



The National Institute for Occupational Safety and Health (NIOSH)

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Apprentice Lineman Dies after Contacting 7200-volt Primary Wire

FACE 89-39

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 May 2, 1989, a 20-year-old male apprentice lineman died after making direct contact with a 7200-volt primary wire.

Contacts/Activities:

State officials notified DSR of this fatality and requested technical assistance. DSR personnel discussed this case with state compliance personnel. On June 26, 1989, a safety specialist and a safety engineer from DSR reviewed the incident with company officials, visited and photographed the accident site, and met with responding EMS personnel.

Overview of Employer's Safety Program:

The employer in this case is a large, multistate utility services contractor. The company has been in operation for more than 70 years and employs more than 10,000 employees. The company has a multifaceted safety program that specifically addresses the hazards employees in each of the various subdivisions (i.e., electrical distribution, gas line distribution, and telephone line distribution) are likely to encounter. The company employs full-time professional safety personnel in each division, a ratio of approximately one safety professional for every 250 employees. Periodic refresher training courses are provided to all employees. In addition, in the electrical distribution division (which was involved in this incident), all service personnel go through a training and classification system sponsored by the local electrical union. The victim was classified by the union as a fifth step (highest level) apprentice lineman at the time he was hired by the company. The victim had worked for the company for 7 months at the time of the incident.

Synopsis of Events:

The victim was employed as an apprentice lineman on one of six powerline construction crews working near a large metropolitan area. These crews consist of a crew leader, a journeyman lineman, and in some cases an apprentice lineman. The victim's father was the crew leader on the victim's crew.

Company procedure for apprentice work on utility poles requires the journeyman to ascend the pole and install all needed guards (line hoses, etc.) before the apprentice ascends the pole. After work is completed, the apprentice descends the pole first. The journeyman then removes the guards and descends.

On the day of the incident, the journeyman lineman for the crew had called in sick, leaving just the apprentice and crew leader at work. Since the crew was short a journeyman, and since it was raining, the company superintendent informed the crew leader the first thing in the morning that the crew would not be working any lines that day. Instead, the crew leader was instructed to complete some outstanding paperwork and deliver it to two area offices. He was also to pick up materials that the crew would be using during the following days.

The rain stopped at approximately noon, and the crew leader and the apprentice decided to go look at an area where they would be working the following day. The work to be done at this site involved transferring one primary and three secondary lines from an old utility pole to a new pole, less than 18 inches away.

After looking at the worksite, the apprentice and his father (the crew leader) discussed performing the job while they were at the site rather than coming back the following day (with the journeyman). The crew leader, in direct violation of company safety policy, agreed to allow the apprentice to perform the job by himself.

The pole was in the backyard of a private residence, and could not be accessed from the crew's bucket truck. Therefore, the apprentice put on his climbing equipment, rubber sleeves (as required by company policy), and a set of leather "protectors" (leather gloves designed to be worn over a pair of rubber lineman's gloves), and climbed the pole. As the apprentice prepared to install a line hose over the primary wire prior to moving this wire to the new pole, the crew leader left the area to go to the crew's truck and obtain a "baker board" (a portable platform linemen erect on a pole to provide a stable platform to work from). As he was approaching the truck, approximately 50 yards from the pole, he heard the apprentice scream. When the crew leader turned around, he saw the apprentice in contact with the 7200-volt primary line. The apprentice collapsed and fell away from the line, still secured to the pole by his climbing belt. The crew leader asked a nearby resident to call for help while he began trying to remove the victim from the pole.

Local fire department and emergency medical services (EMS) personnel were on the scene approximately 6 minutes after the incident. The crew leader assisted rescue personnel in removing the apprentice (his son) from the pole. Cardiopulmonary resuscitation (CPR) was begun immediately by EMS personnel.

The victim had burns on the little finger of each hand and on each shin where his metal climbers were strapped on. It appears that the victim, wearing only his leather overgloves, was attempting to install a section of line hose when the little fingers of both hands made contact with the energized primary wire. A path to ground was established from the victim's hands, through his body, to the metal climbers strapped to his legs, with the new pole serving as "ground."

NOTE: The victim had his rubber gloves and a second pair of leather overgloves in a tool pouch on his hip at the time of the incident. The victim had previously requested and been issued a pair of rubber guards for his climbers. These were in the crew's truck when the incident occurred.

The victim was transported to a nearby hospital where he was pronounced dead approximately 1 hour and 30 minutes after the incident.

Cause of Death:

The medical examiner's report lists the cause of death as electrocution.

RECOMMENDATIONS/DISCUSSION:

Recommendation #1: Established company safety procedures must be followed at all times.

Discussion: In this incident the company has a comprehensive safety program in place. This plan specifically prohibits apprentice linemen from climbing a pole without a journeyman first climbing the pole and installing all needed guards. The policy also calls for the use of both rubber lineman’s gloves and leather protectors to be worn at all times when a lineman is off the ground. Had either of these policies been followed, this incident probably would not have occurred.

Recommendation #2: Line crews should obtain management approval prior to making changes in work assignments or operational procedures.

Discussion: In this case the crew decided to visit a site and perform a task without the knowledge of management. The superintendent was unaware the crew was even in the town where the incident occurred, much less that they were engaged in line work. Had the crew leader contacted his supervisor he probably would have not been permitted to attempt the task which resulted in this fatality.

Recommendation #3: Management should consider the possible consequences of permitting family members to work together when one is serving as a “trainee” under the other’s supervision.

Discussion: When relatives work together, the potential exists for either individual to exert personal influence on the other. For example, the son may have convinced his father to “give him a chance” or, the father may have “pushed” the son to accomplish a task for which he was not adequately trained. In any case, the apprentice attempted, and the crew leader condoned, a task which would ordinarily have been prohibited. Management must stress the fact that company safety policies apply to all individuals, regardless of relationships between individuals.

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