



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Equipment Operator Electrocuted by Contact with Power Line

FACE 89-04

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 November 2, 1988, a 47-year-old male equipment operator was electrocuted when he contacted a 7,600-volt power line.

Contacts/Activities:

On November 3, 1988, a state occupational safety and health program official notified DSR of this fatality and requested technical assistance. On November 17, 1988, a safety specialist met with an employer representative, discussed the incident with the OSHA compliance officer, obtained photographs of the incident and reports from the local fire/rescue service and police department.

Overview of Employer's Safety Program:

The employer in this incident, a large municipality which was chartered over 128 years ago, currently has over 9,000 employees. The victim was one of approximately 200 employees who work for the Department of Transportation/Traffic operations. The victim had worked for the municipality for 22 years, 8 years of which were in his current occupation of equipment operator.

The city employs three safety specialists (one safety officer and two injury prevention specialists) who work with each of the city departments. Although the city uses written safety rules and procedures in all departments, written procedures for certain tasks, such as traffic signal installation, have not been developed.

Synopsis of Events:

A crew installing new traffic signals at a four-way intersection in a residential section of the city consisted of a field supervisor, two laborers, and an equipment operator (the victim). Prior to installing the signals, the crew erected four metal poles (approximately 28 feet high) on each corner of the intersection to support the traffic signals suspended from span wires.

The crew installed two traffic signals, and began work on the third signal. A 1/4-inch-diameter steel wire cut to length (approximately 50 feet) was to be attached to two of the metal poles in order to support the third traffic signal and associated wiring.

The field supervisor and two laborers were on the ground at the corner opposite where the victim was working. The victim picked up one end of the cut steel wire lying on the ground and looped it over his shoulder. He then climbed into the bucket of the vehicle and began raising the boom. While attempting to position the bucket close to the metal pole, the victim apparently misjudged either the height of the power lines (the secondary wire was 19 feet 5 inches from ground level) or their proximity to the metal pole. He contacted the bottom phase of the 7,600-volt (phase to phase) power line with his bare head. This contact provided the electrical current a path through the victim's body and down the steel span wire to ground, causing his electrocution.

The other crew members heard the sound of electricity arcing, and looked up to see the victim in contact with the power line. They contacted the local fire/rescue service. Emergency personnel arrived at the scene approximately 7 minutes later. The victim remained in contact with the power line until the line burned in two and fell to the ground. The local utility company personnel arrived, de-energized the line, and lowered the boom and bucket containing the victim to the ground. The victim was pronounced dead at the scene.

Cause of Death:

The coroner reported the cause of death as electrocution.

Recommendations/Discussion

Recommendation #1: Employers should communicate and coordinate activities with the local utility company before working near energized power lines.

Discussion: The local utility company should be notified prior to initiating work near electrical power lines. The utility company can de-energize and ground power lines, or at least insulate them with line guards, rubber line hoses, or other insulating devices before employees begin work. Had the power line in this incident been de-energized or properly insulated, this death probably would not have occurred.

Recommendation #2: Employers should ensure that minimum clearances between boomed vehicles and power lines are maintained according to existing OSHA regulations.

Discussion: OSHA regulation 1910.67 (b)(4)(i) (Vehicle-mounted Elevating and Rotating Work Platforms) requires that a minimum clearance of 10 feet be maintained between electric power lines rated at 50,000 volts or less and any part of an aerial lift being operated proximate to, under, over, by or near such power lines. The equipment operator did not comply with these requirements and was electrocuted.

The location of the articulating boom platform (beneath the power lines), weather conditions (cloudy and windy 23-29 mph), and the work environment (tree limbs with leaves around the metal support pole, numerous telephone lines, and primary and secondary electric power lines) may have interfered with the operator's perception of the distance to the power line. Employers should designate a person to observe clearance of equipment and to give timely warning when it is difficult for the equipment operator to maintain sufficient clearance by visual means.

Recommendation #3: The employer should design, develop, and implement a comprehensive safety program which includes specific written procedures for all work near energized power lines.

Discussion: The employer should design, develop, and implement written procedures for specific tasks such as traffic signal installation. These procedures should include, but not be limited to: 1) worker training, 2) electrical hazard recognition, 3) use of personal protective equipment, 4) supervisory job site surveys prior to the start of work, and 5) first aid/cardiopulmonary resuscitation (CPR) certification training.

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