



The National Institute for Occupational Safety and Health (NIOSH)

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# 26-Year-Old Electrician's Helper Electrocuted in South Carolina

FACE 86-33

## 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 June 2, 1986, at approximately 5:00 p.m. an electrician's helper was electrocuted while wiring a fluorescent light fixture in a suspended ceiling.

## Contacts/Activities:

Officials of the Occupational Safety and Health Program for the State of South Carolina notified DSR concerning this fatality and requested technical assistance. This case has been included in the FACE Project. On November 18, 1986, the DSR research team (consisting of a research industrial hygienist and an epidemiologist) met with representatives of the company. Interviews were conducted with co-workers who perform the same tasks as the victim. The site of this fatality was not visited. Photographs of the accident site were provided by the employer.

## Overview of Employer's Safety Program:

This is an electrical contracting company that has been in operation since 1960 and employs approximately 230 personnel. The company has a written safety policy and safety program. The Executive Vice-President is assigned responsibility as the primary safety officer on a collateral-duty basis. Safety rules are established, communicated, and enforced by supervisory personnel. Job supervisors are assigned the primary responsibility to ensure safety at the job site and are provided an operations manual which contains a section on safety. The employer retains a safety consultant who communicates directly with field supervisors on potential hazards. All safety training is provided on the job; otherwise, the company has no formal training program.

## Synopsis of Events:

On June 2, 1986, at approximately 5:00 p.m. five electricians and/or electrician's helpers were assigned the task of wiring fluorescent light fixtures in a suspended ceiling of a new wing of a hospital. The panels for the drop ceiling were not in place. Emergency fixtures on a separate circuit were to be wired first and then existing temporary lights were to be de-energized. The crew decided that this process was too slow and, contrary to supervisory directions, proceeded to disconnect the temporary lights and wire the remaining fixtures while some circuits were energized. Co-workers warned the entire crew to test circuits to determine if they were "hot"; however, the victim elected not to use a circuit tester offered to him by a fellow employee. Each member of the crew was to wire the three conductors of a romex cable to the three conductors of the fixture. Members of the crew reported receiving shocks during the installation process.

The victim was standing on a wooden ladder with his body extended above the ceiling grid work which was approximately nine feet above the floor. The victim was wet with perspiration from the warm working conditions. In order to connect the light fixture, he had to lean against the metal grid work while extending his body and arms to reach the conductors to be wired. As he was performing this task, a noise was heard by members of the crew. A co-worker went to the area where the victim was working and saw the victim dangling from the ceiling grid. The co-worker climbed the wooden ladder which the victim had been using and pulled him free of the grid work. The co-worker tried to carry the victim down the ladder; however, both fell to the floor, as they neared the bottom of the ladder.

The co-worker ran into the hospital for help and a doctor and a nurse responded immediately. Cardiopulmonary resuscitation (CPR) was begun and other emergency hospital personnel responded. After an extended effort by medical personnel, the victim was pronounced dead at the scene of the accident.

## Cause of Death:

The medical examiner's certificate of death listed electrocution as the cause of death.

## Recommendations/Discussion:

**Recommendation #1: Employees who work with electrical conductors should de-energize the conductors and take appropriate action to ensure the conductor cannot be accidentally re-energized.**

**Discussion:** The crew knew that some circuits were energized. The victim should have tested to determine whether the circuit that he was wiring was "hot" and he could have postponed wiring this fixture until after the emergency lights were wired. Once the circuit was de-energized and locked out/tagged the wiring could then have been performed safely.

As a result of this incident, the company has had all employees sign a statement that they will not work on energized circuits. Working on energized circuits is contrary to company policy and the company has tried to re-emphasize this policy by using this mechanism.

**Recommendation #2: Circuit testing equipment should be provided and used by employees.**

**Discussion:** The victim was not using a circuit testing device at the time of the accident. All employees should be provided proper testing equipment and be trained in its use.

**Recommendation #3: Employers should ensure that all employees are aware of workplace hazards and safe operating procedures. This can be accomplished by a company-wide training program.**

**Discussion:** At present the company has neither formal training programs for new employees nor periodic retraining of all employees. Safety training would ensure knowledge of hazards and proper operating procedures.

**Recommendation #4: Companies should not let serious accidents or fatalities occur without some effort towards prevention.**

**Discussion:** Companies can often alter the task which was being performed at the time of the accident, inform all employees of what occurred in order to prevent similar accidents, or change company procedures in regards to safety and hazard recognition. This company reinforced company policy by having all employees sign a statement that they would not work on energized circuits. Also, a written tool box explanation on how the fatality occurred and how it could have been prevented was developed and distributed. All company project managers bi-weekly complete a Project Manager Safety Check List for each job site and provide it to the Safety Officer at the project review meetings. This is a change in the company's previous procedure in regards to hazard recognition and compliance with the company's safety program. This forces project manager involvement in workplace safety.

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Last Reviewed: November 18, 2015

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