



041: Hazards of Electricity

Some facts about electrical shocks

It takes only a small amount of current to kill you.

A circuit breaker won't protect you from electrocution. At 120V, just 6 mA can prevent you from being able to let go of a conductor. A 10A current through the body is likely to be lethal. It takes much more than that to trip a 20A breaker.

The longer you are in contact with the energy source, the more damage it will do to you.

A metallic object isn't effectively grounded just because it's attached to a ground rod. The grounding wire must be bonded to the same grounding system as the incoming power. Otherwise, you have a difference in potential between the object and ground. Current can and does flow across that potential.

It is possible for a circuit to be energized from somewhere other than where the drawing shows it to be. This can happen because of an error on the drawing, a backfeed situation, or connection to a second source—inadvertent or otherwise.

Prevention

Inspect portable cords prior to use. If a cord has tape on it—other than for marking,—remove it. If the cord is damaged, replace it. Tape cannot make up for the integrity loss of a damaged cord jacket. If the cord ends slide along the cord, replace the cord.

Route portable cords away from low spots near drains, water faucets, and other sources of water.

If running portable cords across walkways, run them in protective wireways.

Keep portable cords clean. Conductive grime, paint, solvents, grease, or magic marker can reduce the safety of the cord. Before plugging a dirty cord in, wipe it down with a damp cloth, and then dry it off with a second cloth.

Don't create an ionization trail across your hard hat. The hat is made from an insulating material. OSHA has limits on the amount of hardhat space you can cover with stickers. A rule of thumb is one on each side, one on the front, and one in the back. Dry transfer lettering, magic marker, and paint can create a conductive path across your hat.

Never assume something is de-energized. Always measure. A "wiggy" may indicate a safe situation when conditions are actually dangerous. The standard rule is "Check your meter, check the object, check your meter." This means you measure a known source, such as a 120V receptacle, to ensure the meter is measuring. Next, measure the object, and then re-check the meter.

Make sure your meter has the right safety classification for what you are doing. For example, if you are working on a 480V panel inside a building, you should probably be using a meter rated at Category II, 600V. For most contractors, Category II is the minimum. Category I is for electronic work. Ensure the test leads are in good condition—replace them if they are not, and cut up the old ones.

Use only one hand for attaching or removing test leads. This reduces the likelihood of being shocked across the heart, and it eliminates causing an ionization trail between the leads.

Discussion leader duties for this session:

Obtain a damaged extension cord for one part of the demonstration and a meter and receptacle for the other.

What this Safety Talk covers:

Electrical shocks and how to prevent them.

Discussion notes :

