JOB AID

Electrical Arc Flash Awareness

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Significance of the Arc Flash Hazard

The deadly arc flash hazard can generate:

- An explosion with a temperature of up to 19,000 °C (35,000 °F)
  - Vaporizes metal
  - Burns clothing and fuses synthetic material to skin
- A blast strong enough to knock you off your feet and rupture your eardrums

Victims suffer from their injuries and painful surgeries for the rest of their lives – if they survive.

Arc Flash Definition

An arc flash is a phenomenon where a flashover of electric current leaves its intended path and travels through the air from one conductor to another, or to ground. The flash creates an arc fault that generates an instantaneous blast and pressure wave of significant:

- Energy shock wave
- Heat
- Debris
- Sound

An arc flash can be caused by many things, including:

- Dust that builds up and is then disturbed
- Material in the electrical equipment, such as dirt, debris, tools or foreign objects
- The accidental touching of equipment
- Equipment that is faulty due to failure or corrosion

Common Causes of Injury

There are many elements in an arc flash that can cause injury. In addition to the intense heat and light from the flash, an explosion (or blast) can generate dangerous:

- Flying debris
- Molten metal
- Fire
- Hot gases
- Shock waves

Workers can be crushed by materials, equipment or even buildings. They can also be severely burned, thrown across rooms or knocked off ladders or platforms.

General Precautions and Safe Work Practices

To help prevent an arc flash:

- Never open an electrical panel or attempt to reset a breaker unless you have been trained and authorized to do so
  - Be aware that these actions may put you at risk of an arc flash

    - Resetting breakers without knowing what activated these protective devices is DANGEROUS
- Unqualified workers should not enter or block access to electrical rooms
- Understand and respect arc flash labels, which identify safe boundaries

If you are qualified to perform electrical work, then follow all guidelines and requirements related to work area barricading. All other workers must stay clear of electrical work.

PPE

If you are not authorized to work on electrical systems or components, you still need to be aware of the types of PPE that must be worn by authorized employees. The type of PPE required is determined by the amount of risk, voltage and current available.

Typical arc flash PPE includes:

- Electrically rated eye/face protection
- Balaclava
- Smock or electrically rated suit
- Hearing protection
- Gloves

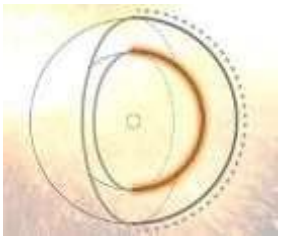
Labels

To protect workers from electrical hazards such as arc flash, employers should conduct an arc flash assessment and label hazardous electrical equipment with pertinent information from the assessment.

- Warning labels provide information about:
    - Arc flash protection
    - Electrical shock protection
    - Required PPE

Boundaries

Boundaries are identified on warning labels.



The Arc Flash Protection boundary is also known as the outer boundary – the point farthest away from the energized equipment that PPE must be worn to protect against 2nd-degree burns or worse if an arc flash occurs.

The Limited Approach Boundary indicates where barriers should be placed to protect unqualified people from an electrical shock hazard. The higher the voltage, the greater the distance. Unqualified people should not cross this boundary unless they are escorted by a qualified person and are wearing the proper PPE.

The Restricted Approach Boundary *(pictured)* can only be crossed by a qualified person wearing appropriate PPE because of the increased risk of electrical shock.