TO: Director, National Institute for Occupational Safety and Health

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

SUBJECT: Developmentally disabled worker dies after being run over by a front-end loader in California

SUMMARY
California FACE Report #95CA021

A 51-year-old male, developmentally disabled worker was run over by a front-end loader while he was at work at a recycling facility. The victim and six of his co-workers (also workers with disabilities) had been assigned the task of cleaning up trash. Their supervisor was operating the front-end loader when the incident occurred. One of the workers ran over to the area where the supervisor was working and told him that the victim was having a seizure. The supervisor and one of the disabled co-workers went over to the victim and attempted to help him walk. The supervisor was not aware that he had run over the victim with the front-end loader. The supervisor called the director of rehabilitation at the main office to request medical assistance. The director of rehabilitation arrived at the scene, and after examining the victim, called 911. The victim was transported to the hospital by paramedics and died three hours later. The CA/FACE investigator concluded that in order to prevent similar future occurrences employers should:

· require that at least one supervisor, trained in safety, maintain constant supervision over disabled workers to assure that they comply with safe work practices.

· require that equipment operators of heavy equipment look in the direction of travel and that workers wear high visibility garments when working in close proximity to large pieces of equipment.

· keep developmentally disabled workers out of the area of danger of any heavy equipment by delineating the danger area's boundaries.

· provide developmentally disabled workers with consistent and ongoing training and re-training regarding job safety hazards.

· consider having proximity sensing devices installed on large pieces of equipment so that an operator is alerted when someone comes into the work area.

· assure that employees are trained in first aid and cardiopulmonary resuscitation (CPR), and receive refresher training so they can provide appropriate treatment.

INTRODUCTION

On December 28, 1995 at 2:25 p.m., a 51-year-old male, developmentally disabled worker died when he was run over by a front-end loader. The CA/FACE investigator was informed of this incident by a California Division of Occupational Safety & Health (Cal/OSHA) district office on January 4, 1996. A site visit and employer interview were conducted by the CA/FACE investigator on January 11, 1996. Photographs were taken of the incident site and equipment involved in this incident. Copies of the Cal/OSHA report, the sheriff-coroner's autopsy report and the paramedic's report were obtained by the CA/FACE investigator.

The employer in this incident was a job training center for persons with disabilities. The employer maintained a staff of 100 employees who served approximately 300 disabled individuals. The director of the facility stated that these individuals had a wide range of disabilities ranging from mild to profound. The staff trained these workers and then contracted out their services to a variety of industries. This incident occurred at a recycling center which had contracted with the training center to employ the disabled workers. The victim had worked for the training center for approximately three months, with one day a week at the recycling center. He also had previously worked for four to five years at the training center 11 years prior to the date of this incident.

The employer had a safety officer on staff who devoted approximately 25% of her time to safety issues. Safety meetings were held twice a month and the safety training committee met periodically. The supervisor in this incident, a training center employee, had taken an operator front-end loader training course provided by an equipment manufacturer. He had also completed a standard first aid course provided by the American Red Cross in April 1995. The employer had an Injury and Illness Prevention Program (IIPP) which was in compliance with Title 8 of the California Code of Regulations (CCRs) section 3203. There was, however, no specific safety training for the workers which addressed the work being performed at the time of the incident.

The company IIPP addressed rescue and injury procedures and how such procedures should be implemented. The IIPP did not, however, provide details on how first aid was to be administered other then to state that a staff member with a valid first aid/CPR card must be on facility grounds at all times. Regular classes in first aid and CPR are taught by qualified personnel at the center.

INVESTIGATION

The incident occurred at a curbside recycling facility. The company picks up plastic, glass, paper, cardboard, and aluminum and tin cans at residences and businesses and transports the materials back to the facility. The materials are sorted by types and placed in separate bins. Some materials are loaded as loose waste and transported to the end user. Other materials are formed into bales in the on-site baling building before being transported to the end user.

At approximately 2:15 p.m. on the day of the incident, the victim's supervisor had assigned the victim and five of his co-workers to perform cleanup work. The workers were picking up loose pieces of cardboard and plastic and placing them into the appropriate bins. Prior to that time, the workers had been working on a conveyor belt in another area of the facility where they were separating plastics and glass and placing them into recycling bins.

The supervisor was operating a front-end loader (see Exhibit 1) in an area which was

approximately 25-50 yards from where the employees were working. The director of the training center stated that the operation of the front-end loader was not a required part of the supervisor's position, but that the supervisor had made arrangements with the recycling facility to operate the loader when working there. The supervisor had been loading cardboard with the bucket of the front-end loader. He moved the loader forward, picked up the cardboard, backed up the loader, and went forward to unload. He stated he had done this one or two times and then was advised not to put any more cardboard in the unloading area. At that point, he drove the loader approximately 25 yards to the north side of the facility and parked it. It was at that time, approximately 2:25 p.m., a disabled co-worker discovered the victim lying on the ground in the area between the baling building room on the east and the cardboard and plastic bins on the west. The co-worker went to the supervisor and advised him that the victim was having a seizure.

The supervisor parked the front-end loader and walked with the co-worker to the victim lying on the asphalt. The victim was conscious and was able to communicate with the supervisor. The victim was moved several feet but was unable to walk. The supervisor ran to the maintenance shop and called the director of rehabilitation at the main office of the training center and requested that she come to the scene. The training center is located approximately one half mile from the recycling facility. The supervisor returned to the victim and attempted again to move him with the aid of a co-worker. The victim was moved approximately 20 feet before he was set back down on the ground. The director of rehabilitation drove to the incident site, briefly examined the victim, and immediately called 911 from her car phone. The director of the training center stated approximately 15 minutes elapsed from the time the victim was injured to the arrival of the paramedics. Paramedics were dispatched at 2:34 p.m. and arrived at the incident scene at 2:38 p.m., where they found the victim to have spontaneous respirations, rapid pulse and incoherent speech. Paramedics transported the victim to the hospital where he was pronounced dead at 5:52 p.m.

The victim and his developmentally disabled co-workers offered conflicting statements about what had occurred. While in the hospital prior to his death, the victim told several family members that he had fallen over a barrel. However, there were no barrels in the area where he was found. The victim's injuries were consistent with being run-over. Post-mortem photographs revealed uniform bruising consistent with the tread of the front-end loader's tires. Several non-disabled workers from the recycling center stated that the victim's pants were torn and that his belt buckle had been ripped from his belt. The victim's supervisor stated that he did not think he hit the victim with the loader because he thought he would have felt the impact. He further stated that, in the past, when he had run over "anything" he had always felt it. He did not recall seeing the victim in the rearview mirrors, but stated that it was possible the victim could have been there, and that this incident could have occurred without him (the supervisor) being able to see the victim.

The front-end loader used in this incident was equipped with a backup alarm and had four external mirrors. Even with the four mirrors it was not always possible to view some areas while sitting in the driver's seat. A job evaluation of the victim's work capabilities by the job training center indicated that he had difficulty attending to tasks, displayed distractable behavior, and needed to enhance his awareness and practice of safety. The recycling work seemed to suit his

needs because he had difficulty with fine motor tasks.

CAUSE OF DEATH

The sheriff-coroner's autopsy report stated the cause of death to be exsanguination secondary to massive hemorrhage into the lower posterior trunk and thoracic cavity due to severe blunt force trauma.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should require that at least one supervisor, trained in safety, maintain constant supervision over disabled workers to assure that they comply with safe work practices.

Discussion: This incident may have been prevented if there had been an additional supervisor or if the supervisor in this incident had safety training and spent his entire time with the workers. In this situation, the victim's attention difficulties indicated a need for high level supervision. In addition, his current work schedule (one day per week) may have enhanced his need for a constant level of supervision. A Standard Operating Procedure (SOP) could address this situation by requiring that at least one supervisor constantly monitor the work of developmentally disabled workers. If a supervisor needed to perform another job, then an additional supervisor or a specially trained lead worker could be assigned to oversee workers while the other job was being completed. Under Title 8 of the California Code of Regulations (CCRs) section 3203 (a) (2) "Include a system for ensuring that employees comply with safe and healthy work practices. Substantial compliance with this provision includes recognition of employees who follow safe and healthful work practices, training and retraining programs, disciplinary actions, or any other such means that ensures employee compliance with safe and healthful work practices."

Recommendation #2: Employers should require that heavy equipment operators look in the direction of travel when backing up equipment and that workers wear high visibility garments when working in close proximity to large pieces of equipment.

Discussion: This incident may have been prevented if the activity involved had been recognized as a workplace hazard. The supervisor stated that he did not think he could have hit the victim because he had always felt something when he had run over it. However, the supervisor also stated that it was possible that the victim could have been behind the loader and he did not see him. If the victim had been required to wear a high visibility garment, the supervisor may have more easily noticed the victim enter his area of operation. Under Title 8 of the CCRs section 3664(a)(12) "operators shall look in the direction of travel and shall not move a vehicle until certain that all persons are in the clear."

Recommendation #3: Employers should keep developmentally disabled workers out of the area of danger of any heavy equipment by delineating the danger area's boundaries.

Discussion: In this facility, off-limit areas could have been designated by painting perimeter markings, or by placing flags or other markers around dangerous areas. Only those workers with authorized permission would be allowed to enter these areas. Had the danger area, the part of

the facility used by the victim's supervisor, been marked and disabled workers not allowed entry into that area, this incident could have been prevented.

Recommendation #4: Employers should provide developmentally disabled workers with consistent and ongoing evaluation of job capabilities, training and re-training regarding job safety hazards.
Discussion: The victim in this incident had not received safety training regarding working near heavy equipment. Although his primary tasks at the recycling center occurred at a site distant from the front-end loader, the possibility that he might encounter one sometime during his work could have been predicted. His improper approach to the front-end loader was at least partly responsible for his death, and was probably at least partly due to his lack of training. It would be good work practice for all developmentally disabled workers that work at a site with heavy equipment to receive heavy equipment safety training. One part of that training could focus on perimeter markings and the meaning of back-up alarms. The training should include multiple training modalities using methods suitable for educational level. The training should be repetitive, and methods should be evaluated to insure that they are effective.

Recommendation #5: Employers should consider having proximity sensing devices installed on large pieces of equipment so that operators are alerted when someone enters their work area.
Discussion: In this incident, the supervisor stated that he did not see the victim behind him at any time. A sensing device may have prevented this incident by alerting the supervisor that someone had entered his work area. This device is a sensor that can detect when something comes into an area within a preset range. It can be set for a specific distance from an object or within a certain arc or radius. These devices cannot see all the way around a machine (e.g., around corners of the machine) and are usually used for the prevention of blind spots.

Recommendation #6: Employers should assure that employees are trained in first aid and cardiopulmonary resuscitation (CPR), and receive refresher training so they can provide appropriate treatment when it is indicated.
Discussion: The supervisor in this incident had been previously trained in first aid. The movement of a victim following an acute injury is not appropriate regardless of medical status. Proper first aid procedures are to leave the victim as found until a skilled medical evaluation is performed. Moving a victim before such an evaluation is performed may aggravate preexisting injuries. Refresher first aid training may have assisted the supervisor in following such recommended procedures.

References
Barclays Official California Code of Regulations, Vol. 9, Title 8, Industrial Relations. South San Francisco, 1990.

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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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