

TO: Director, National Institute for Occupational Safety and Health

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

SUBJECT: A construction laborer was run over by a front-end loader.

SUMMARY
California FACE Report #02CA010

A 19 year-old male construction laborer, performing the duties of a grade checker and directing traffic at a construction site, was inadvertently backed over by a front-end loader. The victim entered the moving equipment's immediate work area. The equipment operator lost sight of the victim as he operated the front-end loader. The front-end loader's back-up alarm was not working at the time of the incident. The company did not have a written code of safe practices that covered the hazards of working in close proximity of moving heavy equipment. 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 employees remain out of the immediate area where heavy equipment is operating.
- Ensure that when visual contact is lost with workers on foot, the equipment operator stops the heavy equipment and does not resume until visual contact is re-established.
- Ensure that the equipment being used has a working back-up alarm.
- Ensure that Injury and Illness Prevention Programs include a written code of safe practices on all hazards associated with the work being performed.
- Ensure employees are adequately trained and that workers' achievement of skills is verified through a testing program.

INTRODUCTION

On November 4, 2002, at approximately 2:30 p.m., a 19-year-old male construction laborer died when he was backed over by a front-end loader. The CA/FACE investigator learned of this incident on November 7, 2002, through the Legal Unit of the Division of Occupational Safety and Health (Cal/OSHA). On November 25, 2002, the CA/FACE investigator contacted the victim's place of employment, and was eventually granted access after an initial delay. On February 7, 2003, the safety representative and other employees of the company were interviewed. A copy of the police report was obtained and the OSHA file was reviewed.

The employer of the victim was a general construction company that specialized in environmental grading, sewer, water, storm drain, and site remediation. The company had been in business for 25 years. The company had on average 17 employees. The victim had worked for the company for about two years. There were 7 employees at the site when the incident occurred.

The employer of the victim had an Injury and Illness Prevention Program (IIPP), but had no written code of safe practices identifying the hazards on the job being performed on the day of the incident. A generic safety field manual was used for that purpose. Safety meetings were held weekly at job sites but not all of them were documented. The victim had never received formal comprehensive training. Experienced workers and operators usually supplied the training by conducting on the job training (OJT) when needed. Experienced operators supplied most of the training for the victim. The victim's competency was never tested.

INVESTIGATION

The site of the incident was a rectangular shaped 60,000 square foot dirt lot that was being renovated for the building of a new warehouse. The victim and his employer were sub-contracted to prepare the foundation for this new building. The equipment involved in this incident was an articulating front-end loader. The loader had a back-up alarm, but it was not working at the time of the incident. The loader's right rearview mirror was also missing. On the day of the incident the victim was functioning as a grade checker and the signalperson for the front-end loader. The other piece of equipment on the lot was a water truck used to moisten the dirt and keep the dust level down.

Around 2:00 pm, the operator of the front-end loader filled the bucket with dirt and proceeded to the north portion of the lot where the new building foundation was being formed. The victim, wearing a reflective orange vest, was standing approximately 15 feet in front of and to the left of the tractor. He waved his hands in a motion that instructed the loader operator to back up. The loader operator looked over both shoulders and then backed up, raised the bucket to about windshield level, and allowed the dirt to fall out in an even pattern. It was during this process that the loader operator lost sight of the victim.

The water truck operator was on the south portion of the lot spreading water in an easterly direction when he looked up and noticed the victim lying underneath the loader. The water truck operator started waving his arms in an attempt to get the loader operator's attention. The loader operator backed approximately 10 feet before realizing he lost sight of the victim. He lowered the bucket arms to gain more vision. He then looked to his rear and noticed the water truck operator waving his arms and pointing to the ground in front of the loader. The loader operator stopped and saw the victim lying on the ground in front of the loader. He immediately got off of the loader, called 911 on his cell phone, and ran to the victim. The paramedics arrived within minutes of being called, checked the victim for a pulse and spontaneous respirations, and found none. Death was pronounced at the site.

CAUSE OF DEATH

The cause of death, according to the death certificate, was blunt head trauma.

RECOMMENDATIONS / DISCUSSION

Recommendation #1: Ensure employees remain out of the immediate area where heavy equipment is operating.

Discussion: Construction heavy equipment is inherently dangerous to work around, especially for employees on foot. Although the victim used standard hand signals to communicate with the operator of the front-end loader when he wanted the loader to move in a certain direction, the victim did not convey his intentions to enter the operating area of the loader. The victim should have waited until the front-end loader stopped its operation, then he could have safely entered the work area after making visual contact with the operator. Employers can ensure worker compliance with safe work practices through programs of training, supervision, safe work recognition, and progressive disciplinary measures.

Recommendation #2: Ensure that when visual contact is lost with workers on foot, the equipment operator stops the heavy equipment and does not resume until visual contact is re-established.

Discussion: Visual contact with all workers on foot is a must to acquaint the operator with all ongoing conditions. A spotter can keep visual contact of all workers on foot for the operator but must inform the operator of any changes that might affect the safety of those on the job. Although the technical aspects of operating heavy equipment can occupy an operator's thoughts when performing his duties, he must also be proficient enough to constantly be aware of the people working in close proximity. Upon losing visual contact with the victim in this incident, the operator should not have proceeded until visual contact was re-established. Had this been done, this incident might have been prevented.

Recommendation #3: Ensure that the equipment being used has a working back-up alarm.

Discussion: The back-up alarm was not working on the piece of equipment involved in this incident. The main purpose of a back-up alarm is to warn workers on foot of a backing piece of equipment. The back-up alarm should be loud enough to be heard from a distance of 200 feet. The back-up alarms should be checked daily for operation and the equipment should not be used until the alarm is working properly. Additional devices for warning employees of a backing piece of equipment such as strobe lights and different audible sounds are also available. Had the back-up alarm on this piece of equipment been working properly, this incident might have been prevented.

Recommendation #4: Ensure that Injury and Illness Prevention Programs include a written code of safe practices on all hazards associated with the work being performed.

Discussion: Construction employers are required to perform a hazard evaluation on every job they undertake in order to ensure employees that all known and possible safety hazards are identified and corrected or averted. Communicating these discovered hazards to affected employees is a must even though they may be repetitive in nature. This practice helps remind employees of their safety responsibilities. Employers can ensure worker compliance with safe work practices through programs of training, supervision, safe work recognition, and progressive disciplinary measures.

Recommendation #5: Ensure employees are adequately trained and that workers' achievement of skills is verified through a testing program.

Discussion: Employees working on foot in the area of heavy equipment should be trained on the blind spots associated with heavy equipment. Formalized testing should be a part of all training programs.

References:

California Code of Regulations, Title 8, Sections 1509(b), 1592 (a)(e)

Association of Equipment Manufacturers SAFETY MANUAL, Wheel Loader / Tractor, 1991

FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the California Public Health Institute, and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations on 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.

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

**California FACE Program
California Department of Health Services
Occupational Health Branch
1515 Clay St. Suite 1901
Oakland, CA 94612
(510) 622-4370**

EXHIBITS:



02CA0010

Exhibit #1

Picture of an articulating front-end loader similar to the one involved in the incident.