

TITLE: 9513 HIGH IMPACT ELECTRICAL SAFETY

VIDEO PLAYING TIME: 19 MINUTES **YEAR PRODUCED:** 1995

PROGRAM SYNOPSIS:

Three- fourths of all electrical accidents result from human error. Electricity knows only one route: the shortest path to ground. To prevent becoming a part of this path, persons working with electricity must have the proper training and have adopted good safety practices before performing any job task.

Accident victims in the video make a variety of mistakes that lead to serious injuries. Some workers, including John Combs, Sherill Foster and Mark Gilliams are not qualified to attempt specific electrical repairs. The results are tragic. Other employees, such as Melton Bush and Jarvis Bunt, simply ignore safe work practices and get electrocuted.

Viewers will see what can happen to them after watching these dramatic re- creations of real life events They will then choose safe work practices.

SHOOTING LOCATIONS: Utility plants, machine shops and a variety of industrial settings.

PROGRAM OBJECTIVES:

After watching the program, the viewer will be able to identify the following:

- * Proper work practices that should have been followed to prevent the accidents that occur in the video;
- * Sources of problems that lead to electrical mishaps;
- * Reasons why only qualified electricians should perform certain job tasks.

PROGRAM COMPONENTS: Videotape and leader's guide

INSTRUCTIONAL CONTENT:

Ten accidents are re- created in the video to show the causes and effects of mishandling electrical currents. After the viewer is shown the circumstances surrounding each accident and the accident itself, the video offers the lessons that employees should learn.

LESSONS TO BE LEARNED

- * Only qualified electricians may install, repair and maintain electrical equipment.
- * Electrical power sources must be de- energized and locked out before repair.
- * Qualified electricians must take the adequate measurements to certify a circuit as de- energized.
- * Proper distances must be maintained from energized tools and equipment according to their voltage level.
- * Proper grounding of leads in a plug must be achieved after recognizing its polarity.

LESSONS (continued)

- * All ground pins must be in place and in good condition before a tool or drop cord is used.
- * Never use defective electrical equipment. Lock and tag it out and have a qualified repair person service it.
- * Only qualified electricians should replace fuses.
- * Insulated ladders must be used in electrical work.
- * Qualified electricians must understand hazards and always identify the special requirements for each electrical job.
- * Never take short cuts when working with electricity.
- * Always follow company policy during electrical repair.

The video also offers specific distances and voltage regulations for electrical work situations.

9513 HIGH-IMPACT ELECTRICAL SAFETY

SYNOPSIS OF ACCIDENTS

ACCIDENT 1

Unqualified Worker Causes Explosion

John Combs and Sherrill Foster were maintenance workers, but not qualified electricians. They volunteered to re-set the circuit on the main chiller; it had been tripping for several days. It exploded violently. Neither John nor Sherrill had any understanding of the possible consequences of their actions. John was killed and Sherrill suffered serious burns.

SAFETY TIPS: *You must be a qualified electrician to install, repair or maintain electrical circuits and equipment. You must know the construction, operation and hazards of each piece of equipment to be serviced.*

ACCIDENT 2

Failure to Lockout Production Heater Results in Death

Charles Sweet, maintenance electrician, worked on a 440-volt, 200-amp electric heater on a production machine number 2. He turned off the power but did not lock it out. His supervisor came to help find the problem and inadvertently threw the disconnect switch on as he passed by. Charles was killed instantly.

SAFETY TIPS: *Lockout of electrical power sources is vital to electrical safety; it's also required by OSHA.*

ACCIDENT 3

Failure to Communicate Accurately and De-Energize Circuits Results in Injury

Two maintenance electricians and their foreman were troubleshooting a 277-volt emergency lighting circuit. The foreman was flipping breakers on and off to try to locate the problem circuit. The men were in communication by radio. One of the men received a nasty shock and the other was electrocuted.

SAFETY TIPS: *While communication can be difficult, it is vital when performing electrical work. Before circuits can be considered de-energized, they must be checked by a qualified electrician. Controls must be placed in the on position for trial and returned to "off."*

ACCIDENT 4

Inadequate Distance from Power Lines Leads to Death

The mechanical crew from the maintenance department was in the process of upgrading the waste treatment system. The job on the system was to be completed at night. Before moving a crane beneath the 13,800-volt lines to the site to finish the job, the crew calculated the clearance height. But because they did not calculate the distance accurately in the darkness, the boom of the crane hit the wire. They also did not take into consideration the need to maintain a minimum 10-foot safe working distance around overhead lines. Consequently, a series of secondary accidents occurred that resulted in one death and the destruction of the nearby service truck.

SAFETY TIPS: *You must be qualified to work near electrical hazards and be aware of proper clearance distances. You should understand that crane booms, metal pipes, scaffolds and ladders can become electrical conductors.*

ACCIDENT 5

Ignorance of Proper Tool Grounding Results in Death

Jarvis Bunt decided to repair an extension cord that he and Alvin Potter had ran over with their forklift. Jarvis found a new end piece and put it on the cord, but was not aware that the wires must be connected to specific terminals. He connected the hot wire to the ground terminal. When Alvin used the cord to power a skill saw about 30 minutes later, he was electrocuted and the saw blade buried in his leg.

SAFETY TIPS: *You must be qualified to do any electrical job. Jarvis was not qualified to repair the cord. He did not understand why each of the three wires must be connected to a specific terminal.*

ACCIDENT 6

Removed Ground Pin Causes Electrocution

Ralph Watson, an electrician, and Herbert Clease were re-routing an old electrical conduit in the plant. Herbert used three extension cords to get power for the portable band saw that Ralph would use in cutting the overhead conduit. Herbert broke off a bent ground pin on the plug connecting the cords to the receptacle. When Herbert saw that Ralph was in trouble with the saw, he unplugged the cord and Ralph fell. His harness prevented his body from hitting the ground, but the electricity from the defective saw had already killed Ralph.

SAFETY TIPS: *Electricity will always seek the easiest path to ground. If the ground pin had been in place, the electricity that killed Ralph would have been safely taken to ground through the ground path provided by the cord.*

ACCIDENT 7

Ignoring Safe Work Practices Results in Electrocution

Melton Bush was using a portable electric welder in the machine shop to repair a broken piece on one of the machines. He knew the plug on the welder was broken, but he did not take the time to have it fixed or replaced. He thought it would surely work one more time. When he plugged it in, a short circuit occurred and he was electrocuted.

SAFETY TIPS: *Never used defective electrical equipment. Always mark or tag the items as defective and notify your supervisor so another person will not unknowingly place himself in danger.*

ACCIDENT 8

Safety Glasses Prevent Eye Injury

Mark Gilliams was an experienced lathe operator who never had an accident. When the lathe stopped working one day, he decided the cause was a blown fuse. Instead of shutting off and locking out the lathe's power supply, he went right to work by opening the control box. When he used his screwdriver to open the box, it contacted a hot terminal and shorted out to the side of the control box. The short caused an explosion which showered particles into Mark's face. Because he was wearing his safety glasses, he was uninjured in the incident.

SAFETY TIPS: *You must be a qualified electrician to work on electrical equipment. Mark was not qualified to check and replace fuses on his machine. He also did not de-energize the lathe and lock it out. Fortunately, Mark's safety glasses protected his eyes from the flash and slag created by the accident.*

ACCIDENT 9

"Rookie Mistake" Leads to Shock and Injury

Jim Cannon, a maintenance electrician, needed to work on the 110-volt power drop suspended above a work station. Since the job wouldn't take long, he decided to use the aluminum ladder in the area instead of the approved fiberglass type. His screwdriver contacted a live wire and the ladder provided a path to one of the machines it was touching. Jim received a shock and was knocked off the ladder, but fortunately escaped serious injury.

SAFETY TIPS: *Always use equipment and tools required for the job at hand; metal ladders and electrical work do not mix. His knowledge of ladder safety rules should have told Jim not to stand above the last safe step on the ladder. Also, he should have de-energized the circuit before attempting repair.*

ACCIDENT 10

Paint Booth Explosion Results in Death

Warren Costino and his assistant were troubleshooting the paint booth lights when Warren's explosion-proof flashlight failed. His assistant retrieved the nearby 110-volt work light that was not intended for use in potentially explosive atmospheres. Warren, who helped write company policy regarding non-sparking equipment, ignored his own procedures when he decided to use the work light. When the light dropped, the unprotected bulb exploded and ignited the paint vapors. Warren died when he was engulfed in flames, his assistant was badly burned, and much of the plant was destroyed as a result.

SAFETY TIPS: *To be qualified, you must understand the hazards associated with the environment in which you are working. Warren did not use his knowledge of special requirements for working in the paint booth to protect himself and his assistant. Even if you are qualified to do electrical jobs, you must follow all correct work procedures.*