

## ARC FLASH

Every year, more than 2,000 workers are treated with severe arc flash injuries. The arc flash is immediate, but the results can cause severe injuries that last months, years—even a lifetime. In some cases, they may cause death.

Fortunately, arc flash hazards can be reduced by following safety precautions and using the recommended arc flash protection and personal protective equipment.

### What is an arc flash hazard?

Think of an arc flash as a short circuit through the air. In an arc flash incident, an enormous amount of concentrated radiant energy explodes outward from electrical equipment.

The explosion creates pressure waves that can damage a person's hearing, a high-intensity flash that can damage their eyesight and a superheated ball of gas that can severely burn a worker's body and melt metal.



The pressure waves can also propel loose material like molten metal, pieces of damaged equipment, tools and other objects, through the air.

### Where do arc flash hazards occur?

A hazardous arc flash can occur in any electrical device, regardless of voltage, in which the energy is high enough to sustain an arc. Potential places where this can happen include:

- Panel boards and switchboards
- Motor control centers
- Metal clad switch gear
- Transformers
- Motor starters and drive cabinets
- Fused disconnects
- Any place that can have equipment failure

### Who is at risk?

Some of the employees at risk from arc flash hazards electrical contractors and HV switchgear installers. The most dangerous tasks include:

- Removing or installing circuit breakers or fuses
- Working on control circuits with energized parts exposed

- Racking circuit breakers in and out of switch gear
- Applying safety grounds
- Removing panel covers
- Low voltage testing and diagnostics

### *Did you know?*

The temperature of an arc flash can reach 35,000 degrees Fahrenheit – about four times as hot as the surface of the sun.

### **What are the effects of an arc flash explosion?**

The effects of an arcing fault can be devastating. The intense thermal energy can cause severe burns in a fraction of a second.

One of the major causes of electrical burns and deaths to workers is ignition of non-fire rated clothing due to an arcing fault. Treatment can require years of skin grafting and rehabilitation. A victim may never return to work or enjoy quality of life.

Other considerations include loss of life, potential litigation fees, loss of process, potential fines and escalation of insurance premiums.

### **What are the NFPA 70E Guidelines?**

An employer is required to:

- Conduct an arc flash hazard analysis of the workplace.
- Implement qualified and general worker safety training based on the arc flash hazard analysis results.
- Establish shock and flash protection boundaries.
- Provide protective clothing (PC) and personal protective equipment (PPE) that meet ANSI standards.
- Put warning labels on equipment (see example at right). A future edition of the arc flash safety code may require more extensive labeling (inset) that includes flash hazard boundary and PPE levels.



### **How can we reduce exposure to arc flash hazards?**

Our arc flash safety experts can help plant and facility managers and other users of electricity understand how to reduce the probability of an arc flash event and its effects.

