

# **F.A.C.E.**

# **INVESTIGATION REPORT**

## Fatality Assessment and Control Evaluation Project

FACE #95-NJ-016-01  
Tree Trimmer Dies After Falling  
with a Fractured Tree



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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 (NJDOH)

**SUBJECT:** FACE Investigation #95-NJ-016-01  
Tree Trimmer Dies After Falling With a Fractured Tree

**DATE:** July 17, 1995

## **SUMMARY**

On February 14, 1995, a 33 year-old male tree climber/crew chief of a small tree trimming company was killed after he fell approximately 42 feet with a falling tree. The victim was working with two other employees to cut and trim a group of three vertical tree limbs (branching out from the main trunk) that had been tied together with steel cable. The victim was tied to the limb and, when he cut the cable, the limb fractured. He fell with the tree and was crushed. NJDOH FACE investigators concluded that, in order to prevent similar incidents in the future, the following safety guidelines should be followed:

- o Tree trimmers should be aware of alternate methods of safely removing hazardous trees;
- o Tree trimmers should be properly trained in identifying hazardous trees and in safely trimming or removing them;
- o Tree trimmers should utilize fall protection when climbing in trees.

## **INTRODUCTION**

New Jersey FACE personnel were notified of this fatality by the county medical examiner on February 15, 1995. On February 28, 1995, FACE investigators visited the incident site and interviewed the company owner and one of the deceased's co-workers. Although the incident site had been altered (all the trees had been removed), FACE staff examined the site and compared it with photographs taken the day after the fatality by the employer. Additional information on the incident was gathered from the state police report and medical examiner's report.

The employer was a small tree trimming company that had been in business for 12 years and employed four workers at the time of the incident. The owner had 22 years of experience and trained the victim in tree trimming. The deceased was a 33 year-old climber and crew chief who had worked for the company since its inception. He was described by his employer and co-worker as a safe and careful worker.

## **INVESTIGATION**

The incident occurred at the rear of a summer house located near a lake in a rural area. Several trees were on the property, including a red oak that was about 35 to 50 years old and approximately 50 feet tall. The tree had three large vertical limbs that grew vertically from the

common trunk. Each of the limbs looked like a tree trunk. The tree grew with one limb in front and two behind and the limbs had been reinforced with 3/8 inch galvanized steel cables about twelve years prior to the incident. The braided steel cable was bolted to each of the three limbs and strung from one limb to another, forming an incomplete triangle, about 35 feet above the ground.

About two years prior to the incident, the home owner contacted the tree trimming company to remove the front vertical tree limb and top the other two. If the rear trees were found to be dead, they were to be removed also. When the home owner contracted for the tree removal, he requested that the job be done in the winter when the ground was frozen in order to prevent damage to the lawn when the pieces of cut tree struck the ground. The company owner estimated the job at the site, but was unable to do the work that winter due to severe weather. He again visited the site to check the job about four months before the incident.

The day of the incident, a Tuesday, was cold with temperatures below freezing. There was snow on the ground from a winter storm two weeks before. The three workers met at the company office and waited until 10 a.m., when the temperature rose to about 30 degrees. The crew consisted of a climber/crew chief (the victim), a full-time groundman, and a part-time groundman.

After arriving at the worksite, the victim struck the tree in several places with a spike to determine by sound if the tree was solid. His co-worker stated that they observed the tree and saw no holes, nests, hardware (other than the cables), unhealthy bark, or other signs of tree rot. The victim wore a climbing saddle and new climbing boots with spikes. He used a life line and two lanyards and had a chain saw with him. He climbed the front tree limb section (the one that was to be removed), tied off his safety lines and topped the vertical limb by cutting a 12 foot section that he dropped to the ground. The groundman cut that section into log size pieces that were solid, good wood.

The tree climber removed branches until he reached the cable that tied the trees together. His head was about level or slightly below the level that was cut. He placed his chainsaw on a belt hook and called down for a boltcutter, which was sent up by a groundman. The tree trimmer cut the cable and yelled "look out below!" The groundmen heard a cracking sound but initially couldn't tell where it was coming from. The sound was from the front vertical tree limb falling and breaking off at the base. It came down with the victim tied to it and struck a metal storage frame before hitting the ground. The witness stated that the limb bounced and struck the victim in the chest. One groundman stayed with the victim and shouted to the other to go for help. The worker left in his truck to find a pay phone. The groundman who stayed with the victim saw a neighbor and asked her to call 911. The police and emergency medical service arrived quickly but they were unable to resuscitate the victim who never regained consciousness. He was pronounced dead at the scene.

The tree fractured because the tree stump was rotted. The tree trimmers believed that trees usually rot from the top down and they were surprised to find rot in the trunk since the wood from the topping was strong and healthy. The tree limb broke off after losing the support of the steel cable. The company owner stated that the cable usually goes slack after the tree is topped and the branches are removed, indicating it is safe to cut. It is not known if the cable went slack.

The company owner called in another tree trimming company to finish the job. That company determined that the two remaining limbs were rotted; they hit the trees with a spike and it sunk into the bark. They used a come-along ( a hand-operated cable winch) to remove the rest of the tree. The employer felt that the back yard was too small and inaccessible to use a crane and there was insufficient area in which to drop the tree (cut it off at the base and let it fall). No other tree

of sufficient size was nearby to use to tie into with a life line.

## **CAUSE OF DEATH**

The county medical examiner determined the cause of death to be from multiple traumatic injuries.

## **RECOMMENDATIONS AND DISCUSSION**

**Recommendation #1** : Tree trimmers should be aware of alternate methods of safely removing hazardous trees.

**Discussion** : The presence of steel cables in the tree was a indication that the tree was unstable and had been cabled to prevent breakage. Other signs of concern that should be looked for are: signs of decay (trees can decay in any area from roots to crown), a hollow sound from rapping on the tree (though this may be less reliable when at the butt of the tree), cracks, root damage, dead wood in the crown, bark peeling or callous formation on the bark. The area at the base where the three limbs (resembling trunks) meet is often a weak point and a site of "butt rot." If one of the vertical limbs is weak, it should be assumed that all three of the limbs are weak.

An instrument available to arborists, for detecting tree rot, is an increment core. This is used to drill into the tree to extract a sample of the wood at the core of the tree. The wood core is visually inspected for damage. The increment core can be used only for trees which will be felled; it should not be used on healthy trees which need only to be trimmed.

Professional tree trimmers should be aware of alternate methods available to use to remove trees that are too hazardous to climb. Alternate methods include the use of cranes, tying in to nearby trees, or dropping the tree. In this situation, the company owner felt that none of these were feasible. The tree was later removed using a come-along. A method recommended by a NIOSH forester is:

Do all trimming of the tree with the cable intact. Take off the section above the cable. Decide where the next cut will be and insert an eye hook on each of the vertical limbs just below that point. Run a wire rope through the eye hooks to form a triangle. Use a come-along or chain stretcher to tighten the wire. This supports the limbs and affords stability of the tree so the next section and the cable can be cut. The trimmer should be tied off to a limb other than the one being cut.

**Recommendation #2** : Tree trimmers should be properly trained in identifying hazardous trees and in safely trimming or removing them.

Discussion: It is important that tree trimmers and tree trimming companies obtain correct 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. Sources of information include:

The Committee for the Advancement of Arboriculture. This organization 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.

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

National Arborists' Association, Inc. offers videos on safety and a training manual titled "Tailgate Safety for Tree Care Professionals." The address of the Association is: The Meeting Place Mall, Route 101/P.O. Box 1094, Amherst, NH 03031-1094. The phone number is (603) 673-3311.

NJ Department of Environmental Protection, Division of Parks and Forestry, Bureau of Forest Management, Board of tree experts, P. O. Box239, New Lisbon, NJ 08064. The telephone number is (609) 726-1621.

U.S. Department of Labor, OSHA, will provide information on federal safety 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, New Jersey 07016. Telephone (908) 272-7712

**Recommendation #3** : Tree trimmers should utilize fall protection when climbing in trees.

**Discussion** : Although it would not have prevented injuries in this situation, in addition to the traditional climbing saddle and ropes, NIOSH foresters recommend that climbers should protect themselves by wearing a body harness with a shock absorbing lanyard. The safety harness should be worn under the climbing saddle. A body harness is specifically designed to distribute the climber's weight and support him in the event of a fall. A shock absorbing lanyard is also specifically designed to decrease the shock to the body if a fall occurs.

## **ATTACHMENTS**

NIOSH ALERT: Request for Assistance in Preventing Falls and Electrocutions During Tree Trimming. DHHS (NIOSH) Publication 92-106, August 1992. NIOSH Publications Dissemination, Cincinnati Ohio. Phone (513)533-8287.

New Jersey Department of Environmental Protection (NJDEP) Certified Tree Expert Information.

Brochure for The Committee for the Advancement of Arboriculture

## **REFERENCES**

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

National Safety Council Data Sheet 1-244-Rev. 84  
National Safety Council, 444 North Michigan Avenue, Chicago, Illinois 60611

Shigo, Alex, A New Tree Biology, Shigo and Trees, Associates, 4 Denbow Road, Durham, NH 03824