



The National Institute for Occupational Safety and Health (NIOSH)

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Electrical Foreman and Groundman Electrocuted When Guy Wire Contacts 13,200- Volt Power Line

FACE 89-17

Introduction:

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatal Accident Circumstances and Epidemiology (FACE) investigations when a participating state reports an occupational fatality and requests technical assistance. The goal of these evaluations is to prevent fatal work injuries in the future by studying the working environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

On October 12, 1988, a 45-year-old male electrical contractor foreman and a 30-year-old male groundman were electrocuted when a guy wire they were touching contacted a 13,200-volt power line.

Contacts/Activities:

State officials notified DSR of this fatality and requested technical assistance. On January 26, 1989, a DSR research safety specialist met with employer representatives, discussed the incident with the OSHA Compliance officer, and photographed the incident site.

Overview of Employer's Safety Program:

The victim had been employed for 1 month by an electrical contractor that specializes in power line construction and maintenance. The contractor has been in operation for 53 years and employs 340 workers. The contractor has a written safety policy and a comprehensive safety program that requires training of all new employees and periodic retraining of all employees. Training is conducted both in the classroom and on the job. Tailgate safety meetings are conducted each day at the jobsite prior to work and the safety director makes periodic visits to all jobsites. All employees are required to be certified in cardiopulmonary resuscitation (CPR).

Synopsis of Events:

The employer had been contracted by the local utility to install a new three-phase 13,200-volt power system adjacent to an existing 13,200-volt system. The job required installing new power poles parallel to the existing poles and stringing three conductors for the new three-phase distribution system. The new conductors were to be attached to insulators mounted at 2-foot intervals on the sides of the new poles. When installed, the lowest of the new conductors would be 5 feet above the existing system. The new conductors were temporarily suspended at a distance of 36 inches from the new poles by individual roller brackets during stringing operations.

On the day of the incident the crew (two linemen, two groundmen, and the foreman) was assigned the tasks of permanently attaching the new conductors to the insulators on the poles and tensioning the new conductors (i.e., adjusting the amount of slack in the new power lines between the two power poles). To accomplish these tasks, two bucket trucks were used, one positioned at the front and one positioned at the back of each pole. The two linemen worked from the buckets while the groundmen and foreman offered assistance from the ground. Two guy-wire anchors had previously been installed in the ground approximately 12 and 15 feet in front of each power pole and guy wires had been attached to the new poles. Standard practice called for the guy-wire anchor farthest from the pole to be set deeper in the ground. Two guy wires would then be attached to that anchor while one guy wire would be attached to the anchor closest to the pole. However, because of an underground rock formation, standard practice could not be followed in this case. Instead, two guy wires were attached to the closest anchor and one was attached to the farthest anchor. The utility company was notified of this change in procedure and, after an inspection by their engineers, said that the modified procedure was acceptable.

As the linemen began to remove the new conductors from the roller brackets and attach them to the insulators, they noticed that the new conductors were coming close to the existing energized conductors. They notified the foreman of the problem. The foreman said he could take additional slack out of the new lines by tightening the guy wire on the farthest anchor, which would pull the new pole toward the guy wire anchor and away from the existing lines. Using a chain come-along (a portable ratcheting winch) the foreman began to tighten the guy wire. As the foreman tightened the single guy wire, the groundman (victim) loosened one of the guy wires on the other anchor. (The reason the groundman did this was unknown; neither the linemen nor the second groundman heard the foreman instruct the groundman to loosen the guy wire.) The foreman, who was facing away from the groundman while working the come-along and communicating with the linemen in the buckets, may not have noticed the groundman's actions.

The second groundman saw the groundman remove the guy wire from the anchor, walk toward the power pole, and bend over to place the guy wire on the ground. As the second groundman turned away, he heard the sound of an arc. When he turned back he saw both the foreman and the groundman lying on the ground near the anchors. The guy wire that the groundman was moving had contacted one of the energized power lines. Apparently both the foreman and groundman were touching the guy wire at the instant of contact. Cardiopulmonary resuscitation (CPR) was begun immediately on both men and the emergency rescue squad was summoned. The men were transported to the local hospital where the foreman was pronounced dead. The groundman died the following morning.

Cause of Death:

The coroner listed the cause of death in both cases to be electrocution.

Recommendations/Discussion

Recommendation #1: Employers must stress the importance of adhering to established standard work procedures.

Discussion: Established employer standard work procedures require that insulating sleeves be placed on energized power lines when guy wires are installed in the vicinity. The groundman relocated a guy wire without following this procedure. None of the other workers heard the foreman instruct the groundman to relocate the guy wire, and it was possible that the foreman was not aware of the groundman's actions. In any case, had the company's standard work procedure of sleeving the energized power lines been followed, this fatal incident might have been prevented.

Recommendation #2: At tailgate safety meetings, the foreman should accurately detail the specific procedures to be followed to perform the designated tasks of the day, address all hazards associated with these tasks, and discuss how potential hazards will be controlled.

Discussion: Daily tailgate meetings should provide a forum to detail the exact procedures necessary to accomplish the assigned tasks for the day and to outline control measures for any hazards associated with these tasks. Supervisors must stress the importance of adhering to these procedures. Any modification to the procedures should be carefully considered before action is taken. Any potential new hazards created by modifying work procedures must be controlled. In this case, the procedures were altered when the victims began to work with the guy wires, thus creating the possibility that the guy wires could contact the existing energized lines. The job should have been delayed while the hazards were re-evaluated and controlled by covering the power lines with protective sleeves. If the newly created hazard had been addressed in this case the incident might have been prevented.

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