

DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

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Juliann Sum, Chief

January 25, 2016

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Re: Arc Flash Safety Standards in California

Dear Mr. Ackerman:

This letter is provided in response to your inquiry to the Division of Occupational Safety and Health (Cal/ OSHA) by letter dated December 29, 2015, regarding your discussion with a Cal/OSHA safety engineer concerning arc flash¹ safety standards and differences between federal OSHA and Cal/OSHA regulations. The content and conclusions of this letter are based only on the facts described below and responsive only to the initial requester. They may not be construed as a statement of general Cal/OSHA policy or general interpretation of the regulations referenced in this letter.

The discussion that follows is organized according to the first four main points in your letter.

1. EMPLOYER'S DUTY TO COMPLY WITH FEDERAL OSHA ARC-FLASH RISK ASSESSMENT AND LABELING STANDARDS

Your letter states that Cal/OSHA takes the following positions: (1) there is no duty by employers to comply with the labeling and arc flash risk assessment standards set forth in federal OSHA regulations (your letter cites 29 CFR 1910.132 et seq.); (2) there are no content requirements for labeling in the State of California; (3) NFPA 70E and NEC

¹ An arc flash is the energy released from an electric arc that travels through air between conductors or from a conductor to ground. The energy of the arc vaporizes metal in the vicinity of the arc. A large volumetric increase of the metal occurs when it transforms nearly instantaneously from solid to vapor. The rapid volume expansion is an explosion of molten metal which can cause serious injury or death.

standards for labeling do not apply; and (4) it is up to the employer to determine how they label any live electrical distribution system components.

1.1 Federal OSHA Standards Applicable to Arc-Flash Risk Assessment and Labeling

The Code of Federal Regulations (CFR), title 29, section 1910.132 et seq. do not require arc flash warning labels² and do not specify that the employer must conduct an arc flash risk assessment³. The arc flash labeling and risk assessment you refer to in your letter are contained in the National Fire Protection Association (NFPA) Standard 70E, '*Electrical Safety in the Workplace*' rather than in federal OSHA regulations. The NFPA is a trade association that publishes voluntary consensus standards designed to minimize the risk and effects of fire, electrical and related hazards.

Federal OSHA issued a letter of interpretation that specifically addressed this issue in 2006. In regards to arc flash warnings labels, federal OSHA stated in part:

...A requirement to mark equipment with flash hazard warnings was not included in the 1981 Subpart S revision. However, paragraph (e) of §1910.303 requires employers to mark electrical equipment with descriptive markings, including the equipment's voltage, current, wattage, or other ratings as necessary. OSHA believes that this information, along with the training requirements for qualified persons, will provide employees the necessary information to protect themselves from arc flash hazards....

In the same letter, federal OSHA discussed the requirements of NFPA Standard 70E as follows:

...OSHA has not conducted a rulemaking to adopt the requirements of the latest edition of NFPA 70E and, therefore, does not "enforce" those requirements. However, industry consensus standards, such as NFPA 70E, can be used by OSHA and employers as guides in making hazard analyses and selecting control measures....

² Arc flash labeling on electrical equipment includes system voltage, arc flash boundaries, and incident energy or personal protective equipment requirements according to NFPA 70E section 130.5(D).

³ An arc flash risk assessment is a documented analysis conducted in accordance with NFPA 70E section 130.5 to determine safe distances from electrical equipment and necessary personal protective equipment.

Furthermore, the letter indicates that federal OSHA is unlikely to use the “*General Duty Clause*⁴” to enforce NFPA 70E:

...The General Duty Clause is not used to enforce the provisions of consensus standards, although such standards are sometimes used as evidence of hazard recognition and the availability of feasible means of abatement. In addition, the General Duty Clause usually should not be used if there is a standard that applies to the particular condition, practice, means, operation, or process involved. See §1910.5(f)....

The entire text of the letter is available at:

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=25557.

Note: Federal OSHA has adopted some requirements similar to NFPA 70E for arc flash protection into 29 CFR 1910.269. However, section 1910.269 is applicable only to electric power generation, transmission and distribution systems. It does not apply to electrical installations and utilization equipment installed or used within or on buildings, structures, and other premises. Outside of electric utilities, electrical hazards in most places of employment are covered by 1910 subpart S, which has not incorporated NFPA 70E.

1.1.1 Federal OSHA requirements for assessing all hazards to identify necessary personal protective equipment

The federal OSHA regulation referenced in your letter, 29 CFR 1910.132, is called “*Personal Protective Equipment – General Requirements*.” Subsection 1910.132(d) contains requirements for employers to conduct a hazard assessment of all hazards (which would include arc flash) to determine the necessary type of personal protective equipment (PPE) for employees. However, the regulation does not incorporate the detailed arc flash risk assessment and warning label requirements found in NFPA 70E. In fact, section 1910.132 does not specifically mention arc flash. The text of the regulation is available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9777.

1.1.2. Federal OSHA requirements for labeling of electrical equipment with markings that describe voltage, current, wattage, and other ratings as necessary

⁴ See section 2 of this letter below for a description of the “*General Duty Clause*”

As discussed in section 1.1 of this letter above, federal OSHA does not require arc flash warning labels on electrical equipment, but pursuant to Title 29 CFR section 1910.303, OSHA does require that equipment be marked with the voltage, current, wattage, or other ratings as necessary. The electrical equipment labeling requirements (section 1910.303) are at

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9880.

1.1.3. Federal OSHA requirements for warning and protecting employees from electric shock, burns, or failure of electrical equipment parts

29 CFR 1910.332, "*Electrical – Training*" requires employers to train employees exposed to electrical hazards on the recognition of electrical hazards and safe work practices and other controls measures to prevent injury. Although arc flash is not mentioned in section 1910.333, it is an electrical hazard which must be included in electrical safety training. The text of the regulation is available at:

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9909.

The safe work practices to which employees must be trained in and follow are contained in 29 CF 1910.333, "*Electrical - Selection and use of work practices.*" The regulation includes procedures for de-energizing electrical equipment, and, when working on energized equipment, the regulation requires use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools. As with the federal electrical safety training requirements, arc flash is not mentioned in this electrical equipment safe work practices regulation (available at

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9910).

29 CFR 1910.335, "*Electrical - Safeguards for Personnel Protection,*" contains requirements for protective equipment and tools suitable for electrical hazards. Although the regulation does not require an arc flash risk assessment or arc flash warning labels on electrical equipment, it addresses arc flash hazards as follows:

1910.335(a)(1)(v)

Employees shall wear protective equipment for the eyes or face wherever there is danger of injury to the eyes or face from electric arcs or flashes or from flying objects resulting from electrical explosion.

1910.335(a)(2)(ii)

Protective shields, protective barriers, or insulating materials shall be used to protect each employee from shock, burns, or other electrically related injuries while that employee is working near exposed energized parts which might be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they shall be guarded to protect unqualified persons from contact with the live parts.

The text of the federal regulation is available at:

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9912.

1.2. Cal/OSHA Standards Applicable to Arc Flash Risk Assessment and Labeling

Cal/OSHA enforces occupational safety and health regulations contained in the California Code of Regulations (CCR), Title 8. These regulations are not always identical to the corresponding federal OSHA regulations, but under California Labor Code section 142.3, the state regulations are required to be at least as effective as the federal regulations.

In California, there are general requirements for evaluating hazards and determining the proper PPE as well as specific requirements for working safely on or in close proximity to electrical equipment.

1.2.1. Cal/OSHA requirements for identifying and evaluating workplace hazards as part of an injury and illness prevention program (IIPP)

In California, there are additional requirements not contained in federal OSHA regulations. Title 8 section 3203, called, "*Injury and Illness Prevention Program (IIPP)*," requires employers to identify and evaluate work place hazards, unsafe conditions and unsafe work practices. The employer must then correct unsafe or unhealthy conditions, work practices and work procedures in a timely manner. There are other requirements in section 3203 including, but not limited to: safety and health training, communication of workplace safety and health issues, and ensuring employees comply with health and safe work practices. Where workplace arc flash hazards exist, the employer's IIPP must effectively address those arc flash hazards to ensure employee safety. Cal/OSHA looks to the National Fire Protection Association (NFPA) Standard for Electrical Safety in the Workplace (NFPA Standard 70E), for guidance on how an employer should assess and address arc flash hazards. Section 3203 is available at: <https://www.dir.ca.gov/title8/3203.html>.

1.2.2. Cal/OSHA requirements for assessing all hazards to identify necessary personal protective equipment (PPE)

General requirements for PPE in California set forth in Title 8 CCR section 3380. With regard to protection from arc flash, subsection 3380(f), entitled "*Personal Protective Devices, Hazard Assessment and Equipment Selection*," is identical to the federal OSHA regulation, 29 CFR 1910.132(d). In California, the employer must select and require employees to use personal protective equipment that will provide adequate protection from workplace hazards, including arc flash. The employer must conduct and document a workplace hazard assessment to determine the correct type of personal protective equipment. Title 8 section 3380 is available at: <https://www.dir.ca.gov/title8/3380.html>.

1.2.3. Cal/OSHA requirements for labeling of electrical equipment with markings that describe voltage, current, wattage, and other ratings as necessary

Title 8 does not require arc flash warning labels on electrical equipment. The labeling requirements in California are very similar to federal OSHA and require that electrical equipment be marked with voltage, current, wattage, or other ratings. The labeling requirements for low voltage equipment that operate at less than 600 volts are located in section 2340.21 (http://www.dir.ca.gov/title8/2340_21.html). The requirements for high voltage equipment that operate at 600 volts or greater is section 2718 (<http://www.dir.ca.gov/title8/2718.html>).

1.2.4. Cal/OSHA requirements for warning and protecting employees from electric shock, burns, or failure of electrical equipment parts

In California, the requirements for electrical safety are divided between work on or in proximity of low voltage installations (less than or equal to 600 volts between conductors) and work on or in proximity of high voltage installations (greater than 600 volts between conductors).

Detailed training, safe work practice and control measures requirements which exceed the federal OSHA requirements are contained in the following sections of Title 8:

- Low voltage: Article 3. Work Procedures (Sections 2320.1 - 2320.10) and Article 4. Requirements for Electrical Installations (Sections 2340.1 - 2340.27). Available at <https://www.dir.ca.gov/Title8/sb5g1.html>
- High voltage: Article 36. Work Procedures and Operating Procedures (Sections 2940 - 2945). Available at <https://www.dir.ca.gov/Title8/sb5g2a36.html>.

The low voltage protective equipment requirements are contained within 8 CCR 2320.2, "*Energized Equipment or Systems.*" This regulation requires suitable protective insulating gloves, insulating tools, insulating barriers and eye protection while working on energized low voltage equipment in addition to training and safe work practice requirements. Insulated gloves and tools must meet and be maintained in accordance with applicable American Society Testing Materials (ASTM) standards. The low voltage Title 8 requirements provide equivalent protection to 29 CFR 1910.335. The text of the regulation is located at http://www.dir.ca.gov/title8/2320_2.html

The high voltage protective equipment requirements are contained in Title 8 CCR 2940.6, "*Tools and Protective Equipment.*" The regulation contains detailed requirements on the design, usage care, and labeling of electrical insulating protective equipment and tools in addition to requiring compliance with relevant ASTM standards. The high voltage Title 8 requirements provide equivalent protection to 29 CFR 1910.335. The text of the regulation is located at http://www.dir.ca.gov/title8/2940_6.html.

Both the low voltage and high voltage regulations contained in subsections 2320.2(a)(8) and 2940.6(j)) of tile 8 contain requirements for arc flash protection. The regulations only allow employee apparel which does not increase the extent of injury to an employee when exposed to flames or electric arcs. Cal/OSHA would use sources such as NFPA Standard 70E when determining what apparel does not endanger employees exposed to arc flash hazards.

2. GENERAL DUTY CLAUSE IN CALIFORNIA

Your letter states that Cal/OSHA takes the position that California does not have a "General Duty Clause" that can be enforced against an employer.

Federal OSHA's General Duty Clause is contained in Section 5 of the Occupational Safety and Health Act of 1970 (Public Law 91-596), which states in part:

SEC. 5 Duties

(a) Each employer --

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.

California law contains similar language. Employers in the California are required to provide safe and healthful workplaces to all employees. The California Labor Code contains the following requirements:

California Labor Code section 6308:

The division, in enforcing occupational safety and health standards and orders and special orders may do any of the following:

(a) Declare and prescribe what safety devices, safeguards, or other means or methods of protection are well adapted to render the employees of every employment and place of employment safe as required by law or lawful order.

(b) Enforce Section 25910 of the Health and Safety Code and standards and orders adopted by the standards board pursuant to Chapter 6 (commencing with Section 140) of Division 1 of the Labor Code, for the installation, use, maintenance, and operation of reasonable uniform safety devices, safeguards, and other means or methods of protection, which are necessary to carry out all laws and lawful standards or special orders relative to the protection of the life and safety of employees in employments and places of employment.

(c) Require the performance of any other act which the protection of the life and safety of the employees in employments and places of employment reasonably demands.

California Labor Code section 6400(a):

Every employer shall furnish employment and a place of employment that is safe and healthful for the employees therein.

California Labor Code section 6401:

Every employer shall furnish and use safety devices and safeguards, and shall adopt and use practices, means, methods, operations, and processes which are reasonably adequate to render such employment and place of employment safe and healthful. Every employer shall do every other thing reasonably necessary to protect the life, safety, and health of employees.

California Labor Code section 6402:

No employer shall require, or permit any employee to go or be in any employment or place of employment which is not safe and healthful.

California Labor Code section 6403:

No employer shall fail or neglect to do any of the following:

- (a) To provide and use safety devices and safeguards reasonably adequate to render the employment and place of employment safe.
- (b) To adopt and use methods and processes reasonably adequate to render the employment and place of employment safe.
- (c) To do every other thing reasonably necessary to protect the life, safety, and health of employees.

California Labor Code section 6401.7, implemented by 8 CCR 3203 (IIPP requirements, discussed in section 1.2.1 above), requires employers to assess all occupational safety and health hazards and correct the hazards in a timely manner. Cal/OSHA enforces section 3203 if there is no specific Title 8 section addressing the hazard.

In addition, California Labor Code sections 6305 and 6308 authorizes Cal/OSHA to issue a "Special Order" to compel an employer to correct an unsafe condition, device, or place of employment which poses a threat to the health or safety of an employee and which cannot be made safe under an existing Title 8 Safety Order. This authority is similar to the federal OSHA's authority under its "General Duty Clause."

3. ENFORCEMENT OF THE NFPA 70E STANDARD IN CALIFORNIA

Your letter states that Cal/OSHA takes the position that the NFPA 70E standards are generally not enforced by Cal/OSHA.

Cal/OSHA enforces Title 8 standards and consensus standards (such as various NFPA standards) specifically incorporated by reference into Title 8. NFPA 70E is not incorporated into Title 8 and is not directly enforced. However, Cal/OSHA will use NFPA 70E as guidance when determining if an employer correctly assessed and addressed electrical arc flash hazards as discussed above in general regulatory requirements, section 1.2.1 of this letter. Where Title 8 and NFPA 70E requirements conflict, the requirement in Title 8 prevails regardless of which requirement is more protective.

4. ENFORCEMENT OF FEDERAL OSHA REQUIREMENTS IN CALIFORNIA

Your letter states that Cal/OSHA takes the position that California has its own laws, has no compunction to enforce federal OSHA standards/regulations, and may adopt looser standards than federal OSHA.

As discussed in above in section 1.2 of this letter, Cal/OSHA enforces requirements contained in the California Code of Regulations, Title 8, and does not enforce the federal OSHA regulations contained in the Code of Federal Regulations, Title 29. The language in Cal/OSHA and federal OSHA regulations are in some cases identical and in other cases different. Regardless, Title 8 regulations are required to be at least as effective as federal OSHA's.

The Occupational Safety and Health Standards Board is the California Agency responsible for adopting California regulations that are at least as effective as the corresponding federal OSHA regulations. The Standards Board is separate and independent from Cal/OSHA. If you believe that a Title 8 regulation is less protective than the corresponding federal OSHA requirement, please contact the Standards Board at: oshsb@dir.ca.gov.

5. CONCLUSION

The NFPA 70E Standard is an excellent guide for workplace electrical safety. It has not been formally adopted into federal OSHA or Cal/OSHA regulations. If you believe that parts of the standard or the entirety of the standard should be included in Title 8, you can petition the Standards Board to make such a change. Instructions for petitioning the Standards Board are at: <https://www.dir.ca.gov/oshsb/petitions.html>.

Sincerely,



Eric Berg
Deputy Chief
Cal/OSHA Research and Standards