

DATE: December 7, 1992

FROM: Fatality Assessment and Control Evaluation (FACE) Project
Minnesota Department of Health (MN FACE)

SUBJECT: MN FACE Investigation MN9216
Tree Service Owner/Operator Dies after Falling from a Tree

SUMMARY

A 53-year-old male tree service owner/operator (victim) died as a result of injuries he received after falling approximately 30 feet from a tree he was preparing to remove. Before felling the tree, it was necessary for him to remove upper branches with a small chain saw. The victim used climbers to ascend the tree and a positioning tree trimmer's belt to support and steady himself while working. He tied off to a tree limb approximately 3 feet above him with a 1/2 inch diameter manila rope that was attached to the belt. No fall-arrest protection was used. He instructed two ground workers to clear the area before he began trimming branches. He made three or four cuts to branches below his anchor point without incident. He then attempted to trim some branches located on the limb above him, onto which he was anchored. He apparently lost track of the location of the manila support rope during this process and severed it approximately 2 feet from his belt. He fell to the ground and died as a result. MN FACE investigators concluded that, in order to prevent similar occurrences, the following guidelines should be followed:

- > employers should supply fall arrest as well as positioning equipment for workers who must perform elevated work and have both hands free for work;
- > cuts to branches and limbs above a tree trimmer's position, or near an anchor point, should not be attempted; and
- > proper personal protective equipment should be provided for workers to perform their jobs safely.

INTRODUCTION

MN OSHA notified MN FACE investigators of a August 31, 1992, fall incident on September 2, 1992. A county sheriff's report was requested the same day. A company representative was interviewed September 9, 1992, via telephone, and a site investigation was conducted on September 11, 1992.

The victim was one of two partners of a small tree service business. This company was approximately six months old, but the victim had been in the tree service business for ten years. The owners occasionally employed laborers to assist with jobs during the summer. The company had no written safety rules and no safety officer. The three-person crew on this job had discussed electrical hazards before beginning work on the day of the incident because the tree's branches extended close to overhead power lines. Fall safety was not discussed.

INVESTIGATION

A three-person tree trimming/removal crew was in the process of preparing a tree for removal at a private residence. It was a clear, dry afternoon; the crew had been on site approximately 30 minutes. Before cutting the tree down it was necessary to remove some upper branches. The victim used climbers to ascend the tree and a positioning/suspension tree trimmer's belt (Figure 1.) to steady himself while working. A positioning system is designed to help hold a worker in place while leaving his hands free to work; it does not provide fall-arrest protection. No fall-arrest protection was in use during this tree removal.

After ascending to the desired position, approximately 30 feet high, the two seat belt D-rings of the positioning belt were brought together to the front of the belt. A 1/2 inch diameter, 40-60 foot long manila rope was attached to both D-rings with a metal clip. The rope was then hand tied to a tree limb, approximately 3 feet above him, with a Prusik knot (a type of mountaineering knot used for slowly lowering oneself) or 2 half hitch knots; it was not determined which knot was used on the day of the incident. The rope was, at the end of this anchoring process, taut and in front of the victim.

The victim instructed the two ground workers assisting in the tree removal to clear the area. Three to four branches below the victim (standard operating procedure [SOP]) were cut without incident. The last cut involved branches located on the limb above him, onto which the victim was anchored. He apparently lost track of the support rope during this process. It was cut approximately 2 feet from the tree trimmer's belt and the victim fell to his death.

A 911 call was placed from the residence and emergency help arrived within 3-4 minutes. The victim was transported to an emergency room but attempts to resuscitate him were unsuccessful.

CAUSE OF DEATH

The cause of death as listed on the death certificate was closed head injury with multiple skull fractures.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should supply fall-arrest as well as positioning equipment for workers who must perform elevated work with both hands.

Discussion: No fall-arrest protection was being used by the victim when this incident occurred. Equipment exists which provides both positioning and fall-arrest capabilities. A positioning system is used when a worker must be held in place while leaving his hands free to work. It is an active system and in use whenever the worker leans back. A positioning system can help prevent a fall, but should not be used as a replacement for a fall-arrest system. Unlike a positioning system, a fall-arrest system is a passive protection system which only comes into service when a fall occurs. Whenever possible, when a worker must work freely with both hands in an elevated position, a combination fall-arrest/positioning system should be used.

Recommendation #2: Cuts to branches and limbs above a tree trimmer's position and/or near an anchor point should not be attempted.

Discussion: In this company it was standard operating procedure for workers positioned in trees to only cut branches below themselves. Reasons for this SOP include eliminating the possibility of being hit by falling branches and ensuring that support ropes were not cut during work. Possible kick-back during chain saw operation is another reason to avoid overhead work. Since there was no fall-arrest protection used in this instance, overhead cutting near the tie off point was especially hazardous. A slight slip or loss of balance, a small judgment error in the location of the rope could, and perhaps did, mean the difference between life and death.

Recommendation #3: Proper personal protective equipment should be provided for workers to perform their jobs safely. This issue is discussed more fully in ANSI Standard Z133.1-1988.

Discussion: Though not directly related to this incident, the manila support rope used during this incident was probably not the best choice. Natural rope can be easily abraded on tree bark with repetitive use. Lanyards made from synthetic fiber, on the other hand, can be impregnated with latex or resin for extra durability and

can provide more abrasion resistance. They are brightly colored as well and may be more easily seen during work performance.

REFERENCES

1. Klein Tools, Inc., Occupational Protective Equipment (catalog), Chicago, IL, 1991.
2. ANSI [1988]. American national standard for tree care operations: pruning, trimming, repairing, maintaining, and removing trees, and cutting brush - safety requirements. New York, NY: American National Standards Institute, ANSI Z133.1-1988.

Georjean Madery

Safety Field Investigator Principal Investigator

MN FACE

David L. Parker, M.D., M.P.H.

MN FACE

Debora Boyle, R.N., D.V.M.

Chronic Disease &

Environmental Epidemiology