

Tree Trimmer Electrocuted in Orchard¹

California NURSE Project²

SUMMARY : CASE 192-036-01

A tree trimmer was pruning walnut trees in an orchard. He used a *lift bucket* (a "cherry picker") attached to a mobile platform, which he could raise, lower and move along the rows of trees while standing in the bucket. At the edge of the orchard, high voltage power lines crossed over the last row of trees just above the tree tops. The power company was usually called in to trim these trees.

However, on this day the worker began pruning the last row of trees. He raised his *lift bucket* to the top of one tree. His pruning shears touched the power line and he was electrocuted. Although co-workers pulled the lift bucket and platform away from the power lines with a truck, the worker died instantly. His body was badly burned.

How could this death have been prevented?

- Hold safety meetings before every shift, warning workers of dangers in their area.
- Ask the power company to shut off power to lines in the work area, instead of expecting workers to avoid the lines.
- Work as a team. Other tree trimmers in the orchard should be on the look-out for danger.
- Mark dangerous areas for employees to avoid, such as trees near power lines.
- Use tree trimmers who are specially trained to work near power lines.

BACKGROUND

On April 1, 1992, at 3:15 p.m., the California Occupational Safety and Health Administration (Cal/OSHA) district compliance office was notified by an orchard owner of an electrocution in a walnut orchard. This fatal injury occurred at approximately 2:20 p.m. earlier that day, when a 38 year-old male Hispanic tree trimmer was electrocuted while pruning walnut trees.

Cal/OSHA notified NURSE Project staff of the incident on April 9, 1992. A Senior Safety Engineer from the NURSE project conducted an on-site investigation on June 2, 1992, and July 1, 1992 and discussed the incident with the farm owner and crew foreman. NURSE staff reviewed the medical examiner/coroner records and the Cal/OSHA investigation report.

This electrocution occurred on a family-owned farm of 1,000 acres, of which about half are planted in tree fruit and nuts and half in cotton. Approximately 300 casual (1 to 12 weeks per year) farm workers are employed by the farm during peak harvest season, and 15 workers are employed year-around. Cal/OSHA investigated the incident on April 6, 1992, and found the employer's safety program to be in compliance with Title 8 California Code of Regulations 3203 -- Injury and Illness Prevention Program. (As of July 1, 1991 the State of California requires all employers to have a written seven point injury prevention program: designated safety person responsible for implementing the program; mode for ensuring employee compliance; hazard communication; hazard evaluation through periodic inspections; injury investigation procedures;

1. This document, CDHS(COHP)-FI-92-005-12, was extracted from a series of the Nurses Using Rural Sentinel Events (NURSE) project, conducted by the California Occupational Health Program of the California Department of Health Services, in conjunction with the National Institute for Occupational Safety and Health. Publication date: May 1992.

2. NURSE Project, California Occupational Health Program, 2151 Berkeley Way, Annex 11, Berkeley, CA 94704.

intervention process for correcting hazards; and a health and safety program.)

The tree trimmer had worked on this farm for several years as the foreman of a 30-worker crew, but then had returned to his home in Mexico. He returned to California and was hired in December, 1991 to prune trees in the orchards during the next spring season. He received two days of safety training at that time. Current farm safety policy includes tailgate safety meetings held every ten days. (Tailgate safety meetings are brief talks on safety practices by the foreman or supervisor at the work site before the day's work begins.) The employer noted that the tree trimmer had been warned of the presence of the power lines during the initial safety training in December, 1991. During the pruning season last spring, the power company had trimmed the trees near the power lines.

INCIDENT

On April 1, 1992, at approximately 2:20 p.m., a tree trimmer was pruning walnut trees using a mobile lift bucket. The lift bucket is mounted on a platform that has a tricycle-type configuration, with dual wheels on each of the three axle points. One set of wheels, in the rear, steers the platform. The wheels in the front are used to move the unit. A diesel engine in the base of the platform powers the drive wheels and the hydraulic system. The control system for the hydraulic lift and the power system for the mobile platform are in the lift bucket, enabling the driver to stand in the bucket and operate the controls that raise and lower the bucket, and move the platform. Using mobile lift buckets for pruning eliminates the use of ladders and is more efficient. This lift bucket was not insulated because it was not intended for use around high voltage power lines. Therefore, the lift bucket was incapable of preventing electrical current from flowing through it to the ground.

At the time of this incident, the fatally injured tree trimmer and one other tree trimmer were working from two mobile buckets in the orchard. A 12,000 volt power line (30 feet and 3 inches above the ground) runs parallel and crosses the last row of trees (see diagram). At the time of the investigation, tree branches were observed to be touching the power line.

The tree trimmer was pruning the last row of trees adjacent to the roadway with the power lines over his head. The worker trimmed one side of the tree, then moved the platform into the roadway on the far side of the tree to prune the other side. He raised the bucket

approximately 25 feet high (as high as the bucket could go) and lifted his pruning shears over his head. His shears then came into contact with the high voltage power line. Upon contact with the power line, a path-to-ground circuit was established and electricity flowed through the pruning shears, his body, and down to the ground through the platform.

Other employees on the farm used a truck to pull the mobile platform away from the power lines and lower the lift bucket. Farm employees also called 911, with the fire and ambulance service, the county sheriff and the coroner's office all responding. The coroner noted the tree trimmer was lying on the ground under the tree where he had been working, and pronounced him dead at 2:40 p.m.

The deceased tree trimmer had deep and extensive abdominal burns. These burns corresponded to clothing burns and burns on the plastic bumper of the inside edge of the lift bucket where he had been leaning. There were also burns on his thumbs and fingers, the front left side of his chest, his right thigh, right shin, and toes. The metal shaft and plastic handle of the pruning shears were blackened where he had been holding them. The boom (neck leading from the platform to the bucket) of the lift bucket showed electrical discharge markings such as blackened and peeling paint, and two of the six wheels had electrical burns down the side with the ground next to them burned.

The coroner reported the cause of death as cardiac arrest and arrhythmia due to electrocution with extensive thermoelectric burns.

PREVENTION STRATEGIES

1. Employers should keep the work environment free of hazards. The presence of high voltage power lines is a hazard for any workers performing their routine work tasks. If the tree trimmer was going to be working near these lines, the power company should have been notified and shut off power during the pruning activity. If the lines had been de-energized or covered with insulated sleeves, the tree trimmer would not have been electrocuted when his pruning shears contacted the lines.
2. Workers who are working as a team or in the same area need to be sure that there is constant communication and visual contact among themselves. In this incident, two tree trimmers were working in the same orchard. If there had been communication between them, one of the tree

trimmers may have warned the other that they were not supposed to work in the row near the power lines.

3. Employers should have tailgate safety meetings prior to every work shift. The foreman should re-enforce the importance of safety procedures at the work site prior to starting the work day. Emphasis should be on pointing out specific hazards related to their tasks and ensuring that employees understand that safety procedures must be followed to prevent injuries. If this worker had been instructed earlier that day that he should not trim the trees next to the power line, he might not have attempted to do so.
4. Employers should identify and mark all hazards in the work environment. In this incident, there were no warning signs placed on trees which were close to the power lines. If these trees in the last row (near the power lines) had been marked with highly visible paint, perhaps the tree trimmer would have been warned that he was in the vicinity of the high voltage lines. There was also no warning sign on the mobile work platform saying that equipment should not be operated within ten feet of the power line*. Originally the mobile platform had a manufacturer's warning sign, but it had been removed when a heater was added by the employer.

*** Title 8 California Code of Regulations 2947: The owner..shall post and maintain in plain view of the operator and driver on each crane, derrick...a durable warning sign legible at 12 feet reading: "Unlawful to Operate This Equipment Within 10 Feet Of High Voltage Lines of 50,000 Volts or Less."**
5. Employers and foremen should never allow their employees to perform work that they have not been specifically trained for or for which they do not have protective equipment. Working in the vicinity of high voltage power lines requires specialized equipment and training. Qualified line clearance tree trimmers are specially trained (with eighteen months of experience and on-the-job training) for working in the vicinity of power lines. If the farm owner had hired a qualified line clearance tree trimmer to perform this task, the worker's death might have been prevented.

FURTHER INFORMATION

For further information concerning this incident or other agriculture-related injuries, please contact:

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The NURSE (Nurses Using Rural Sentinel Events) project is conducted by the California Occupational Health Program of the California Department of Health Services, in conjunction with the National Institute for Occupational Safety and Health. The program's goal is to prevent occupational injuries associated with agriculture. Injuries are reported by hospitals, emergency medical services, clinics, medical examiners, and coroners. Selected cases are followed up by conducting interviews of injured workers, co-workers, employers, and others involved in the incident. An on-site safety investigation is also conducted. These investigations provide detailed information on the worker, the work environment, and the potential risk factors resulting in the injury. Each investigation concludes with specific recommendations designed to prevent injuries, for the use of employers, workers, and others concerned about health and safety in agriculture.