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TO: Director, National Institute for Occupational Safety and Health

FROM: California Fatality Assessment and Control Evaluation (FACE) Program

SUBJECT: Pipefitter electrocuted when closing metal gates at construction site in California

SUMMARY

California FACE Report #92CA013
April 15, 1993

A 30-year-old white male pipefitter (victim) was electrocuted while closing a steel chain link gate at a construction site. The victim was leaving the premises at the time of the incident, and was not wearing any personal protection equipment (PPE) other than workboots. An office/trailer which had been used by the construction crew as an office was located immediately adjacent to a freestanding (no post) chain link fence when the incident occurred.

It was determined that the grounding wire in the office/trailer was not connected to provide effective grounding when the incident occurred. As a result of this, one side of the gate became energized from the freestanding fence and as the victim grabbed the other gate he completed the circuit to ground. The other gate (side opposite the office/trailer) had posts which ran into the ground. A co-worker pushed the victim from the gate and was shocked. Cardiopulmonary resuscitation was given by co-workers until paramedics arrived. The California FACE investigator concluded that, in order to prevent similar occurrences, employers should:

- make sure all structures are grounded properly before allowing electricity to flow into them.
- conduct jobsite surveys to identify potential hazards prior to beginning work on a project and during the project.

INTRODUCTION

On August 17, 1992 a 30-year-old white male pipefitter was electrocuted while attempting to close a chain link gate at a construction site where he was employed. The incident occurred at 3:38 pm. The California FACE investigator was informed of the incident that afternoon by the California Occupational Safety and Health Administration's (Cal/OSHA) Bureau of Investigations (BOI) office. The California FACE investigator went to the site that afternoon but the employer had already left for the day.

An interview was conducted with the supervisor and co-workers on August 18, 1992. The victim had worked for the employer for 11 years. There were a total of 35 employees who worked for the construction company. The employer had been working at this location for 21 days at the time of the incident. There were four other employees with the same occupation as the victim.

The employer had a comprehensive written safety training program and the employees were required to use personal protective equipment (PPE) while at work. The employer also had a safety officer. In this incident the victim was leaving work so he was not wearing any PPE at the time. The California FACE investigator obtained reports from the Cal/OSHA investigator, the Coroner/Sheriff's report, and the Police report. Photographs were taken of the incident site by the California FACE investigator.

INVESTIGATION

The employer in this incident was a construction company. The victim's job description was that of a pipefitter, although he was not engaged in his normal duties at the time of the incident. The victim was in the process of leaving work when the incident occurred. He was closing the chain link gates when co-workers heard him scream. According to one co-worker, it was thought the victim had pinched his fingers while closing the gate. He (co-worker) went to help the victim and received a powerful shock. The co-worker then yelled to the other co-workers to call paramedics and proceeded to knock the victim off the fence. There were eight co-workers at the site when the incident occurred.

According to the voltmeter, the reading after the incident was 116 volts between the office/trailer and the ground. Inside the office/trailer there was a sub panel (electrical panel) which when opened revealed a ground wire that had not been connected. The air conditioner and lights were on in the office and were apparently grounding through the office/trailer's metal shell and the steel chain link fence. The fence was leaning against the metal frame of the office/trailer and both were resting on the surface of the ground.

The office/trailer was a rental unit which had not been inspected by the construction company at any time prior to the incident. It had been plugged into a temporary power pole which was equipped with a ground fault circuit interrupter (GFCI). It was determined by a city building inspector that the GFCI was in good working order, however, because the ground wire inside the office/trailer had not been connected properly it did not detect the problem. For this same reason, it was concluded, that the electrical current was able to flow from the office/trailer to the fence and finally through the victim to a metal post in the ground.

Cardiopulmonary resuscitation (CPR) was given by co-workers until paramedics arrived a few minutes after the incident occurred. Paramedics continued CPR on the victim during transportation to the hospital, the victim was pronounced dead at the hospital at 4:29 pm.

CAUSE OF DEATH

The Sheriff-Coroner's autopsy report stated the cause of death as cardiac arrhythmia due to electrocution.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should make sure all energized machines and appliances are grounded properly before allowing electricity to flow into them.

Discussion: This incident may have been prevented if the electrical system in the office/trailer had been inspected before work began. Under Title 8 of the California Code of Regulations (CCRs) section 2395.51 (A) (1) The path to ground from circuits, equipment, and conductor enclosures shall be permanent and continuous.

Recommendation #2: Employers should conduct jobsite surveys to identify potential hazards prior to beginning work on a project and during the project.

Discussion: A thorough evaluation of each jobsite should take place before and during any jobs, in order to detect workplace hazards. In this incident, the office/trailer which was being used as an office was not inspected for potential hazards. Employers are responsible for their employees health and safety while they are at work.

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