



Electrical Safety Training Program

Part of the Avitus Group 5-in-1
Safety Training Series



AVITUS GROUP[®]
Simplify, Strengthen and Grow Your Business

Introduction

Section 1: Introduction

Section 2: Safe Work Practices

Section 3: Special Environments

Contact Information

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The materials and accompanying video provide general information on the subject with practical application for use in the workplace. These materials are designed to increase education and awareness to help the learner identify situations when they need to get their supervisor or employer involved. It is the on-site employer's responsibility to make sure the employees are trained in proper safety practices and that those practices are followed. Avitus Group always recommends contacting a certified Safety professional and/or legal counsel that specializes in the Safety laws specific to your state.

Safety laws and regulations change often at the federal, state, and local level, therefore some information may not be current. Because of the constant changes to the law, these materials repeatedly recommend contacting your Safety department or your Avitus Group representative for help.

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Our purpose: Fast, effective, and practical training that improves productivity in the workplace.

Tips: Each section only take a few minutes. If multiple section are to be covered, keep the fast pace going. First watch the video content for the selected section. Stop the video and answer the questions at the end of the section. If watching in a group, each learner should answer the questions in the manual first and then discuss the answers with the group.

SECTION 1

Introduction

The Basics of Electricity

Current is the flow of electricity and it is measured in amps. Most residential and commercial lines can safely carry 15 to 20 amps. Industrial electrical lines routinely carry 125 to 145 amps.

Volts measure the force behind the flowing current. Most power tools and appliances in the home run on 120 volts. The greater the voltage, the greater the danger.

Electricity flows when a loop is formed, which electricians call a circuit. Only when the loop or circuit is completed can machinery be energized.

The "on" and "off" switch on a machine interrupts the loop of electricity.

A fuse or circuit breaker can protect property from too many appliances demanding power on a single circuit. It can also protect property from power surges and lightning strikes.

Any attempt to override this system by installing higher rated breakers or fuses or taping or blocking a breaker in the open or "on" position is very dangerous.

When people tamper with these safe-guards they are literally putting their lives and the lives of others in danger.

If a breaker has tripped while you are working on a machine, contact your supervisor or a maintenance employee to determine WHY the breaker tripped. Failure to do so will likely result in repeated tripping, and may lead to a shock.

If there's a change in the flow causing the breaker to trip, there's likely a larger problem in the loop, or circuit which needs to be evaluated by a professional.

It's also important to remember that stray electricity will always head toward the ground so the electrical charge can be neutralized. If you are in the path of the electricity, this could result in a serious shock.

Controlled grounding allows for a safe alternative to direct stray electricity to the ground.

If electricity leaks through cracked or defective wiring, the ground wire will direct the electricity back to the ground through a safe path. The ground wire on an electrical plug is the round third prong and if any part of the plug is bent or damaged, it needs to be professionally repaired, replaced, or discarded before further use.

Outlets within 6 feet of a water source or in high hazard areas, should be fitted with a Ground Fault Circuit Interrupter, often referred to as a GFI or GFCI. These devices immediately shut off the flow of electricity when it senses a change in the strength of the electrical circuit.

SECTION 1

Questions

QUESTION: How many amps can most residential and commercial electrical lines safely carry?

QUESTION: Explain why you should never tamper with safe-guards like fuses and breakers.

SECTION 2

Safe Work Practices

Electrical hazards are capable of producing fires, shocks, and burns.

Many accidents occur as a result of poor or faulty wiring. Before plugging in a piece of equipment, inspect the wires.

Is the wire coating in good condition?

Look closely at the plug.

Is the connection between the plug and wire in good condition?

Plugs and wires are often damaged due to improperly removing the plug from the outlet. Instead of carefully removing the plug from the outlet by grabbing the plug, people will pull on the wire and snatch the plug out of the outlet.

Plugs with multiple outlets can lead to the circuit drawing too much electricity, which can lead to an electrical overload. This can cause wires to heat up, and significantly increase the risk of an accidental fire.

Extension cords are designed only for temporary use and should never be used in place of proper wiring. Inspect your extension cords before and after each use to make sure they are still in good shape. Keep in mind that extension cords will eventually wear out depending on how often they are used, where they are used, and how they are stored.

Never alter three pronged plugs to fit into a two pronged outlet. Adapters for a two pronged plug can be used, but only if the adapter is properly connected to a ground wire.

Always use double-insulated tools.



Pay close attention to the performance of any machines or tools you are using. Sometimes a machine can be functional, but may show warning signs of deeper problems:

A machine that doesn't normally spark may emit an occasional spark.

A machine may emit a burning smell or a wisp of smoke.

A machine may have an unusual vibration or unusual sound.

Any of these warning signs may be an indication that the circuit is overloaded and is in need of repair. This should be reported to your supervisor and the maintenance team immediately.

Never attempt to fix or research the problem yourself.

SECTION 2

Questions

QUESTION: How can you tell if a tool is double-insulated?

QUESTION: Briefly explain the lockout/tag out process.

SECTION 3

Safe Work Practices

Let's talk a moment about special environments.

Water

Water and electricity can be a deadly combination and should be avoided at all costs. Never plug in a cord that is wet and never touch an outlet if YOU are wet.

All water should be removed prior to beginning work. Make sure that the area is bone dry before turning on machinery or plugging in tools.

Use double insulated tools or those with a ground fault circuit interrupters or GFI's.

Confined Spaces

Confined spaces can be cramped and dangerous, especially where live wires and electrical hazards are present. Take a good look into the area before venturing in.

Is it well lit?

Is there water present?

If you have any doubt about entering a confined space where electricity may be present, contact your supervisor for help.

Powerlines

Metal ladders should never be used when working near power lines, electrical wires, or energized machinery parts, regardless of voltage.

The metal can conduct stray electricity straight to your body and could cause a shock. Use a fiberglass or wooden ladder.

Always look around your work environment and know what is there, whether inside or outside.

If you are not designated a "qualified" employee to work around exposed power lines, you and any object that you are holding should never come within the "Minimum Safe Approach Distance" of the power lines.

These clearance distances also apply to vehicles that may come near overhead lines.

Voltage Range (Phase to Phase)	Minimum Safe Approach Distance (Feet) (Meters)	
0 to 300 V	Avoid Contact	
Over 300 V to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72

SECTION 3

Safe Work Practices

Flammables

In areas where flammable liquids or atmospheres exist, it is especially important that the proper tools are selected for the job.

If equipment is being used in an area where a flammable liquid or gas has been exposed, do not turn equipment on or off, as this could result in an electric arc.

Wait until the atmosphere is clear of flammable vapors before using any electrical equipment.

SUMMARY: Electricity flows in a loop or a circuit and you never want to be a part of that loop.

Fuses and breakers prevent damage from changes to the flow of electricity. Blown fuses tripped breakers signal there is a problem within the circuit.

Always inspect cords and plugs to make sure they are not damaged.

Avoid overloading a circuit with too many devices.

Use extension cords correctly.

Use double-insulated tools whenever possible.

When you suspect a machine or tool isn't functioning properly, contact your supervisor or maintenance so it can go through lockout/tag out and be repaired.

Be aware of your environment.

Water and electricity are a deadly combination.

Always look for electrical lines and keep yourself, your tools, and your vehicles safely away.

If there are flammable liquids or gases present, do not turn on anything that uses electricity.

Live follow up Q & A is available for this training. Just call **1-800-454-2446** or visit our website to learn more.

QUIZ

Electrical Safety

Questions

Multiple Choice, 10 points

1. Current is the flow of electricity and is measured in:

- Volts Inches
 Amps Lumen's

True/False, 10 points

2. Very little current is required to cause a serious injury.

- True False

True/False, 10 points

3. A circuit is completed when electricity runs from the power source to the machine or appliance and back to the power source creating a loop.

- True False

True/False, 10 points

4. If a defective tool leaves you vulnerable to shock, a ground fault circuit interrupter will shut down the flow of electricity.

- True False

True/False, 10 points

5. Repeatedly unplugging a piece of equipment by "yanking" out the plug will not harm the plug or cord.

- True False

QUIZ

Electrical Safety

Questions

True/False, 10 points

6. It is acceptable to remove the round grounding pin on a three-pronged plug to allow it to fit into a two-pronged outlet.

True False

Multiple Choice, 10 points

7. The lockout/tag out procedure includes taking which of the following steps?

- Disconnect the power source. Apply a lock to the on/off switch or at the breaker box.
 Test the machine to make sure it is completely off. All of the above.

True/False, 10 points

8. Electricity running through wires is always illuminated and easy to see.

True False

Multiple Choice, 10 points

9. Due to its conductive nature, which of the following types of ladders should not be used around power lines because ladder contact with the lines can lead to electrocution?

- Fiberglass Wooden
 Metal None of the above

Multiple Choice, 10 points

10. Water and _____ are a deadly combination that should never be mixed.

- Electricity Static energy
 Baking soda Sodium

