

New OSHA regulations for arc flash safety—what does this mean for you?

OSHA has recently added a new regulation: “Electric Power Generation, Transmission, and Distribution and Electrical Protective Equipment.” This paper will outline the background of the changes and offer best practices for how you can make your business safer by protecting against arc flash hazards.

Background

Historically, OSHA has provided general language to industry requiring employers to provide a workplace free of hazards. This broad definition left it to the employer to determine how to accomplish this feat. With the new rule, OSHA is addressing arc flash hazards with required estimations for incident energy. This new regulation gives teeth to citations and essentially requires an arc flash study be performed.

Significant changes to the OSHA standards

- General training of workers
- Employer and contractor coordination of rules and procedures
- Fall protection
- Minimum approach distances and insulation
- Protection from flames and electric arc hazards
- Foot protection
- De-energizing transmission and distribution lines and equipment
- Protective grounding
- Underground electrical installations
- Electrical protective equipment



Worker wearing PPE



Arc flash label

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Who does this apply to?

Potentially affected companies found in a variety of manufacturing and other industries that own or operate their own electric power generation, transmission or distribution installations as a secondary part of their business operations:

- Companies that rely on NFPA 70E® table method to determine AFH rating for PPE and customers that have not taken action on determining incident energy because OSHA does not enforce NFPA 70E
- Companies that have not performed arc flash analysis yet to determine incident energy
- Companies with multiple sites that a localized small competitor could not easily access or deliver mass product to within a short time frame

When did the changes occur?

On July 10, 2014, the final rule became effective (90 days after publication).

In fact, all employers must estimate the incident heat energy of any electric-arc hazard to which a worker would be exposed no later than January 1, 2015. And by April 1, 2015, employers must provide workers exposed to hazards from electric arcs with protective clothing and other protective equipment with an arc rating greater than the estimated hazard.

Benefits of the changes

OSHA expects the updated standards to prevent at least an additional 118 workplace injuries and 20 fatalities annually, compared to earlier standards. It estimates the net monetized benefits of the final rule to be about \$130 million annually. In addition, the updated standards are easier to understand and apply, thus improving safety by facilitating compliance.

Arc flash basics

NFPA 70E defines arc flash hazard as “a dangerous condition associated with the possible release of (thermal) energy caused by an electric arc.” NFPA, CSA® Z462, MSHA, OSHA and IEEE® all deal with arc flash.

Definitions

Incident energy (arc flash energy)

- The amount of thermal energy impressed on a surface, a certain distance from the source, generated during an electrical arc event
- Incident energy is measured in calories/cm²
- 1.2 cal/cm² of heat energy can cause a second degree burn to unprotected skin

The arc flash boundary

- The distance from the source of the arc flash blast where the incident energy equals 1.2 cal/cm²
- In order to protect workers, one would have to stand outside of this boundary or be dressed in personal protective equipment (PPE) that would have a withstand rating exceeding the level of exposure at a given distance (usually a working distance of 18–24 inches)



Worker wearing PPE inspecting low voltage switchgear



Example of arc flash event



Medium voltage switchgear



Low voltage switchgear

Eaton's answers to mitigating arc flash hazards

Eaton offers a wide range of expertise to help address the new OSHA regulations.

- Strong track record performing arc flash hazard analysis and studies
- Attention to detail and quality when personal safety is at stake
- Remediation solutions to lower incident energy levels

Eaton arc flash prevention solutions

Solutions for reducing arc flash generally involve decreasing fault clearing time, increasing the distance from the arc to the worker or reducing fault current. Eaton has solutions for all of these.

- Arc flash studies
- Arc flash training
- Compliant labels
- Arcflash Reduction Maintenance System™ breaker upgrades
- Arc-resistant low and medium voltage switchgear
- FlashGard® motor control center (MCC)
- Arc-resistant medium voltage variable frequency drives
- And more!

Eaton has nearly 100 solutions to help you keep your personnel and operations safe from arc flash hazards.

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Printed in USA
Publication No. WP083012EN / Z16993
September 2015