

TO: Director, National Institute for Occupational Safety and Health

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

SUBJECT: Laborer Dies When He Falls 35 Feet From a Scaffold After Being Electrocuted

SUMMARY
California FACE Report #08CA006

A 34-year-old male Hispanic laborer working for a solar energy company fell 35 feet from a scaffold to the ground below after being electrocuted. The victim was standing on the scaffold and lifting a 20-foot aluminum bracket from the ground. When the metal bracket reached the top of the scaffold, the victim pulled on one end of the bracket. The other end of the bracket contacted high voltage electrical lines approximately 10 feet away from the scaffold, and the victim was electrocuted. The victim fell from the scaffold approximately 35 feet to the ground below. The FACE investigator determined that, in order to prevent future electrocutions among solar energy workers:

- Solar energy contractors should conduct a daily job hazard analysis of the work area, including any electrical hazards from high voltage power lines.
- Solar energy contractors should establish and maintain safety programs that include electrical hazard recognition, including high voltage power lines.

These recommendations should be implemented as part of the required Injury and Illness Prevention Program (IIPP).

INTRODUCTION

On June 13, 2008, at approximately 11:00 a.m., a 34-year-old male Hispanic laborer died when he fell from a scaffold after a metal bracket he was lifting made contact with high voltage electrical lines. The CA/FACE investigator was notified of this incident on June 16, 2008, by the Los Angeles District Office of the Division of Occupational Safety and Health (Cal/OSHA). On July 30, 2008, the CA/FACE investigator inspected the incident scene and interviewed the company owner and four employees.

The employer of the victim was a solar energy contractor that designs, builds, and installs high efficiency conservation equipment for both residential and commercial markets. The employer had been in business for 29 years and had approximately 15 employees. There were three employees at the site where the incident occurred. The victim had been employed as a solar technician with this company on an intermittent

basis for about two years. The victim was born in Guatemala and had been in the United States for about five years. He had a third grade education and spoke only Spanish. Most routine job and safety instructions between the company supervisors and the victim were in Spanish.

The employer of the victim had a safety program and a written IIPP. There were written safe work procedures for most tasks including lifting materials, however only some of the safe work procedures were in Spanish. Safety meetings were held weekly and were documented. The company had a formal training program that was usually conducted in a classroom setting with solar equipment manufacturer representatives, or by on-the-job-training (OJT) from experienced solar technicians. The safety meetings and training were held in both English and Spanish by bilingual instructors, and records of training were maintained. Employee proficiency after training was measured through on the job demonstration of their skills. The training program on solar equipment installations covered the safety hazards for the electrical feeds into the solar system, but did not include hazard recognition and safe work procedures in the vicinity of high voltage electrical lines.

INVESTIGATION

The site of the incident was a three-story commercial building that was under construction. Utility power poles with 4,800 voltage power lines were located at the rear of the building approximately 10 feet away from the roof where the solar installation was to be performed. On the day of the incident, the victim and two co-workers were sent by their supervisor to the building site to strap a solar hot water tank to the roof of the building. The strapping material was an aluminum channel bracket that measured approximately 20 feet in length, and weighed approximately 20 pounds. The crew climbed an existing scaffold that was in place at the rear exterior of the building, and a rope was secured to the metal bracket on the ground. The victim was standing on the top of the scaffold and raised the bracket from the ground with the rope. As the victim pulled the bracket to the top of the building, he turned the bracket to a horizontal position with his back towards the nearby power lines. One end of the bracket made contact with the high voltage power lines sending electric current through the victim. The victim fell off the scaffold approximately 35 feet to the ground below. Emergency response personnel transported the victim to the local hospital where he died the following day.

CAUSE OF DEATH

The cause of death according to the death certificate was multiple traumatic injuries and electrocution.

RECOMMENDATIONS / DISCUSSION

Recommendation #1: Solar contractors should conduct a daily job hazard analysis of the work area, including any electrical hazards from high voltage power lines.

Discussion: When installing solar equipment on roofs, workers may use conductive equipment that can come into contact with nearby high voltage power lines. In this incident, a high voltage power line was located about 10 feet from the scaffold and roof edge. The twenty-foot long metal bracket, as it was being lifted, easily spanned the distance between the scaffold and the power line. A daily job hazard analysis would have identified the risk of the metal bracket contacting the high voltage power line, and safe work procedures could have been implemented to bring the bracket to the roof. The metal bracket could have been cut into smaller sections on the ground and then brought to the roof, or a different means of roof access could have been used.

Recommendation #2: Solar contractors should establish and maintain safety programs that include electrical hazard recognition, including high voltage power lines.

Discussion: The growing demand for solar energy may require installation of solar heaters and energy systems on rooftops in proximity to high voltage power lines. Solar contractor employees should be aware of the risks of electrocution when working in the vicinity of high voltage power lines. In this instance, the victim did not receive specific training on hazard recognition and safety procedures when installing solar equipment in the vicinity of high voltage power lines. Had the victim been aware of the risk of the nearby high voltage power line, he may have taken steps to modify his work procedures to ensure that there was no risk of contact by the metal bracket. A safety training and testing program on hazard recognition that gives employees the ability to identify a condition or behavior that could cause serious injury should be given:

- To all new employees;
- To all employees given new job assignments for which training has not previously been received;
- Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard;
- Whenever the employer is made aware of a new or previously unrecognized hazard; and
- Supervisors should familiarize themselves with the safety and health hazards to which employees under their immediate direction and control may be exposed.

In addition, the safety training should be given in a language and literacy level that employees can understand.

References:

California Code of Regulations: Vol. 9, Title 8, Subchapter 4. Construction Safety Orders, Article 3. General §1511. General Safety Precautions. §1518. Protection from Electric Shock.

Subchapter 5. Electrical Safety Orders, Group 2. High-Voltage Electrical Safety Orders, Article 37. Provisions for Preventing Accidents Due to Proximity to Overhead Lines (Formerly Article 86) §2946.

EXHIBITS:



Exhibit 1. The high voltage lines in relation to the building under construction.



Exhibit 2. The top of the building under construction where the victim was working.



Exhibit 3. Looking up from the ground to where the victim was working.

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Public Health, 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 the CA/FACE program is to prevent fatal work injuries. 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.

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

California FACE Program
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