TO: Director, National Institute for Occupational Safety and Health

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

SUBJECT: A tractor operator dies when his tractor rolls over on him.

SUMMARY
California FACE Report #01CA002

A 69-year-old equipment operator died when the tractor he was operating rolled-over as he attempted to make a left turn at the bottom of a steep ravine he had just descended. The victim was clearing the land and doing site preparation for a future housing development and golf course. A witness to the incident saw the unbuckled victim standing at the operator controls just prior to it rolling over. The tractor was equipped with the required rollover protective structure (ROPS) and seat belt. The front of the tractor was equipped with a clamshell type bucket with a capacity of approximately five yards. The bucket was in a raised position when it rolled over. The employer had no written Injury and Illness Prevention Program, written job hazard evaluations, or documented training programs for employees at the time of the incident. 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 employees, when operating equipment, wear the seatbelt that is required with the equipment.

- Ensure operators are trained and skilled in safe work practices, especially maneuvers that adversely affect the center of gravity and increase the likelihood of a tractor rollover.

INTRODUCTION

On February 1, 2001, at approximately 9:30 a.m., a 69-year-old male equipment operator died when the tractor he was operating turned over as he descended a steep ravine and attempted a left turn at the bottom. The CA/FACE investigator learned of this incident on February 8, 2001, through the local legal office of the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA). On March 15, 2001, the CA/FACE investigator traveled to the decedent's place of employment and interviewed the company owner, then traveled to the incident site and interviewed the witness and took pictures of the scene.

The employer of the victim was a land clearing company that prepared property for housing developments and other improvements. The company had been in business for over

thirty years and had 12 employees working for them at the time of the incident. Four of those employees were at the site when the incident occurred. The owner of the company stated the victim had been part owner of the company since its inception until his retirement at age 65. He later returned to work as an equipment operator. The victim had over 30 years experience as an equipment operator and had been working at the site sporadically for 6 months depending on weather conditions.

The company had a safety program but no written Injury and Illness Prevention Program (IIPP) at the time of the incident. There were no written task specific safe work procedures or operator manuals for the machines. The only training made available to employees was undocumented on-the-job-training (OJT), which the victim conducted.

INVESTIGATION

The site of the incident was a large commercial development project being cleared for a housing complex and golf course. The multi-acre parcel of land contained numerous hills and steep ravines that had to be cleared. On the day of the incident, the four employees assigned to this job site were operating equipment at different locations. The victim was operating a crawler type tractor with a clamshell type bucket. The victim was going to finish clearing a steep ravine of small trees and shrubbery with the bucket attachment on his tractor. The victim had started clearing this ravine at an earlier date but was unable to finish because of inclement weather.

The angle of the ravine varied between 50 and 60 degrees and the slope was approximately 30 feet in length. The bottom of the ravine was approximately 10 feet wide. The victim descended the ravine with the tractor bucket pushing the earth in front of it. Just before he reached the bottom of the ravine, he raised his bucket and attempted to make a left turn while still on the incline. While in the process of turning left, the tractor rolled-over and came to rest on its right side at the bottom of the ravine. The victim was ejected and pinned between the tractors rollover protective structure (ROPS) and the ground. A witness to the incident stated he saw the victim standing up at the control panel just prior to the tractor rolling over. The witness ran to the incident site, saw the victim pinned beneath the tractor canopy, and then ran up the ravine to call for help. The paramedics responded within minutes, checked for spontaneous respirations and pulse and found none, and pronounced the victim at the scene.

CAUSE OF DEATH

The cause of death, according to the death certificate, was blunt head and face injuries.

RECOMMENDATIONS / DISCUSSION

Recommendation #1: Ensure that employees, when operating equipment, wear the seatbelt that is installed on the equipment.

Discussion: A witness to the event stated he saw the victim standing at the tractor controls just prior to the tractor rolling over. It is not known if the victim was wearing the seat belt and unbuckled it in an attempt to jump free of the tractor, or if he wasn't wearing the seat belt at all. A comprehensive safety program should include instructions to operators on the importance of staying buckled in the operators seat especially during a roll over situation with a tractor equipped with a roll over protective structure (ROPS). Had the victim been buckled in the operators seat when the roll over occurred, this incident might have been prevented.

Recommendation #2: Ensure operators are trained and skilled in safe work practices, especially maneuvers that adversely affect the center of gravity and increase the likelihood of a tractor rollover.

Discussion: According to the operator's manual for this tractor, the stability of the tractor could be affected when the bucket is used, therefore, the bucket should be carried as close as possible to the ground. Most equipment's operator's manuals give clear instructions as to the safe heights a bucket could be raised before it affects the equipments center of gravity. In this particular situation, the bucket was raised just before the tractor reached the bottom of the ravine. With the bucket in a raised position and the tractor on an incline making a left turn, the center of gravity of the tractor was adversely affected and the tractor rolled over on its right side. Employers can ensure worker compliance with safe work practices through programs of training, supervision, safe work recognition, and progressive disciplinary measures.

References:

California Code of Regulations, Vol. 9, Title 8, Sections 1590, 1596

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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, Maryland, Massachusetts, Maryland, Minnesota, Nebraska, New Jersey, New York, Ohio, Oklahoma, Texas, Washington, West Virginia, and Wisconsin.

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

California FACE Program
California Department of Health Services
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