

Missouri Occupational Fatality Assessment and Control Evaluation (MO FACE)

Cable Television Installer Electrocuted When Cable Wire Contacts 7,200-Volt Powerline

MO FACE INVESTIGATION 98MO042

Date: October 30, 1998

Type: Electrocution

SUMMARY:

On April 13, 1998, a 24-year-old male cable television (CATV) installer (the victim) was electrocuted when the cable wire he was holding contacted a 7,200-volt powerline. The victim was in the process of installing CATV to a customer. The incident site contained two sets of powerline poles. Line #1 was a single 7,200-volt primary line, with a single neutral. Line #2 was a secondary line that ran adjacent to the primary line on a separate set of poles. It contained a 120/220 volt line, a telephone line and the CATV trunk line. The vertical height of the trunk line on Line #2 was slightly higher than the neutral wire on the Line #1. In order to get the cable wire to the customer it had to cross between the primary 7,200 volt powerline and neutral. The victim had climbed Line #2 pole utilizing a ladder and the installed climbing pegs and secured himself with his safety strap. He was attempting to pass the cable wire between the primary and the neutral when the end of the cable wire contacted the primary line. The victim was immediately electrocuted.

The MO FACE investigator concluded that in order to prevent similar occurrences, all employers should:

- adopt company policies that comply with and emphasize state and federal statutory requirements for working at safe distances from all powerlines;
- develop, implement, and enforce a comprehensive safety program that includes, but is not limited to, training of employees in hazard recognition and avoidance, and safe work practices;

- provide a program that introduces and enforces use of appropriate personal protective equipment.

INTRODUCTION:

On April 13, 1998, the MO FACE Program was notified of a fatality incident involving the electrocution of a CATV installer. The installer was electrocuted while passing the cable wire between a 7,200 volt primary line and the corresponding neutral.

On May 1, 1998, the MO FACE investigator traveled to the incident site, met with the county coroner and local law enforcement. On May 5, 1998, the company manager and the victim's supervisor was interviewed.

The employer in this incident has been in operation for approximately 27 years. They have been servicing this area with CATV for approximately 18 years. The company as a whole employs approximately 300 persons with this branch office employing 20. The company did not have written safety rules and procedures for the task the victim was performing and did not have written general safety rules and procedures in place at the time of the incident.

At the time of the incident, they employed two persons with the same job title as the victim. The victim had been employed by the company for approximately seven months. He received on-the-job training and training during informal safety meetings. The victim was trained to follow existing power and telephone lines with the cable line when possible.

INVESTIGATION:

The victim arrived at the site at approximately 9:00 a.m. the morning of the incident. There was a strong thunderstorm passing through the area and he probably waited in his service van until the weather was suitable for work. After the storm had passed the victim proceeded with this installation. The terrain at the site consisted of a ridge where Line #2 was located, followed by a steep drop of approximately 3 feet to a leveled access road where Line #1 was located, then another steep drop of approximately 20 feet to the customer's building. The customer was a commercial business with a newly constructed building on a large leveled lot. The building was

located down hill on a steep grade from the CATV trunk line. Between the CATV trunk line and the building was an access road to a city-owned sewage pump station. Running beside this access road was a line of poles containing Line #1, a primary 7,200-volt powerline and single neutral. Adjacent to Line #1 and on a separate set of poles and at a higher elevation was Line #2, a 120/220 volt line, a telephone line and the CATV trunk line. These lines serviced a neighboring trailer park. The line of poles carrying Line #2 were set at a higher elevation than Line #1 but were shorter in length. The difference in elevation between the two sets of lines caused the primary and secondary lines to have similar distances above the ground. The CATV trunk line located on Line#2 was just slightly above the neutral of Line #1. To connect the CATV line from the source to the customer, and avoid contact with other lines, it had to pass over the neutral line and under the primary line of Line #1.

Apparently the victim parked the service van on the access road facing away from the main road. He had removed a standard fiberglass extension ladder and set it against a pole for Line#2. He pulled several feet of CATV wire from a spool located in the back of the van. Holding onto the cut end with approximately 18 to 24 inches of line extending past his hand he ascended the ladder. After climbing the ladder to the pole he then started climbing the pole on the installed climbing pegs. Reaching the height of the CATV trunk line, he strapped himself to the pole. The victim was going to attempt to follow the phone line that was present and servicing the commercial building. It stretched from the pole where he was located over the top of the Line#1 neutral. The victim, leaning back away from Line #2, was in close proximity to Line #1 and the neutral. With his right hand holding onto a climbing peg and his left hand holding the cable wire he reached behind the neutral and attempted to place the cable wire between the powerlines. The end of the cable wire contacted the energized 7,200 volt primary causing the victim to be electrocuted. The energy entered his left hand and primarily exited his right hand.

A neighbor heard some noises from out side his trailer. Upon investigation he found the victim lifeless hanging from his safety belt. Emergency personnel were summoned to the scene. They found the victim without pulse but could remove the

victim from the pole. Assistance was requested from the city electrical service provider and the district electric cooperative. The victim was pronounced dead at the scene.

CAUSE OF DEATH:

High-Voltage Electrocution

RECOMMENDATIONS/DISCUSSION:

The following recommendations are intended to educate all employers and employees on how similar occurrences can be avoided.

Recommendation #1: Adopt company policies that comply with and emphasize the federal and state requirements for working at safe distances from all powerlines.

Discussion: All companies should maintain and enforce a written policy that emphasizes safe working distances from overhead powerlines. Employers should enforce that non-qualified workers are not allowed to work in the vicinity of exposed overhead powerlines or other exposed electrical sources where a person, a piece of equipment, a conductive tool, or other material could reasonably be expected to move or be placed within 10 feet of the powerline. This is a requirement of federal statute 29CFR 1926.416(g)(2) and state statute, RsMO 319.080. Violation of the 10-foot rule assumes that the employee is a qualified person. The distances provided in CFR 1926.(g)(2)(ii) may be applicable if the provisions of the “qualified person” are met. All distances should include the extended reach of the employee in addition to any conductive object or material held by the employee.

According to 29CFR1910.269(a)(2)(ii), Electric Power Generation, Transmission, and Distribution, *qualified employees shall also be trained and competent in:*

The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment;

- *The skills and techniques necessary to determine the nominal voltage of exposed live parts;*
- *The minimum approach distances specified in this section corresponding to the voltages to which the qualified employee will be exposed; and*
- *The proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working*

on or near exposed energized parts of electric equipment.

Note: For the purposes of this section, a person must have this training in order to be considered a qualified person.

According to the National Electrical Safety Code, 1997, “Qualified” means *having adequate knowledge of the installation, construction, or operation of apparatus and the hazards involved. in order to be considered a qualified person.*

In this instance this magnitude of training was not provided to the employee prior to his working as a CATV installer.

Recommendation #2: Develop, implement, and enforce a comprehensive safety program that includes, but is not limited to, training of employees in hazard recognition and avoidance, and safe work practices.

Discussion: Employers should develop, implement and enforce a comprehensive written safety program to help workers recognize and control hazards in the workplace. Training employees should be a documented part of such a program. Documentation helps ensure that all workers are trained, and assists the employer by tracking training frequency.

Some CATV installers may be untrained or unqualified to work near high voltage. Therefore, they should be trained in hazard recognition and avoidance. Also, employers should train installers to handle equipment, materials, and tools safely when working in the vicinity of high voltage sources. Specialized training in handling long-dimensional conductive objects (such as cable wire, tools,...etc.) in areas where workers may be exposed to non-insulated energy sources will help minimize the hazard. The preceding information may also be found in Subpart S of 29CFR 1910 and Subpart K of 29CFR 1926.

Employers should ensure that workers assigned to install CATV are specifically trained in all applicable standards of safe working distances from any energized overhead powerline. In the event the installation cannot be performed within applicable safe working conditions, workers **should not** attempt the installation; or, employers

could request assistance and confirmation from the local power provider to ensure that the lines will either be de-energized or insulated before and while the employees are working in the vicinity.

Recommendation #3: Provide a program that introduces and enforces use of appropriate Personal Protective Equipment (PPE).

Discussion: The employer in the instance did provide and enforce the use of PPE. But there is a need to emphasize this necessity for all employers and employees.

The first priority of any safety effort should be controlling work environment conditions through engineering and administration of workplace design. Management's job is to design a safe work environment by eliminating hazards in the workplace. Sometimes these efforts are limited by factors that are impossible to control, leaving elements of risk that the worker must face. In such instances, the way to prevent a fatality or reduce the effects of an injury or illness may be the proper use of PPE.

The proper selection of equipment, training employees to use it, and enforcing its use are some of the most important elements of an effective PPE program. A written policy, stating the need for PPE and its use may also be necessary. Those individuals who install CATV should use the following suggestions as a minimum selection of PPE:

- Head Protection--provide a helmet or hard hat that meets ANSI Z89.1-1986, Class A and B, for head protection. The helmet should be designed to protect the wearer's head from impact and penetration of falling objects, and from incidental contact with high-voltage energy sources.
- Protective Footwear-- footwear should have soles that provide good traction on a variety of work surfaces including ladders and roofs. Footwear should provide adequate support for the ankle and foot.
- Hand Protection--provide leather work gloves to help prevent cuts, bruises, and abrasions where heavy, sharp, or rough material is handled.

The Missouri Department of Health, in co-operation with the National Institute for Occupational Safety and Health (NIOSH), is conducting a research project on work-related fatalities in Missouri. The goal of this project, known as the Missouri Occupational Fatality Assessment and Control Evaluation Program (MO FACE), is to show a measurable reduction in traumatic occupational fatalities in the state of Missouri. This goal is being met by identifying causal and risk factors that contribute to work-related fatalities. Identifying these factors will enable more effective intervention strategies to be developed and implemented by employers and employees. This project does not determine fault or legal liability associated with a fatal incident or with current regulations. All MO FACE data will be reported to NIOSH for trend analysis on a national basis. This will help NIOSH provide employers with effective recommendations for injury prevention. All personal and company identifiers are removed from all reports sent to NIOSH to protect the confidentiality of those who voluntarily participate with the program.

SIGNATURES:

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Chief Investigator

Dr. Howard Pue
Chief
Office of Surveillance

MO FACE Dissemination List

NIOSH

Alaska Department of Health and Social Services

California Public Health Foundation

University of Iowa

Kentucky Injury Prevention and Research Center

Massachusetts Department of Public Health

Maryland Division of Labor & Industry

Minnesota Department of Health

Nebraska Department of Labor

State of New Jersey Department of Health

Ohio Department of Health

Oklahoma State Department of Health

Texas Worker's Compensation Commission

Washington Department of Labor & Industries

Wisconsin Division of Health

WVU School of Medicine

Wyoming Department of Health

Missouri Southern State College

Missouri Department of Public Safety

Cuivre River Electric Company

University of Missouri

OSHA Kansas City Area Office

MIRMA

OSHA St. Louis Area Office

St. Joseph Safety Council

Missouri Safety Council

St. Louis County Department of Community Health

41st Judicial Circuit of Missouri

Cape Girardeau County Community Traffic Safety

St. Louis County Medical Examiner Office

Missouri Police Chiefs Association

Children's Mercy Hospital

St. Louis City Medical Examiner Office

St. Charles Police Department

Grundy Electric Company

Jackson County, Office of the Medical Examiner

Shelter Insurance Companies

Missouri Hospital Association

Safety Council of Greater St. Louis

MO Department of Elementary & Secondary Education

Missouri Farm Bureau

Missouri State Labor Council

Empire District Electric Company

NIOSH FACE Program

AK FACE Program

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NE FACE Program

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OH FACE Program

OK FACE Program

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WA FACE Program

WI FACE Program

WV FACE Program

Mine Safety and Health Administration
Safety Council of the Ozarks
Missouri Department of Mental Health
Missouri Department of Labor and Industrial Relations
Empire District Electric Company
North Central Missouri Safety Council
Safety and Health Council of Western Missouri & Kansas