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Insulation Installer Dies When His Aluminum Ladder Makes Contact With Overhead Power Line

New Jersey Case Report: 90NJ013 (formerly NJ9009)

SUMMARY

On July 26, 1990, a 28-years-old insulation installer was killed when an aluminum extension ladder which he was holding made contact with an overhead power line, causing him to receive 2,400 volts of electricity. Two experienced insulation installers, both foremen, were raising an aluminum extension ladder in order to start a job. The victim held the ladder while his partner used a rope to extend the ladder. NJDOH FACE personnel concluded that the following guidelines should be followed:

- Non-conductive ladders and equipment should be used whenever there is any danger of contact with energized power lines.
- A hazard analysis of each job and each job site should be performed by the employer.
- The employer must provide safety training which informs employees about potential hazards to which they may be exposed, particularly when working near overhead power lines.
- In areas where it is available, utilize services of the local power company to cover power lines with insulating sleeves or blankets.

INTRODUCTION

FACE project personnel of the New Jersey Department of Health learned about this work-related electrocution from the victim's newspaper obituary. We informed OSHA and, on August 24, 1990, were present during the opening conference conducted by the OSHA compliance officer with the company owners and when the victim's co-worker was interviewed. FACE personnel visited the site of the fatality and took photographs. Further information was derived from the police detective's report.

The victim had been employed for four years as a insulation installer and was proficient enough at his job to have become a foreman. A crew usually consisted of a foreman and his assistant. The company, with 22 employees, has been in business for ten years and does several types of light construction. The owners had contracted with a large, regional power company to provide weatherization to homes of low income families through a special project sponsored by the utility. The power company's representative inspects each home, decides what work needs to be done, and informs the contractor.

INVESTIGATION

On July 26, 1990, a hot, humid day, the two-man crew arrived at the two-story home in which they were to blow cellulose insulation into the attic and then install roof vents. The two men, both foremen, inspected the exterior of the home, located in a large city, for about ten minutes. They were aware of overhead power lines in front of the home and planned the job with that danger in mind. Since the home is attached to other structures on each side, they could access the home only from the front or rear. The two men planned to enter the attic by cutting a hole in the roof. To reach the roof, the men needed to use an extension ladder. The victim, who wore sneakers, stood on the front sidewalk facing the center of the house and steadied the aluminum ladder by holding it upright with both of his hands at shoulder height and his feet on either side of the ladder. His partner had previously used the unextended ladder to climb onto the front porch roof. While standing on the porch roof, he pulled the rope to extend the ladder. When fully extended the 36-foot ladder measures 32 feet in height because of the four foot overlap in the two sections. The partner stood with his back to the house, facing the victim. He was looking up as he pulled the rope, heard the victim call his name, and then saw him shaking. He pulled the rope to release the victim from the ladder and the electrical contact. The feet of the ladder locked, the ladder tipped forward and rested at a 45 degree angle against the house. The victim's co-worker immediately checked him for a pulse and respirations and, finding none, began CPR. After determining that the victim was breathing, he immediately entered the home, asked to have rescue services summoned, and returned to assist his co-worker.

Emergency medical services, including paramedics, arrived and assumed emergency treatment of the victim who was cyanotic and unconscious. He was transported to the hospital emergency room where he was pronounced dead.

The victim's partner stated that he never saw the ladder hit the wire and never heard or saw a spark. According to representatives of the power company who inspected the electrical lines after the fatality, the aluminum ladder came in contact with the primary power line (4KV) which carries 2,400 volts (primary to ground). The primary line is 23 feet 4 inches above the ground. There are conflicting findings about burn marks on the ladder. The detective's report documents burn marks on the ladder, five inches from the top on the left side of the ladder, facing the house. The OSHA compliance officer could find no burn marks. We were denied access to the report of the investigation conducted by the utility company. There are also conflicting reports about the exact location of the victim's co-worker when the incident occurred. The police officer, who interviewed the co-worker immediately after the fatality, stated that the partner stood on top of a small front porch roof. The partner states that he stood on the sidewalk in front of the house.

CAUSE OF DEATH

According to the medical examiner, death was caused by electrocution. Electric burns were noted on the palms of both hands. The medical examiner determined that the electric current passed into one arm and out the opposite arm.

RECOMMENDATIONS/DISCUSSIONS

Recommendation #1: Non-Conductive ladders and equipment should be used in an area in which they may contact energized power lines.

Discussion: According to 29 CFR 1926.450(a)(11)¹, portable metal ladders may not be used in areas in which they may make contact with electrical conductors. The employer has short fiberglass ladders but his employees were not willing to use the longer ladders because of the ladders' excessive weight. Although they are also quite heavy compared to aluminum ladders, dry wood ladders are also nonconductors.

Recommendation #2: A hazard analysis of each job and job site should be performed.

Discussion: Because of the nature of the homes and structures which the workers must weatherize, it is necessary that each site and situation be evaluated. Different hazardous situations may exist at any site. Employers are required to do this, but employees should be included since it is the employees who will be at the job site, usually without an employer present. Pre-planning of the job will include alternative ways in which a job may be approached and may include a request to the power company (although not all utility companies are willing to do so) to apply insulating sleeves over the energized power lines. By not maintaining an accident prevention program, the employer is in violation of 29 CFR 1926.21(b)(1).²

Recommendation #3: The employer must provide safety training which informs employees about potential hazards to which they may be exposed, particularly when working near overhead power lines.

Discussion: A training plan should be documented in writing, with one person responsible for its implementation. The employer is mandated to instruct each employee in the recognition and avoidance of unsafe conditions, according to 29 CFR 1926.21(b)(2).³ Since the employer in this situation has a contract with a power company, employees may be eligible to attend some of the classes and courses offered by the power company to its employees.

Recommendation #4: The general contractor in charge of a project should describe existing safety hazards and how to reduce exposure to them in his or her written instructions to the subcontractor.

Discussion: The power company representative who inspects the house to be weatherized should look for electrical and other potential hazards and inform the subcontractor about them. The need for this could be written into the contract.

Recommendation #5: In areas where it is available, and the service is necessary, the employer should request the local power company to de-energize or insulate any power lines in proximity to a work area.

Discussion: Once it has been determined that there is a chance of a person or equipment coming in contact with energized power lines, the utility company should be requested to de-energize, when feasible, or cover the lines with insulating sleeves. In this situation, the on-site workers were unaware that they could make this request.

REFERENCES

1. 29 CFR 1926.450(a)(11) Code of Federal Regulations. Washington, DC; U.S. Government Printing Office, Office of the Federal Register.
2. 29 CFR 1926.21(b)(1) Code of Federal Regulations. Washington, DC: U.S. Government Printing Office, Office of the Federal Register.
3. 29 CFR 1926.21(b)(2) Code of Federal Regulations. Washington, DC: U.S. Government Printing Office, Office of the Federal Register.
4. NIOSH ALERT, Preventing Electrocutions of Workers Using Portable Metal Ladders Near Overhead Power Lines, U.S. Government Printing Office, Publication Number 89-110, July, 1989

FATAL ACCIDENT CIRCUMSTANCES AND EPIDEMIOLOGY (FACE) PROJECT

Staff members of the FACE project of the New Jersey Department of Health, Occupational Health Service, perform FACE investigations when there is a work-related fatal fall or electrocution reported. The goal of these investigations 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.

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