Preventing Electrocution



What’s at Stake?

Consider the following story…

A worker noticed condensation on the high voltage power supply while doing electrical maintenance in a hospital laboratory. With the power still on, he wiped the moisture with a tissue and made contact with the exposed terminal.

He received a severe electrical shock and second degree burns to his right thumb and abdomen. Witnesses stated they heard a loud “snap” and then heard the worker scream and stagger out to the hallway. He had no pulse and was not breathing. Medical personnel were nearby and able to restore his heartbeat using a defibrillator.

What’s the Danger?

Electrocution results when a person is exposed to a lethal amount of electrical energy. An electrical hazard can be defined as a serious workplace hazard that exposes workers to the following:

Burns **E**lectrocution **S**hock **A**rc Flash/Arc Blast **F**ire **E**xplosions

Therefore, you can remember to BE SAFE by recognizing, avoiding and protecting against these electrical hazards.

1. Contact with Power Lines – Overhead and buried power lines are especially hazardous because they carry extremely high voltage.

- Fatalities are possible as electrocution is the main risk; however, burns and falls from elevations are also hazards workers are exposed to while working near high voltage power lines.
- Workers may not realize that cranes are not the only equipment that reaches overhead power lines. Working on a ladder or in a man-basket suspended near power lines also poses a risk of electrocution.
- IMPORTANT! The covering on an overhead power line is primarily for weather protection; therefore, workers need to know that if they touch a power line, covered or bare, death is likely.

2. Contact with Energized Sources – The major hazards regarding contact with energized sources are electrical shock and burns.

- Electrical shock occurs when the body becomes part of the electric circuit.
- The severity and effects of an electrical shock depend on many factors, such as the pathway through the body, the amount of current, the length of time of the exposure, and whether the skin is wet or dry.
- Water is a great conductor of electricity, allowing current to flow more easily in wet conditions and through wet skin.
- If the power supply to electrical equipment is not grounded or the path has been broken, a fault current may travel through a worker's body.
- Even when the power system is properly grounded, electrical equipment can instantly change from safe to hazardous because of extreme conditions and rough treatment.

3. Improper use of Electrical/Flexible Cords – The normal wear and tear on extension and flexible cords can loosen or expose wires, creating a hazardous condition.

- Cords that are not 3-wire type, not designed for hard-usage, or have been modified, increase the risk of shock.
- Because they are exposed, flexible, and unsecured, they are more susceptible to damage than fixed wiring. Hazards are created when cords and their components are improperly used and maintained.
- When a cord connector is wet, electric current can leak to the equipment grounding conductor, and to anyone who picks up that connector if they provide a path to ground. Such leakage can occur not just on the face of the connector, but at any wetted portion.

How to Protect Yourself

1. Maintain a safe distance from overhead power lines. Before work begins, be sure the:

- Equipment/activity is located within a safe working distance from power lines.
- Utility company has de-energized and visibly grounded the power lines or installed insulated sleeves on power lines.
- Flagged warning lines have been installed to mark horizontal and vertical power line clearance distances.
- Tools and materials used are nonconductive.

2. Use ground-fault circuit interrupters (GFCI). GFCIs detect ground faults and interrupt the flow of electric current and are designed to protect the worker by limiting the duration of an electrical shock.

3. Inspect portable tools and extension cords. Workers need to inspect extension cords prior to their use for any cuts or abrasions.

- Extension cords may have damaged insulation. When the insulation is damaged, exposed metal parts can become energized if a live wire inside touches them.
- Flexible cords used with temporary and portable lights must be designed for hard or extra-hard usage and be marked with usage type, size and number of

conductors.

4. Follow lockout/tagout procedures. Lockout/tagout is an essential safety procedure that protects workers from injury while working on or near electrical circuits and equipment.

- In addition, lockout/tagout prevents contact with operating equipment parts such as, blades, gears, shafts, etc.
- Also, lockout/tagout prevents the unexpected release of hazardous gases, fluids, or solid matter in areas where workers are present.

Final Word

Recognizing electrical hazards and then taking appropriate measures to prevent and protect workers will help to avoid electrocution and electricity-related injuries.