Electrical Safety

Keene State College Policies and Procedures

Electrical Safety

Section Menu

General Electrical Safety

Keene State College has licensed electricians or electrician’s apprentice level employees on site to perform electrical repair work of all kinds, from installing outlets to troubleshooting tripped switches. Typically, KSC employees do not work on systems greater than 120 volts, as found in most offices or residence halls, although some equipment motors on campus may operate at 440 volts. Work on systems at higher voltages is typically performed by outside contract personnel. Electrical department employees also are responsible for lock out tag out of equipment with an electrical power source.

The danger of injury through electrical shock is possible whenever electrical power is present. When a person’s body completes a circuit and thus connects a power source with the ground, an electrical burn or injury is imminent. Most fatal injuries result from high-voltage exposure; however, people can sustain severe injuries from low voltage power if it has a high current flow. Electrical safety is important in every work environment. The following sections cover circuit breaker loads, electrical grounding, electrical safety guidelines, and electrical emergency response.

Definitions

Amps. The standard unit for measuring electrical current.

Watts. A unit of electrical power, equal to the power developed in a circuit by a current of amp flowing through a potential difference of one volt.

Voltage. Electromotive force expressed in volts.

Circuit Breaker. A device that automatically interrupts the flow of an electrical current.

Electrical Panel. An listed panel on which electrical wires are mounted and interconnected circuits are mounted.

Current Flow. The rate of flow of an electrical charge, generally expressed in amps.

Electrical Load. The amount of power delivered by a generator or carried by a circuit. A device to which the power is delivered.

Ground-Fault Circuit Interrupter (GFCI). A GFCI detects grounding problems and shuts electricity off to prevent a possible accident.

High Voltage. The term high voltage applies to electrical equipment that operates at more than 600 Volts (for terminal to terminal operation) or more than 300 Volts (for terminal to ground operation). Low voltage, high current AC or DC power supplies are also considered to be high voltage.

Hazardous Energy Sources. This term applies to stored or residual energy such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure.

Lockout. The placement of a lock on an energy-isolating device. This act prevents workers from operating a piece of equipment until the lock is removed.

Tagout. The placement of a tag on an energy-isolating device. A tagout device is a prominent warning device of a lockout.

Energy-Isolating Device. A mechanical device that prevents the transmission or release of energy. Examples include the following:

1. Manually operated circuit breakers
2. Disconnect switches
3. Line or block valves

- Pushbuttons, selector switches, and other control circuit devices do not isolate energy.
- Energy-isolating devices should be lockable by means of a hasp or other type of attachment. It should not be necessary to dismantle or reassemble

a device to lock it.

Authorized Employee. A person who locks out or tags out equipment for service or maintenance. Authorized employees have been formally trained in proper lockout/tagout procedures.

Circuit Breaker. Most office and laboratory locations have 20 amp circuit breakers that serve two or more outlets. These breakers can handle most office equipment; however, the widespread use of personal computers and associated hardware can create an electrical overload. To determine your current electrical load, follow these steps:

1. Check office/laboratory equipment for a manufacturer's rating label that indicates total watts or amps. Take special care to check appliances that use electricity to generate heat.
2. Convert the watts rating to amps: Amps = Watts ÷ 120 Volts
3. Total the amps for each circuit.
4. If the total equals more than 15 amps per 20 amp circuit, you may be overloading the circuit. Move enough equipment to a different circuit to reduce the circuit load; otherwise, have the Physical Plant inspect the circuit wiring.

Electrical Grounding

Proper electrical grounding can help prevent electrical injury. Most electrical equipment is grounded with either a three-prong plug or a two-prong plug and insulation. Because a grounding system may be defective without your knowledge, use a GFCI to ensure electrical safety. GFCIs are required in moist or potentially damp environments.

Electrical Panels

Electrical panels or breaker boxes require special safety considerations, including the following:

- Know where your panel box is located.

- Ensure that breaker circuits are accurately labeled within panel boxes.
- Ensure that panel box doors are securely attached.
- Do not block panel boxes. There should be at least 30 inches of clear space in front of a panel box.
- Report tripped breakers and refer any electrical questions to the Physical Plant.

Electrical Safety Guidelines:

- Be familiar with the electrical hazards associated with your workplace.
- Unplug electrical equipment before repairing or servicing it.
- If a prong breaks off inside an outlet, do not attempt to remove it yourself. Call the Physical Plant for assistance.
- Ensure that outlets are firmly mounted. Report loose outlets to the Physical Plant.
- Report all electrical problems, including tripped breakers, broken switches, and flickering lights, to the Physical Plant.
- All appliances used in UTA buildings must be UL or FM (Factory Mutual) labeled.
- Do not use an appliance that sparks, smokes, or becomes excessively hot, unless the appliance is specifically designed to exhibit these characteristics.
- Portable electrical heaters must be placed to avoid causing a trip hazard must be kept away from combustible material. Never leave a heater unattended. Unplug the heater at the end of the day or when not in use. Heaters have a high amperage draw, and may very well overload the circuit. If you want to use a portable heater, contact the Physical Plant Electrical Department.
- Keep electrical equipment away from water, unless the appliance is specifically designed for use around water, such as a wet-dry shop vacuum.
- Use GFCIs whenever possible.
- Be aware of overhead power lines when working with tall equipment (e.g.,

grain augers, cranes, sailboats, etc.).

- Follow lockout/tagout procedures, as appropriate.

Electrical plug and cord safety:

- Do not remove the prongs of an electrical plug. If plug prongs are missing, loose, or bent, replace the entire plug.
- Do not use an adapter or extension cord to defeat a standard grounding device. (e.g., Only place three-prong plugs in three-prong outlets; do not alter them to fit in a two-prong outlet.)
- Use extension cords only when necessary and only on a temporary basis.
- Do not use extension cords in place of permanent wiring.
- Request new outlets if your work requires equipment in an area without an outlet.
- Use extension cords that are the correct size or rating for the equipment in use.
- The diameter of the extension cord should be the same or greater than the cord of the equipment in use.
- Do not run electrical cords above ceiling tiles or through walls.
- Keep electrical cords away from areas where they may be pinched and areas where they may pose a tripping or fire hazard (e.g., doorways, walkways, under carpet, etc.)
- Avoid plugging more than one appliance in each outlet. If multiple appliances are necessary, use an approved power strip with surge protector and circuit breaker.
- Do not overload the circuit breaker.
- Discard damaged cords, cords that become hot, or cords with exposed wiring.
- Never unplug an appliance by pulling on the cord; pull on the plug.

Electrical Emergency Response

The following instructions provide guidelines for handling three types of

electrical emergencies:

1. Electric Shock:

When someone suffers serious electrical shock, he or she may be knocked unconscious. If the victim is still in contact with the electrical current, do not touch the victim but immediately turn off the electrical power source. If you cannot disconnect the power source, try to separate the victim from the power source with a nonconductive object, such as a wood-handled broom, or clothing made into a sling.

IMPORTANT: Do not touch a victim that is still in contact with a power source; you could electrocute yourself. Have someone call for emergency medical assistance immediately. Administer first aid, as appropriate.

2. Electrical Fire:

If an electrical fire occurs, try to disconnect the electrical power source, if possible. If the fire is small, you are not in immediate danger, and you have been trained in fighting fires, use any type of fire extinguisher except water to extinguish the fire.

IMPORTANT: Do not use water on an electrical fire.

3. Power Lines:

Stay away from live power lines and downed power lines. Be particularly careful if a live power line is touching a body of water. The water could conduct electricity. If a power line falls on your car while you are inside, remain in the vehicle until help arrives.