



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Two Painters Electrocuted in Ohio

FACE 87-28

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 November 17, 1986, two painters were electrocuted while painting a twenty foot metal light pole. The two men were using a 36 foot aluminum extension ladder. One painter was standing on the ladder painting the pole. The second painter was on the ground steadying the ladder. The ladder slipped away from the light pole and the painter on the ladder contacted a 12,460 volt power line causing the electrocution of the two painters.

Contacts/Activities:

Officials of the Industrial Commission of Ohio notified DSR concerning this fatality and requested technical assistance. This case has been included in the FACE Project. On February 18, 1987, the DSR research team met with representatives of the Industrial Commission of Ohio and employer representatives. Photo documentation of the accident site was provided by the Industrial Commission of Ohio.

Overview of Employer's Safety Program:

The victims were employed by a firm that provides commercial painting services. The firm consisted of three painters and the owner. The firm had no written safety policy or safety program. The owner of the firm would outline the work procedures to be followed by the painters on the job site prior to the start of each job.

Synopsis of Events:

The firm had been contracted to paint the interior of a restaurant and six light poles around the perimeter of the restaurant's parking lot. The light poles were inverted-L shaped and were 20 feet in height. The crossbars on the tops of the poles were approximately six feet in length.

On the day of the accident the owner and one painter were working inside the restaurant while the two victims were outside painting the light poles. The victims were painting the fifth light pole, using an airless spray gun to paint the pole and a 36 foot aluminum extension ladder to reach the top of the pole. A 12,460 volt power line was located approximately 21 feet above the ground (twelve inches above the crossarm, and twenty inches to the outside of the vertical support). The actual length to which the ladder had been extended at the time of the accident is unknown, but it at least extended beyond the crossbar. One victim was standing on the ladder painting the crossbar at the top of the light pole. The second victim was standing on the ground steadying the ladder. The owner, who had been checking on the progress of the two workers painting the light poles, heard a scream as he was walking back to the restaurant. The owner turned and saw the painter and the ladder falling to the ground. The worker who had been steadying the ladder was lying on the ground. The fire department rescue squad and the emergency medical service were summoned.

The fire department rescue squad arrived first and administered cardiopulmonary resuscitation (CPR) to both victims. Upon arrival, the emergency rescue squad performed advanced cardiac life support (ACLS) procedures, which were unsuccessful. The two men were pronounced dead at the scene. There were no eye witnesses to the accident, but it is assumed that the ladder slid horizontally along the crossbar and the victim on the ladder contacted the power line. An entrance wound was present on the back of the right forearm of the victim who had been working on the ladder. The current passed through the victim and the ladder to ground. The current also passed through the second victim (holding the ladder) to ground. There were two factors present that may have contributed to this accident. First, the ladder was placed on uneven ground and wooden blocks were placed under one leg of the ladder in an effort to provide an even surface. It is possible the blocks may have slid out from under the ladder. Secondly, the top rung of the ladder was damaged. The victim may have leaned on this damaged rung and lost his balance, causing the ladder to slide along the crossbar.

Cause of Death:

The cause of death of the two men was listed as electrocution.

Recommendations/Discussion:

Recommendation #1: Ladders used near energized power lines should be made of non-conductive materials.

Discussion: OSHA Standard 1926.951(c) states that “conductive ladders shall not be used near energized lines...” The aluminum ladder used in this incident was conductive. If a ladder made of non-conductive material had been used in this case, the double fatality might have been prevented.

Recommendation #2: Ladders should be properly maintained in accordance with applicable standards.

Discussion: The damaged top rung on the ladder in this case may have contributed to the accident by causing the victim to lose his balance. When a ladder is found to be defective it should be removed from service or properly repaired. OSHA regulation 1926.450(2) states that “The use of ladders with broken or missing rungs...is prohibited.”

Recommendation #3: Ladders should be placed on level ground and adequately supported to prevent movement.

Discussion: In this instance the ladder was placed on an uneven surface. Wooden blocks were placed under one side of the ladder to level the ground surface. This is a poor safety practice. The ladder may have fallen because these blocks moved. Ladders should be placed on even surfaces and adequately supported in order to attain maximum stability. Additionally, the ladder should have been tied to the light pole to prevent the top of the ladder from sliding off of the pole.

Recommendation #4: A safe working distance must be maintained between power lines and equipment or structures that require periodic maintenance or access.

Discussion: Energized power lines in proximity to a work area constitute a safety hazard. Extra caution must be exercised when working near energized power lines. A distance of six feet between power lines and ladders, tools, or scaffolds should be maintained at all times. At least one state (California) requires that a six foot minimum clearance be maintained.

The power line in this instance was within two feet of the light pole. Proximity of the pole to the power line should not constitute a hazard during maintenance operations. To allow the pole to remain within two feet of the power line would jeopardize the future safety of maintenance personnel. The light pole or the power line should be moved.

Recommendation #5: All personnel should be trained to recognize safety hazards associated with the tasks they are assigned to perform.

Discussion: Training should be provided to all personnel that would enable them to identify safety hazards associated with the tasks they are assigned to perform (i.e., energized power lines, etc.). Measures could then be taken to control these hazards and assure worker safety. The fact that this condition was allowed to continue even after the owner checked the area demonstrates that none of the persons involved recognized the serious hazards that were present.

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