

F.A.C.E. INVESTIGATION REPORT

Fatality Assessment and Control Evaluation Project

FACE #96-NJ-074-01
Tree Trimmer Killed When a Branch to
Which He Was Tied Broke And His Lifeline Failed



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TO: Division of Safety Research
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FROM: Fatality Assessment and Control Evaluation (FACE) Project
New Jersey Department of Health and Senior Services (NJDHSS)

SUBJECT: FACE Investigation #96-NJ-074-01
Tree Trimmer Killed When a Branch to Which He Was Tied Broke
And His Lifeline Failed

DATE: March 27, 1997

SUMMARY

On September 9, 1996, a 28 year-old tree trimmer died when he fell 60 feet from a tree he was cutting to a gravel driveway below. He was attached by a lanyard to the branch he was trimming and, when the branch broke behind him, he fell with it. His safety line was attached to the tree trunk and, as he and the 25 foot long branch section fell, his safety line broke and he fell to the ground. New Jersey FACE investigators concluded that, in order to prevent similar incidents, the following safety guidelines should be followed:

- o Arborists should use appropriate fall arrest systems when working in trees.
- o Arborists should use appropriate cutting techniques.
- o Employers should provide appropriate training and supervision to employees.
- o Employers and employees should be aware of the dangers of drugs and other substances that may impair judgment or alertness.
- o Arborists should be properly trained in identifying hazardous trees and in safely trimming or removing them.

INTRODUCTION

On September 19, the NJDHSS FACE staff was informed of this fatal work-related incident by an individual familiar with the FACE project. After contacting the owner of the tree trimming company, the site was visited on September 30 to photograph the tree and discuss the incident with the home owner. The employer was interviewed on October 19. Further information was received from the medical examiner, police report, and federal OSHA. Technical assistance for this report was received from a forestry expert at NIOSH and an instructor on tree climbing safety for the Committee for the Advancement for Arboriculture in New Jersey.

The employer, college-educated in forestry management with 17 years of professional experience, was an arborist who had been in business for 11 years. He did not specialize in any one type of tree trimming but did mostly “take down” work. Although he usually worked alone, he at times had others help him in exchange for the wood. Occasionally he and other tree services assisted each other. The employer hired the deceased, five months prior to this incident, to work two or three days a week. The company did not belong to any professional organization but subscribed to a monthly trade journal. The company had no written safety program or written procedures.

The deceased sought work with the tree service by phoning and asking if work was available. According to his employer, he claimed to have had five years of experience climbing but actually had only five months of experience. His limited experience was noticed when first on a job site. Training given to the employee by this tree service was on-the-job. The employer said he demonstrated safe ways of doing the work. According to the employer, the victim had potential to become a tree trimmer and his technique had improved in the five months that he worked for him.

INVESTIGATION

The site of this incident was the yard of a home in a suburban area. The company had done work for the homeowner previously and successfully bid on this job. He was hired to take down two 75 foot oak trees. It was not possible to take the incident tree down by “dropping” it because it grew between a power line and a telephone line. The arborist planned to remove the tree limbs and cut away sections of the tree until there was no danger of damaging the power lines. The tree could then be taken down in one piece by dropping it.

The day of the incident started with the company owner and the deceased stopping first at a house at which he was to take down a tree. Circumstances of the owner prevented them from doing work there. They proceeded to the site of the incident, a home with a large yard in a suburban area, and arrived at 10 a.m.. At the site on this sunny day were the deceased, the employer, two men who wanted the wood, and their friend. One of the men on the ground was to lower the limbs as they were cut.

Hired to take down two trees, the employer felt his employee was capable of handling one of the trees on his own. The tree was visually inspected prior to climbing and the deceased reportedly checked the tree as he climbed by hitting it with a handsaw or piece of wood. The company owner checked all equipment except for the victim’s climbing saddle. The deceased roped the first tree and the employer roped the second one. The deceased wore a climbing saddle, which he owned, and climbing spurs. He used a 102 foot long “safety blue” ½ inch nylon rope lifeline and a 6 foot flat belt-type lanyard, referred to as a “gut strap.”

The deceased climbed the tree using his climbing rope attached to his climbing saddle and secured his line to a crotch of the tree trunk. He proceeded to trim the branches off of the tree with a gas-powered chain saw and removed several branches. Around 11 a.m., he descended to a branch

about 60 feet above the ground and anchored himself by wrapping the lanyard around the limb. His lifeline was secured to the tree, at a point either below the branch on which he was working or level with his working area. He straddled the branch he planned to cut and made two cuts in the branch in front of him. When he made the second cut, it caused a jolt which fractured the branch, near the trunk of the tree. The branch fell with the climber, who was attached to the limb by his lanyard. He fell freely, head first, for at least twenty feet before the slack in the lifeline was taken up and stopped his fall. At that point the lifeline broke. The tree trimmer fell another forty feet with the branch to the gravel driveway, with the branch striking the side of the house as it descended (Figure 1). The limb that fractured and fell was approximately 10 inches in diameter, 25 feet long, and weighed between 200 and 400 pounds.

The company owner was in the second oak tree at the time and had just climbed to the top after roping the tree and tying in to it. He observed the incident from that point. A neighbor who had been watching the tree trimming phoned for help. Police and paramedics arrived at the site and the victim was pronounced at the scene.

CAUSE OF DEATH: The medical examiner determined that death was caused by cranio-cerebral injuries and fracture of the thoracic spine.

RECOMMENDATIONS/DISCUSSIONS

Recommendation # 1: *Arborists should use appropriate fall arrest systems when working in trees.*

Discussion: According to his employer, the victim was tied off to the tree with his climbing line at or below the level at which he was working. He straddled the limb, which grew diagonally upward from the tree and which he planned to cut, and was about 20 feet from the tree trunk. Because of the distance from his tie off point to where he was working, he was able to fall freely for at least 20 feet. According to ANSI A10.14 - 1991, personal fall arrest systems should be rigged so that the worker can neither free-fall more than five feet nor contact any lower level. His safety line may have failed because of the extra stress placed on the rope by the combination of the weight of the limb plus the tree trimmer.

The tree climber had wrapped his lanyard around the limb, effectively tying off to it. According to experts consulted by NJ FACE staff, this is not an acceptable practice. Lanyards are to be used to assist with balance and stabilization when on a limb, not for fall protection.

Recommendation # 2: *Arborists should use appropriate cutting techniques.*

Discussion: When cutting the tree limb, the climber made an undercut and then a backcut. However, according to the company owner, the climber made the cut on the side of the limb so that the limb fell sideways instead of straight down to the ground. The undercut should have been made on the bottom so the limb would have fallen in the direction of the weight of the branch.

Recommendation # 3: ***Employers should provide appropriate training and supervision to employees.***

Discussion: The company owner stated that he would have roped the tree differently; he would have made a false crotch and attached the rope to the top. He would also have made the cuts in the branch differently. It is essential that employers and senior arborists train less experienced workers in safe tree climbing and rigging and supervise them to be sure correct methods are used. This is required by ANSI Z133.1-1994.

Recommendation # 4: ***Employers and employees should be aware of the dangers of drugs and other substances that may impair judgment or alertness.***

Discussion: The medical examiner's report noted a toxicology test positive for drugs. The FACE investigation did not determine if the victim was under the influence or if this may have contributed to the incident. However, the FACE project recommends that employers and employees be aware of the dangers that drugs (including prescription, non-prescription, and illegal drugs) and alcohol may present in the workplace. Safety training should include strong warnings about the use of drugs that may impair a worker's judgment, alertness, or physical abilities.

Recommendation # 5: ***Arborists should be properly trained in identifying hazardous trees and in safely trimming or removing them.***

Discussion: Some trees and their environments may present a safety hazard to arborists during trimming or removing them. It is important that arborists and tree trimming companies obtain appropriate information on safety regulations and methods of ensuring safe working conditions. Attendance at training and participation in professional organizations fosters improvement of skills and awareness of new equipment and trends in tree care and safety. Training programs should be approved by organizations such as the National Arborist Association or the International Arborist Association. Arborists should also be aware of OSHA regulations and American National Standards Institutes, Inc. (ANSI) standards.

Sources of information include:

The Committee for the Advancement of Arboriculture offers courses on basic and advanced tree climbing and other pertinent courses in tree safety and arboriculture. For information, contact David Shaw, Monmouth County Shade Tree Commission, P.O. Box 1255, Freehold, NJ 07728-1255. The telephone number is (908) 431-7903.

International Society of Arboriculture, Savoy, Illinois

Local utility companies offer seminars for tree trimmers in avoiding electrical hazards.

The National Arborists' Association, Inc. offers videos on safety and training manuals. The address of the Association is: The Meeting Place Mall, Route 101/P.O. Box 1094, Amherst, NH

03031-1094. The telephone number is (603) 673-3311.

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research, 1095 Willowdale Road, M/S 180 Prete, Morgantown, WV. 26505-02845. The telephone number is (304) 285-5894.

The NJ Department of Environmental Protection, Division of Parks and Forestry, Bureau of Forest Management, Board of Tree Experts, P.O. Box 329, New Lisbon, NJ 08064. The telephone number is (609) 726-1621.

The U.S. Department of Labor, OSHA, will provide information on federal safety and health standards. OSHA has four offices in New Jersey that cover the following areas:

Hunterdon, Union, Middlesex, Warren, and Somerset Counties.....(908) 750-3270
Essex, Sussex, Hudson, and Morris Counties.....(201) 263-1003
Bergen and Passaic Counties.....(201) 288-1700
Atlantic, Gloucester, Burlington, Mercer, Camden, Monmouth, Cape May,
Ocean, Cumberland, and Salem Counties.....(609) 757-5181

The NJ Safety Council provides a variety of courses on general work-related safety. There is a charge for the seminars. Their address is 6 Commerce Drive, Cranford, NJ 07016. The telephone number is (908) 272-7712.

ATTACHMENTS

NIOSH Alert. Request for Assistance in Preventing Falls and Electrocutions During Tree Trimming, U.S. Department of Health and Human Services, February, 1994

REFERENCES

ANSI Z133.1 - 1994, for Tree Care Operations - Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush - Safety Requirements. American National Standards Institute, Inc..

ANSI A10.14 - 1991, for Construction and Demolition Operations - Requirements for Safety Belts, Harnesses, Lanyards and Lifelines for Construction and Demolition Use. American National Standards Institute, Inc.

Tail Gate Safety Program, Trainers Instructions, National Arborist Association, 1994

Tree Climbers Guide, International Society of Arboriculture, Savoy, Illinois, 1994

Tree Trimming. National Safety Council Data Sheet 1-244-Rev.84. National Safety Council, Chicago, IL