



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Construction Worker Electrocuted in North Carolina

FACE 88-05

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 on selected work-related fatalities.

On September 24, 1987, an 18-year-old construction worker was electrocuted and two co-workers received an electrical shock when the 32 foot aluminum extension ladder they were using contacted a 7200 volt overhead power line.

Contacts/Activities:

officials of the Occupational Safety and Health Program for the State of North Carolina notified DSR concerning this fatality and requested technical assistance. This case has been included in the FACE Project. On November 19, 1987, a DSR safety specialist conducted a site visit, collected incident data, photographed the accident site, met with an employer representative and co-workers, and discussed the incident with the OSHA compliance officer.

Overview of Employer's Safety Program:

The victim was employed as a part-time construction worker for a small residential/commercial contractor. The company consists of an owner, two full-time employees, and part-time workers who are employed as necessary. The company had no written safety program when this incident occurred, but has since developed and implemented a safety program addressing the recognition and avoidance of hazards.

Synopsis of Events:

The employer had been contracted to remodel the roof of a two-story office building. On September 24, 1987, the owner, victim, and two other employees were awaiting the arrival of roofing shingles at the construction site. In the interim the victim and the two employees positioned a fully extended 32 foot aluminum extension ladder between a three phase 7200 volt overhead power line and the side of the office building. The power line is located 27 feet above ground level and six feet horizontally from the building.

While the victim and one employee held the ladder, another employee climbed it in an attempt to locate an area on the roof to store the shingles. The employee on the ladder then indicated that the roof was too steep to store the shingles and that he was coming down. As he descended, the ladder tipped backwards, contacting the power line. The employee on the ladder and one employee stabilizing the ladder were shocked and knocked away from the energized ladder. The victim, who was gripping the ladder to stabilize it, remained in contact with the energized ladder for approximately 10 seconds before falling and breaking contact.

The owner, after seeing what had happened and determining that two of the employees who received electrical shocks were not seriously injured, then turned his attention to the victim. The victim was unconscious and not breathing, so the owner ran inside the office building and telephoned for help.

An emergency rescue squad arrived on the scene in less than 10 minutes and provided advanced cardiac life support (ACLS) measures, which were unsuccessful. The victim was transported to the local hospital, seven minutes away, where he was pronounced dead.

Cause of Death:

The coroner's report stated the cause of death was electrocution.

Recommendations/Discussion

Recommendation #1: Employers should inspect and identify all hazards at a work site prior to beginning work.

Discussion: Energized power lines in proximity to a work area constitute a safety hazard. A safe distance between power lines and equipment should be maintained at all times. A thorough inspection by the employer should have disclosed the hazards of working in this particular area, since the power line was within six feet of the office building. Arrangements could then have been made with the power company to de-energize the lines or to cover the lines with insulating hoses or blankets prior to beginning this work.

Recommendation #2: Ladders used near energized power lines should be made of non-conductive materials.

Discussion: OSHA Standard 1926.450 (a)(11) states that "portable metal ladders shall not be used for electrical work or where they may contact electrical conductors." If a ladder made of non-conductive material had been used in this case, the fatality might have been prevented.

Recommendation #3: Employees and/or employers should be trained in cardiopulmonary resuscitation (CPR).

Discussion: CPR should begin within four minutes (in accordance with American Heart Association guidelines) in order to achieve the best results. To meet this criteria for successful resuscitation, employees/employers should be trained in CPR to support the victim's circulation and respiration until trained medical personnel arrive. No one at the accident site was trained in CPR and, therefore, resuscitation was delayed until the EMS arrived.

[Return to In-house FACE reports](#)

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Very helpful