

Toolbox Talk # 9.05 – Hazards of Electricity

Electricity is necessary to get work done at construction sites. However, with its benefits come deadly hazards you should be aware of and guard against when working with electrically-powered equipment or wiring. Primary hazards are shock and possible electrocution, burns, arc-blasts, explosions, and fires. Electricity travels in closed circuits; its normal route is through a conductor and load. You can get a shock when some part of your body becomes part of the circuit. An electric current enters your body at one point and exits at another.

Shock normally occurs when you touch:

- both wires of an electric circuit, or
- one wire of an energized circuit and ground, or
- a metallic part that is “hot” because it is contacting an energized wire and you are in contact with the ground.

The severity of the shock depends on three factors:

- how much current flows through your body (measured in amperes),
- what path the electric current takes through your body, and
- how long your body is part of the electric circuit.

The effects of an electric shock on your body can range from: a faint tingle at 1 milliamp, to cardiac arrest, severe burns, and probable death, at 10,000 milliamps.

A severe shock can also cause considerably more damage to your body than is visible. You can suffer internal bleeding and destruction of tissues, muscles, nerves, and internal organs. In addition, shock is often only the beginning in a chain of events. The final injury may be from a fall, cuts, burns, or broken bones. The most common shock-related injury is a burn. Burns suffered in electrical accidents are of three types: electrical burns, arc burns, and thermal contact burns.

Electrical burns — are the result of current flowing through tissue or bone, generating heat, and causing injury. They are serious injuries and should be given immediate attention.

Arc or flash burns — are the result of high temperatures near the body. They are produced by an electric arc or explosion.

Thermal contact burns — are those experienced when the skin contacts hot surfaces of overheated electric conductors, conduits, or other energized equipment. Additionally, clothing may be ignited in an electrical accident and a thermal burn will result.

Other injuries — of an indirect or secondary nature, caused by involuntary muscle reaction from the shock, can result in bruises, bone fractures, and even death resulting from collisions or falls.

Fire, explosion, and flying metal — hazards are created from resulting arcs when a short circuit occurs. If high current is involved, arcs can cause injury or start a fire. Extremely high-energy arcs can damage equipment, causing fragmented metal to fly in all directions. Even low-energy

arcs can cause violent explosions in atmospheres that contain flammable gases, vapors, or combustible dusts.

Construction workers can't do their job without electricity. However, constant activity at a construction site makes it a particularly hazardous environment. Extension cords, temporary wiring panels, water hoses, materials laying around, and constant use of electric tools, make it extremely important that you are careful around electricity. Your life may depend on it.

Toolbox Talk # 9.05 – Hazards of Electricity

Project: _____

Date: _____

Supervisor: _____

Company: _____

Other safety issues covered or comments from crew members:

Attendees:

| Name: (please print) | Signature: | Company: |
|----------------------|------------|----------|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |
| 6. | | |
| 7. | | |
| 8. | | |
| 9. | | |
| 10. | | |
| 11. | | |
| 12. | | |
| 13. | | |
| 14. | | |
| 15. | | |