The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research

Laborer Electrocuted in Virginia

FACE 87-66

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 August 10, 1987, a laborer was electrocuted when the mast of a well drilling rig he was operating came in contact with a 7200 volt overhead power line.

Contacts/Activities:

Officials of the Occupational Safety and Health Program for the Commonwealth of Virginia notified DSR concerning this fatality and requested technical assistance. This case has been included in the FACE Project. On September 9, 1987 the DSR research team discussed the incident with the OSHA compliance officer, conducted a site visit, met with the employer and family of the victim, photographed the site and drilling rig, and spoke with emergency rescue squad personnel.

Overview of Employer's Safety Program:

The employer in this incident is a residential and commercial drilling company with four employees. The victim was the son-in-law of the owner of the company. The company had no written safety program or policies. However, the victim and the owner of the company had worked together for ten years in the well drilling business, six of which were for a large corporation with an extensive safety program. For the past four years they had worked together in the family business. Awareness of the hazards posed by overhead power lines is evident in the presence of "look up and live" signs posted on company equipment.

Synopsis of Events:

Normally the owner of the company visits the work site prior to sending the drilling rig out. However, in this case the company owner had been unable to contact the property owner and locate the site for the well.

On the day of the accident the victim and a co-worker completed work on one well and returned to the company office where the victim was advised that the property owner had called and wanted his well drilled that day. The victim, along with the co-worker, drove the drilling rig out to look for the site of the new well. They experienced some difficulty in locating the site and called the office for additional information. At that time the company owner advised the victim not to begin operations until he (the owner) arrived on the scene.

The victim and his co-worker returned to the property where the well was to be drilled. They then met with the owner of the property who helped them locate the well site. Access to the well site was obtained by backing the drilling rig approximately 150 feet along a power line right-of-way beneath a 7200 volt, three phase electrical line suspended at a height of 24 feet. The drilling rig then backed off the power line right-of-way at a 45 degree angle to reach the well site, which had been selected by the county health department. The victim and his co-worker went to the rear of the drilling rig and the victim stepped up on a steel platform on the rig to raise the mast. As the mast was being raised the co-worker observed smoke coming from under the drilling rig. The victim stepped down from the operator's platform to attempt to locate the source of the problem. He and his coworker observed smoke coming from the tires of the drilling rig, but they apparently failed to associate this with contact between the mast and the overhead power lines. The victim then attempted to enter the cab of the drilling rig to shut-down the rig. As he touched the cab of the truck his body provided a path to ground from the electrically energized vehicle and he was electrocuted. The owner of the property realized then that the truck was energized and used a stick to push the victim away from the vehicle.

Emergency medical service (EMS) for the county where the accident occurred is provided by a volunteer rescue squad. Although the squad was called at 2:48 p.m., response was delayed by the fact that EMS personnel had to respond from their homes. Therefore, the ambulance did not leave the station until 3:05 p.m. and did not reach the scene of the accident until 3:07 p.m. (19 minutes after the call was received). EMS personnel began CPR at the scene and continued it enroute to the hospital where the victim was pronounced dead on arrival. Although the EMS unit had a manual defibrillator on board, the rescue squad was not trained in its operation.

Cause of Death:

The medical examiner ruled that electrocution was the cause of death.

Recommendations/Discussion

Recommendation #1: A job site survey should be conducted prior to the commencement of any work.

Discussion: A job site survey conducted prior to the start of work would serve as a time for identifying hazards (such as overhead power lines) and for planning work to avoid these hazards. Such a procedure, which was usually routine for this company, could have prevented the fatality.

Recommendation #2: Employers should comply with OSHA regulations concerning the operation of boomed-vehicles near electric power lines.

Discussion: Although the OSHA regulation governing the operation of boomed vehicles near electric power lines does not strictly apply to drilling machines, a safety conscious employer should voluntarily comply with OSHA 29 CFR 1926.550(a)(15) which requires that the minimum clearance between electrical lines rated 50 kv or below and any part of the crane or load (boom) shall 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." Obviously, complying with this standard will often involve cooperation with the power company.

Recommendation #3: Employers should assure that an observer is present whenever elevated equipment is used near overhead power lines, especially when it is difficult for the operator to maintain visual separation.

Discussion: Both employees were at the rear of the vehicle, with the operator 36 feet from the tip of the mast. From this position it would be difficult for the operator to gauge the proximity of the mast to the overhead lines. Employers should comply with OSHA 29CFR 1926.550(a)(15)(IV) which requires that a person 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 #4: Periodic refresher training should be made available to employees emphasizing the hazards of working in close proximity to overhead power lines and the danger associated with any piece of equipment in contact with overhead power lines.

Discussion: Neither employee involved in this incident had received any recent training in the hazards associated with overhead power lines. Since they had backed the drilling rig for some distance along the power line right-of-way it would appear unlikely that they failed to note the presence of overhead lines; nevertheless they failed to associate the smoke coming from the vehicle with the power lines. The victim then approached the drilling rig and made contact with the energized vehicle, which resulted in the electrocution. A simple observation ("look up and live") could have prevented this fatality.

Recommendation #5: Personnel responsible for selecting well sites should choose sites well away from hazardous conditions.

Discussion: County health department personnel responsible for the selection of this well site apparently did not recognize the hazard posed by the overhead power lines. The selection criteria used in site selection should be evaluated and revised as necessary.

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Last Reviewed: November 18, 2015