Laborer Electrocuted as Boom of Bucket Truck Contacts a 7200-volt Power Line

FACE 89-15

Introduction:

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatal Accident Circumstances and Epidemiology (FACE) investigations when a participating state reports an occupational fatality and requests technical assistance. The goal of these evaluations is to prevent fatal work injuries in the future by studying the working 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.

On January 11, 1989, a 31-year-old laborer was electrocuted while contacting an aerial bucket truck when the boom of the truck contacted a 7200-volt power line.

Contacts/Activities:

p>State officials notified DSR of this fatality and requested technical assistance. On January 26, 1989, a DSR research safety specialist conducted a site visit, met with representatives of the company, and discussed the incident with the Occupational Safety and Health Administration Compliance officer.

Overview of Employer's Safety Program:

The victim was one of 30 workers employed by a power line right-of-way clearance company. The company, which had been in operation for 6 years, had no safety policy, no safety program, and no written safe work procedures. All training was on-the-job. The victim had worked for the company for three days.

Synopsis of Events:

On the day of the incident, the victim and a truck driver (crew chief) were clearing a section of right-of-way for a single-phase 7200-volt power line in a wooded rural area located approximately one-quarter of a mile off the main road. Each time the truck was positioned, the victim would drop outriggers, and the driver would raise himself into position in the bucket and trim the trees with a chain saw or pneumatic clippers. When the driver had trimmed all branches within reach

he would lower the boom to the truck. The victim would then raise the outriggers and reposition the truck. Once the truck was repositioned, the victim would stand near where the boom was mounted to the truck, in sight of the driver, until trimming was completed in that area. The truck was not grounded during this procedure.

In mid-afternoon the men decided to take a break. When they returned from the break the victim positioned the truck for the driver who began trimming branches. When the driver had finished trimming in that area, the victim repositioned the truck. When the driver saw the victim begin to drop the outriggers, he raised himself in the bucket to a position above the 7200-volt power line (the power line was approximately 22 feet above the ground). The driver assumed that the victim had returned to his position on the ground. As the driver repositioned the bucket he heard the victim groan and call out his name. The driver then noticed that the lower side of the uninsulated boom had contacted the power line and that the victim was lying on the ground beside the truck. He immediately lowered the bucket to the truck. As the driver exited the bucket he noticed that the victim was standing. As he approached, however, the victim collapsed. When he noticed that the victim was having difficulty breathing, the driver began “massaging” his chest. He looked up, saw three men in an adjacent field burning trash, and ran to them for assistance. One man left to summon the rescue squad while the others returned to the victim. When they arrived they noticed the victim had no vital signs. Once the rescue squad arrived, the physician’s assistant pronounced the victim dead at the scene. The victim had apparently been in contact with the truck and the ground at the time the boom contacted the power line, allowing the electric current to pass through him to ground causing his electrocution.

Cause of Death:

The county coroner listed electrocution as the cause of death.

Recommendations/Discussion

Recommendation #1: Booms used in the vicinity of power lines should be insulated or adequate alternate means should be taken to protect workers.

Discussion: Booms used in proximity to power lines should be insulated to prevent the flow of current over the entire vehicle in case of inadvertent contact with the power lines. Safety measures such as those outlined in OSHA Standard 1910.180(j)(1)(i) should be utilized when uninsulated booms are used. Although this standard actually applies to cranes, the precautions are applicable to bucket trucks and other boomed vehicles as well. This standard states that “except where power lines have been deenergized and visibly grounded at the point of work, or where insulating barriers not a part of the crane have been erected to prevent physical contact with the lines, a minimum clearance of ten feet must be maintained between power line and machine for power lines rated 50 kV or less.” If an insulated boom had been used or if a safe clearance distance had been maintained, this fatality may not have occurred.

Recommendation #2: The employer should develop a safety program designed to recognize and control hazards.

Discussion: The ever-present danger of overhead power lines appears obvious; however, contacts between booms and overhead power lines which result in occupational electrocutions continue to occur. OSHA Standard 1926.21 (b) (2) states that “the employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury.” The tasks performed by workers should be evaluated and the associated hazards identified. A safety program should then be developed that addresses the control of these hazards. The program should also stress hazard awareness training for all employees, especially new employees. The victim should have been made aware of all hazards associated with the performance of his task, including the hazards associated with working in proximity to power lines with boomed vehicles. If the victim had understood the hazards he may have known to watch and alert the driver that the bucket was too close to the power lines. Additionally, it was a poor safety practice for the driver to extend the boom of the truck over the power line. The truck should have been repositioned so that this action would not have been necessary. If the truck had been repositioned or if the victim had recognized the existing hazards, this fatality may have been prevented.

Recommendation #3: Employees who perform their duties in proximity to electrical energy should be certified in cardiopulmonary resuscitation (CPR).

Discussion: Although the majority of work performed by this company is in proximity to power lines the workers are not all certified in CPR. When the driver noticed that the victim was having difficulty breathing he began to massage the victim's chest. If the proper procedures for CPR had been immediately initiated, the victim's chances for survival would have been increased.

Return to In-house FACE reports

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