



The National Institute for Occupational Safety and Health (NIOSH)

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Apprentice Lineman Electrocuted in Virginia

FACE 87-42

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 March 12, 1987, a lineman trainee was electrocuted while removing grounds from a 230 kV transmission circuit.

Contacts/Activities:

Officials of the Occupational Safety and Health Program for the Commonwealth of Virginia notified DSR concerning this fatality and requested technical assistance. This case has been included in the FACE Project. On May 6, 1987, a DSR safety specialist met with employer representatives, collected incident data, and interviewed comparison workers.

Overview of Employer's Safety Program:

The employer is an electric utility employing a total of 400 workers. The utility has a full-time safety director and a comprehensive safety program. New employees undergo orientation and all employees receive structured classroom and on-the-job training. All employees receive written safety rules and safe work procedures.

Synopsis of Events:

On the day of the incident the crew was replacing a three foot section of a power line that had been damaged by a gunshot. The power line was part of one of the two 230 kV circuits that were suspended from a 120 foot high steel tower. An additional 150 kV circuit was located in the same electrical right-of-way, but on a separate structure. The crew consisted of a lineman, a lineman trainee (the victim), and a supervisor. The circuit with the damaged power line was de-energized and the lineman and trainee climbed the tower. The victim positioned himself on a tower arm above the lineman. Grounds were attached on both sides of the work area from the line being repaired to the tower. These grounds provided a path to ground for any currents induced by the other circuit.

The lineman trainee (the victim) had been assigned to this worksite for six days and served only as an observer throughout the repair process. The repair work was not completed until early evening and the work area was dark. The lineman stated during his interview with the compliance officer that flood lights on the truck were not used to provide lighting for the work area. Upon completion of the repair work the lineman removed the line end of one of the grounds and shook the wire to show the victim which ground he had removed. The lineman then instructed the victim to remove the tower end of that ground. This action was in direct violation of the company safety policy which states that the line end of all grounds will be removed before the tower end of any ground is removed. The victim grasped the tower end of the ground still attached to the line and the induced current present in the line traveled through the victim, down the tower, and to ground. The lineman noticed the victim in trouble and knocked the ground wire from his hand with a hot stick.

The lineman and the supervisor brought the victim to the ground and began cardiopulmonary resuscitation (CPR). The victim was revived for a short time by the lineman and the supervisor. The Emergency Medical Service (EMS) transported the victim to the hospital where he was pronounced dead two hours later. Tests performed by power company personnel after the incident determined that approximately 5,000 volts were present on the line after an initial surge of 11,000 volts.

Cause of Death:

The medical examiner listed electrocution as the cause of death.

Recommendations/Discussion:

Recommendation #1: Employees must follow established safe work procedures.

Discussion: Employees must understand that established safe work procedures must be followed at all times. The lineman violated established procedure when he instructed the victim to remove the tower end of the ground before the line end of both grounds had been removed. Had established safe work procedures been followed, this accident might have been prevented.

Recommendation #2: Employers should assure that work areas are sufficiently illuminated.

Discussion: The repair work was not complete until early evening. Because of the poor illumination the victim may have been unable to distinguish which ground the lineman wanted him to remove. The supervisor on the ground should have used the available floodlights on the truck to provide a safe level of illumination for the workers on the tower.

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Last Reviewed: November 18, 2015

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