TO: Director, National Institute for Occupational Safety and Health

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

SUBJECT: An Electrician Was Electrocuted While Repairing a Lighting Circuit

SUMMARY
California FACE Report #06CA007

A 43-year-old Hispanic electrician was electrocuted while repairing a lighting circuit that had been damaged by a contractor doing building renovations. The victim was installing a temporary feed to replace wires that had been damaged when the incident occurred. The victim was instructed by his supervisor to shut off the power to the circuit at the junction box before working on it. The power had not been shut off and no lockout/tagout had been applied. The CA/FACE investigator determined that in order to prevent future occurrences, employers, as part of their Injury and Illness Prevention Program (IIPP), should:

- Ensure that workers follow established lockout/tagout procedures for control of hazardous energy when working on electrical circuits.

INTRODUCTION

On August 22, 2006, at approximately 3:30 p.m., a 43-year-old Hispanic electrician died when he was electrocuted while working on a lighting circuit that had been damaged. The CA/FACE investigator learned of this incident on August 31, 2006, through the Los Angeles Coroner's post mortem report. Contact with the victim's employer was made on November 2, 2006. On November 14, 2006, the CA/FACE investigator traveled to the company site where the incident occurred and interviewed company managers, supervisors, and employees. The area where the incident took place was photographed and examined.

The employer of the victim was a newspaper recycling company. The company had been in business for 39 years and had approximately 120 employees. The company had a maintenance department that consisted of 15 mechanics and eight electricians. The victim was one of the electricians and had worked for the company for six months. Although he was not licensed as an electrician, the victim worked under the direction of a licensed supervisor. The victim was born in Mexico and had been in the United States for 33 years. The victim was a high school graduate and spoke English and Spanish.

The company had a written Injury and Illness Prevention Program (IIPP) that was printed in English. The safety program had all the elements required by state law. Safety meetings were held on a regular basis and were documented. The company had a training program that provided regular safety training to employees. According to the company's human resource manager, their company offered training to their employees on a monthly basis and included training as part of their safety meetings. The victim had received lockout/tagout training. The victim's supervisor had observed his work and had decided he could work independently.

INVESTIGATION

The site of the incident was a large industrial factory that made newsprint out of recycled paper. The incident took place on the second floor of the mill building. The factory was undergoing renovation with replacement and repair of the steel beams in the walls, floors, and ceilings of the mill building's third floor. The incident occurred at ceiling level on the second floor of the mill building.

On the day prior to the incident, the victim and other electricians had re-routed the electrical circuits that were still in use so that the contractor could do his work. The electrical circuits were located at the ceiling level of the second floor. On the day of the incident, the contractor was working around a steel beam at floor level on the third floor and inadvertently cut a conduit with an energized line that was used for lighting on the second floor of the mill building. The lead electrician for the company assigned the victim the task of repairing this line, instructing him to "kill the circuit" at the junction box and to repair the damaged wiring. The victim had helped in the re-routing of the circuit, so he was familiar with the system, and was also an experienced electrician. The lead electrician was working in the same area but did not have visual contact with the victim. The lead electrician finished his work and went to the storeroom for parts. When he returned approximately 20 minutes later, he decided to check on the victim. He went to the area where the victim was working and found him down on a scaffold platform unconscious and non-responsive. He immediately radioed for help. Other employees in the area responded and started performing CPR on the victim. The paramedics and fire department arrived, found the victim without a heartbeat, and intubated him. They initiated CPR and transported him to the local hospital where he was pronounced dead.

After the victim was removed from the incident scene by the paramedics, the victim's employer and local police did a preliminary investigation. They found the victim's pliers that were used for stripping electrical wire, still attached to a wire from the damaged circuit at ceiling level. Closer inspection showed that there were burn marks on the pliers and a pipe, indicating that contact was made at these points. The physical evidence indicated that the victim climbed up on the contractor's scaffold and then climbed onto a piece of machinery to gain access to the damaged lighting circuit. While the victim was working on the energized circuit, his pliers made contact with the pipe, completing a circuit, and he was electrocuted. It is not known how long he remained in contact with the energized system. It appears that when the electrical breakers finally tripped, cutting off the electrical current to the circuit, the victim fell off the machinery

and landed on the scaffolding planks just below him, where he was found by his supervisor. An inspection was conducted of the junction box where the circuit breakers were housed and it was determined that the circuit had not been manually turned off or locked out and tagged prior to the start of work. The circuit had been tripped when the victim made contact with the energized line. The victim's circuit tester, which is intended to be used to verify that a circuit has been de-energized before work, was found in his locker after the incident.

CAUSE OF DEATH

The cause of death, according to the death certificate, was electrocution.

RECOMMENDATIONS / DISCUSSION

Recommendation #1: Ensure that workers follow established lockout/tagout procedures for control of hazardous energy when working on electrical circuits.

Discussion: The employer of the victim had an established lockout/tagout procedure in place that addressed all the following issues:

- Workers are able to secure energy control devices with their own individually assigned locks and keys, and there is only one key for each lock the worker controls.
- The locks used to secure an energy control device are clearly labeled with durable tags to identify the worker assigned to the lock.
- There is verification by test and/or observation that all energy sources are de-energized before work begins.
- All workers are clear of danger points before re-energizing the system.
- There is a hazardous energy control program with any confined space entry program.

Although the employer in this case had a lock out/tag out program, it was not being used when the victim was working on the energized lighting circuit that was damaged by a contractor. Had the victim followed the company's policy and procedures, this incident might have been prevented. Employers can enhance worker compliance with safe work practices through programs of task-specific training, supervision, recognition, and progressive disciplinary measures.

References:

California Code of Regulations, Vol. 9, Title 8, Sections 3314, The Control of Hazardous Energy for the Cleaning, Repairing, Servicing, Setting-Up, and Adjusting Operations of Prime Movers, Machinery and Equipment, Including Lockout/Tagout.

http://www.ncjrs.gov/pdffiles1/nij/grants/209730.pdf

http://www.medscape.com

EXHIBITS:

Exhibit 1. A picture of the area where the victim was working.

Exhibit 2. A picture of the victim's pliers attached to a wire.

Hank Cierpich
FACE Investigator

Robert Harrison, MD, MPH
FACE Project Officer

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Laura Styles, MPH
Research Scientist

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the Public Health Institute and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations of work-related fatalities. The goal of this program, known as the California Fatality Assessment and Control Evaluation (CA/FACE), is to prevent fatal work injuries in the future. CA/FACE aims to achieve this goal by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact. NIOSH-funded, State-based FACE programs include: California, Iowa, Kentucky, Massachusetts, Michigan, New Jersey, New York, Oregon, and Washington.

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Additional information regarding the CA/FACE program is available from:

California FACE Program
California Department of Public Health
Occupational Health Branch
850 Marina Bay Parkway, Building P, Third Floor