



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



19-Year-Old Electrician's Apprentice Electrocuted in Maryland

FACE 87-58

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 18, 1987, an electrician's apprentice was assisting his supervisor (a journeyman electrician) install lights on a private dock when he made contact with an energized circuit and was electrocuted.

Contacts/Activities:

Officials of the Occupational Safety and Health Program for the State of Maryland notified DSR concerning this fatality and requested technical assistance. This case has been included in the FACE Project. On July 28, 1987, a research industrial hygienist met with the compliance officer investigating the accident for the state, conducted a site visit, and interviewed the employer of the victim.

Overview of Employer's Safety Program:

The employer is an electrical contractor with two employees, a journeyman electrician and an apprentice electrician (victim). The employer has no written safety program. Training of new employees is provided on-the-job. The employer recommends to all employees that they take advantage of courses conducted locally on electrical safety.

Synopsis of Events:

On June 18, 1987, the owner of the electrical contracting company instructed his two employees (the journeyman and apprentice electrician) to finish a pier lighting job. The job originally called for installation of ten 110 volt lights (along the right side) on a private 250 foot pier and a 220 volt circuit from the house to the boat house (along the left side) at the end of the pier. All electrical work had been completed a month earlier, except for the installation of five lights, which were on order.

The day of the accident, the journeyman electrician (supervisor) and the apprentice electrician went to the private residence (after lunch) to complete the job. The employer stated this was an easy task assignment, even for an apprentice electrician. All the two men had to do was install five light fixtures and wire them to the previously installed 110 volt system under the pier. Five separate wires were run through plastic conduit under the pier. The five wires were: one hot, one neutral, one ground, and two trailing wires for multiple switch installation on the same circuit. Plastic junction boxes were located under the pier where each light was wired into the system. The procedure required one worker to screw the fixture into the pier while the other worker wired the fixture to the 110 volt circuit below.

According to the employer, the men parked their truck near the pier and started to work. The apprentice stated he would wire the lights under the pier while the journeyman installed the fixtures above. The apprentice jumped into the water (waist deep) and proceeded to go under the pier to start to work. The journeyman (supervisor) yelled down to him, "Do not touch anything until I check to see if the circuit is shut off." The supervisor started for the boat house (although the circuit breaker for this 110 volt circuit was located at the house on shore) to see if the circuit was shut off, when he heard a loud moan. He immediately ran back to where the victim was working and saw him (back arched) with both hands on a wire stripper, attempting to strip the black (hot) wire. He knocked the victim's right hand loose, and then knocked his left hand loose from the hot wire. The supervisor then jumped into the water and pulled the victim out of the water on to a lower section of the pier. The victim was unresponsive and had no pulse. The owner of the private residence called the emergency fire/rescue squad, who arrived 20 minutes later. The squad found that the victim had no vital signs and cardiopulmonary resuscitation (CPR) had not been initiated. The coroner arrived a few minutes later and pronounced the victim dead at the scene.

Cause of Death:

The coroner listed the cause of death as "electrocution."

Recommendations/Discussion

Recommendation #1: Employers should develop safe work procedures that address tasks performed by employees, identify safety hazards, and stress safety training.

Discussion: The employer did not have established safe work procedures that were specific to the tasks to be performed. Procedures should be developed and implemented that detail the tasks to be performed and should identify the safety hazards associated with these tasks. The employer should assure that the safety procedures are followed.

Recommendation #2: Employers should ensure that all employees are aware of workplace hazards and safe operating procedures.

Discussion: At the present time the company has no written training program for new employees. Safety training should ensure that the employees are knowledgeable of hazards, including the increased chance of an electrical fatality in wet conditions, and appropriate safety procedures. These procedures should include locking and/or tagging out hazardous energy sources.

Recommendation #3: Circuit testing should be done before any work is commenced.

Discussion: Although a circuit testing device was available on the pier, it was not used to test the circuit. All employees should be instructed on the use of circuit testers and their importance.

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