

**NJ FACE**

# **INVESTIGATION REPORT**



*Fatality Assessment & Control Evaluation Project*

**FACE 00-NJ-087-01**

**May 23, 2001**

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## **Groundsman Killed by Falling Tree Section During Tree Trimming Work**

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### **SUMMARY**

On November 1, 2000, a 47-year-old groundsman was killed when he was struck by a falling tree section during a tree trimming job. A crew leader was in the elevated bucket of a truck-mounted aerial lift cutting the top of the trunk of an 80-foot-high oak tree when the groundsman walked onto the landing zone (the area under the tree to which branches and debris will fall). He had been told by the crew leader, who was in charge of the site, to remain on a work break at their pickup truck. The crew leader was unaware that the victim was under his work area. He cut away a tree section, pushed down on it, and it fell onto the victim's head. NJ FACE staff concluded that, to prevent similar incidents, the following safety guidelines should be followed:

- The employer should conduct a job briefing at the start of each job.
- The employer should establish a written safety and health policy and written company operational policies that include ANSI Z133.1.
- Employers should become familiar with available resources on safety standards and safe work practices.



**NJ Department of Health & Senior Services**  
Occupational Health Service  
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## **INTRODUCTION**

FACE staff were informed about this work-related fatal injury on November 2, 2000, by the county medical examiner. An inspection of the incident site was conducted on November 3 and the employer and his assistant were interviewed on November 16. None of the victim's co-workers were available for interview. Additional information was received from the county medical examiner's reports, police report, and federal OSHA.

The employer was a tree service company that had been in business for 20 years and consisted of five employees and the owner, an arborist. They had never had a serious injury. The employer was a member of the National Arborist Association and used the Association's audio-visual tapes for training. There was no written company safety program or formal training on use of the aerial lift. Their verbal standard operating procedures included policies that 1) forbid any worker to enter the area under the canopy of the tree (called "the drip line" by the company) while work was going on and, 2) designated the worker doing tree trimming as the crew leader, in charge of the site. The employer assessed each job during the estimating procedure and held a meeting at each site to review the work they planned to do and hazards of each job. He also made visits to job sites to ensure the quality of the work being done. The company's equipment included three chippers, one skid-steer loader, a truck mounted with an aerial lift, and other vehicles. Most of the employees had been with the company for several years. Workers were allowed to climb trees only if they had prior training and experience, usually with larger companies.

The victim was hired by the employer approximately four months prior to the incident when the employer contracted with the victim and his family to store equipment on their vacant land. He worked as a groundsman, pulling branches and operating the chipper at times, but did no climbing. He had no prior experience working in tree trimming; his employment background was in plumbing, construction, and auto body work. His employer considered him an enthusiastic and dependable employee who was good with small details. The employer reported that he had previously walked onto the landing zone at two other sites.

## **INCIDENT**

The site of the incident was the back yard of a single family home in a suburban area. The tree service company was hired by the home owner to take down two pin oak trees, both approximately 80 feet high. The tree involved in the incident had been damaged at its base by carpenter ants, making the tree unsafe to climb. The second tree was healthy but was to be removed because its limbs were hanging over a neighbor's garage. The employer allotted two days to complete the job.

Work started at 8 a.m. The victim drove the truck with the mounted aerial lift, towing the chipping machine, to the incident site. Others arrived in pickup trucks. They arrived at the site before 9 a.m.. Instructions by the employer to the three-man crew included caution about the neighbor's garage. After giving instructions, the owner left the site; the crew leader, who did the tree trimming, was then in charge of the job. The team consisted of the crew leader and two groundsmen. The second groundsman operated the chipping machine, and the victim hauled brush to the chipper. The crew leader worked from the bucket of the elevated aerial lift and stripped the branches off the tree. He lowered the tree limbs to the ground with a rope thrown over the crotch of the tree and finished removing all branches in 1½ hours.

At 10:30 a.m., the crew stopped work to take a break. The chipper was turned off. After the break, the crew leader told the two ground workers to remain on their break, sitting on the tailgate of a pickup truck parked 30 to 40 feet from the tree. The crew leader returned to the aerial lift truck that was parked about 6 feet from the tree and elevated the lift. He started to take down the top of the tree in sections ("chunking") using a chain saw. He cut a section that was 25 inches long, 7 inches in diameter, and 45 pounds in weight and pushed down on it. It fell toward the ground. Unknown to him, the victim had walked onto the landing zone of the tree and was struck on the head and neck by the tree section. At this time, the chipping machine was running. The area where the victim was injured was 65 feet from the chipping machine. It is not known if any brush or debris had remained on the ground.

Help was summoned by the chipper operator, using the company's cellular phone. The victim was transported to the nearest hospital where he died an hour later. The employer requested another tree service company to remove the rest of the tree trunk and the second tree. They completed the job the day after the fatality.

### ***RECOMMENDATIONS/DISCUSSIONS***

***Recommendation # 1:*** The employer should conduct a job briefing at the start of each job.

***Discussion:*** ANSI Z133.1 (Revision – October 2000), section 4.1.2, states: “A job briefing, work procedure, and assignment shall be worked out carefully before any job is begun.” The job briefing should include a description of the work to be done, the environmental and safety hazards of the job including definition of the work zone, job descriptions, and methods of communication between tree trimmers and the ground personnel.

The employer did hold a job briefing before this incident, but methods of communication between the tree trimmer and the ground crew may not have been clearly established. The tree trimmer was unaware that the groundsman was under the area where he was working. Apparently, the groundsman was unaware the tree trimmer was about to drop the tree section. Well established methods of communication would designate ways in which this hazard would be communicated. For example, the tree trimmer could establish that he would yell a prearranged phrase or blow a loud whistle or use some other loud noise to signal other workers of impending timber drops. According to the National Arborist Association Pocket Guide: Preventing “Struck-By’s,” The person in the tree must give clear, audible or visible warnings to the ground crew. The ground crew must acknowledge that the warning was received and followed. This is called the “Command/Response system.” The Guide uses the example: verbal command: “Stand clear!” The verbal response could be: “All clear!” When loud noises, operations, or distances prevent verbal communication, pre-arranged hand signals should be used.

The work zone should be clearly defined. Although it was accepted that no worker should walk under what they called the “drip line,” or canopy, of the tree this may be difficult for workers to visualize when the foliage and branches have been removed from the tree. If necessary, the landing zone should be physically marked, such as by using construction cones or some other markers at the perimeter of the work zone.

According to the ANSI standard, (part 9.5.7): “Workers returning to the work area shall not enter until the chain saw operator has acknowledged that it is safe to do so.”

***Recommendation # 2:*** The employer should establish a written safety and health policy and written company operational policies that include ANSI Z133.1.

***Discussion:*** Although the company had only five employees, most of whom were experienced in the arborist field, the safety and health policies should be in writing. Company operational policies should also be written. Having policies in writing fosters consistency and makes rules and standards clear to all workers. A written policy should address warnings and discipline for a worker who disregards company safe work practices. The victim was reported to have walked into the hazardous work zone on two previous occasions. Some companies use a written policy of warnings that may consist of a written warning with the first offence, a suspension for a second offence, and dismissal for continued offences.

A written safety and health policy would include organized training and education of workers. ANSI Z133.1 (Revision - October 2000), section 4.1.2, states “Employers shall instruct their employees in the proper use, inspection and maintenance of tools and equipment, including ropes and lines, and shall require that safe appropriate working practices be followed.” Training at this company was provided by using the National Arborist Association training tapes but should be expanded to include use of the aerial lift.

**Recommendation # 3** Employers should become familiar with available resources on safety standards and safe work practices.

**Discussion:** The employer was a member of the National Arborist Association. Sources of information on occupational safety and health and information specific to the arborist profession include:

#### **U.S. Department of Labor, OSHA**

On request, OSHA will provide information on safety and health standards. OSHA has four offices in New Jersey that cover the following areas:

Hunterdon, Middlesex, Somerset, Union, and Warren counties .....	(732) 750-4737
Essex, Hudson, Morris, and Sussex counties.....	(973) 263-1003
Bergen and Passaic counties.....	(201) 288-1700
Atlantic, Burlington, Cape May, Camden, Cumberland, Gloucester, Mercer, Monmouth, Ocean, and Salem counties.....	(856) 757-5181

#### **NJ Public Employees Occupational Safety and Health (PEOSH) Program**

The PEOSH Act covers all NJ state, county, and municipal employees and is administered by two departments; the NJ Department of Labor (NJDOL) which investigates safety hazards, and the NJ Department of Health and Senior Services (NJDHSS) which investigates health hazards. Their telephone numbers are:

NJDOL, Office of Public Employees Safety.....	(609) 633-3896
NJDHSS, PEOSH Program.....	(609) 984-1863

#### **NJDOL Occupational Safety and Health On-Site Consultative Program**

Located in the NJ Department of Labor, this program provides free advice to private businesses on improving safety and health in the workplace and complying with OSHA standards. For information regarding a safety consultation, call (609) 292-0404, for a health consultation call (609) 984-0785. Requests may also be faxed to (609) 292-4409.

#### **New Jersey State Safety Council**

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

#### **Professional Organizations**

National Arborist Association (NAA) - P.O. Box 1094, Amherst, NH 03031-1094  
Phone (800) 733-2622

Committee for the Advancement of Arboriculture – Monmouth County Shade Tree Commission,  
P.O. Box 1255, Freehold, NJ 07728-1255, Phone (732) 431-7903

International Society of Arboriculture – P.O. Box 3129, Champaign, IL 61826-3129  
Phone (217) 355-3516

Society of Commercial Arboriculture – P.O. Box 3129, Champaign, Il 61826-3129  
Phone (217) 355-3516

ACRT, Inc., Utility Forestry Specialist, P.O. Box 401, 2545 Bailey Road, Cuyahoga Falls,  
OH 44221-0401, Phone (800) 622-2562  
Shigo and Trees Association, 4 Denbow Road, Durham, NH 03824, Phone (603) 868-7459

### **Internet Resources**

Information and publications on safety and health standards can be obtained from the Internet. Some useful websites include:

[www.natlarb.com](http://www.natlarb.com) – The National Arborist Association

[www.isa-arbor.com](http://www.isa-arbor.com) – The International Society of Arboriculture

[www.aces.uiuc.edu/~isa-sca/](http://www.aces.uiuc.edu/~isa-sca/) - The Society of Commercial Arboriculture

[www.osha.gov](http://www.osha.gov) -The US Department of Labor OSHA

[www.cdc.gov/niosh/](http://www.cdc.gov/niosh/) - CDC/NIOSH

[www.state.nj.us/health/eoh/peoshweb/](http://www.state.nj.us/health/eoh/peoshweb/) - NJDHSS PEOSH

[www.dol.gov/elaws](http://www.dol.gov/elaws) -USDOL Employment Laws Assistance for Workers and Small Businesses.

## Annex D

(Informative)

### Available Resources

#### **D.1 Applicable American National Standards**

- Z133.1, Arboricultural operations, safety
- A300, Standard practices for trees, shrubs and other woody plant maintenance (publication pending)
- A10.14, Requirements for safety belts, harnesses, lanyards, lifelines, and drop lines for construction and industrial use
- A14.1, Ladders – Portable wood – Safety requirements
- A14.2, Ladders – Portable metal – Safety requirements
- A14.5, Stepladder and platform ladders, aluminum magnesium, fiberglass ladders
- A92.2, Vehicle-mounted elevating and rotating aerial devices
- Z359.1, Safety requirements for personal fall arrest systems, subsystems, and components
- B175.1, Gasoline-powered chain saws, Safety requirements
- Z87.1, Practice for occupational and educational eye and face protection
- Z89.1, Personnel protection – Protective headgear for industrial workers – Requirements

#### **D.2 Applicable Federal Regulations<sup>4</sup>**

- US Department of Labor – Occupational Safety and Health Administration:
  - 29 CFR 1910.000, General Industry
  - 29 CFR 1910.67, Vehicle-mounted elevating and rotating work platforms
  - 29 CFR 1910.95, Occupational noise exposure
  - 29 CFR 1910.132-136, Personal protective equipment
  - 29 CFR 1910.151, Medical services and first aid
  - 29 CFR 1910.268, Telecommunication
  - 29 CFR 1010.269, Electric power generation, transmission, and distribution

- 29 CFR 1910.331-335, Safety – Electric-related work practices
- 29 CFR 1910.1200, Hazard communication
- 49 CFR, Transportation

#### **D.3 Training Programs Available from the National Arborist Association<sup>5</sup>**

- Video programs:
  - Professional tree care safety:
    - General requirements
    - Personal protection
    - Equipment procedures
    - Operational practices
  - Electrical hazards and trees
  - Aerial rescue
  - Rigging for removal
  - Basic training for tree climbers
  - Principles of pruning
  - Pruning standards
  - Chipper use and safety
  - Back injury prevention program
  - Chain saw selection & maintenance
  - Chain saw use and safety
  - Ropes, knots and climbing
  - Basic training for ground operations in tree care
- Written Programs:
  - Home Study Program in Arboriculture - Series I & II
  - Crewleader home study program
  - Tailgate safety
  - Electrical hazards awareness program
- Other publications:
  - The treeworker
  - Climber's Guide to Tree Hazards (manual & decals)
  - Pocket guide: Preventing falls

<sup>4</sup>) All Available from the U.S. Department of Labor, OSHA, 200 Constitution Avenue, NW, Washington, DC 20201

<sup>5</sup>) All available from the National Arborist Association, 3 Perimeter Road, Unit 1, Manchester, NH 03103

ANSI Z133.1 Revision-October 2000

- Pocket guide: Preventing electrocutions
- Pocket guide: Preventing struck-by accidents
- Pocket guide: Tree felling guidelines

#### D.4 Publications Available from the International Society of Arboriculture<sup>6</sup>

- Video programs:
  - ArborMaster Series I:
    - Introduction to Climbing Techniques and Equipment
    - Introduction to Secured Footlock: Equipment and Techniques
    - Introduction to Ropes: Care, Construction and Limitations
    - Introduction to Belay: Equipment and Techniques
    - Introduction to Throwline: Equipment and Techniques
    - Climbing Knots and Hitches
  - ArborMaster Series II:
    - Innovations in Climbing Equipment
    - Rigging Knots, Rope Slings, and Eye Splices
  - ArborMaster Series III:
    - Chain Saw Safety
    - Chain Saw Maintenance
    - Notches, Hinges, and Backcuts
    - Felling Techniques
    - Limbing and Bucking
    - Chain Saw Use in Trees
  - Other videos:
    - Basic Training for Tree Climbers
    - Basic Training for Ground Operations in Tree Care
    - Climbing Skills Test Preparation
    - Basic Training for Ground Operations in Tree Care
    - Conducting a Tree Climbing Jamboree
    - Utility Pruning: A Video Guide for Pruning Near Utility Conductors
    - Managing Trees for Public Safety: An Arborist's Guide
    - Tree Health Management: Evaluating Trees for Hazard
- Written programs:
  - Arborists' Certification Study Guide (English, Spanish and audio cassette)
  - Tree Climbers' Guide
  - Arborist Equipment: A Guide to the Tools and Equipment of Tree Maintenance and Removal
  - A Handbook of Hazard Tree Evaluation For Utility Arborists
  - Trees and Overhead Electric Wires: Proper Pruning & Selection
  - A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas
  - Tree Pruning Guidelines (English and Spanish)
- Other Publications:
  - Spanish-English/English-Spanish Dictionary of Arboricultural Terms
  - Tree Climber's Companion (written and published by Jeff Jepson)
  - On Rope (written by Smith and Padgett, published by National Speleological Society)

#### D.5 Other Publications

- ACRT Line-Clearance Tree Trimmer Certification Manual, Revision 1996<sup>7</sup>
- ACRT Electric Hazard Recognition Certification Manual<sup>7</sup>
- ACRT Electric Hazard Recognition for Substation Grounds Maintenance Personnel and Herbicide Applicators Certification Manual<sup>7</sup>
- US Department of Agriculture – US Forest Service Job Corps Urban Forestry Student Activity Guide<sup>7</sup>
- ACRT Working in Trees – Self Study Program<sup>7</sup>
- Pruning Trees Near Electric Utility Lines<sup>8</sup>

<sup>6</sup>) All available from the International Society of Arboriculture, P.O. Box 3129, Champaign, IL 61826-3129 ([www.isa-arbor.com](http://www.isa-arbor.com))

<sup>7</sup>) All available from ACRT, Inc., Utility Forestry Specialist, P.O. Box 401, 2545 Bailey Road, Cuyahoga Falls, OH 44221-0401, (800) 622-2562, [www.acrtinc.com](http://www.acrtinc.com)

<sup>8</sup>) Published by Shigo and Trees Associates, 4 Denbow Road, Durham, NJ 03824, (603) 868-7459

## ***REFERENCES***

American National Standards Institute Z133.1 Revision – October 2000. American National Standards for Tree Care Operations – Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements. October, 2000.

National Arborist Association Pocket Guide: Preventing “Struck-By’s,” National Arborist Association, Inc., 2000.

## DISTRIBUTION LIST

### Immediate Distribution

NIOSH  
Employer  
Incident Site Owner  
Decedent's Family, on request  
Labor Union(s)  
NJ State Medical Examiner  
County Medical Examiner  
Local Health Officer  
NJDHSS Census of Fatal Occupational Injuries (CFOI) Project

### General Distribution

USDOL-OSHA New Jersey Area Offices (4)  
NJDOL Office of Public Employees Safety  
NJDHSS Public Employees OSHA  
NJDOL OSHA Consultative Service  
NJ State Safety Council  
NJ Institute of Technology  
University of Medicine & Dentistry of NJ  
Rutgers University  
Stevens Institute of Technology  
College of NJ  
NJ Shade Tree Federation  
NJ Utilities Association  
NJ School Boards Association  
Public Service Electric and Gas Company  
Liberty Mutual Insurance Company Research Center  
Private Consultants (4)  
Private Employers (9)  
Public Employers (6)  
Other Government Agencies (4)

**Fatality Assessment and Control Evaluation (FACE) Project**  
**Investigation # 00-NJ-087-01**

Staff of the New Jersey Department of Health and Senior Services, Occupational Health Service, perform FACE investigations when there is a report of a targeted work-related fatal injury. The goal of the FACE Program is to prevent injuries by studying and identifying the risk factors that contribute to workplace fatalities, by recommending intervention strategies, and by disseminating information to employers and employees. NJ FACE data is reported to NIOSH for trend analysis on a national basis. All identifiers are removed from the FACE reports and other data to protect the confidentiality of those who participate in the program.

NIOSH-funded state-based FACE Programs include: Alaska, California, Iowa, Kentucky, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas, Washington, West Virginia, and Wisconsin.

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