The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research

24-Year-Old Manufactured Home Installer Electrocuted in Indiana

FACE 86-28

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 May 27, 1986, two workmen were using an electric powered (110 V) auger machine to install tie down rods for a manufactured home when the accident occurred. The ground was wet and a continuous grounding system was not provided for the auger machine. A workman provided a path-to-ground when a ground fault condition occurred in the auger machine.

Contacts/Activities:

Officials of the Occupational Safety and Health Program for the State of Indiana notified DSR concerning this fatality and requested technical assistance. This case has been included in the FACE Project. A research industrial hygienist conducted an evaluation of this case, which included: a visit to the accident site, meetings with the compliance officer and the employer, and interviews with a surrogate for the victim and comparison workers. No photographs were taken because the accident site (house foundation) is now concealed by concrete blocks.

Background/Overview of Employer's Safety Program:

The mobile home service and supply company is a relatively small operation, consisting of the owner, a parts manager, two working foremen, and two service men. The company has been in business for approximately 17 years to service and install manufactured homes and to provide a parts supply service. The company has no written safety policies or procedures. Training for new employees is provided on the job by an experienced worker and/or the owner.

Synopsis of Events:

On May 27, 1986, four mobile home service men were installing a new manufactured home. Two workers were inside the home doing finishing work, while the other two workmen were under the home installing tie-down anchors. The workmen under the home were to install nine, 36-inch steel anchor rods. The steel rods are screwed into the ground manually or by using an electric (110 V) auger machine. The auger machine is a one-quarter horsepower electric motor with a gear down drive, encased in a metal housing with two handles (one handle with a dead man's switch). The auger machine is usually operated by two men; however, it can be operated by one man.

The electric service had not been hooked up on the new home; therefore, the workmen had to seek a different source of electricity for the auger machine. They received permission from the adjoining property owner to run an extension cord to his property. The electric outlet used was in a tool shed 200 feet from the work site. They used six 50-foot extension cords to reach the outlet. Two cords had ground prongs missing and some of the cords were repaired with electrical tape. The electric outlet used was a two prong, 110/120 volt receptacle. An adaptor (which permits a three prong plug to be inserted into a two prong receptacle) was used at the tool shed receptacle. The ground wire of the adaptor was not connected. The extension cords were tied in knots at each connection and these connections placed on concrete blocks. However, the rest of the cord was on wet grass, mud, and wet pea gravel.

The workmen were working under the home on wet pea gravel. They had removed their shirts because of the heat and humidity and were sweating. They had installed seven rods. (It took approximately five minutes to install each rod.) The workmen had inserted half of the eighth rod when the one holding the deadman's switch was shocked and knocked back from the auger machine. The machine fell across the victim. The workman that was knocked back, immediately kicked the auger machine off of the victim; however, he noticed the electric cord was wrapped around the victim's thigh. He yelled for the workmen in the house to disconnect the power, which they did.

Workmen at the site administered CPR, but could not revive the victim. The paramedics and deputy coroner arrived approximately 25 minutes later and pronounced the man dead at the scene.

Cause of Death:

The coroner's verdict listed the cause of death as electrocution.

Recommendations/Discussion

Recommendation #1: The company should develop and implement a written safety program.

Discussion: Worker safety is the primary responsibility of the employer. In order to carry out this responsibility, the employer should: 1) develop a written company safety policy, and 2) develop, document, and enforce the adoption of safe work procedures for all employees.

Recommendation #2: A training program in hazard recognition and control should be initiated for all employees.

Discussion: Although workers may be aware of on-the-job, day-to-day hazards, they sometimes become complacent of such hazards. This complacency, especially when working with electrical energy, can lead to a serious accident. Therefore, it is not only important to train new employees, but to provide refresher training to other employees concerning safe work practices and hazard recognition.

Recommendation #3: A ground-fault circuit interrupter or an assured grounding system should be provided and maintained on electrical equipment (such as the auger machine), as required by OSHA Standard 1926.400(h)(2) and (3).

Discussion: All electrical equipment should be provided with an adequate and approved continuous grounding system to prevent electrical energy going to ground through the equipment and/or user. This is particularly true when the equipment is used in damp or wet areas. This grounding protection is essential for the safety of all employees.

Recommendation #4: All equipment, tools, electrical extension cords, etc. should be inspected and maintained in good repair. Extension cords should be maintained to provide ground continuity. (See OSHA Standard 1926.401(f).)

Discussion: Safe work procedures for employees are interrelated with the use of tools and equipment that are in good condition. The extension cords used in this operation were reported to be in fair to poor condition. Electrical tape was used in several places, and ground prongs were missing from two of the six cords. It is important that extension cords, as well as other equipment used with electrical energy, be properly maintained and replaced when necessary.

Return to In-house FACE reports

Last Reviewed: November 18, 2015