Younger Worker Electrocuted On Ladder



INCIDENT

At approximately 12:00 p.m., the 16-year-old victim gathered a model D1828-2EQ Werner aluminum extension ladder and moved to the front of the house to begin work there while three other workers moved on to the side of the house. At the front of the house, there were two 4 ft. x 4 ft. boxwood bushes planted 3 feet from the home's exterior wall at the point where the victim was attempting to access the roof.

There were no witnesses, but it is believed that because of the bushes, the victim was having trouble accessing the roof. With the ladder still fully extended, the victim attempted to move it closer by lifting the ladder and walking between the bushes to find a suitable base. The ladder became unstable, causing the victim to lose his balance falling backwards.

As the victim and ladder were falling, the ladder fell into a top phase power line carrying 7.2 kilovolts (7,200 volts). Because the victim was still in contact with the highly conductive aluminum ladder when it struck the power line, electricity was able to travel through the metal and into the young worker. He was immediately electrocuted.

After hearing a noise from the front of the home, the owner of the subcontracting company went to investigate and found the victim lying unresponsive on the ground. He immediately knocked on the home's front door and frantically tried to communicate to the wife what had happened and asked for help. The homeowner called 911 at 12:15 p.m. When EMS arrived eight minutes later, they observed the victim lying on the ground facing upwards. Both of the worker's boots had burn holes near the fifth toe; burn marks were also present on the stomach area. He was pronounced dead by the county coroner minutes later with electrocution as the cause of death.

In an interview with the county sheriff's office with the help of a translator, the coworkers stated that they were on the side of the home and did not observe this incident. The owner of the subcontracting company acknowledged that he had instructed the victim to move to the front of the house to continue work there. Both coworkers were aware that the victim was putting up a ladder to access the front roof and that the victim had not asked for assistance.

NEED TO KNOW

On Monday, Sept. 10, 2018, at 8.00 a.m., a 16-year-old male roofer arrived at the worksite to begin work on a private residential home to replace the roof.

The owner of the general contracting company hired a subcontractor to perform the work, a process he informed authorities that he does regularly.

BUSINESS / REGULATIONS

This preventable “accident” is being investigated by the Kentucky Fatality Assessment and Central Evaluation (FACE) program for the purpose of making recommendation to ensure these fatalities do not occur again.

The National Institute Occupational Safety and Health (NIOSH) investigators underscore that occupational fatalities and injuries are often the result of one or more contributing factors that ultimately result in death as in this case.

The investigators identified unrecognized hazards as key contributing factors in this case.

- Work performed outside youth employment regulations
- Lack of hazard recognition and safety training
- Use of a conductive ladder around high voltage lines
- Transporting an extension ladder in the vertical position

STATISTICS

CFOI (Census of Fatal and Occupational)

Compiled data on electrocutions in the US since 1992 from diverse state and federal source documents, including deaths certificates, workers compensation reports, OSHA reports and medical examiner reports. It is widely regarded as more complete than any source of data on Occupational Injury fatalities.

TAKE – AWAYS FROM THE DATA

Key Points

- Electrocution is the fifth leading cause of occupational injury death in the United States.
- The highest rates of death occurred in males, those aged 20-34, and among whites and American Indians.
- Rates of death were highest during the summer months, in the South, and in smaller business.
- Rates by industry were highest in construction, in mining, and agriculture, forestry, and fishing.

PREVENTION

“An ounce of prevention gives you a pound of cure.” This refrain is true literally and figuratively. We know that employer is required under law to provide a safe work environment for workers.

But there is no one “panacea” to avoid workplace injuries and fatalities. Vigilance and awareness of hazards and dangers in the workplace is the first

step towards preventing “accidents.” A safe workplace is the result of cooperation between employers and employees.

Preventing an incident like the one at hand takes the following form:

1. **Conduct a job hazard analysis prior to performing a new task.**

In this incident employees were exposed to working at heights, working from ladders, and close proximity to high voltage power lines.

1. **Full compliance with all federal, state and local regulations associated with youth employment.**

In this incident The Kentucky Labor Cabinet lists 19 occupations that are prohibited for minors, including #16: “Roofing operations and all work on or about a roof.” Subcontractors and contractors should familiarize themselves with Kentucky child labor laws and Federal child labor laws before employing youths in specific occupations. In addition, federal laws apply Hazardous Occupations from the US department of labor: Eighteen is the minimum age for employment in non-agricultural occupations declared hazardous by the Secretary of Labor. The rules prohibiting working in hazardous occupations apply either on an industry basis, or on an occupational basis no matter what industry the job is in. Parents employing their own children are subject to these same rules. General exemptions apply to all of these occupations.

These rules prohibit work in, or with the following:

HO 16.

Roofing operations and all work on or about a roof.

1. **Use of conductive ladders around high voltage electrical lines.**

At the time of the incident, the victim was using an aluminum ladder to access the roof. Because of its extremely low resistivity and extremely high conductivity, aluminum is one of the best electrical conducting metals, behind only silver, copper, annealed copper, and gold. As the ladder contacted the overhead power line, 7,200 volts and 16 amperes (amps) travelled through ladder, into the victim, and exited his body via the stomach and each foot’s fifth (pinky) toe. At values as low as 100 milliamps (.1 amps), death can occur. Due to the high number of amperes that entered the victim’s body, cardiac arrest occurred instantly.

In order to prevent similar incidents, the employer should consider using a non-conductive ladder, such as those made of a fiberglass-reinforced polymer, when working around live power lines. Due to its low electrical conductivity and high resistance to corrosion, these ladders would make a safe and practical choice when working outdoors around electricity. However, employers should ensure that these fiberglass ladders are maintained properly as required by 29 CFR 1926.1053. Unmaintained ladders may accumulate excess dirt or moisture that can conduct electricity in the event it encounters a high voltage line.

1. **Proper instruction in the transport of ladders.**

The victim was moving a model D1828-2EQ Werner aluminum extension ladder that weighed approximately 56 lbs. When collapsed, the ladder was 14 feet tall and had a maximum open extended length of 25 feet. At the time of the incident, the victim, who measured 5’10” tall and weighed 165 lbs., was moving the ladder, which was extended to the maximum length of 25 ft. As the ladder became unstable and began to fall, the victim may have been unable to support the ladder’s top-heavy design while standing on uneven terrain, which allowed it to contact the power line.

In instances where an extension ladder needs to be relocated, employees should lower the extended portion of the ladder until it is appropriately collapsed, carefully lay the ladder down, and transport it horizontally while grasping the ladder’s middle section with both hands in order to safety manage its weight. Once the ladder is placed in the necessary area, ensure the base is secure and re-extend the ladder to the appropriate height. Had the ladder been lowered and transported horizontally, the high voltage line could have been avoided including the death of this keys old.