



The National Institute for Occupational Safety and Health (NIOSH)

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# 22-Year-Old Construction Worker Electrocuted in Kentucky

FACE 86-36

## 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 July 10, 1986, a carpenter was electrocuted when a portable electric saw he was using apparently developed a ground fault.

## Contacts/Activities:

Officials of the Occupational Safety and Health Program for the Commonwealth of Kentucky notified DSR concerning this fatality and requested technical assistance. This case has been included in the FACE Project. On July 23, 1986, the DSR research team (a safety specialist and a safety engineer) met with employer representatives, conducted a site visit, interviewed comparison workers and a surrogate for the victim, and photographed the accident site.

## Overview of Employer's Safety Program:

The general contractor and the construction subcontractor both stated that the victim was an independent contractor and was not an employee. Representatives of the construction subcontractor stated that their company paid the workers' compensation for the victim; however, most employees at this work site were designated independent contractors.

The work site did not have a safety program.

## Synopsis of Events:

The victim (a 22-year-old carpenter) was working at a construction site where a 396 unit apartment complex was being built. The victim had agreed to construct the wooden framework for a laundry building located at the site. Electricity to operate portable power tools was supplied to the laundry building from a temporary service pole approximately 50 feet away. This temporary service pole had not been inspected by the city having jurisdiction and did not satisfy the applicable

code requirements (not grounded, etc.). Mounted on the temporary pole were a panel box, a ground fault circuit interrupter (GFCI) receptacle installed in a weatherproof box, and a regular receptacle installed in a weatherproof box (or a total of two duplex receptacles). The victim used a homemade extension cord (Type NM, 12/2 wire with a four-gang receptacle and a plastic box) to supply power from the receptacle on the temporary pole to the laundry building. A second extension cord (UL approved) was used to supply power from the homemade extension cord to a portable power saw. The accident site was wet, since it had rained hard the previous night and had sprinkled that morning. It was hot and humid and the victim was sweating.

The victim had cut the tails off of two roof trusses (that portion of the roof truss that overhangs the walls) and was preparing to come down the makeshift ladder (a piece of a floor truss). When he shifted his portable power saw from his right hand to his left hand, he was shocked. The victim fell from the ladder into a puddle of water at the base of the ladder. Apparently, when he contacted the source of electricity, his left hand contracted and he was “locked” to the power saw. This contact with the power saw (the electrical source) continued until a co-worker was able to disconnect the power cord to the saw and the extension cord.

An untrained co-worker tried to give the victim CPR. Approximately five minutes after receiving the call EMS personnel were at the scene and advanced cardiac life support was given. The victim was transported to a local hospital, where he was pronounced dead at 12:38 p.m. The victim had burns on his left hand (the hand gripping the saw) and his left thigh.

## Cause of Death:

Not available at this time.

## Recommendations/Discussion:

**Recommendation #1: Electrical equipment that is malfunctioning should be taken out of service immediately and not used until evaluated and approved by qualified electrical repair personnel.**

**Discussion:** The victim reportedly had been receiving shocks throughout the morning. He apparently replaced one of the extension cords he had been using in an effort to eliminate these shocks; however, the source of these shocks (the saw) was not replaced.

**Recommendation #2: Equipment should be used only for those applications for which it was designed and approved.**

**Discussion:** Although it does not appear that the homemade extension cord contributed to this accident, it was not approved for this application and should not have been used. The makeshift ladder (i.e., a floor truss) was totally inadequate to be used as a ladder.

**Recommendation #3: Electrical service supplied to a construction site should comply with all local regulations and OSHA standards.**

**Discussion:** The temporary pole supplying service to the laundry building was not inspected and wiring methods did not comply with the requirements of applicable regulations. OSHA Standard 1926.400(h)(2) requires that all 120 volt, single-phase, 15-and- 20-ampere receptacle outlets on construction sites, which are not part of the permanent wiring of the building or structure, have approved GFCIs. Mounted on the temporary pole were a panel box, a GFCI receptacle installed in a weatherproof box, and a regular receptacle installed in a weatherproof box (or a total of two duplex receptacles). The GFCI receptacle and the receptacle that the victim was using were tested the day after the accident and both apparently operated properly. Therefore, it can only be conjecture at this time why the GFCI did not adequately protect the victim. The three most obvious reasons for this failure are (1) the GFCI failed to operate properly, (2) the regular receptacle was not protected by the GFCI, or (3) the weatherproof boxes were not sealed adequately.

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