



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



23-Year-Old Groundman Electrocuted in North Carolina

FACE 86-31

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 30, 1986, at 8:20 a.m. a 23-year-old groundman was electrocuted while making preparations to anchor and plumb a previously set electric utility pole.

Contacts/Activities:

Officials of the Occupational Safety and Health Administration for the State of North Carolina notified DSR concerning this fatality and requested technical assistance. This case will be included in the FACE Project. On July 17, 1986, a DSR research team met with employer representatives, interviewed comparison workers who perform the same tasks as the victim, interviewed the next-of-kin, conducted a site visit, discussed the incident with the OSHA Compliance Officer, and photographed the accident site.

Overview of Employer's Safety Program:

The employer is an electrical contracting corporation that employs 200 people. The corporation has four divisions: 1) Power Line Construction; 2) Electrical Communications/Industrial Wiring; 3) Telephone Services; and 4) General Contracting.

Synopsis of Events:

This employer had been contracted by a local utility company to replace a number of existing wooden electric utility poles. This particular pole, which contributed to the accident, was set approximately four weeks prior to the accident. On the day of the accident, June 30, 1986, a five-man crew was assigned the task to plumb and anchor the previously set new electric utility pole. Electric distribution lines and a transformer were also to be transferred from the old pole to the new pole.

The crew consisting of a foreman, two linemen, and two groundmen arrived at the work site and began preparations to plumb and further anchor the new pole. Before the pole was moved into a plumb position, a lineman attached a temporary insulator on the side at the top of the new pole. A saddle which was attached to the primary line by two squeeze-on clamps was removed. The saddle was used to allow connection of the transformer to the primary line and once removed the two squeeze-on clamps remained on the primary line. The primary line was then positioned on top of the insulator and secured to the insulator with a 1/8" standard aluminum wire. The squeeze-on clamps, approximately six to eight inches apart, were located on either side of the insulator such that the primary line could not slide through the aluminum tie wire.

A groundman attached a chain winch to the guy and anchor, which had been put in place earlier, to move the pole to a plumb position. As this groundman operated the winch, the foreman, who was standing 25-35 feet away from the new pole, would visually check the new pole to determine if it was vertical. As the groundman operated the winch, moving the top of the new pole approximately two-three feet, tension was increased on the primary line tied to the insulator. The increased tension on the primary line caused the aluminum tie wire to break and the primary line moved away from the top of the insulator and down on top of the new pole, energizing it. At the same time the other groundman (victim) was moving a second guy into position to be hoisted to the top of the new pole for attachment. The victim walked between the new and old poles carrying the second guy. As he moved between the poles he passed the guy around the new pole from one hand to the other. The guy contacted the copper butt ground wire running down the side of the new pole, energizing the guy. The groundman holding the guy was electrocuted and the groundman operating the winch was seriously injured.

Cause of Death:

The county coroner stated the official cause of death was electrocution.

Recommendations/Discussion:

Recommendation #1: Safe job work procedures should include the identification of all safety hazards prior to the commencement of work assignments.

Discussion: The squeeze-on clamps may have restricted the horizontal movement of the primary line through the aluminum tie, breaking the tie, and allowing the primary line to contact the top of the new pole. Identification and elimination of such hazards may preclude accidents of this type.

Recommendation #2: Squeeze-on clamps should be removed or positioned in a manner not to contact the insulator. The employer should also investigate alternate materials to be used for ties.

Discussion: Increased tension which was placed on the aluminum tie wire causing it to break may have been avoided if the squeeze-on clamps were either removed or positioned in a manner that contact with the insulator was eliminated. The standard 1/8" aluminum tie wire was apparently too weak and not flexible enough to withstand the increased tension applied to it by moving the pole into position. Alternate materials should be investigated by the employer and implemented where applicable.

The corporation vice-president was provided the following:

- Request for Assistance in Preventing Electrocutions from Contact Between Cranes and Power Lines (85-111)
- Warning – Confined Space! Article by Richard W. Braddee and Ted A. Pettit. Reprinted from Operations Forum (June 1986), Volume 3: 22-23.
- Overview of the National Institute for Occupational Safety and Health (NIOSH).

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