

*Ampere* or *Amp:* The unit of *electrical current* (flow of electrons).

• One *milliamp (mA)* = 1/1,000 of 1 Amp.

*Conductors:* Materials, such as metals, in which electrical current can flow.

*Electrical Hazards* can result in various effects on the body, including:

- **Shock** The physical effects caused by electric current flowing in the body.
- *Electrocution* Electrical shock or related electrical effects resulting in death.
- **Burns** Often occurring on the hands, thermal damage to tissue can be caused by the *flow of current* in the body, by *overheating* of improper or damaged *electrical components*, or by an *arc flash*.
- **Falls** A common effect, sometimes caused by the body's reaction to an electrical current. A non-fatal shock may sometimes result in a fatal fall when a person is working on an elevated surface.

**Exposed live parts**: Energized electrical components not properly enclosed in a box or otherwise isolated, such that workers can touch them and be shocked or killed.

Some of the common hazards include: missing knockouts, unused openings in cabinets and missing covers. Covers must not be removed from wiring or breaker boxes. Any missing covers must be replaced with approved covers.

*Insulators:* Materials with high electrical resistance, so electrical current can't flow.

*Lockout/Tagout:* The common name for an OSHA standard, *"The control of hazardous*"

energy (lockout /tagout)." **Lockout** is a means of controlling energy during repairs and maintenance of equipment, whereby energy sources are *de-energized*, *isolated*, and then *locked out* to prevent unsafe start-up of equipment which would endanger workers.

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*Lockout* includes – but is not limited to – the control of electrical energy. *Tagout* means the placing of warning tags to alert other workers to the presence of equipment that has been locked out. Tags alone <u>do not lock out</u> equipment. **Tagout is most effective when done in addition to lockout.** 

**Ohm** or  $\boldsymbol{\Omega}$ : The unit of *electrical resistance* (opposition to current flow).

**Ohm's Law**: A mathematical expression of the relationship among *voltage* (volts), *current* (amps) and *resistance* (ohms). This is often expressed as:  $\mathbf{E} = \mathbf{I} \times \mathbf{R}$ . In this case, E =volts, I = amps and R = ohms. (The equation, Amps = Volts <u>divided by</u> Ohms, as used in this curriculum, is one form of Ohm's Law.)

**Volt**: The unit of *electromotive force (emf)* caused by a *difference in electrical charge or electrical potential* between one point and another point. **The presence of voltage is necessary before current can flow in a** *circuit* (in which *current* flows from a *source* to a *load* – the equipment using the electricity – and then back to its source).

*Wet Conditions:* Rain, sweat, standing in a puddle – all will decrease the skin's electrical resistance and increase current flow through the body in the event of a shock.

Have a qualified electrician inspect any electrical equipment that has gotten wet before energizing it.

