The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research NIOSH

Fatal Incident Summary Report: Electrocution of a Painter

FACE 83-09

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) Study. By scientifically collecting data from a sample of similar fatal incidents, this study will identify and rank factors which increase the risk of fatal injury for selected employees.

On July 14, 1983, a 22-year-old white male painter working on an electrical transmission tower accidentally contacted a grounding line which had a static charge. After entering a state of ventricular fibrillation for several seconds, he lost consciousness and fell to a lower beam on the tower. By the time co-workers lowered him to the ground, rescue attempts were unsuccessful in reviving him.

CONTACTS/ACTIVITIES

DSR received notice of the case from the attending medical examiner on July 20, 1983, and contacted the power company whose transmission tower was involved. Contact was also made with the painting firm contracted by the power company to paint its towers. On July 28, a safety researcher and epidemiologist traveled to the town near the incident site where meetings were held with representatives from the painting company, and the co-workers and supervisor of the fatally injured painter. During these meetings, information was obtained about the case, the painting company and worker perceptions of what had happened. The attending medical examiner also participated in the latter part of this discussion.

In mid-afternoon, the researchers, medical examiner, and OSHA personnel investigating the case participated in a discussion and site visit with the power company officials. During the meeting at the power company's local office, information was obtained about the essential aspects of the company's safety program and on the design considerations of transmission towers that seemed relevant to the fatal electrocution. A visit was then made to the incident site where both painting and power company representatives reviewed the circumstances and events of the accident. Photographs and a videotape showing details of the tower were taken.

SYNOPSIS OF EVENTS

The power company has in excess of 500 electrical power transmission towers in the region. The painting company had contracted to paint several hundred of these during the summer of 1983. The tower painting task was carried out by a team of six to eight skilled painters who testified that a single tower could be completely painted in two hours if the entire crew was present.

The tower involved in the incident was approximately 100' high, and situated roughly 100 yards from the nearest roadway. At about 9:00 a.m. the crew was working on the tower. The victim was painting the framework of a tower member at a height of about 94' above ground, and was wearing a safety belt around his waist. Other crew members were working on another section of the tower some distance from him. Co-workers reported that they heard a “crackling noise” and “staccato shouts,” and the victim saying “the wire bit me.” They saw him fall about 20', hitting several cross-members before he stopped. His co-workers lowered him to the ground and began mouth-to-mouth resuscitation. Emergency medical personnel were called and they instituted full cardiopulmonary resuscitation without success. He was pronounced dead at 9:20 a.m.

Based on evidence of paint on the victim’s sleeve, it is believed he brushed the static line with his sleeve or arm as he painted the supporting element. The charge on this line, which functions as a grounding wire, can climb to 1000 volts or 100 amps before flashover to the tower occurs. While the charge is a static one which discharges quickly, workers are aware that it can jolt and are trained to keep a distance. It is believed in this case that the charge was large enough to induce heart fibrillations which resulted in loss of consciousness.

MEDICAL FINDINGS

The deceased was examined by the Deputy Chief Medical Examiner, who reported no entrance or exit wounds on the body, which are often formed in electrocution cases. The body was that of a healthy, athletic young male with no other pathological anomalies. The medical examiner reported that he had seen other electrocutions with no exit-entry wounds, especially in cases where electricity is transferred to the body diffusely over an area.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

Electrocution is not an uncommon cause of death, particularly in this and other occupations. Had the following factors been better controlled, this untimely death may have been prevented.

First, the static or ground line on transmission towers is capable of carrying lethal charges, which can vary with atmospheric, climatic, and power usage factors. A practice of discharging the ground line through a special grounding tool to the tower itself was apparently not followed just prior to this exposure.

Second, in spite of training in the hazards of electrical work, the lack of warning associated with such hazards as this one requires special precautions. A test instrument to help the worker judge the charge on the ground line may in some cases be feasible.

Third, a fatal heart attack, of the kind induced here, need not be inevitable if emergency steps are taken immediately. While in this case emergency actions appear to have been as prompt as possible, a general warning seems appropriate that CPR may be necessary and should be available.

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