

ELECTRICAL SAFETY

Safety Training For The Non-Qualified



LANGUAGE OF ELECTRICITY

- ◆ Electricity: Negatively Charged Particles Moving Over A Conductor
- ◆ Current: Movement Of Electrons Along A Conductor
- ◆ Ground Or Grounding: The Draining Or Passage Of Electricity Into The Earth

LANGUAGE OF ELECTRICITY

- ◆ Alternating Current: Current That Alternates Direction Through A Conductor
- ◆ Direct Current: Current That Flows In The Same Direction Through A Conductor
- ◆ Static Electricity: Electrical Charge Resulting From Friction Between Two Objects Or From Objects Striking

LANGUAGE OF ELECTRICITY

- ◆ Shock: Condition When The Body Becomes A Part Of A Circuit
- ◆ Polarity: The Flow Of Electrons In The Proper Direction (From The Source To The Device Or Negative To The Positive Through A Device)

HOW DOES ELECTRICITY WORK?

- ◆ Like Charges Attract; Unlike Charges Repel
- ◆ Electricity: Negatively Charged Particles (Electrons) Moving Over A Conductor
- ◆ Conductor: A Material With A Relatively Low Resistance To The Flow Of Electrons
- ◆ Insulator: Material That Has A High Resistance To The Flow Of Electrons

HOW IS THE SERIOUSNESS OF AN ELECTRICAL SHOCK DETERMINED?

- ◆ The Voltage (Pressure) On Circuit
- ◆ Skin Resistance And Internal Resistance
- ◆ Amount Of Current Flowing Through The Body, A Function Of Volts And Amps
- ◆ Path The Current Takes
- ◆ Body's Reaction To The Shock
- ◆ Length Of Time Electricity Is Applied

WHAT CAUSES SHOCKS?

- ◆ Touching Both Wires Of An Electrical Circuit
- ◆ Touching One Energized Wire And A Ground Conductor
- ◆ Touching The Case Of A Faulted Or “Short” Circuited Appliance Or Machine

EFFECTS OF ELECTRICAL SHOCK

- ◆ Volts Divided By Resistance in Ohms = Current In Amps
- ◆ 120 Volts Divided By 100,000 Ohms = 0.0012 Amps Or 1.2 Milliamps
- ◆ 1.2 Milliamps Is Perception Threshold
- ◆ 10-20 Milliamps Is Painful; Let-Go Threshold; Can Kill In Time
- ◆ 100 Milliamps Can Kill In A Second; Can't Let Go
- ◆ 200 Milliamps Kills; Causes Heart Fibrillation; Burns Human Flesh

MEASURING ELECTRICITY

- ◆ Volts: A Measurement Of Electrical Pressure
- ◆ Watts: A Unit Of Electrical Power
- ◆ Amperes: A Measurement Of The Volume Of Electrical Current
- ◆ Ohms: Measure Of The Resistance To The Flow Of Electrons

ELECTRICAL SAFETY DEVICES

- ◆ Insulation
- ◆ Ground Fault Circuit Interrupters (GFCIs)
- ◆ Double-Insulated Devices
- ◆ Grounding (Circuit And Equipment)
- ◆ Guarding
- ◆ Fuses And Circuit Breakers
- ◆ Personal Protective Equipment

SAFE WORK PRACTICES

- ◆ Know Where The Hazards Are
- ◆ Properly Maintain Equipment
- ◆ No Exposed Parts Or Energized Surfaces
- ◆ Use Barriers And Devices Where Appropriate
- ◆ No Conductors To Walk On Or Trip On
- ◆ No Jewelry, Or Other Metal Objects Around Electricity

SAFE WORK PRACTICES

- ◆ Never Use Plugs Or Receptacles That Can Alter Polarity
- ◆ Properly Plug All Connecting Plug-Ins
- ◆ Install And Use Protective Devices
- ◆ Stay Away From All Unguarded Conductors
- ◆ Never Overload A Circuit Or A Conductor

WORKING SAFE WITH CORDS

- ◆ Inspect Cords Before Each Use
- ◆ Be Sure Plug And Receptacle Have Proper Mating Configuration
- ◆ To Unplug, Never Pull On The Cord, Pull On The Plug
- ◆ Don't Use Nails, Staples, Screws, Etc, To Attach Or Fasten A Cord Or Plug

WORKING SAFE WITH CORDS

- ◆ Two Conductor Cords Are Illegal
- ◆ Damaged Cords Should Never Be Used
- ◆ Ensure Enough Slack To Prevent Strain On Plug Or Receptacle
- ◆ A Plug-Receptacle Should Have At Least 8 Ounces Of Contact Tension

WORKING SAFE WITH CORDS

- ◆ Cords Should Be Kept Clean And Free Of Kinks And Insulation Breaks
- ◆ Cords Crossing Vehicular Or Personnel Passageways Should Be Protected, Sign Posted, And Used Temporarily Or In An Emergency
- ◆ Cords Should Be Of Continuous Length And Without Splices

IF ELECTROCUTION OCCURS

- ◆ **DO NOT** Touch The Victim Or The Conductor
- ◆ Shut Off The Current At The Control Box
- ◆ If Shutoff Not Immediately Available, Use Non-Conducting Material To Free Victim
- ◆ Call For Help
- ◆ If Necessary And You Know How, Begin CPR
- ◆ In Dealing With Electricity, Never Exceed Your Expertise

CONTROL OF CIRCUITS

- ◆ Only Switches And Breakers Designed To Do So May Be Used To Control Current
- ◆ Only Approved Equipment May Be Used In Wet Or Damp areas. Always Use GFCI
- ◆ Never Energize Equipment When Shields Or Guards have Been Removed
- ◆ Always Honor LockOut/TagOut Situations

BEST ADVICE

Treat Electricity With
The Respect It Demands,
And It Will Serve You
Efficiently And Effectively