

1. Change behaviors.
2. Challenge ourselves to re-think how we work.
3. Certify the results on a daily basis.



Tool Box Talk

Week of May 16th, 2011

Electrical Safety

This is the third in the series of May's Electrical Safety Tool Box Talks. The goal of the second Tool Box Talks is to review the unseen power of electrical energy and discuss the two main ways to prevent injury.

We know that the principal danger of electricity is electrocution, a leading cause of fatal injuries. Understanding just how small the quantity of electrical energy is required for electrocution allows us to respect electricity's power. The current drawn by a tiny 7 watt, 120-volt lamp is 6/100th of an amp. This small current passed from hand to hand or hand to foot across the chest is sufficient to cause electrocution. In some situations even less current can be fatal; for example, if the shock is received while standing in water or the victim is sweating.

The extent of electrical injuries received depends on the current's magnitude, measured in Amps; the pathway of the current through the body (particularly the heart); the duration of current flow through the body; and the timeliness and quality of emergency medical treatment.

However, once we're exposed to the shock - there is no way for us to control the amperage, the pathway of the current through the body, or how long the current will flow through the body. Thus, the ultimate safety effort would be to first prevent electrical contact with live electrical parts and secondly use GFCI's when required.

- 1) Prevent Contact - when you see exposed electrical wires or devices (uncovered breaker panel or work box) contact a qualified electrician. Always inspect extension cords, tools and lights before applying power or have a qualified electrician conduct inspections.
- 2) GFCI's are required when temporary wiring (extension cords or temporary receptacle power) is used. The GFCI's trip at a fault current far less than the power that would injure a worker. Therefore, test the GFCI via the test button to ensure it works if needed – it can save your life.

A GFCI's purpose is to constantly measure the current difference between the current carrying conductors which are the Black and White wires. When that difference of 5/1000th of an amp is detected, the GFCI trips in about 1/40th of a second (one heartbeat) to disconnect power. That can save a life by preventing the 5/1000th of an amp (or greater amperage) from entering our body. For example, if an ungrounded drill develops a high resistance short to its frame, this typically will not trip a standard 20 amp breaker and certainly has the power to be fatal.

What about double insulated tools? Because GFCI's work by measuring the current difference between the Black and White wires – GFCI's will protect us when using double insulated tools. Note, that Circuit Breakers offer very limited protection as they are designed only to protect the equipment and wiring, not workers. **Prevent Contact, inspect electrical equipment, test GFCI's, and respect electrical power.**