

# PowerFlow

## APPLICATION NOTE

PRODUCTS AND INFORMATION FOR POWER PROFESSIONALS

TurPower Associates Application Note #109

### Why perform an arc-flash hazard analysis ?

Starting at the beginning... an electrical arc occurs when a short circuit or insulation breakdown occurs and the insulating materials can not contain the applied voltage. The short circuit creates a bypass around a circuit, generating heat and high current that melts/vaporizes the conducting material, creating an arc. The arc-flash produces a large amount of heat that can burn the skin of a nearby person and/or set their clothing on fire. From the fault location, the arc-flash can also emit a flash of light, loud noises, ionized gases, metal vapors, shrapnel, and shock waves that can actually blow a person off of his or her feet. Needless to say, an arc-flash can result in serious injury or death to nearby personnel.

An arc-flash could happen anytime, but especially when transformers have been upgraded, electrical equipment has been added, or the facility has expanded. With these situations, it is likely that the protective devices have not been reviewed and are not at appropriate settings.

#### What is an arc-flash hazard analysis?

An arc-flash hazard analysis looks at the protective devices and coordination of the power system and takes this process a step further by determining incipient energy levels and analyzing the arc-flash and shock hazards at the facility. This enables the owner or manager to protect the safety of personnel by describing appropriate Personal Protection Equipment (PPE) for working near energized equipment, as well as safe distances around pieces of equipment like substations, switchboards, panel boards, and motor/industrial control panels.



**The NFPA estimates that up to 80% of all injuries from a release of electrical energy are due to arc-flash, like the one shown to the left.**

#### Governing Regulations

OSHA's Electrical Safety Requirements for Employee Workplaces [OSHA 29 CFR 1910.132(d)] says, "The employer shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present, or likely to be present, the employer shall... verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated..."

NFPA 70 Section 110.16 says "Flash protection. Switchboards, panelboards, industrial control panels, motor control centers in other than dwelling occupancies, that are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn qualified persons of potential electric arc flash hazards."

#### How do I get an arc-flash hazard analysis?

Engineering firms that perform arc-hazard analyses are not easily found. The company needs to be experienced, specifically trained in arc-flash hazard analysis, and know the regulations. Call TruPower Associates, your resource for arc-flash hazard analysis, to learn more.

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