MO FACE INVESTIGATION 96MO059

SUBJECT

Wireless Cable TV Service Installer Electrocuted by Overhead Power Line

SUMMARY

A 33-year-old male installer (victim) of a wireless cable TV service was electrocuted when the antenna mast he was raising/installing came into contact with a 7,200 volt overhead power line. Prior to the incident the victim had placed a ladder against the front of the home and had climbed to the roof to test for signal strength with a signal strength meter. It is believed that the victim could not get a signal of sufficient strength at this location from the wireless cable transmitter. He indicated to the property owner that he would raise the antenna to see if they could get any reception. The victim then assembled the mast and antenna and placed it on the ground perpendicular to the front of the house. There was a single-phase, 7,200-volt powerline that paralleled the front of the home. The line was located approximately 12 feet in front of the home and was approximately 21 feet above the ground. As he raised the mast to a vertical position he contacted the power line with the antenna portion of the unit.

The MO FACE investigator concluded that, in order to prevent similar occurrences, all employers should incorporate the following recommendations into their safety and health plans:

- adopt company policies that comply with and emphasize state and federal statutory requirements for working at safe distances from all power lines;
- 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 July 19, 1996, a 33-year-old male installer (victim) of a wireless cable TV service was electrocuted when the antenna mast he was raising came into contact with an overhead power line. The line was a single-phase, uninsulated, 4-gauge wire, energized with 7,200 volts. On July 23, 1996, the MO FACE Investigator traveled to the incident site and met with company officials. The company representatives were interviewed and an incident site investigation was conducted and photographs were taken. The following day, the Investigator met with and interviewed the county medical examiner, the county emergency responders who responded to the incident, and the safety officer of the local power provider.

The employer provides a wireless cable TV service to rural customers in their corporate-designated operating territory. There were 18 employees at the time of the incident, with 6 employees having the same job title as the victim. Installers usually work alone for 8-10 hours a day, 5-6 days per week. The employer said the average time to complete an installation was about 45 minutes, and that three completed installations per day were typical.

The company conducted safety meetings involving installers and management. The company's safety plan included a copy of the mast and antenna manufacturer's "Safety Information". The section titled "Installation and dismantling safety instructions" included a warning indicating that the installer should "assume that any overhead lines can kill you," and, "Call your power company. Tell them your plans and ask them to look at your site. This is little inconvenience, considering your life is at stake." "Do dress properly--shoes with rubber soles and heels, rubber gloves, a long-sleeved shirt or jacket, and a hard-hat." The mast was marked with an orange manufacturer's label warning of the danger of electrocution.

The victim had worked for the company for less than one year and was considered a productive installer at the time of the incident. The victim received training in proper installation of the antenna units, and he received on-the-job safety training for antenna installation from the Supervisor/Chief Engineer.

INVESTIGATION

According to the victim's work log, he arrived at the incident site at 12:30 p.m. The incident site was a residence located in a rural section of the company's operating territory. The victim began by locating a suitable site for installing the antenna mast unit. This site was along the southern side of the home and away from any obstructions. The victim then placed a ladder against the front of the house and climbed to the roof to measure the signal strength. After returning from the roof, the victim claimed he had difficulty getting a strong UV signal from his measurement tool. He then called his supervisor who was unavailable. He told the customer that he was going to raise the antenna to see what kind of picture he could get on the television set. The victim then assembled the mast and antenna unit. The unit measured 24 feet, 4 inches long when measured during the investigation. He placed the unit in front of and perpendicular to the home, with the base against the front step leading to the home's doorway. Also located approximately 12 feet from the front of the house was a single-phase, uninsulated, 4-gauge wire, energized 7,200 volt powerline. The line was approximately 20 feet, 8 inches above the ground at the point of contact according to the electrical utility company, as measured on the day of the incident. There appeared to be no obstructions that would obscure the victim's vision of the powerline. As he raised the unit, the antenna dish portion contacted the overhead power line. The mast and the victim provided a path-to-ground and the victim was electrocuted. At approximately 12:55 p.m., the home owner heard a noise outside. She found the victim lying on his back, with his head against the front step. Her son, who also lives at the residence, immediately called 911. Emergency personnel responded, arriving at the scene in about 10 minutes. Upon their arrival, emergency responders found the victim lifeless. Attempts to revive him were unsuccessful. He was transported to a local hospital and declared deceased.

CAUSE OF DEATH

The Certificate of Death lists accidental electrocution as the immediate cause of death.

RECOMMENDATIONS/DISCUSSION

The following recommendations are intended to educate all employers and employees on how occurrences, similar to the one described above, may be avoided.

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

Discussion: All companies should maintain a written policy that emphasizes safe working distances from overhead powerlines. Employers should enforce that workers are not allowed to operate in the vicinity of exposed overhead power lines 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 ten feet of the power line. This is a requirement of federal statute 29CFR 1910.333 (c)(3)(i)(B) and state statute, RsMO 319.080. Also the distances provided in CFR 1910.228 may be applicable if the provisions of the "qualified person" are met.

In addition, employers should express interest to manufacturers regarding production of masts and other long-dimensional objects designed with non-conductive materials.

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 and implement 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 antenna 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 antenna masts, ducts, pipes,...etc.) in areas where workers may be exposed to uninsulated 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 antenna units are specifically trained in proper site selection and placement. Proper site selection should comply with 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 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 wireless antenna masts should use the following suggestions as a minimum selection of PPE:

I. 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.

II. 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.

III. 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 **(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/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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Thomas D. Ray	**Daryl Roberts**
Chief Investigator	**Chief**
MO FACE Program Administrator	**Bureau of Environmental Epidemiology**

DISSEMINATION LIST

National Institute for Occupational Safety and Health	NIOSH
Alaska State Department of Health and Social Services	AK FACE Program
California State Public Health Foundation	CA FACE Program
Colorado State Department of Health	CO FACE Program
Georgia State Department of Health	GA FACE Program
Iowa State Department of Public Health	IA FACE Program
Indiana State Department of Health	IN FACE Program
Kentucky State Department of Health	KY FACE Program
Massachusetts State Department of Health	MA FACE Program
Maryland State Department of Health	MD FACE Program
Minnesota State Department of Health	MN FACE Program
Nebraska State Department of Health	NE FACE Program
New Jersey State Department of Health	NJ FACE Program
Wisconsin State Division of Health	WI FACE Program
Wyoming State Department of Health	WY FACE Program

Jackson County Missouri Office of the Medical Examiner
Mine Safety and Health Administration
Missouri Department of Agriculture
Missouri Department of Elementary & Secondary Education
Missouri Department of Health, Office of Injury Control
Missouri Department of Labor and Industrial Relations
Missouri Department of Public Safety
Missouri Department of Social Services
Missouri Farm Bureau
Missouri Head Injury Advisory Council
Missouri Hospital Association
Missouri Injury Control Advisory Council
Missouri Police Chiefs Association
Missouri Safety Council
Missouri Sheriff's Association
Missouri Southern State College
Central Missouri State University
Missouri State Labor Council, AFL-CIO
North Central Missouri Safety Council
OSHA Area Office, Kansas City, MO
OSHA Area Office, St. Louis, MO
Safety and Health Council of Western Missouri & Kansas
Safety Council of Greater St. Louis
Safety Council of the Ozarks
Shelter Insurance Companies
St. Joseph Safety Council
St. Louis City Medical Examiner Office
St. Louis County Department of Community Health
St. Louis County Medical Examiner Office
The Educational Center on Family Violence
University of Missouri, Agricultural Engineering