



**COMPLIANCE  
TRAINING ONLINE**

**Cal/OSHA, DOT HAZMAT, EEOC,  
EPA, HAZWOPER, HIPAA, IATA,  
IMDG, TDG, MSHA, OSHA, and  
Canada OHS Regulations and  
Safety Online Training**

**Since 2008**

This document is provided as a training aid  
and may not reflect current laws and regulations.

Be sure and consult with the appropriate governing agencies  
or publication providers listed in the "Resources" section of our website.

[www.ComplianceTrainingOnline.com](http://www.ComplianceTrainingOnline.com)



[Facebook](#)



[LinkedIn](#)



[Twitter](#)



[Website](#)

Subchapter 5. Electrical Safety Orders  
Group 1. Low-Voltage Electrical Safety Orders  
Article 3. Work Procedures

[Return to index](#)  
[New query](#)

## §2320.11. Protection From Flames and Electric Arcs.

Scope: This section covers the construction, operation, and maintenance of electric power generation, control, transformation, transmission, and distribution lines and equipment. This includes related equipment for the purpose of communication or metering that are accessible only to qualified employees.

### (a) Hazard Assessment.

- (1) The employer shall assess the workplace in accordance with GISO, Section 3203 to identify employees exposed to hazards from flames or from electric arcs.
- (2) For each employee exposed to hazards from electric arcs, the employer shall make a reasonable estimate of the incident heat energy to which the employee would be exposed. Note 1

NOTE 1 to subsection (a)(2): Appendix D of the HVESO provides guidance on estimating available heat energy. The Division of Occupational Safety and Health will deem employers following the guidance in Appendix D to this article to be in compliance with subsection (a)(2) of this section. An employer may choose a method of calculating incident heat energy not included in Appendix D to this article if the chosen method reasonably predicts the incident energy to which the employee would be exposed.

NOTE 2 to subsection (a)(2): This subsection does not require the employer to estimate the incident heat energy exposure for every job task performed by each employee. The employer may make broad estimates that cover multiple system areas provided the employer uses reasonable assumptions about the energy-exposure distribution throughout the system and provided the estimates represent the maximum employee exposure for those areas. For example, the employer could estimate the heat energy just outside a substation feeding a radial distribution system and use that estimate for all jobs performed on that radial system.

(b) Selection and Prohibited Clothing. The employer shall select the apparel based on the hazard assessment in subsection (a)(2) and shall ensure that each employee who is exposed to hazards from flames or electric arcs is provided suitable apparel in accordance with the requirements of Section 2940.6(k). The employer shall not select the apparel that could melt onto the employee's skin or that could ignite and continue to burn when exposed to flames or the heat energy estimated under subsection (a)(2) of this section.

(1) Flame-resistant clothing. The employer shall ensure that the outer layer of clothing worn by an employee, except for clothing not required to be arc rated under subsections (b)(2)(A-E) of this section, is flame resistant under any of the following conditions:

- (A) An electric arc could ignite flammable material in the work area that, in turn, could ignite the employee's clothing,
- (B) Molten metal or electric arcs from faulted conductors in the work area could ignite the employee's clothing, or

EXCEPTION: Subsection (b)(1)(B) does not apply to conductors that are capable of carrying, without failure, the maximum available fault current for the time the circuit protective devices take to interrupt the fault.

(C) The incident heat energy estimated under subsection (a)(2) of this section exceeds  $2.0 \text{ cal/cm}^2$ .

(2) Arc rating. The employer shall ensure that each employee exposed to hazards from electric arcs wears protective clothing and other protective equipment with an arc rating greater than or equal to the heat energy estimated under subsection (a)(2) of this section whenever that estimate exceeds  $2.0 \text{ cal/cm}^2$ . This protective equipment shall cover the employee's entire body, except as follows:

(A) Arc-rated protection is not necessary for the employee's hands when the employee is wearing rubber insulating gloves with protectors or, if the estimated incident energy is no more than  $14 \text{ cal/cm}^2$ , heavy-duty leather work gloves with a weight of at least  $407 \text{ gm/m}^2$  ( $12 \text{ oz/yd}^2$ ).

(B) Arc-rated protection is not necessary for the employee's feet when the employee is wearing heavy-duty work shoes or boots,

(C) Arc-rated protection is not necessary for the employee's head when the employee is wearing head protection meeting GISO, Section 3381 if the estimated incident energy is less than  $9 \text{ cal/cm}^2$  for exposures involving single-phase arcs in open air or  $5 \text{ cal/cm}^2$  for other exposures,

(D) The protection for the employee's head may consist of head protection meeting GISO, Section 3381 and a faceshield with a minimum arc rating of  $8 \text{ cal/cm}^2$  if the estimated incident-energy exposure is less than  $13 \text{ cal/cm}^2$  for exposures involving single-phase arcs in open air or  $9 \text{ cal/cm}^2$  for other exposures, and

(E) For exposures involving single phase arcs in open air, the arc rating for the employee's head and face protection may be  $4 \text{ cal/cm}^2$  less than the estimated incident energy.

### (3) Dates.

(A) The requirement in subsection (a)(2) of this section for the employer to make reasonable estimates of incident energy commences October 1, 2018.

(B) The requirement in subsection (b)(1)(C) of this section for the employer to ensure that the outer layer of clothing worn by an employee is flame-resistant when the estimated incident heat energy exceeds  $2.0 \text{ cal/cm}^2$  commences October 1, 2018

(C) The requirement in subsection (b)(2) of this section for the employer to ensure that each employee exposed to hazards from electric arcs wears the required arc-rated protective equipment commences October 1, 2018.

(c) Fuse Handling. When an employee must install or remove fuses with one or both terminals energized at more than 300 volts, or with exposed parts energized at more than 50 volts, the employer shall ensure that the employee uses tools or gloves rated for the voltage.

When an employee installs or removes expulsion-type fuses with one or both terminals energized at more than 300 volts, the employer shall ensure that the employee wears eye protection meeting the requirements of Section 3382, uses a tool rated for the voltage, and is clear of the exhaust path of the fuse barrel.

(d) Energized Covered (Noninsulated) Conductors. The requirements of this section that pertain to the hazards of exposed live parts also apply when an employee performs work in proximity to energized covered (noninsulated) wires.

(e) Non-Current-Carrying Metal Parts. Non-current-carrying metal parts of equipment or devices, such as transformer cases and circuit-breaker housings, shall be treated as energized at the highest voltage to which these parts are exposed, unless the employer inspects the installation and determines that these parts are grounded before employees begin performing the work.

(f) Opening and Closing Circuits Under Load. The employer shall ensure that devices used by employees to open circuits under load conditions are designed to interrupt the current involved and the devices used by employees to close circuits under load conditions are designed to safely carry the current involved.

Note: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

## HISTORY

1. New section filed 2-27-2018; operative 4-1-2018 (Register 2018, No. 9).