

**California Department of Public Health
Occupational Health Branch**

**FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM
(CA/FACE)**

**Two Tree Trimmers Die When They Are Electrocuted
While Pollinating Date Palm Trees
Case Report: 16CA003**

SUMMARY

Two tree trimmers were electrocuted by an overhead high voltage electrical power line while pollinating date palm trees. Both victims were in the bucket of an aerial lift bucket truck when the incident occurred. The vehicle involved in the incident was parked under high voltage power lines and the bucket was raised up directly into the lines. One of the victims in the bucket made contact with the lines, causing a large arc and fire. The electric utility company was not notified of the work being performed in close proximity to its high voltage lines. There were no written safety procedures or an Injury and Illness Prevention Program (IIPP) in place at the time of the incident.

The CA/FACE investigator determined that, in order to prevent future incidents, tree trimming companies and self-employed tree trimmers working in close proximity to high voltage power lines should:

- Ensure that a daily job hazard analysis of the work area is conducted, including any electrical hazards from high voltage power lines.
- Ensure there is a minimum of ten feet between the work area and high voltage power lines.
- Ensure that workers are trained on safety policies and procedures on electrical hazards around high voltage power lines.
- Ensure that the electric utility company is notified whenever tree trimmers will be working in close proximity to high voltage power lines.

INTRODUCTION

On Saturday, March 12, 2016, at approximately 11:00 a.m., a 45-year-old Hispanic male and a 22-year-old Hispanic male, both tree trimmers, were electrocuted when one of the victims made contact with high voltage power lines. CA/FACE learned of the incident on April 8, 2016, from media reports. On Tuesday, May 16, 2016, the incident site was visited, the company

owner was interviewed, and the bucket truck involved in the incident was inspected and photographed.

EMPLOYER

The employer of the victims was a local tree service company that specialized in trimming and pollinating date palm trees. The company had been in business for 20 years and was primarily an entity of two (father/son). Neither the owner nor his son was a licensed contractor. Other employees were hired on a seasonal basis and were let go when a project was completed.

WRITTEN SAFETY PROGRAMS AND TRAINING

The company did not have a written IIPP. There was no written policy or procedures for any of the tasks performed or equipment used. Safety instructions were nonspecific and generic in nature and were given verbally to employees in their primary language when they were hired for various jobs.

WORKER INFORMATION

Victim #1 was a 45-year-old Hispanic male who had been working seasonally for the company for five years. Victim #2 was a 22-year-old Hispanic male who had been working seasonally for the company for 1½ years. According to the company owner, both victims were experienced trimmers and pollinators of date palm trees who also worked for other tree companies. Both victims had been working for this company for two months at the time of the incident but neither were certified tree trimmers. Victim #1 had a sixth-grade education, victim #2 had an eighth-grade education. Their primary language was Spanish.

WORK PROCESS

The pollination process used in this incident involves cutting strands of male flowers from a freshly opened leaf (spathe) and placing and tying two to three of these strands between the strands of the female flower cluster (inflorescence) after some pollen had been shaken over the female inflorescence. When tree workers are trimming or pollinating date palm trees, an aerial lift truck with a bucket is often used to gain access to the top of the tree.

INCIDENT SCENE

The scene of the incident was a large field covering several acres serving as a nursery for hundreds of date palm trees. Dirt roads gave access to the rows of trees.

WEATHER

On March 12, 2016, the weather at the incident site was clear and sunny with 7 mph winds and a high temperature of 85F.

INVESTIGATION

On the day of the incident, the two tree trimmers (victims #1 and #2) were continuing their work which they started five days earlier. Their assignment was to continue pollinating the date palm trees in a large orchard. They arrived at the company yard at approximately 10:30 a.m. and checked in with the owner who gave them the keys to the aerial lift truck. When they arrived at the orchard, they parked the aerial lift truck under high voltage power lines.

Both victims entered the bucket of the aerial lift. Using the controls inside the bucket, they raised it up directly under the high voltage lines and made contact. Victim #1 reached out to move the line and when he made contact it produced a huge electrical arc and both victims were electrocuted. The arc started a fire in the bucket and the victim #2 fell out of the bucket to the ground below.

At the company yard, the owner and his son were busy with other tasks and unaware of the events occurring at the orchard. When a relative arrived at the orchard to bring the victims' lunch, he observed the raised bucket on fire and victim #2 on the ground. The relative called the owner who immediately called 911 and then drove to the incident site with his son. Emergency services arrived and secured the incident scene. The electric utility company was notified and the fire department arrived and put out the fire. The hydraulic lines to the aerial lift were cut by the fire department in order to lower the bucket to retrieve the other victim. Both workers were pronounced dead at the scene.

CONTRIBUTING FACTORS

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in an injury or fatality. The CA/FACE team identified the following items as contributing factors in this incident that ultimately led to the fatality:

- A daily hazard analysis was not performed.
- Working in close proximity to high voltage electrical power lines.
- No safety policies or procedures.
- Electric utility company was not contacted prior to beginning work.

CAUSE OF DEATH

The cause of death for both victims according to the death certificate was electrocution.

RECOMMENDATIONS

To prevent future incidents, tree trimming companies and self-employed tree trimmers working in close proximity to high voltage electric lines should:

Recommendation #1: Ensure that a daily job hazard analysis of the work area is conducted, including any electrical hazards from high voltage power lines.

Discussion: In this incident, a high voltage power line was located about 15 feet from the top of the palm trees being pollinated, and the aerial truck was parked under the high voltage power lines. However, in raising the boom lift to access the date palms, it was foreseeable that it could contact the high voltage line. A daily job hazard analysis would have identified this risk, and safe work procedures could have been implemented to prevent this incident. For example, the aerial boom truck could have been parked on the other side of the palm trees, thereby creating a safer distance from the high voltage power lines.

Employers should conduct a job hazard analysis (with the participation of employees) of all work areas and job tasks. A job hazard analysis should begin by reviewing employee responsibilities and equipment used. Each task is further examined for mechanical, electrical, chemical, or any other hazards the worker may possibly encounter.

Recommendation #2: Ensure there is a minimum of ten feet between the aerial lift bucket and the high voltage power lines.

Discussion: In this incident, the work was not performed at a minimum recommended distance from high voltage power lines. To pollinate the palm trees, the two victims positioned the bucket truck in close proximity to the high voltage power lines. The victims raised the bucket and it made contact with the lines. When any boom-type lifting or hoisting equipment is operated in close proximity to high voltage power lines, a minimum clearance from the high voltage lines needs to be maintained. In this case, the minimum distance was ten feet. If the victims had positioned the bucket truck appropriately, the bucket would not have made contact and this incident would have been prevented.

Note: Currently available devices that detect electric fields (proximity warning devices) do not provide consistent warning and have operational limitations. They are not recommended at this time (see http://www.dir.ca.gov/oshsb/petition_551.html).

Recommendation #3: Ensure that workers are trained on safety policies and procedures on electrical hazards around high voltage power lines.

Discussion: In this instance, the victims never received proper instructions on hazard recognition and safety procedures when using equipment in the vicinity of high voltage power lines. Had the victims been aware of the risk of the nearby high voltage power line, they may have taken steps to modify their work procedures to ensure that there was no risk when raising the aerial lift bucket. A safety training and testing program on hazard recognition that gives employees the ability to identify a condition or behavior that could cause serious injury should be given:

- To all new employees;
- To all employees given new job assignments for which training has not previously been received;
- Whenever new substances, processes, procedures, or equipment are introduced to the workplace and represent a new hazard;
- Whenever the employer is made aware of a new or previously unrecognized hazard; and
- Supervisors should familiarize themselves with the safety and health hazards to which employees under their immediate direction and control may be exposed.

In addition, the safety training should be given in a language and literacy level that employees can understand. If the victims had received proper training, they may have recognized the hazard from the adjacent high voltage lines and this incident could have been prevented.

Recommendation #4: Employers should always inform the electric company whenever working in close proximity to their high voltage power lines.

Discussion: In this incident, the victims raised an aerial boom basket up into the energized high voltage power lines. Tree trimming companies should always notify the utility company when tree trimming work is to be performed in close proximity to energized power lines. When any operations are to be performed within close proximity to energized high voltage lines, Cal/OSHA High-Voltage Electrical Safety Orders states that the person or persons responsible for the work to be done shall promptly notify the operator of the high voltage line of the work to be performed. Cal/OSHA High-Voltage Electrical Safety Orders also states that employers shall not permit any employee to perform any function in proximity to energized high voltage lines until all danger from contact with the high voltage lines has been effectively guarded against.

The utility company and the employer should discuss the options for protecting workers, such as de-energizing and grounding the power lines or covering them with insulating hoses or blankets. Had the electric company been notified before the start of this job and the power de-energized, the victims' death could have been prevented.

EXHIBITS



Exhibit 1. The vehicle involved in the incident.



Exhibit 2. The melted bucket that held the victims when they made contact with the high voltage electrical line.



Exhibit 3. Location of truck (adjacent to power lines).



Exhibit 4. The proximity of the power lines to the palm trees.

REFERENCES

California Code of Regulations, Vol. 9, Title 8, Sections 1509, 1938, 2946, 4552

Cal/OSHA - Title 8 regulations

Chapter 4. Division of Industrial Safety

Subchapter 7. General Industry Safety Orders

Group 1. General Physical Conditions and Structures Orders

§3203. Injury and Illness Prevention Program.

Subchapter 4. Construction Safety Orders

Article 3. General

§1509. Injury and Illness Prevention Program.

California Code of Regulations: Vol. 9, Title 8, Subchapter 4. Construction Safety Orders, Article 3. General §1511. General Safety Precautions. §1518. Protection from Electric Shock.

Subchapter 5. Electrical Safety Orders, Group 2. High-Voltage Electrical Safety Orders, Article 37. Provisions for Preventing Accidents Due to Proximity to Overhead Lines (Formerly Article 86) §2946

<http://www.cdc.gov/niosh/face/in-house/full9039.html>

<http://www.cdc.gov/niosh/face/in-house/full8948.html>

<http://tcia.org/sites/tcia.org/files/public/resources/safe-palm-pruning-guide-bilingual20120522.pdf>

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December 1, 2016

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Public Health, in cooperation with the Public Health Institute and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations of work-related fatalities. The goal of the CA/FACE program is to prevent fatal work injuries. CA/FACE aims to achieve this goal by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact. NIOSH-funded, state-based FACE programs include: California, Iowa, Kentucky, Massachusetts, Michigan, New Jersey, New York, Oregon, and Washington.

Additional information regarding the CA/FACE program is available from:

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