

FACE 90-04

Meter Reader Dies When He Contacts Energized Clothesline Wire in Puerto Rico

SUMMARY

A power company crew (a supervisor, a lineman, and two meter readers) was assigned the task of restoring secondary service to residences in an area that had been damaged by Hurricane Hugo. When the crew arrived at the jobsite after dark, the supervisor decided that two phases of an existing three-phase drop service needed to be reattached to a pole-mounted transformer near a residence. When the lineman had completed reattaching the two phases, one of the meter readers (the victim) went to the residence to tell the occupants that their power had been restored. As the victim stepped over a chain-link fence into the yard of the residence, he lost his balance and grabbed a wire clothesline in an effort to regain his balance. Co-workers noticed the victim was being shocked and knocked him away from the clothesline and fence. The wire clothesline was attached to a metal pole that supported the tin roof of the residence. An energized secondary service from a nearby residence had been torn loose from its connection and was lying across and energizing the tin roof, metal pole and clothesline at 110 volts. When the victim grabbed the wire clothesline, his body provided a path to ground, causing his electrocution. NIOSH investigators concluded that, in order to prevent future similar occurrences, employers and employees must:

- conduct a comprehensive jobsite survey prior to the start of work to identify all potential hazards that workers might encounter during the performance of their duties
- provide and utilize adequate lighting while performing work place safety inspections prior to the start of work and during powerline repair work at night
- instruct all workers to treat all conductive components in their work area with extreme caution, especially when the electrical system in their work area has suffered extensive damage, and wear appropriate personal protective equipment when necessary.

INTRODUCTION

On September 28, 1989, officials of the Commonwealth of Puerto Rico notified the Division of Safety Research (DSR) that a 28-year-old male meter reader was electrocuted when he grasped an energized clothesline wire to regain his balance while crossing a chain-link fence. Technical assistance was requested by officials of the Commonwealth and during the week of October 2-6, 1989, a DSR field team (two occupational safety and

health specialists, a safety engineer, and an epidemiologist) conducted an investigation, met with the Commonwealth Epidemiologist and his staff, the Secretary of Health, representatives of the Medical Examiner's office, and power company officials to obtain information concerning the circumstances surrounding the incident. Videotape and photographic documentation of storm damage to the electrical transmission and distribution system was taken. This investigation was one of five separate investigations (90-02 through 90-06) conducted by DSR staff. All five of the investigations involved workers who were electrocuted while restoring electrical power to the island of Puerto Rico as a result of damage caused by Hurricane Hugo (1).

The employer is a major utility company with more than 10,500 employees. The company has been in operation for the past 41 years. The company has a comprehensive safety program with written policies and procedures for all routine operations. The corporate safety staff consists of a supervisor of industrial safety, six safety engineers, and seven safety advisors. Training for all workers is provided in the classroom as well as on the job. All workers receive periodic retraining and workers that perform line work are certified in cardiopulmonary resuscitation (CPR).

INVESTIGATION

On the day of the incident, the crew members (a supervisor, a lineman, and two meter readers) were assigned the task of restoring secondary electrical service to residences in an area that had been damaged by Hurricane Hugo. The two meter readers were being utilized as part of this crew because of the manpower shortage created by the extensive utility line damage from the hurricane. The crew worked at this task throughout the day and at the time of the incident were restoring power to the last residence scheduled for that day (after dark). When the crew arrived at the last jobsite the supervisor decided that some tree trimming was necessary and that two phases of an existing three-phase drop service needed to be reattached to a pole-mounted transformer near the residence. The lineman prepared the two phases for reattachment on the ground while the meter readers did the required tree trimming. When the lineman had completed his preparations, he raised himself in the bucket of a bucket truck and attached the two phases to the transformer while the meter readers collected the tools that had been used and placed them on the truck. When the lineman had completed the connections, one of the meter readers (the victim) went to the residence to tell the occupants that their power had been restored. As the meter reader stepped over a chain-link fence into the yard of the residence he lost his balance and grabbed a wire clothesline in an effort to regain his balance. After a period of minutes co-workers noticed the victim was being shocked and knocked him away from the clothesline and fence. The co-workers initiated cardiopulmonary resuscitation and transported the victim to the local hospital where he was pronounced dead one-half hour after arrival.

Investigation of the incident site by power company officials revealed that the wire clothesline was attached to a metal pole that supported the tin roof of the residence. An

energized secondary service line from a nearby residence had been torn loose from its connection and was lying across and energizing the tin roof at 110 volts (Figure). This action, in turn, energized the metal pole and clothesline at 110 volts. When the victim grabbed the wire clothesline, his body provided a path to ground, causing his electrocution.

CAUSE OF DEATH

The medical examiner listed electrocution as the cause of death.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: A comprehensive jobsite survey should be conducted prior to the start of work to identify all potential hazards that workers might encounter during the performance of their duties.

Discussion: A comprehensive jobsite survey should be conducted by the supervisor or worker in charge prior to the start of any work to identify all potential hazards that may confront the workers performing the task at that given site. This type survey is particularly necessary in incidents where extensive damage has been inflicted by a natural disaster, e.g., a hurricane. The possibility of potential electrical hazards is greatly increased by the presence of conductive components and multiple powerlines being downed. These hazards include those that might be present both at ground level and at any level above ground where conductive components might be physically connected to conductive components at ground level, such as the metal pole and wire clothesline in this instance. This situation is compounded further since work was being performed in the dark, making identification of existing and potential hazards even more difficult. Had an inspection been conducted it is possible the downed live conductor on the conductive roof would have been identified, and this fatality would have been prevented.

Recommendation #2: Adequate lighting should be provided and utilized while performing work place safety inspections prior to the start of work and during powerline repair work at night.

Discussion: Adequate lighting should be provided and sufficient time taken to thoroughly inspect the entire worksite for hazards prior to the start of electrical repair work. If adequate lighting had been used during an inspection of the roof, the downed powerline in contact with the roof could have been discovered and properly repaired, preventing the fatality. In addition, adequate lighting must also be provided when powerline work is performed after dark.

Recommendation #3: Workers should be instructed to treat all conductive components in their work area with extreme caution, especially when the electrical system in their work area has suffered extensive damage, and wear appropriate personal protective equipment when necessary.

Discussion: Workers should be instructed to exercise extreme caution when working with or near an electrical system which has suffered extensive damage, especially in a work area that contains conductive components. In the presence of multiple downed powerlines and conductive components, workers should be extremely cautious, and wear appropriate personal protective equipment when necessary.

REFERENCES

1. Morbidity and Mortality Weekly Report, October 27, 1989/Vol.38/No. 42 Update: Work-Related Electrocutions Associated with Hurricane Hugo - Puerto Rico.

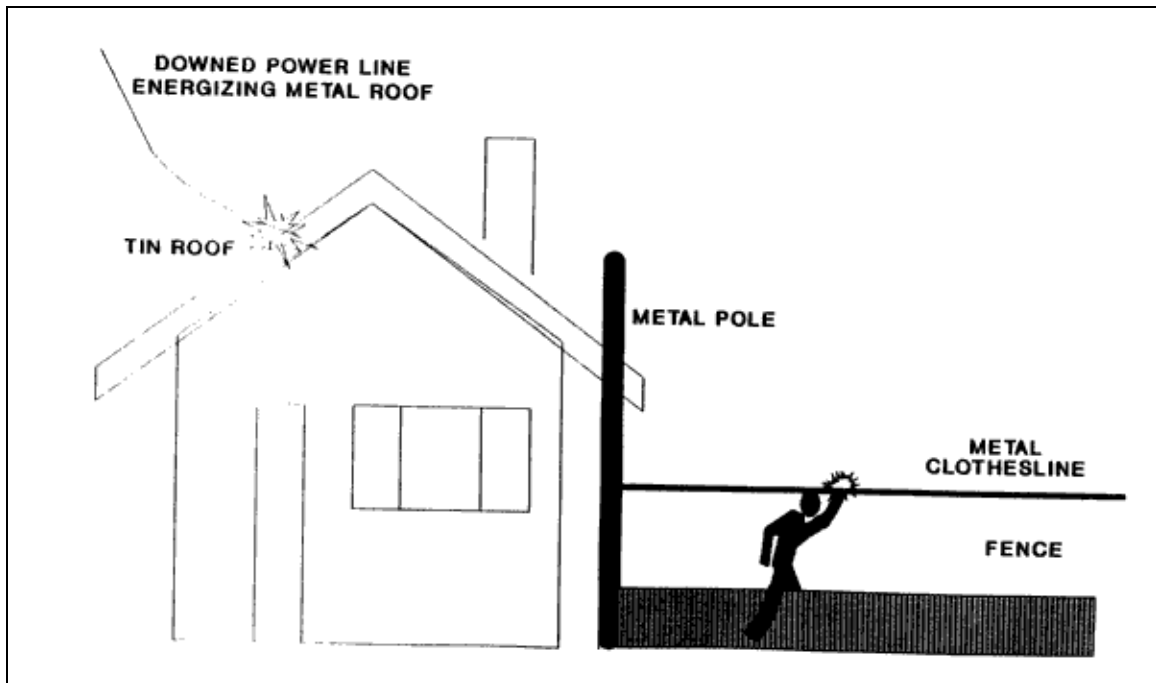


Figure. Meter Reader Electrocution