



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Telephone Construction Worker Electrocuted in North Carolina

FACE 86-18

Introduction:

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR) is currently conducting the Fatal Accident Circumstances and Epidemiology (FACE) Project, which is focusing primarily upon selected electrical-related and confined space-related fatalities. By scientifically collecting data from a sample of fatal accidents, it will be possible to identify and rank factors that influence the risk of fatal injuries for selected employees.

On February 5, 1986, a groundman for a telephone construction contractor was electrocuted when the boom from a truck crane contacted a 7.2 kV power line.

Contacts/Activities:

officials of the Occupational Safety and Health Administration for the State of North Carolina, in cooperation with the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR) notified NIOSH of this fatality and requested technical assistance. This case has been included in the FACE Project. On February 19, 1986, the DSR research team (a safety specialist and a medical officer) conducted a site visit and met with representatives of the company which employed the victim. Interviews were conducted with the victim's foreman and a co-worker; both of them witnessed the incident. The accident site was visited and photographs were taken. A surrogate interview was conducted to obtain personal characteristics of the victim.

Background/Overview of Employer's Safety Program:

The victim worked as a groundman for a telephone construction company that employs 250 people and contracts with the local telephone company to construct outside telephone lines. The construction company's safety program is totally administered by the telephone company. There is a written safety policy and safety meetings are held at the beginning of every work week.

Synopsis of Events:

On February 5, 1986, a construction crew was to place a guy wire between a power company pole and a ground anchor. The ground anchor unit consisted of a guy wire anchor rod attached to a screw type anchor. The crew consisted of five people: two groundmen (including the victim), one lineman, one operator, and a foreman.

The temperature at the time of the accident was slightly above 50 degrees F. The ground at the work site was saturated with water after heavy rainfall.

The truck crane used by the crew had an auger attachment on the hydraulic boom. After the auger was removed, the ground anchor could be inserted into the auger attachment and rotated. This action would screw the anchor into the ground and was done to avoid digging a hole and backfilling around the anchor. The projected location of the anchor was almost directly under a 7.2 kV power line, which was 23 feet above the ground at the pole. The hydraulic boom could potentially reach a height of 39 feet above the ground.

The operator was standing on the back of the truck at the control panel. As he rotated the boom (with the anchor unit suspended), the boom contacted the high voltage line. The operator realized he had contacted the line and jumped from the truck. He was not injured until he reached back to the control panel in an effort to move the boom away from the line. The operator received electrical burns to his left foot and was sent to the regional burn center.

The victim (a groundman) was repairing the frayed end of the wire to be used as the guy wire. A section of this wire was lying across the extended outrigger of the truck crane. When the crane contacted the power line the guy wire became energized. The victim, who was holding one end of the energized guy wire, fell to the ground. When the circuit opened, the foreman began pulling the victim away from the truck. However, the recloser closed the circuit automatically and the foreman received an electrical shock. The foreman, who was wearing rubber boots, was not seriously injured. After the circuit opened for the second and final time, the foreman began cardiopulmonary resuscitation on the victim. The ambulance arrived within approximately 10 minutes. The victim was pronounced "dead on arrival" at the local emergency room.

The lineman, who was in contact with the anchor unit and guiding it towards the marked location, was also injured. He received electrical burns to his legs and scalp, and apparently had a respiratory arrest. He was revived by mouth-to-mouth resuscitation given by the foreman. He was sent to the local hospital by ambulance and subsequently transferred to a regional burn center.

The other groundman was standing on the driver's side of the truck putting on his equipment belt. He felt the voltage, but was not seriously injured.

Cause of Death:

The coroner reported the cause of death to be cardiac arrest secondary to electrocution.

Recommendations/Discussion:

Recommendation #1: Employers should enforce existing regulations concerning crane operations in the vicinity of overhead power lines.

Discussion: OSHA Standard 1926.550(a)(15) requires that the minimum clearance between electrical lines rated 50 kV or below and any part of the crane or load be ten feet, unless the electrical lines have been "de-energized and visibly grounded" or insulating barriers have been erected "to prevent physical contact with the lines, equipment or machines." When it is necessary to work closer than 10 feet (horizontal distance) from an energized line, the power company should be contacted to comply with this standard. In many cases, the power company will send an engineer or safety specialist to assure the safety of the operation.

Recommendation #2: When working near a high voltage line, if visibility could be obstructed, an observer should be used to help the operator maintain the required clearance. This is required by OSHA Standard 1926.550(a)(15)(iv).

Discussion: The boom of the crane was rotated into a position that obscured the operator's view of the power line. Additionally, the sun may have played a significant role. Re-creation of the operator's line of sight indicated that it was very difficult to see the power lines at that time of day from the operator's position. Also, the operator was preoccupied with positioning the anchor. If an observer had been present, he could have warned the operator of his proximity to the power line, and the accident could have been avoided.

Recommendation #3: The procedures to be followed in the event of an emergency should be familiar to every crane operator. Specific training should be given concerning the procedures to be followed if electrical energy is contacted.

Discussion: A crane operator who contacts a power line should stay on the vehicle and attempt to move the boom away from the power line. If the operator must dismount the vehicle while it is in contact with the power line, he should jump from the vehicle and walk away from the electrical source. He should take short steps to avoid contacting different ground surface potentials and receiving an electrical shock. He must not "step down" from the vehicle, as that would provide a path to ground and cause serious or fatal injury. No one should return to the crane until the power company has de-energized the line. When the operator realized he had contacted the power line, he apparently jumped from the crane. While standing on the ground he reached back to the control panel, which was energized. He received electrical shock and serious electrical burns that could have been avoided if he had not returned to the truck. If he had moved the boom before dismounting the truck, he could have avoided his own injury and may have lessened the severity of injury to co-workers.

[Return to In-house FACE reports](#)

Last Reviewed: November 18, 2015

How helpful was this page?



Not helpful

Very helpful