



Arc Flash

Understanding “Arc Flash”

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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 results are often violent and when a human is in close proximity to the arc flash, serious injury and even death can occur. It’s not uncommon for an injured employee to never regain their past quality of life and need extended medical care.

Arc flash can be caused by many things including:

- Dust
- Dropping tools
- Accidental touching
- Condensation
- Material failure
- Corrosion
- Faulty installation

Three factors determine the severity of an arc flash injury:

1. Proximity of the worker to the hazard
2. Temperature
3. Time for circuit to break

Approach Protection Boundaries

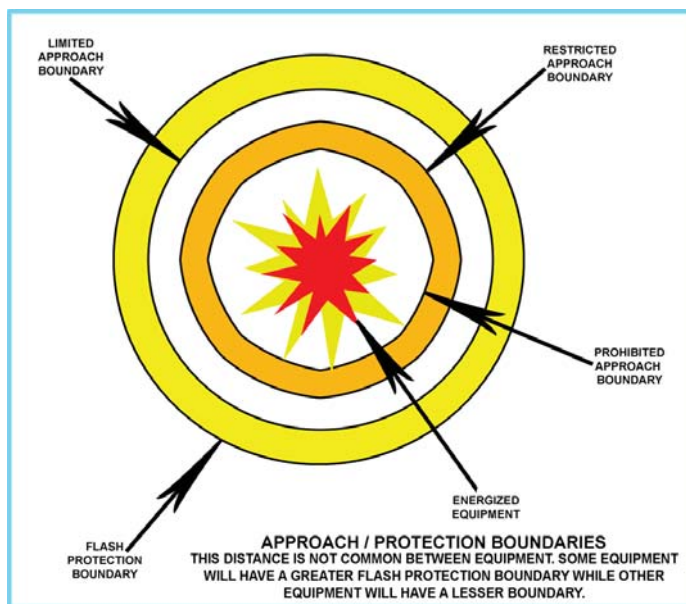
Flash Protection Boundary: The flash boundary is the farthest established boundary from the

energy source. If an arc flash occurred, this boundary is where an employee would be exposed to a curable second degree burn (1.2 calories/cm²). The issue here is the heat generated from a flash that results in burns.

Limited Approach: An approach limit at a distance from an exposed live part where a shock hazard exists.

Restricted Approach: An approach limit at a distance from an exposed live part which there is an increased risk of shock.

Prohibited Approach: A distance from an exposed part which is considered the same as making contact with the live part.



Ways to Protect the Workers

There exists a number of ways to protect workers from the threat of electrical hazards. Some of the methods are for the protection of qualified employees doing work on electrical circuit and other methods are geared towards non-qualified employees who work nearby energized equipment.

- De-energize the circuit
- Work Practices
- Insulation
- Guarding
- Barricades
- Ground Fault Circuit Interrupters (GFI)
- Grounding (*secondary protection*)

If the work must be done on Energized Circuits, and has been determined that deenergizing a circuit is not feasible, and the employee must work “hot,” the employer shall develop and enforce safety-related work practices to prevent electric shock or other injuries.

The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

- Energized Electrical Work Permit
- Personal Protective Equipment
- Insulated Tools
- Written Safety Program
- Job Briefing

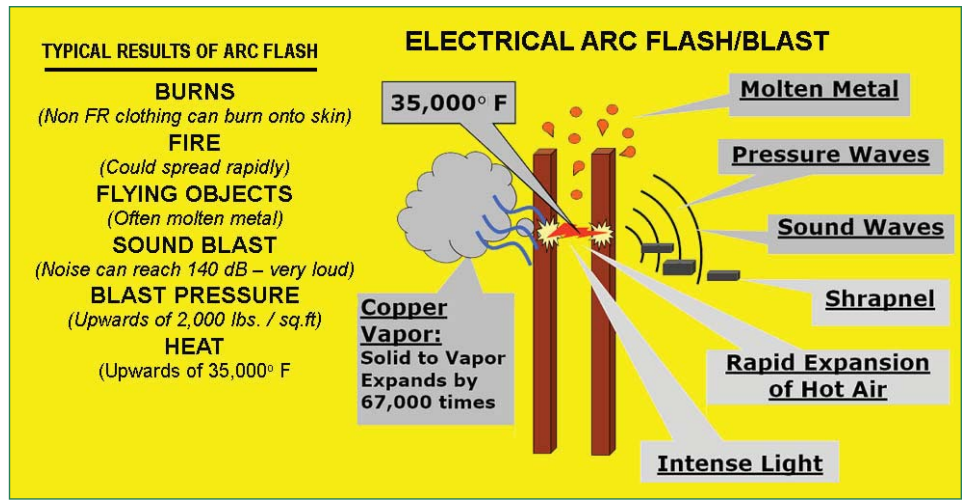
The Employee's Obligation

Employees must follow the requirements of the Arc Flash Hazard label by wearing the proper personal protective equipment (PPE), use of insulated tools and other safety related precautions. This includes not working on or near the circuit unless you are a "qualified" worker.

Qualified person: One who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved.

Qualified persons (i.e. those permitted to work on or near exposed energized parts) shall, at a minimum, be trained in and familiar with the following:

- The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
- The skills and techniques necessary to determine the nominal voltage of exposed live parts.
- The clearance distances specified in 1910.333(c) and the corresponding voltages to which the qualified person will be exposed.



The National Fire Protection Association has developed specific approach boundaries to protect employees while working on or near energized equipment.

Fast Fact:

The most effective and fool-proof way to eliminate the risk of electrical shock or arc flash is to simply deenergize the equipment.

SAFETY TRAINING SIGN-IN SHEET

Company Name: _____ Date: _____

Subject: Arc Flash

The following employees participated in this training.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____



Each piece of equipment operating at 50 volts or more, and not put into a deenergized state, must be evaluated for arc flash and shock protection.

This evaluation will determine the actual boundaries (i.e. prohibited, limited, restricted, etc.) and will inform the employee of what PPE must be worn.

Once the evaluation is complete, an Arc Flash Hazard warning label must be affixed to the equipment and readily accessible to employees who may work on the energized equipment.

