>
Arc-rated long sleeve shirt with arc-rated long pants, or arc-rated coveralls	●	●
Arc-rated face shield or arc-rated flash suit hood	●	●
Arc-rated balaclava or arc-rated flash suit hood		●
Arc-rated gloves or heavy-duty leather gloves (or VR gloves with leather protectors when shock protection is required)	●	●
<b>Other Required PPE</b>		
Non-conductive, hard hat (Class G or E)	●	●
Eye protection (safety glasses or safety goggles under the face shield or hood)	●	●
Hearing protection (ear canal inserts)	●	●
Heavy-duty leather footwear or dielectric footwear or both	As needed	●
● = required equipment. <b>This table should only be used by an authorized person who is qualified to identify the short-circuit current available and the fault clearing time needed to choose the proper PPE. These values must be within the parameters shown in note 2 below.</b>		

Table 1 is based on NFPA 70E® 2018 Section 130.4 and Table 130.4(D)(a). Table 2 is based on Table 130.5(C). Table 3 is based on 130.7(C)(15)(a).

**Notes:**

1. The requirements of Tables 1 and 2 apply to circuits that are energized or could become energized. They do not apply when tasks are performed in an *electrically safe work condition* (such as when a portable power distribution system is not connected to a power source or when the employer's lockout/tagout procedure is followed).
2. The arc flash protection given in Table 3 is valid only for equipment within the following parameters:
  - a. Systems up to 240 V: maximum of 25kA short-circuit current available, maximum of 0.03 sec (2 cycles) fault clearing time, working distance 18 in.
  - b. 480/277 V systems: maximum of 65kA short-circuit current available, maximum of 0.03 sec (2 cycles) fault clearing time, working distance 18 in.

If the specifications of the equipment exceed the short-circuit current or fault clearing time, or the working distance is closer than 18 in. do not use this table to determine arc flash PPE. In such cases, PPE must be determined by an incident energy analysis.

3. The operation of switches and circuit breakers is not considered an arc flash hazard if all of the following conditions are met:
  - a. The equipment is properly installed.
  - b. The equipment is properly maintained.
  - c. The equipment is used in accordance with the manufacturer's instructions and instructions on the labeling.
  - d. The equipment doors are closed and secured.
  - e. All equipment covers are in place and secured.
  - f. There is no evidence of impending failure.

Best practice is to stand to the side (not in front of) when operating switching devices such as circuit breakers and safety switches.

Consult with the employer to verify the condition of maintenance. If the equipment does not meet one or more of these requirements, an arc flash risk assessment should be performed to determine if additional protective measures are required. If the maintenance condition of the equipment is unknown, check with the employer regarding use of additional arc flash PPE.

4. Employees performing metering must be trained and qualified to select and use the meter safely.
5. Connections and disconnections should **not** be made with wet hands. Connections shall be handled only with insulating protective equipment if the condition of the connection could provide a conductive path to the employee's hand (e.g. if the cord connector is wet from being immersed in water).
6. Energized work is only permitted if the employer can show justification for performing such work in an energized state; meaning performing the work de-energized is infeasible or would create a *greater* hazard. The person performing the work must be qualified with regard to the equipment, the method, and the energized condition of the circuit. An energized electrical work permit may be required for energized work other than inspection and diagnostic metering.