Electrical Safety Month: Shock and Arc Flash Prevention on the Worksite



June is recognized as Electrical Safety Month across North America, making it an ideal time for employers, worksite managers, and occupational health and safety (OHS) professionals to review electrical hazards and reinforce safe work practices. While electricity powers nearly every modern workplace, it also presents some of the most serious and potentially fatal hazards workers can encounter. Electrical incidents can result in severe injuries, permanent disabilities, fires, explosions, and fatalities in a matter of seconds.

Two of the most significant electrical hazards in the workplace are electric shock and arc flash incidents. Understanding these risks, and implementing effective prevention measures, can help organizations protect workers and maintain compliance with safety regulations.

Understanding Electrical Shock Hazards

An electrical shock occurs when a person becomes part of an electrical circuit and electricity passes through the body. The severity of the injury depends on several factors, including the voltage involved, the path the current takes

through the body, the duration of contact, and the worker’s physical condition.

Even relatively low voltages can cause serious injuries. Electrical shock can result in:

- Burns to the skin and internal tissues.
- Muscle contractions that prevent a worker from letting go of energized equipment.
- Respiratory paralysis.
- Cardiac arrest.
- Falls caused by sudden involuntary movements.
- Permanent nerve damage.
- Fatal electrocution.

Electrical shock hazards exist in virtually every industry but are especially common in construction, manufacturing, utilities, telecommunications, maintenance, oil and gas operations, transportation, and municipal services.

Workers may be exposed through damaged cords, defective tools, improper grounding, exposed conductors, overloaded circuits, wet environments, or accidental contact with energized equipment.

What Is an Arc Flash?

An arc flash is a sudden release of electrical energy caused by an electrical fault traveling through the air between conductors or from a conductor to ground. Unlike electrical shock, workers do not need to touch energized equipment to be injured by an arc flash.

Arc flash events can generate temperatures exceeding 19,000°C (35,000°F), hotter than the surface of the sun. The resulting explosion can produce:

- Severe thermal burns.
- Intense ultraviolet and infrared radiation.

- Molten metal spray.
- Flying debris and shrapnel.
- Pressure waves capable of throwing workers across a room.
- Hearing damage from explosive sound levels.
- Fires and secondary explosions.

Arc flash incidents often occur during equipment maintenance, troubleshooting, testing, switching operations, or when workers accidentally create a fault by using tools improperly or contacting energized components.

Common Electrical Hazards on Worksites

Worksite managers should remain vigilant for common electrical hazards, including:

- Damaged extension cords and power cables.
- Missing electrical panel covers.
- Improper lockout/tagout procedures.
- Unauthorized electrical repairs.
- Overloaded circuits and power strips.
- Contact with overhead or underground power lines.
- Wet working conditions.
- Faulty grounding systems.
- Damaged insulation on tools and equipment.
- Energized work conducted without proper controls.

Busy worksites often present additional risks because multiple trades may be working simultaneously around temporary power systems, portable equipment, and exposed electrical installations.

Electrical Safety Prevention

Checklist

A comprehensive electrical safety program should include the following preventive measures:

Identify Electrical Hazards

Conduct regular inspections of equipment, tools, cords, panels, and temporary power systems. Hazard assessments should identify potential shock and arc flash exposure before work begins.

Follow Lockout/Tagout Procedures

Ensure hazardous energy sources are isolated before maintenance or repair work begins. Verify de-energization before workers contact equipment.

De-Energize Whenever Possible

The safest electrical work is performed on de-energized equipment. Energized work should only occur when absolutely necessary and under controlled conditions.

Maintain Equipment Properly

Inspect electrical tools, cords, and equipment regularly. Remove damaged equipment from service immediately and ensure repairs are completed by qualified personnel.

Use Qualified Workers

Only trained and qualified workers should perform electrical tasks or access energized electrical equipment.

Establish Arc Flash Boundaries

Identify and communicate approach boundaries around energized equipment. Workers should understand when specialized PPE and

permits are required.

Wear Appropriate PPE

Depending on the task, workers may require:

- Arc-rated clothing
- Voltage-rated gloves
- Face shields
- Safety glasses
- Hard hats
- Hearing protection
- Insulated footwear

PPE should match the level of electrical hazard identified through risk assessments.

Maintain Safe Distances from Power Lines

Ensure equipment operators and workers understand minimum approach distances for overhead and underground utilities. Spotters should be used when equipment is working near energized lines.

Keep Work Areas Dry

Water significantly increases electrical hazards. Ensure workers use ground-fault circuit interrupters (GFCIs) and avoid operating electrical equipment in wet conditions whenever possible.

Provide Ongoing Training

Regular training sessions, toolbox talks, and safety meetings help reinforce safe electrical work practices and increase hazard awareness throughout the organization.

Creating a Culture of Electrical Safety

Electrical safety cannot rely solely on procedures and PPE. Organizations that successfully reduce electrical incidents foster a culture where workers feel empowered to identify hazards, stop unsafe work, and report concerns without fear of reprisal.

Electrical Safety Month provides an excellent opportunity to review electrical safety programs, inspect equipment, update training, and ensure workers understand the potentially devastating consequences of electrical incidents. By focusing on shock prevention, arc flash protection, hazard identification, and safe work practices, OHS professionals and worksite managers can significantly reduce risks and help ensure every worker returns home safely at the end of the day.