NIOSH

FACE

Fatality Assessment and Control Evaluation Program

Division of Safety Research • 1095 Willowdale Road • Morgantown, West Virginia 26505 • Phone: (304)285-5916

FACE Report Number: 2003-10 **April 2, 2004**

Hispanic Painter Electrocuted When the Metal Ladder He was Repositioning Contacted an Overhead Powerline - North Carolina

SUMMARY

On February 13, 2003, a 24-year-old Hispanic painter (the victim) was electrocuted when the metal ladder he was repositioning contacted an overhead powerline. The victim and his co-workers were painting several two-story townhouses. The victim attempted to reposition the 28-foot-aluminum extension ladder he was using. Several seconds later, the foreman heard a buzzing sound and observed the victim gripping his ladder before falling to the ground. The co-workers ran to help the victim while the foreman called 911. The employees performed cardiopulmonary resuscitation (CPR) on the victim, who had no pulse and was not breathing. Emergency Medical Services (EMS) and police personnel responded within 5 minutes. EMS personnel continued CPR on the victim while transporting him to the local hospital. The victim was pronounced dead in the hospital emergency room.

Incident Scene

Fatality Assessment and Control Evaluation (FACE) Program

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatality Assessment and Control Evaluation (FACE) investigations when notified by participating states (North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia); by the Wage and Hour Division, Department of Labor; or when a request for technical assistance is received from NIOSH-funded state-level FACE programs in Alaska, California, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, Nebraska, New Jersey, New York, Oklahoma, Oregon, Washington, West Virginia, and Wisconsin. The goal of FACE is to prevent fatal work injuries by studying the work 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. FACE investigators evaluate information from multiple sources that may include: interviews of employers, workers, and other investigators; examination and measurement of the fatality site, and related equipment; and review of records such as OSHA, police, medical examiner reports, and employer safety procedures and training records. The FACE program does not seek to determine fault or place blame on companies or individual workers. Findings are summarized in narrative reports that include recommendations for preventing similar events in the future. For further information visit the FACE website at www.cdc.gov/niosh/face/faceweb.html or call toll free 1-800-35-NIOSH.

NIOSH investigators concluded that, to help prevent similar occurrences, employers should

- ***eliminate the use of conductive ladders in proximity to energized overhead powerlines***
- ***conduct a jobsite survey during the planning phases of any construction to identify potential hazards, and to develop and implement appropriate control measures for these hazards***
- ***develop, implement and enforce a comprehensive safety and training program in language(s) and literacy level(s) of workers, which includes training in hazard recognition and the avoidance of unsafe conditions***

Additionally, general contractors should

- ***ensure through contract language that all subcontractors implement appropriate safety and health programs and training specific to the work to be performed***

Additionally, ladder manufacturers should

- ***consider affixing dual language labels with graphics to provide hazard warnings and instructions for safe use of equipment***

INTRODUCTION

On February 13, 2003, a 24-year-old Hispanic painter (the victim) was electrocuted when the metal ladder he was repositioning contacted an overhead powerline. On February 20, 2003, officials of the North Carolina Occupational Safety and Health Administration (NCOSHA) notified the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), of the incident. On June 18, 2003, a DSR safety and occupational health specialist and a senior investigator conducted an investigation of the incident and reviewed incident circumstances with the NCOSHA compliance officer assigned to the case. Photographs of the incident site and the ladder taken by NCOSHA shortly after the incident were reviewed. No site visit was conducted because the project had been completed. The victim's employer was interviewed by telephone. The medical examiner's and county police reports were viewed. The official cause of death was obtained from the medical examiner report.

Employer. The victim's employer was a painting subcontractor that had been in business for approximately 19 years. The company employed 14 full-time workers, all of whom were working at the jobsite when the incident occurred. All of the employees except the foreman and one other employee were Hispanic. All of the Hispanic employees spoke Spanish. During the witness interviews with the Hispanic coworkers, the NCOSHA compliance officer used an interpreter. The foreman had worked for the employer for 8 years and spoke primarily English; however, he could speak a few words in Spanish. The incident occurred 4½ hours into the first work day with this general contractor. This was the company's first workplace fatality.

Victim. The 24-year-old male victim had moved from El Salvador to the United States approximately 4 years before the incident and had been working for the company as a painter for 1½ years. The victim's primary language was Spanish.

Training. The company had no comprehensive written safety program. On-the-job safety training was provided on an as-needed basis by the foreman or the owner to help increase the employees' awareness of potential worksite hazards. This safety training was conducted in English and was not documented by the company. The victim had no training beyond on-the-job task training.

Incident Scene. The employer was subcontracted to paint the exterior of the two-story townhouses that were under construction and unoccupied. The townhouses were brick with wood shingle exterior siding. A three-phase 24-Kilovolt[a], overhead powerline was located approximately 21 feet above the ground level at the site. In addition, there were also three lower telecommunication lines underneath the powerlines. The powerlines and the telecommunication lines were approximately 16 feet from the front of the townhouses (Photo1).

Ladder. The victim was using an 28-foot aluminum, two-section, Type II-Medium Duty/Commercial use ladder at the time of the incident. During the incident, the ladder was extended approximately 26-feet when it made contact with the powerline. The labels on the ladder were written in English and consisted of the manufacturer's name and use specifications.

Weather. It was daylight at the time of the incident, with sunny and clear conditions and the temperature was in the 40's.

INVESTIGATION

The incident occurred at a five unit, two-story townhouse complex under construction. According to the subcontractor, his company had been contracted to perform painting work on the townhouses. The crew of 13 workers and the foreman were assigned to paint the exterior of the townhomes. They arrived on site at approximately 8:00 a.m. on the day of the incident. Once on the site, the employees began unloading ladders from trucks and racks from the top of several vans. While placing the ladders at various locations around the structure, the foreman told everyone in English to be careful of the overhead powerlines. After positioning approximately ten ladders on the site, the employees divided up and began preparing the structure to be painted and unloading paint.

At approximately 10:00 a.m. the general contractor met on the site with a representative from the power company. The purpose of the meeting was to discuss the location of permanent power to each individual unit. The general contractor also suggested that the power lines should be relocated, due to the close proximity to the residents' balconies, and that he had concerns about the workers having to be positioned so close to the powerlines to do the painting. According to the general contractor, the power company representative acknowledged his concerns and told him that he needed to keep the workers a safe distance

[a] Each kilovolt is equal to 1,000 volts.

away from the powerlines. After meeting with the power company representative, the general contractor went over to the painters, pointed to the overhead powerlines and shook his head in a negative response, while telling them that lines were very "hot." At approximately 11:15 a.m., the general contractor left the job site.

At approximately 12:30 p.m., the victim carried a two-section, 28-foot-aluminum extension ladder that had been extended approximately 26 feet and positioned it on the front of the structure. At the time of the incident, there were two other ladders near the victim, one which was unattended and the other which was being used by the foreman. The ladder being used by the foreman was approximately 30 feet away from the ladder being used by the victim. The victim decided to reposition his ladder by picking it up and stepping around the base of the unattended ladder. While holding his ladder, he stepped back and the top of the ladder contacted the overhead powerline.

After hearing a buzzing noise, the foreman looked over and observed the victim in a frozen position gripping his ladder while his hands were shaking. The ladder fell towards the structure and the victim fell to the ground face down. The co-workers ran over to the victim and rolled him over. He had no pulse and was not breathing. The co-workers began cardiopulmonary resuscitation (CPR), while the foreman called 911 on his mobile telephone. Emergency Medical Services (EMS) and police personnel responded within 5 minutes. According to the police, the victim had burns marks on both of his hands and on his right foot. At 12:41 p.m., the victim was transported in a medic unit to the local hospital. EMS personnel continued performing CPR during the transport. At 1:03 p.m., the victim was pronounced dead in the hospital emergency room. The police interviewed the Hispanic workers through an interpreter following the incident.

According to the victim's employer, after the incident, his company purchased several fiberglass ladders for his employees to use when they work near overhead powelines. The employer has also begun Spanish language lessons, and is working on developing a bilingual written safety program, and is in the process of providing employee training in Spanish.

CAUSE OF DEATH

The medical examiner's report indicated that the cause of death was high voltage electrocution.

RECOMMENDATIONS /DISCUSSION

Recommendation #1: Employers should eliminate the use of conductive ladders in proximity to energized overhead powerlines.[1,2]

Discussion: Energized overhead powerlines in proximity to a work area constitute a significant safety hazard. Extra caution must be exercised when working near energized powerlines. Metal ladders should not be used for electrical work or where a possibility of contact with electrical conductors exists. Ladders made of non-conductive materials, such as fiberglass, should be substituted for work near energized electrical conductors. The powerlines in this incident were approximately 16 feet from the front of the structure.

Recommendation #2. Employers should conduct a jobsite survey during the planning phases of any construction project to identify potential hazards and to develop and implement appropriate control measures for these hazards.[3]

Discussion: Before beginning work at any site, a competent person[b] should evaluate the site to identify any potential hazards and ensure appropriate control measures are implemented. The jobsite had an identifiable hazard, i.e., a three-phase 24-Kilovolt overhead powerline in close proximity to the structure where the painting was to be performed. A safe distance between powerlines and ladders, tools, and work materials should be maintained at all times. In this incident, control measures may have included using non-conductive ladders made of fiberglass, or alternatively, a mobile platform. A mobile platform can be lowered and may have provided a more efficient and less hazardous way to maneuver near the overhead powerline that was present on the jobsite. Once hazards are identified, appropriate control measures should be incorporated prior to the work begins and remain in place until the job is completed.

Recommendation #3: Employers should develop, implement and enforce a comprehensive safety and training program in language(s) and literacy level(s) of workers, which includes training in hazard recognition and the avoidance of unsafe conditions.[4]

Discussion: A comprehensive safety and training program should identify required safety training (e.g., working around electricity and overhead powerlines, work site and ladder safety). Overcoming language and literacy barriers is crucial to providing a safe work environment for a multilingual workforce. Companies that employ workers who do not understand English should identify the languages spoken by their employees, and design, implement, and enforce a multilingual safety program. The safety program and training should be developed at a literacy level that corresponds with the literacy level appropriate for the company's workforce.

Employers should ensure that employees who do not speak English or have limited use of English are afforded an interpreter who can clearly convey instructions, and ensure that employees clearly understand the instructions given. The program, in addition to being multilingual, should include a competent interpreter to explain worker rights to protection in the workplace, safe work practices workers are expected to adhere to, specific safety protection for all tasks performed, ways to identify and avoid hazards, and who they should contact when safety and health issues or questions arise. A method to ensure comprehension could be to provide testing to ensure that the information conveyed was understood.

[b] Competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate them.

Additionally,

General contractors should ensure through contract language that all subcontractors implement appropriate safety and health programs and training specific to the work to be performed.

Discussion: General contractors should ensure that all subcontractors have safety and health training programs in place that address the tasks their workers are assigned to perform through contract language that requires all subcontractors to identify how they intend to implement a site-specific safety and health program before the initiation of work. The subcontractors' contract should contain clear and concise language describing which party is responsible for a given safety or health issue. Any differences should be negotiated before work begins. Once the provision for these responsibilities has been established, the respective parties should ensure that the provisions of the contract regarding safety and heath are upheld through regular inspections of the worksite.

Additionally,

Ladder manufacturers should consider affixing dual language labels with graphics to provide hazard warnings and instructions for safe use of equipment. [5-8]

Discussion: Over the past several years, the United States has seen a dramatic increase in its population of Hispanic, Spanish-speaking citizens who are entering the work force. The Bureau of Labor Statistics estimated 15.4 million employed Hispanics in 2000, making up 10.9% of the U.S. workforce. The Hispanic workforce increased 43% between 1990 and 2000, and is expected to increase another 36% by 2010 to nearly 21 million employed Hispanic workers.

Having employees who speak limited or no English presents unique challenges. It is important for Spanish-speaking employees to be able to interpret instruction and warning labels on work equipment such as ladders. While some equipment is bought or shipped with manufacturers' documentation in at least one language other than English, many instruction and warning labels on the equipment are only in English (Photo 2). A dual language label with a graphic or picture label could offer an additional warning to workers of potential hazards.

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INVESTIGATOR INFORMATION

This investigation was conducted by Nancy T. Romano, Safety and Occupational Health Specialist, and Virgil Casini, Senior Investigator, Fatality Investigations Team, Surveillance and Field Investigations Branch, Division of Safety Research.

Photo 1. Photo of the incident scene. Photograph courtesy of the NCOSHA

Photo 2. Photo illustrates an example of the type of instructions and hazard warnings on ladders.