

# FAST FACTS on Arc Flash Safety



Gary Larkins, President APS

**1.** *“The ruling is straightforward. Companies are required to make Arc Flash Hazard an integral part of an ongoing documented safety program.”*

The official ruling from the Department of Labor states:

*“Though OSHA does not per se, enforce the NFPA 70E standard, OSHA considers the NFPA Standard a recognized industry practice. The employer is required to conduct hazard assessment in accordance with 29CFR1910.132(D)(1). If an arc flash hazard is present, or likely to be present, then the employer must select and require employees to use the protective apparel. Employers who conduct the hazard/risk assessment, and select and require their employees to use protective clothing and other PPE appropriate for the task, as stated in the NFPA 70E standard are deemed in compliance with the Hazard Assessment and Equipment Selection OSHA Standard.”*

In short:

OSHA considers NFPA-70E a consensus industry standard for arc flash standards. Follow NFPA-70E to be in compliance.

**2.** *“It can happen in your plant. Every single day in the USA between 5 and 10 arc flash explosions occur in electrical equipment based on statistics compiled by CapSchell, Inc.”*

Data from the Census of Fatal Injuries indicates that over 8% of fatalities each year are due to electrical shocks, fires and explosions.

Over 55% of the fatalities that occurred in the US Chemical industry in a five year period were attributable to burns, fires and explosions linked to electrical ignition sources.

**3.** *“Arcs can produce radiant energy 4 times hotter than the temperature on the surface of the sun”*

Whether caused by a dropped tool, an accidental contact with a live circuit or build-up of dust, dirt, corrosion or particles that can act as a conductor, arcing faults release dangerous levels of radiant energy.

Metal is vaporized. It spews from the arc. The air is super-heated causing pressure waves that can literally throw workers across rooms and knock them off ladders.

**4.** *“Arc Flash incidents kill, maim and can cost a company millions.”*

Treatment for stricken workers can require years of skin grafts, hospital stays and rehabilitation. They may never recover sufficiently to regain their lifestyle.

In addition to worker treatment costs a company can face extensive litigation fees, fines and increases in insurance. All in addition to down-time costs.

**5.** *“You can reduce risk and exposure to Arc Flash Hazards through an overall Electrical Safety Program.”*

Major elements of an effective arc flash & electrical safety initiative include:

- a) Acknowledge there is a hazard.** Become aware of arc flash hazard dangers.
- b) Train management and workers on the hazards.** Begin to develop work practices and procedures to help avoid hazards.

**c) Evaluate the risks in your facility and develop an economic benefit case to obtain management buy in and funding.** The OSHA General Duty Clause makes it clear that the employer has an obligation to protect workers from known hazards.

**d) Identify resources that you have available to address the issues.** This includes financial resources, human resources, software tools, training resources and reference materials.

**e) Define the goals of your arc flash and electrical safety initiative and develop an action plan.** Then evaluate the gap between your current electrical safety program and your goals. With this you can develop an action plan, budget and timeline.

**f) Evaluate Exposure to potential Arc Flash/ Blast Hazards.** Determine if the work can be completed with equipment de-energized to minimize hazards.

Evaluate the hazards. This includes determining Incident Energy, PPE Requirements, Flash Hazard Boundary, Shock Hazard and the Limited, Restricted and Prohibited Approach Boundaries for Shock Hazard.

Estimated PPE requirements can be determined by NFPA 70E tables

and detailed arc flash hazard analysis can be performed using commercially available software.

**g) Personal Protective Equipment.**

PPE is your last line of defense should an accident occur, thus the choice of appropriate PPE for the hazards involved is essential. Workers trained to properly apply PPE minimize injuries.

**h) Labeling.** Use high quality UV resistant Vinyl or Phenolic labels. Label for worst case conditions in the gear (Switchboard, Motor Control Center, etc.) based on calculations and utilize Energized Work Permits

**i) Energized Work Permits.**

Energized Work Permits, an NFPA 70E 2004 requirement, should be used to prevent unnecessary risks and requires management/supervisor signature for hot work.

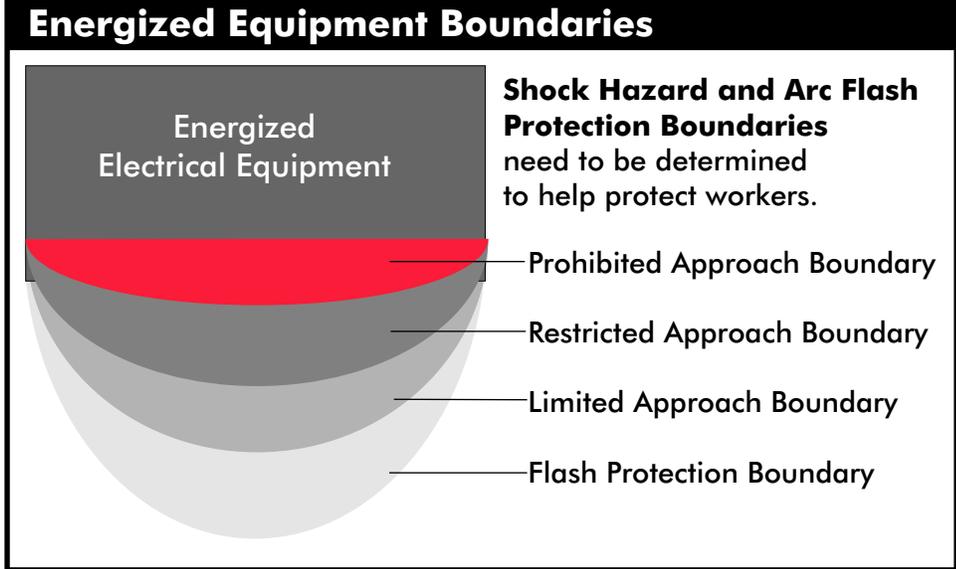
**j) Training.** Qualified Person: One who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received training on the hazards involved.

Non-qualified personnel that may be in the proximity of electrical equipment should also be trained. We also recommend awareness training for management.

**k) System Maintenance.** System maintenance, including cleaning, breaker testing, insulation testing, etc. needs to take place to avoid unnecessary hazards.

**l) Safety Program Development.**

An arc flash and electrical safety program needs to be integrated into the facility safety program. Work procedures, practices and documentation requirements need to be developed and implemented.



Personal Protective Equipment Requirements NFPA-70E 2004(Proposed)		
Category	Energy Level	Typical Personal Protective Equipment required (NFPA-70E)
0	≤2 cal/cm <sup>2</sup>	Non-melting or untreated natural fiber
1	4 cal/cm <sup>2</sup>	Fire Resistant (FR) shirt and pants
2	8 cal/cm <sup>2</sup>	Fire Resistant shirt and pants, cotton underwear
3	25 cal/cm <sup>2</sup>	Two layers Fire Resistant clothing, cotton underwear
4	40 cal/cm <sup>2</sup>	Fire Resistant shirt and pants, multilayer flash suit, cotton underwear
Other: Face Protection Face Shield and/or safety glasses Hand Protection Leather over rubber for arc flash protection Leather work boots above 4 cal/cm <sup>2</sup>		

**6. "Don't expect to become an expert overnight. Take advantage of the expertise available to you."**

We understand your concerns, your budget limitations, your time constraints and the ongoing need to show productivity gains...even in safety programs that provide compliance with Federal standards and industry recommended practices.

**APS can help you enhance plant safety and profitability through a properly planned and**

**implemented arc flash hazard and electrical safety program.**

Call or e-mail us for advice and assistance. We bring practical solutions to challenging industry issues.

We look forward to connecting with you.



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