The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research

56-Year-Old Pipe Layer Electrocuted in North Carolina

FACE 87-41

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. The purpose of the FACE program is to identify and rank factors that influence the risk of fatal injuries for selected employees.

On April 23, 1987, a pipe layer was guiding a load attached to the bucket of a backhoe when the accident occurred. The pipe layer was electrocuted when the boom of the backhoe contacted a 13,200 kV overhead powerline.

Contacts/Activities:

Officials of the Occupational Safety and Health Program for the State of North Carolina notified the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR) concerning this fatality and requested technical assistance. This case has been included in the FACE Project. On May 7, 1987, a DSR safety specialist conducted a site visit, collected incident data, photographed the site, interviewed comparison workers, and discussed the incident with the state compliance officer and a representative of the employer.

Overview of Employer's Safety Program:

The employer is a general contracting company that has approximately 400 full-time employees. The company has a comprehensive safety program and a full-time safety manager.

Employees receive a copy of the company safety policy and employee safety manual. On-the-job training is provided to all new employees for specific job tasks.

Synopsis of Events:

A pipe layer (the victim) was an employee of a general contracting company that was under contract to install a water drain pipe. One phase of the project involved installing a section of drain pipe underneath an asphalt road. In order to bore under the road to install the drain pipe, a pit (9' deep x 7' wide) had been dug to within 10 feet of the roadway berm. Sections of

steel track (1' high x 3' wide x 10' long) were being positioned on the floor of the pit in order to support and direct the boring machine.

In preparing to move a section of steel track into the pit, a crawler type backhoe equipped with an articulated (jointed) boom capable of reaching vertically approximately 28' was positioned for the lift. A 13,200 volt overhead powerline approximately 25' 8" from ground level and perpendicular to the roadway was located directly above the pit. A steel chain was then placed around the bucket of the backhoe and attached to a section of steel track. The pipe layer then guided the section of steel track as it was being moved into the pit. As the backhoe operator lifted and swung the boom in the direction of the pit, the upper arm of the boom (above the elbow) contacted the overhead powerline. The victim, who was guiding the load, provided a path to ground for the electrical current and was electrocuted.

A rescue squad was summoned and arrived at the scene eight minutes after receiving the call. When the rescue squad arrived no one was performing CPR even though the victim was not breathing and had no pulse. Resuscitation was attempted at that time, but was unsuccessful. The victim was later pronounced dead at the hospital. Entry wounds were noted on both hands of the victim and an exit wound was located on his right foot. (The length of time that the victim was in contact with the electrical current was estimated to be 20 seconds.)

Cause of Death:

The coroner's report stated cause of death as electrocution.

Recommendations/Discussion:

Recommendation #1: Employers should enforce existing regulations concerning equipment operating in the vicinity of overhead powerlines.

Discussion: OSHA regulation 1926.600 (a) (6) Subpart 0 – Motor vehicles, mechanized equipment, and marine operations requires that all equipment (i.e., backhoes covered by this subpart) when working or being moved in the vicinity of powerlines rated 50 kV or below must maintain a minimum clearance of ten feet. The backhoe operator did not comply with these requirements.

Recommendation #2: Employees should be trained in hazard recognition.

Discussion: Employees working in the vicinity of electrical powerlines should be trained to recognize electrical hazards. Supervisory personnel of the employer generally conduct daily safety meetings; however, a meeting was not held on the day of the accident. During these meetings employees should be made aware of all hazards associated with the tasks to be performed during the day, including electrical hazards.

Recommendation #3: Non-conductive tag lines should be used to aid in guiding and stabilizing the load.

Discussion: The use of non-conductive tag lines could help prevent exposure of the worker to electrical current in the event of an electrical mishap. Note: Although all ropes will conduct electricity, dry polypropylene rope provides better insulating properties than most commercially available rope.

Recommendation #4: Additional personnel should be used to observe clearances when equipment is being operated in the vicinity of electrical powerlines.

Discussion: A person should be designated to observe clearance of the equipment and to give timely warning for "all" operations where it is difficult for the operator to maintain desired clearances by visual means.

Recommendation #5: Employees and/or employers should be trained in the use of cardiopulmonary resuscitation (CPR).

Discussion: CPR should begin within 4 minutes (in accordance with American Heart Association guidelines) in order to achieve the best results. To meet this criteria for successful resuscitation, workers should be trained in CPR to support the victim's circulation and ventilation until trained medical personnel arrive. No one at the accident site was trained in CPR and, therefore, critical care was not provided in a timely manner.

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Last Reviewed: November 18, 2015