Massachusetts Arborist Electrocuted On Contact With 13,800 Volt Public Utility Powerline

Investigation #94-MA-003

SUMMARY

On October 16, 1993, a 32 year old male arborist was electrocuted when he came in contact with a 13,800 volt public utility power line while cutting down a large pine tree. The victim was tied off to the upper section of the tree by a safety harness and lanyard, and was cutting branches. A co-worker, who was on the ground passing the branches through a chipper, heard a groan, and looking up saw that the victim had come in contact with the powerline at the back of his neck. The victim appeared unconscious, and the powerline was visibly arcing. The co-worker called for help, but subsequent rescue efforts were hampered when the tree itself became energized. It was not until approximately fifty minutes later that the powerline was de-energized and the victim retrieved from the tree. He was pronounced dead at the scene by a state medical examiner. In order to prevent similar future occurrences, MA FACE recommends that employers:

- contact the public utility to arrange to have power lines de-energized and grounded, or insulated, prior to requiring employees to trim trees in close proximity to energized power lines
- ensure that tree trimming employees maintain the minimum safe working distances specified by OSHA when working near energized powerlines
- develop, implement and enforce comprehensive safety programs that include, but are not limited to, electrical hazard control and fall protection
- provide workers exposed to the hazards of electrocution and/or severe burns with training in electrical safety

Also, public utilities should consider:

- underground placement of potentially hazardous utilities, permanent insulation and/or implementation of a permit system whereby persons or firms engaged in work near high voltage power lines must first notify the public utility prior to commencement of work

INTRODUCTION

On October 17, 1993, MA FACE learned through a major Massachusetts newspaper that a 32 year old arborist had been electrocuted the previous day. An investigation was immediately initiated.

On October 26, 1993, the MA FACE Program Field Investigator met with the responding police officials and an employer representative. The death certificate, municipal police report, OSHA information relating to the incident, and assorted newspaper clippings were obtained during the course of the investigation.

The employer was a small regional tree service company in business for approximately twenty-one years. The company employed personnel on an as needed basis. Although the owner initially claimed that the victim was an independent contractor, OSHA determined that the victim was indeed an employee. The employer did not have any written comprehensive safety or health policies, training procedures or safety and health committees in place at the time of the incident.

The victim was a 32 year old male arborist who was primarily self trained and who routinely worked for approximately five different regional tree service companies. Although he owned some of his own basic tree service equipment such as a helmet, gloves, safety belt and lanyard, boots, spikes and one chain saw, he did not own any of the heavy equipment associated with self employment in the tree service sector (bucket truck, dump truck, chipper, etc.).

INVESTIGATION

At approximately 9:00 a.m. on October 16, 1993, the owner of a tree service company left his company yard to deliver a load of firewood that he, his brother-in-law, and another employee (the victim) had just put into the company truck. Before leaving, the owner told his employees to continue cutting and stacking fire wood in the yard.

When the employer returned he instructed the workers to meet him at a municipal location where they would then follow him to a jobsite. This was a commercial facility in a suburban community with trees and powerlines running parallel to the building approximately 30 feet away. At the jobsite the employer showed the workers which trees were to be cut and removed. He warned them to pay particular attention to the trees in close proximity to the public utility power lines, which were 13,800 volts. The employer did not, however, contact the regional public utility to ask them to help ensure safe removal of the trees.

After the smaller trees were cut, removed and passed through the chipper, the workers moved on to the bigger pines. Climbing to the upper section of one of the pines in his safety belt, the victim secured his lanyard to a tree limb and began cutting branches. Once these branches were dropped to the ground, his co-worker passed them through the chipper.

At approximately 1:00 p.m., as the co-worker was picking up branches to pass through the chipper, he heard a groan from above. Looking up into the tree, the co-worker witnessed the victim in contact with one of the power lines at the back of his neck. He was unconscious and exhibiting no visible signs of life. The powerline was visibly arcing (a spark or luminescence caused by a flow of electrical current across a gap between two electrical terminals) and smoldering.

After the co-worker ran to the nearby property office to solicit a call for help, he immediately returned to the scene and attempted to climb the tree to expedite rescue efforts. The co-worker was thrown to the ground because the entire tree had become

energized. Not taking his own safety into consideration, the co-worker began to cut the tree trunk with a chain saw. Once the tree trunk was cut, victim contact with the current was broken; the tree, however, came to rest against the utility line and caught fire. The victim remained suspended from a tree limb by his safety belt and lanyard, and it was not until the power line was de-energized some fifty minutes later that the victim was removed from the tree. The victim was then officially declared dead by an awaiting state medical examiner.

CAUSE OF DEATH

The medical examiner listed the cause of death as electrocution.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should contact the public utility to arrange to have power lines de-energized and grounded, or insulated, prior to requiring employees to trim trees in close proximity to energized power lines.

Discussion: U. S. Department of Labor OSHA Standard 29 CFR 1910.333(c)(3) requires that energized overhead power lines are de-energized and grounded or insulated **prior** to beginning work less than ten feet from the lines. Employers should notify the utility company when tree trimming work is to be performed in close proximity to energized power lines. The utility company and the employer should then discuss the options for protecting workers: de-energizing and grounding the power lines or covering them with insulating hoses or blankets. Had the power line been de-energized before the victim and co-worker began cutting down the trees, the victim's death could have been prevented.

Recommendation #2: Employers should ensure that tree trimming employees maintain the minimum safe working distances specified by OSHA when working near energized powerlines.

Discussion: OSHA Standard 29 CFR 1910. 333(c)(3)(i)(a)(1) requires a minimum distance of 10 feet between unqualified persons working in elevated positions and energized overhead power lines with voltages to ground rated 50kV or below. Furthermore, if the employee could come in contact with conductive equipment while working in the elevated position near overhead power lines, then a minimum 10 feet must be maintained between the conductive equipment and the overhead power line. For voltages to ground rated over 50kV, an additional 4 inches must be added to the 10 feet for each 10 kV.

Recommendation #3: Employers should develop, implement and enforce comprehensive safety programs that include but are not limited to electrical hazard control and fall protection.

Discussion: Comprehensive safety programs should include, but not be limited to, routine job site hazard surveys, the use of fall protection equipment and other protective gear, and worker training in the recognition and avoidance of electrical and fall hazards. Safe work procedures should be developed for working around overhead power lines, for climbing, felling, topping and pruning trees, and for the use of mobile equipment and hand and portable power tools. If safe work procedures had been developed and implemented to protect employees during tree trimming operations in close proximity to overhead power lines, the victim's death may have been prevented.

Recommendation #4: Employers should provide workers exposed to the hazards of electrocution with training in electrical safety.

- recognizing the hazards associated with performing tree care operations in close proximity to energized power lines
- recognizing the hazards associated with uninsulated power lines (and that all power lines should be considered uninsulated and energized unless otherwise notified)
- the hazards of using conductive equipment in close proximity to overhead power lines
- establishing procedures for emergency situations such as staying clear of energized objects or objects that MAY BE energized, and always keeping others away as well.

Recommendation #5: Public utilities should consider underground placement of potentially hazardous utilities, permanent insulation and/or implementation of a permit system whereby persons or firms engaged in work near high voltage power lines must first notify the public utility prior to commencement of work.

Discussion: Public electrical utilities should analyze municipal powerline layouts to determining the most obvious areas where unreasonable high voltage hazards may exist. Consequently, such areas could be addressed to eliminate or minimize the hazards in the targeted problem areas. They should investigate the possibility of permanently insulating high voltage power lines in thickly settled areas and consider underground placement of utilities for existing and future installations. Study should also be given to implementation of a public utility permit system such as those required for building or plumbing work that would provide aid to both the utility and person or firm engaging in the work to identify jobsite locations most likely to involve high voltage hazards. Unless already in place, a municipal electrical layout or physical site inspection by a qualified utility representative would dictate if de-energization and/or insulating (booting) of the powerline is required PRIOR to issuance of the permit to proceed with the project.

LIST OF REFERENCES

1. Office of the Federal Register: 1992 Code of Federal Regulations, Labor 29 Parts; 1910.332(b)(1), 1910.333(c)(3), 1910.333(c)(3)(i)(a)(1).

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