Electrical Safety – Know the Ground Rules Meeting Kit

What’s At Stake

Electricity is an essential source of energy for most work-related operations. However, fewer sources have a greater potential to cause harm than electricity.

THE ELECTRICAL CIRCUIT – ELECTRICITY 101

By its nature, electricity will take the path of least resistance to the ground. If your body happens to be in that path, even a small amount of electric current can have fatal effects. The risk of shock or electrocution is greatest around metal objects and in damp conditions. Therefore, make sure all electric equipment, switch enclosures, and conduit systems are properly grounded and that all external or damp operations are wired for wet conditions.

All electrical systems have the potential to cause harm. Electricity can be either “static” or “dynamic.” Dynamic Electricity is the uniform motion of electrons through a conductor (this is known as electric current). Conductors are materials that allow the movement of electricity through it. Most metals are conductors. The human body is also a conductor.

Static Electricity is accumulation of charge on surfaces as a result of contact and friction with another surface. This contact/friction causes an accumulation of electrons on one surface, and a deficiency of electrons on the other surface.

Unbroken Path: Electric current cannot exist without an unbroken path to and from the conductor. Electricity will form a “path” or “loop”. When you plug in a device (e.g., a power tool), the electricity takes the easiest path from the plug into the tool, and back to the power source. This is action is also known as creating or completing an electrical circuit.

What’s the Danger

TYPES OF INJURIES CAUSED BY ELECTRICITY

- Electrocution (fatal), Electric Shock, Burns, Falls

DANGERS/HAZARDS OF ELECTRICITY

1. **Avoid contact with live electrical systems:** Fatal injuries can occur if any part of an employee’s body meets an energized electrical system, even if a small amount of current is flowing. Remind your employees to treat every electrical wire or system as if it were live until proven otherwise. The first step is to turn off the electricity before working on it, whenever feasible.
2. **Water and electricity can be a fatal combinations:** Damp areas often serve as shortcuts for electricity. If a worker’s hands are sweaty, if socks and shoes are moist or damp, if the floor is wet, or if the worker is standing in a puddle of water, the moisture will allow more current to pass through the body. These conditions can happen at any time, but especially during wet winter months.
3. **Keep electrical systems in good condition:** Defective electrical equipment should be tagged as “do not use or operate”, removed, and repaired or replaced
   Anyone feeling the slightest tingling or shock must stop using the equipment immediately. If someone detects the smell of a hot or burning substance, they need to turn the power to the equipment off immediately.
4. Perilous Power Lines: Consider all power lines to be live and dangerous. Instruct co-workers to stay away from downed lines as well as any vehicles or objects in contact with them.
   Common Mis-Steps – Deadly Consequences
5. Failure to use electrical lockout devices

- Overloading circuits
- Careless employees
- Outlets too close to conductors
- Torn or frayed cords and wires

HOW TO PROTECT YOURSELF

BEST SAFETTY PRACTICES WHEN WORKING WITH OR NEAR ELECTRICITY

- Inspect portable cord-and-plug connected equipment, extension cords, power bars, and electrical fittings for damage or wear before each use. Repair or replace damaged equipment immediately.
- Always tape extension cords to walls or floors when necessary.
- Use extension cords or equipment that is rated for the level of amperage or wattage that you are using.
- Replacing a fuse with one of a larger size can cause excessive currents in the wiring and possibly start a fire.
- Be aware that unusually warm or hot outlets or cords may be a sign that unsafe wiring conditions exists. Unplug any cords or extension cords from these outlets and do not use until a qualified electrician has approved.
- Always use ladders made with non-conductive side rails when working with electricity or power lines.
- Risk of electric shock is greater in areas that are wet or damp. Install Ground Fault Circuit Interrupters (GFCIs) as they will interrupt the electrical circuit before a current sufficient to cause death or serious injury occurs.
- Use a portable in-line Ground Fault Circuit Interrupter (GFCI) if you are not certain that the receptacle you are plugging your extension cord into is GFCI protected.
- Make sure that exposed receptacle boxes are made of non-conductive materials.
- Know where the panel and circuit breakers are located in case of an emergency.
- Label all circuit breakers and fuse boxes clearly. Each switch should be positively identified as to which outlet or appliance it is for.
- Do not use outlets or cords that have exposed wiring.
- Do not use portable cord-and-plug connected power tools if the guards are removed.
- Do not block access to panels and circuit breakers or fuse

boxes.

- Do not touch a person or electrical apparatus in the event of an electrical incident. Always disconnect the power source first.

FINAL WORD

Electrical repairs must be carried out only by persons who are qualified and authorized to do so. Makeshift repairs of electrical equipment have resulted in many deaths in the workplace. Remember, you are in danger of electrocution if testing and repairs are done incorrectly.