Massachusetts FACE • Occupational Fatality Report

Massachusetts Department of Public Health
Occupational Health Surveillance Program
Fatality Assessment and Control Evaluation Project

Immigrant Roofer Electrocuted When an Aluminum Ladder Platform Hoist Contacted Overhead Power Line - Massachusetts

Investigation: # 10-MA-019-01
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SUMMARY

On August 3, 2010 a 23-year-old male laborer (victim) was electrocuted and two co-workers were severely shocked when the 32-foot aluminum ladder that was part of a ladder platform hoist came in contact with energized overhead power lines. The victim and the two co-workers were in the process of raising the ladder from a horizontal position on the ground to a vertical position against a building. While raising the ladder to the vertical position, the workers lost their footing and the ladder fell towards and came in contact with energized overhead power lines. Two co-workers were shocked and thrown to the ground. The victim was electrocuted and the ladder fell to the ground landing on top of him. Once the two co-workers regained mobility, they went to assist the victim. One of the co-workers placed a call for emergency medical services (EMS) and then placed a second call to the employer. The local police arrived followed by EMS within minutes of the call. The victim was transported to a local hospital where he was pronounced dead. The Massachusetts FACE Program concluded that to prevent similar occurrences in the future, employers should:

- **Eliminate the use of conductive tools and equipment, including ladders, in proximity to energized overhead power lines;**
- **Conduct job site surveys prior to the start of construction projects to identify potential hazards, such as energized overhead power lines, and implement appropriate control measures for these hazards; and**
- **Develop, implement, and enforce a comprehensive safety program, which includes hazard recognition and avoidance of unsafe conditions, such as working around energized overhead power lines.**

In addition, manufacturers of ladder platform hoists should:

- **Design the ladder section of the platform hoists to be non-conductive.**

INTRODUCTION

On August 4, 2010, the Massachusetts FACE Program was notified by the Occupational Safety and Health Administration (OSHA) through the 24-hour Occupational Fatality Hotline that on August 3, 2010, a male roofer had been electrocuted when the ladder he was up-righting came in contact with energized overhead power lines. An investigation was initiated. On August 27, 2010, the

Massachusetts FACE Program Director traveled to the company's office location and met with the company owner to discuss the incident and then traveled to the incident location. The police department report, death certificate, company information, and the OSHA fatality and catastrophe report were reviewed during the course of the investigation.

The employer is a masonry and roofing contractor and had been in business for thirteen years. The company owner reported that the company usually has three employees, but that a week prior to the incident, he had hired the victim and the co-workers to help out with the job involved in the incident. The company owner also reported that he planned on extending the length of employment for the victim and co-workers if the work load continued to increase. The victim and the two co-workers were hired as roofers and had previous experience as roofers. The day of the incident was their third day of work with the employer. The victim was an immigrant from the Eastern Europe and had been in the country for approximately four years. It was reported that the victim and the co-workers all spoke English.

The company did not have a health and safety program, and had not provided health and safety training to employees. The company had workers' compensation insurance as required by law in Massachusetts (G.L. c. 152, Sec. 25A). There was no union representation at the company.

INVESTIGATION

The job being performed at the time of the incident involved replacing the roofing shingles of a condominium building and masonry work on the building's center chimney. It was estimated that the job would take two weeks to complete. The condominium complex consists of a single building in a suburban residential area. The building houses 24 condominiums and is two and one half stories high with a 4 in 1 pitch hip style roof that was approximately 23 feet high at the roof's edge (Figure 1). The front of the building faces east and is parallel to the roadway.

The northern side of the building has mature bushes against the building, then a grassy area, a cement retaining wall, and a parking lot for the condominium unit owners. The grassy area between the building and the cement retaining wall slopes away from the building. There are two utility poles on the northern side of the building. One of the poles is located in front of the building, between the building and the street, and the second utility pole is located at the building's center point and approximately 16 feet away from the building in the grassy area between the building and retaining wall. The utility poles carry the building's electrical, telephone, and cable wiring from the street. The main electrical wire attached to the utility pole was an 8,000 volt line (Figure 2).

The company owner reported that he knew he would need additional help to complete the project and began looking for workers to hire once he was awarded the job. After passing a residential roofing job site a few times and thinking that the work being done was of good quality, the company owner stopped and asked the workers, one of whom was the victim, if they wanted to work for him as roofers. The response from the victim and other workers was "yes".

The first two days of the job, the work crew had been working on the southern side of the building where there were no overhead utilities. The day of the incident was the third day of the job, and the work crew, including the victim, co-workers, and the company owner, had arrived at the work site around 8:15 a.m. The weather was approximately 70 degrees Fahrenheit, with no wind, and no recent

precipitation, although it was reported by the employer that there was dew on the grass the morning of the incident.

Once onsite the day of the incident, the workers offloaded materials, supplies, and equipment from the company truck. Then the company owner left the work site at a little before 9:00 a.m. to pick up some additional supplies. After the company owner left the work site, the victim and two co-workers started to set up an aluminum ladder platform hoist on the northern side of the building on the grassy area between the building and the utility pole and overhead power lines (Figure 2).

An aluminum ladder platform hoist is a piece of equipment that is used to bring materials, such as bundles of roof shingles or tools, to a work location that is at a higher level, including roofs. The use of ladder platform hoists will help ensure that workers are not carrying materials, supplies or tools up and down extension ladders. This allows workers to climb ladders safely by being able to keep three point contact with the ladder at all times. Ladder platform hoists are typically made up of a heavy duty straight aluminum ladder, motor, cables, pulleys, and a platform or carriage that the items to be lifted are set on or in. The ladder platform hoist involved in this incident was designed with a five horsepower gasoline engine and a 32-foot long ladder. The 32-foot ladder was made of two 16-foot straight ladders bolted together with a metal plate. The ladder did have a warning sticker from the manufacturer that stated "warning, watch for wires (with an arrow point up), aluminum conducts electricity".

Prior to the incident, the ladder was lying on the ground parallel to the building, between the building's northern side and the utility pole on the grassy slope. The victim and the two co-workers then started the task of up-righting the ladder. The victim grabbed the end of the ladder that was to be raised and the two co-workers footed the other end of the ladder. The victim then started to walk the ladder up to the vertical position. When the ladder reached a fairly vertical position, the two co-workers started to slide, potentially on the damp grass, and lost their balance. The ladder fell in a northerly direction and came in contact with the 8,000 volt energized overhead power line.

When the ladder contacted the power line, the victim was electrocuted and thrown to the ground with the ladder landing on top of him. At the same time, the two co-workers were severely shocked and also thrown to the ground. Once the two co-workers regained mobility and were able to get up off the ground, they went to assist the victim. One of the co-workers used a cell phone to place a call for emergency medical services (EMS). EMS and police personnel arrived within minutes. The victim was transported to a local hospital were he was pronounced dead.

CAUSE OF DEATH

The medical examiner listed the cause of death as electrocution.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should eliminate the use of conductive tools and equipment, including ladders, in proximity to energized overhead power lines.

Discussion: Energized overhead power lines within work areas on constructions sites can constitute a significant safety hazard.[1] Extreme caution must be exercised whenever working near energized power lines, especially when employees' tasks will bring them or the tools/equipment they are using in

proximity to the power lines. Only non-conductive tools/equipment, such as fiberglass ladders, should be used when energized power lines are present on construction work sites and in proximity to the specific work areas.[2,3]

Recommendation #2: Employers should conduct job site surveys prior to the start of construction projects to identify potential hazards, such as energized overhead power lines, and implement appropriate control measures for these hazards.

Discussion: Days before beginning construction work at any job site a competent person should evaluate the site to identify potential hazards.[2,3] Once hazards, such as overhead power lines, are identified during the initial jobsite survey, this should lead to the implementation of appropriate control measures before work begins. It should be ensured that the information about identified hazards are communicated with employees. When power lines are observed on the job site during the initial survey, it should always be assumed that the power lines are energized.

In this case, with energized overhead power lines in close proximity to the building, the control measures should have included, but not have been limited to:

- Using only non-conductive tools/equipment, including ladders (Recommendations #1).
- Contacting the local electric company to either shield the power lines or, if necessary, turn off the power if work will require employees to get closer than 10 feet to energized power lines (for high voltage levels over 50 kv, distances greater than 10 feet are required).[4,5]
- Reviewing the hazards and the control measures with all employees onsite. These hazards and control measures should also be explained to any employee arriving onsite for the first time throughout the project.

The employer should ensure that all control measures remain in place until the job is complete. In addition, in this case, observing the overhead power lines could have led to not allowing the ladder platform hoist to be set up on the same side of the building as the power lines.

Recommendation #3: Employers should develop, implement, and enforce a comprehensive safety program, which includes hazard recognition and avoidance of unsafe conditions, such as working around energized overhead power lines.

Discussion: At a minimum, a comprehensive written safety and health program should include an explanation of worker's rights to protection in the workplace, safe work practices workers are expected to adhere to, specific safety protection for all tasks performed, ways to identify and avoid hazards, and whom they should contact when safety and health issues or questions arise.[6]

When developing a safety and health program all tasks performed by employees should be evaluated for potential hazards, such as using tools/equipment near energized power lines (Recommendation #2). Employers should use their employees' expertise throughout the program development and task evaluations by seeking employee input. Employers should continue to seek employees' input during the routine updating of the program. The program should be updated when safety concerns arise and when new equipment and new tasks are introduced into the workplace. Employers should provide employees training on the safety and health program topics, including hazard recognition, controls for

identified hazards, and the avoidance of unsafe conditions.[7,8] All trainings provided to employees should be documented by the employer.

The Massachusetts Department of Labor Standards (DLS) offers free consultation services to help small employers improve their safety and health programs, identify hazards, and train employees. DLS can be contacted at 617-969-7177. More information about DLS can be found on their Web site at www.mass.gov/dos/consult.

Recommendation #4: Manufacturers of ladder platform hoists should design the ladder section of the platform hoists to be non-conductive.

Discussion: To ensure that workers are not shocked or electrocuted when up-righting or maneuvering ladders, manufacturers of ladder hoists should design the ladders to be non-conductive. Non-conductive ladders will help protect workers and others from electric shock and electrocution if the ladder was to inadvertently come in contact with an electrical conductor, such as an overhead power line. In this incident, the ladder section of the hoist was two 16 foot long straight aluminum ladders bolted together. If the ladder used on top was made of non-conductive material or had a non-conductive coating, then the electrocution hazard would be minimized.

REFERENCES

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5. National Grid. New England Hazard Identification Hotline: 1-888-625-3723. www.nationalgridus.com/masselectric/safety.asp. Date accessed: May 17, 2011.

6. DOL. OSHA Draft Proposed Health and Safety Program, Docket No. S&H-0027. www.osha.gov/SLTC/safetyhealth/nshp.html. Date accessed: May 17, 2011.

7. Code of Federal Regulations, 29 CFR 1926.21 Safety training and education. Washington D.C.: U.S. Printing Office, Office of the Federal Register.

8. Code of Federal Regulations, 29 CFR 1926.1060 Training requirements. Washington D.C.: U.S. Printing Office, Office of the Federal Register.

Figure 1 – Building where the work was being performed

Figure 2 – Incident location

Figure 3 – Ladder platform hoist similar to the one involved in the incident