TO: Director, National Institute for Occupational Safety and Health

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

SUBJECT: A Maintenance Supervisor Dies When He Falls off a Ladder into a Hot Water Tank.

SUMMARY
California FACE Report #07CA005

A 54-year-old Hispanic maintenance supervisor died from injuries he received when he fell off a ladder into a tank of hot water. The tank did not have a cover or grate over the top to prevent objects or people from falling in. The victim ascended the ladder to check the wiring in a conduit above the tank. The ladder was placed adjacent to the tank. The victim had to extend his body to his right beyond the rails of the ladder in order to get to the conduit. The company safety training program was prepared and implemented by an outside safety consulting company. 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 vats and tanks are safeguarded by grates or covers whenever work occurs above them.
- Ensure that a general hazard assessment is conducted prior to beginning any job or work task.
- Ensure that employees use a safe method to gain access to elevated work areas.
- Develop, implement, and enforce a fall protection program in conjunction with the IIPP.

INTRODUCTION

On February 7, 2007, at approximately 1:00 p.m., a 54-year-old Hispanic maintenance supervisor fell into a tank of approximately 160 degree Fahrenheit water and died in the hospital on February 25, 2007 subsequent to his injuries. The CA/FACE investigator learned of this incident on March 3, 2007, from the Los Angeles County Coroner's post mortem reports. Contact with the victim's employer was made on June 12, 2007. On July 24, 2007, the CA/FACE investigator traveled to the company that employed the victim and interviewed the company owner and other employees in the shop. Photographs of the incident scene were taken. Representatives from the contract company that was responsible for the safety training program were also interviewed.

The employer of the victim was a metal finishing company. The company had been in business for 13 years and had 34 employees. There were 12 employees at the facility

on the day of the incident. The victim had been employed with the company for 15 years. He was born in Mexico and had been in the United States for 25 years. The victim had a high school education and spoke, wrote, and understood Spanish and English. The victim was the company maintenance and safety supervisor and reported directly to the owner of the company. According to the owner, the victim was allowed to make decisions about the maintenance and repair of the shop equipment as he was familiar with the operation of the machinery. The victim usually performed electrical repairs in the shop, or he supervised one of the other maintenance workers when they made the necessary repairs.

The company had a safety program and an Injury and Illness Prevention Program (IIPP). A written copy of the program was not available for review at the time of the investigation. The safety program was prepared and implemented by an outside safety consulting firm which prepared the documents in both English and Spanish. The last update to the program prior to the incident was in 2004. The ladder safety portion of the program outlined how to place, secure, and use a ladder, and the hazards of falling.

The outside safety consulting firm performed safety training for the company employees. Training was routinely offered on a quarterly basis for all employees, and more often when the need arose. The training was also conducted in Spanish. The general training consisted of classroom sessions, safety videos, and a question and answer session. Required specific training included hands-on sessions where employees were tested on their knowledge and abilities and the results documented. The last ladder training program, which the victim attended, was given in April 2005.

INVESTIGATION

The site of the incident was the tank area of a metal finishing company. The hot water tank the victim fell into was three feet deep with a water temperature of approximately 160 degrees Fahrenheit. The tank was used for rinsing off parts that had been dipped in other chemical or acid tanks, and was not covered. On the day of the incident, the victim was responding to a service call involving a possible electrical short circuit in a dryer. With the help of an apprentice worker, the victim secured an extension ladder adjacent to the hot water tank in order to gain access to the conduit located above him. The victim used a 20-foot extension ladder with a 250-pound capacity that was manufactured in 2006. The victim ascended the ladder to the eighth or ninth rung and reached beyond the rails of the ladder to remove the cover plate on the conduit. He was about to check the wires with an electrical tester when he told the apprentice to go to the supply room for a part. It is not known if the victim slipped or received an electrical shock that may have precipitated his fall into the hot water tank. Other employees witnessed the victim exiting the tank by himself after approximately 10 seconds.

The victim was transported by paramedics to the hospital with 81% total body burns. He was transferred to a burn center where he died from multiple complications from his burns on February 25, 2007.

CAUSE OF DEATH

The cause of death, according to the death certificate, was sequelae of burns.

RECOMMENDATIONS / DISCUSSION

Recommendation #1: Ensure vats and tanks are safeguarded by grates or covers whenever work occurs above them.

Discussion: The tank involved in this incident was not covered to prevent objects or individuals from falling into it. When employees are required to work directly above open tanks, employers should ensure that the top of the tank is covered with a grating or grille with openings no larger than two inches and of sufficient strength to hold the weight of anything that may fall on it.

Recommendation #2: Ensure that a general hazard assessment is conducted prior to beginning any job or work task.

Discussion: The worksite should be evaluated for potential hazards prior to beginning any job or work task. Such an evaluation would have shown that a ladder was not the appropriate choice for the job. The electrical repair was located above the tank such that the use of a ladder required reaching beyond a safe distance.

Recommendation #3: Ensure that employees use a safe method to gain access to elevated work areas.

Discussion: The use of a ladder limited the work area of the victim to an arm's length on each side of the ladder. In order to reach the conduit, the victim needed to maintain his balance while holding the ladder with one hand. Although the fall was not witnessed, it is likely the victim lost his balance by attempting to exceed a safe reach. The use of mobile scaffolding or another type of work platform such as a scissor lift would have provided a stable work surface and enabled the repairs to be completed safely.

Recommendation #4: Develop, implement, and enforce a fall protection program (FPP) in conjunction with the IIPP.

The goal of a FPP is to eliminate workplace fall hazards. If a hazard cannot be eliminated, the FPP's goal is to then reduce the risk of falls and to minimize the consequences if a fall does occur. Conducting fall hazard assessments and choosing the safest methods to access elevated work areas are integral parts of an FPP. Other parts of a FPP include training, rescue and retrieval, personal fall protection equipment use, and program monitoring. By establishing a FPP, workplaces are better assured that all fall hazards are identified and addressed.

References:
California Code of Regulations

Subchapter 7, General Industry Safety Orders, §3203 Injury and Illness Prevention Program. Group 3, General Plant Equipment and Special Operations. Article 15, Vats, Pans, Bins, Bunkers, Hoppers, and Similar Containers and Vessels. §3480. Vats, Pans and Tanks.

Subchapter 4. Construction Safety Orders Article 24. Fall Protection §1669. General, §1670. Personal Fall Arrest Systems, Personal Fall Restraint Systems and Positioning Devices.

Subchapter 5. Electrical Safety Orders, Group 1. Low-Voltage Electrical Safety Orders, Article 3. Work Procedures, §2320.8. Fall Protection

http://www.cdc.gov/niosh/face/stateface/ak/93ak045.html
http://www.cdc.gov/niosh/face/stateface/ca/96ca015.html
http://www.cdc.gov/niosh/face/stateface/mi/05mi163.html

EXHIBITS:

Exhibit 1. The shop where the incident took place.

Exhibit 2. The tank filled with hot water.

Exhibit 3. The incident scene with the ladder in place.

Exhibit 4. Alternate view of the ladder secured in place.

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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.

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

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