TO: Director, National Institute for Occupational Safety and Health

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

SUBJECT: Warehouseman dies when crushed by forklift in California

SUMMARY
California FACE Report #96CA016

A 21-year old male warehouseman (victim) died after being crushed between a forklift and the edge of the floor of a railroad boxcar. The victim was attempting to attach a chain to the boxcar door to pull it closed with the forklift. He was standing on the ground between the loading dock and the boxcar. The victim had parked the forklift on or very near the boxcar loading dock without setting the parking brake. As the victim was in the process of attaching the chain, the forklift rolled backward across the dock and fell partially over it with the rear of the forklift pinning the victim against the side of the boxcar. The wheels of the forklift had not been chocked nor had the forks been fully lowered. The victim was not trained nor certified to operate a forklift. The CA/FACE investigator concluded that, in order to prevent future occurrences, employers should:

- Ensure that forklift operators, when dismounting, always set the parking brake, lower the forks/mast, and neutralize the controls when the forklift is attended (i.e. running forklift within 25 feet and in view of the operator).
- Closely supervise new employees until properly trained and evaluated for all job tasks.
- Disallow the practice of operators standing between a forklift pointing in a direction it normally travels and fixed objects when the forklift is on an incline.

Additionally, manufacturers should:

- Design and build all forklifts so that the parking brake is automatically set when the operator gets out of the seat.

INTRODUCTION

On October 24, 1996 at 5:00 p.m., a 21-year old male warehouseman was crushed by a forklift when it pinned him against the edge of the floor of a railroad boxcar at a receiving and distribution warehouse. The victim was declared dead at 5:32 p.m. The CA/FACE investigator learned of the fatality on November 15, 1996 from the coroner's office. The CA/FACE investigator responded to the site of the incident on December 2, 1996. He met with the vice-president of operations, a safety engineer and a safety and risk management consultant and took

photographs of the site. The CA/FACE investigator obtained copies of the coroner's report, death certificate, Cal/OSHA form 36, and police report.

The employer had been in business for 5 years and had 2000 employees. A supervisor at the site was responsible for safety and devoted 10 to 20 percent of his time to safety duties**.** The victim had worked for the company for 3 days and had not yet attended a new employee orientation nor had he been trained in forklift operations. The employer had its own forklift training program. Safety meetings were held once a month**.** Forklift rules of safe operation were prominently displayed at the warehouse.

INVESTIGATION

The site of the incident is a large warehouse that receives, stores and distributes goods. The employer is also involved in receiving and distributing recycled metals. The decedent was working in the copper recycling area. Copper is stored at the warehouse as plates bundled together. Each bundle weighs approximately 5,000 pounds. When the bundles are due to be distributed, forklifts are used to load the bundles onto a railroad boxcar (**Exhibit 1**). The boxcar is accessed by means of a dock plate, one end of which is placed on the bed of the boxcar and other end on the loading dock.

On the day before the incident, the decedent cut his hand. He had been placed on restricted duty, with sweeping as his function. The decedent had only been working for the company for three days. In an apparent attempt to demonstrate his willingness and ability to do the job, he undertook some of the duties in the copper recycling area. On the day of the incident, near the end of shift, the side doors to the railroad boxcars needed to be closed to prevent unauthorized entry. Closing the door of the boxcar involved in this incident was assigned to the decedent by a floor supervisor. The door could normally be closed by one employee who would push it closed. The decedent could not push the door closed. A crowbar was normally used as a lever to shut doors that could not be closed by hand. In this incident, a crowbar was used but could only move the door one foot. In those situations where other methods failed to close the door, as come-a-long would be used to winch the door closed. A come-a-long was used in this incident but also failed to close the door.

Another warehouseman attempted to close the door with the forks of a forklift. However, the forklift's propane tank was indicating that it was almost empty. The decedent volunteered to drive the forklift to the mutual propane tank area. However, he ran out of propane prior to reaching the mutual propane tank. The warehouseman who had been helping him previously noticed him and helped the decedent remove and refill the tank. The other warehouseman went to unload a flatbed. The decedent replaced the tank on the forklift and drove back to the loading dock to close the boxcar's door. The decedent, according to company officials, took it upon himself to devise a new method of closing a troublesome door. He had obtained a chain, one end of which would be fastened to the door and the other to the forklift. The forklift would be moved in such a way that the door would be pulled closed.

In order to attach the chain to the door, the decedent jumped off the loading dock, which no longer had a dock plate, to the ground below. The ground is about four feet from the top of the dock. The boxcar, sitting on tracks, is positioned approximately 5 feet from the leading edge

of the loading dock (**Exhibit 2**). There is a difference in elevation between the loading dock and the boxcar of approximately one foot so that a dock plate would be angled down from the dock to the boxcar's floor (**Exhibit 3**).

The decedent used the forklift with the refilled propane tank for the task (**Exhibit 4**). He had parked the forklift on or very near the loading dock, which protruded from the wall of the building approximately 6 feet, with its rear facing the boxcar. When he exited the forklift, the mast was in its full, upright position, the forks were slightly off the ground, and the parking brake had not been set. The dock was fixed on a two percent grade, in order for rain runoff to go down and away from the building. As the decedent was attaching the chain, the forklift began to move down the dock. Apparently, before he noticed or could react, the forklift went over the edge of the dock and pinned the decedent, who was working at the boxcar door's opening. The forklift went over with the rear of the forklift pinning the decedent at his waist against the edge of the floor of the boxcar.

Several employees heard what they described as a loud boom or crash. The decedent's regular floor supervisor was in the front office, approximately 75 yards away and did not hear the crash**.** The floor supervisor who had assigned the job to the decedent was the first to arrive. He found the decedent pinned at the waist by the forklift with his feet still on the ground and his head lying down on the boxcar's floor. The decedent was conscious but had difficulty breathing. The other supervisor yelled for help and also used his hand-held radio to summon help.

When the decedent's regular floor supervisor heard the radio call, he jumped on a forklift and drove it to the site of the incident. He found the other supervisor standing on the ground trying to push the forklift off the decedent. The forklift was tilted at a 45 degree angle. The floor supervisor grabbed the chain, which was still nearby, and attached it to his forklift and the forklift which was pinning the decedent in attempt to pull the forklift off the decedent. This rescue effort proved futile as his forklift could not pull the other forklift. The floor supervisor then directed another employee to bring a larger forklift to the site. A similar rescue effort was tried with the larger forklift and proved successful. As the forklift was pulled away from the decedent, he fell into the arms of the other supervisor, who then lowered him to the ground. The regular floor supervisor then drove back to the office to call 911.

No first aid was attempted by company employees. When the paramedics arrived at 5:08 p.m., they found the decedent lying on the ground with no pulse or spontaneous respiration. They attempted CPR and cut away his shirt to assess the injury. They found what was described as an indentation and laceration approximately one-half inch wide and 14 inches long across the abdomen, just above the navel. Assessment also revealed a lack of blood pressure and a distended abdomen with blood in the abdominal cavity. The decedent was transported to a local hospital where a doctor pronounced him dead at 5:32 p.m.

CAUSE OF DEATH

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

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure that forklift operators, when dismounting, always set the parking brake, lower the forks/mast, and neutralize the controls when the forklift is attended (i.e. running forklift within 25 feet and in view of the operator).
Discussion: When the decedent dismounted the forklift and went to the boxcar to attach the chain to the boxcar door, he neglected to set the parking brake and lower the mast and forks. In a normal situation, both of these actions would prevent the forklift from running away. When the operator of an forklift is dismounted and within 25 feet (7.6 meters) of the forklift which remains in the operator's view, the load engaging means must be fully lowered, controls neutralized, and the brakes set to prevent movement. If the operator had performed all of these actions, this incident most likely would not have happened.

Recommendation #2: New employees should be closely supervised until properly trained and evaluated for all job tasks.
Discussion: New employees are usually eager to show employers that they are fully capable of doing the job for which they were hired. Employers occasionally will allow employees to undertake job tasks for which they have not been completely trained or experienced. In this incident, the employee took it upon himself to operate the forklift in an attempt to use an unauthorized method to close the boxcar door. Employers should use a formal checkoff sheet for a new employee so he understands what the scope of his duties are. New employees should be informed that they can be disciplined for undertaking tasks before they are authorized. Had the employee in this incident understood that he was not yet authorized to drive a forklift, this incident may not have happened.

Recommendation #3: Employers should disallow the practice of operators standing between a forklift pointing in a direction it normally travels and fixed objects when the forklift is on an incline.
Discussion: It is a very dangerous practice to allow an employee to stand between a forklift and any fixed object in a direction it can potentially roll**,** especially on a slope. An employee can be crushed between a runaway forklift and the fixed object. Forklifts must not be placed facing anyone standing in front of a bench or other fixed object of such size that the person could be caught between the truck and object. Had the operator turned the forklift ninety degrees in the direction he had to travel before dismounting, the forklift most likely would not have run away and he would not have been in a danger zone.

Recommendation #4: Manufacturers should design and build all forklifts so that the parking brake is automatically set when the operator gets out of the seat.
Discussion: Some electric forklifts are constructed with seats that rise and automatically set the parking brake when the operator gets out of his seat. One of the common omissions of forklift operators is to fail to set the parking brake when they assume the forklift is on level ground. Results of other forklift runaway investigations suggest manufacturers should consider designing forklift parking brakes that automatically set on all types of forklifts.

References

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Forklift Safety Training, *Professional Safety*, American Society of Safety Engineers, January 1993

The New Professionals, Rules for Safe Industrial Truck Operation, Clark Equipment Company, Battle Creek, MI, 1983

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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: Alaska, California, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, Nebraska, New Jersey, New York, Oklahoma, Oregon, Washington, West Virginia, and Wisconsin.

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

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