The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research NIOSH

Technical Engineer Dies After Being Struck and Crushed By a Bulldozer/Earth Compactor– Pennsylvania

FACE 9307

SUMMARY

A 31-year-old technical engineer (the victim) died after being struck and crushed by a 12-ton bulldozer/compactor at a private landfill while he was attempting to obtain a soil sample for analysis. A landfill employee was bulldozing a new access road across the landfill to a new dumping area. The steel compactor-type wheels on the bulldozer were 36 inches high, 30 inches wide, and equipped with 3-inch-round, 1-foot-long cleats that compacted the soil as the road was being bulldozed. As the equipment operator began to bulldoze the road in the direction away from the landfill office and entrance, the victim arrived at the landfill in his pickup truck. The victim drove his truck to the new road, parked on the side, and with his back to the bulldozer, prepared to collect a soil sample from the new road. To compact the ground further, the equipment operator began to back the bulldozer over the area he had just traversed. As the bulldozer continued to back up, the victim was caught and fatally crushed between the right side rear compactor wheel and the body of the bulldozer. NIOSH investigators concluded that, to prevent similar incidents, employers should:

- **ensure that safety features incorporated into the design of machinery are operable at all times**
- **instruct workers to ensure that equipment operators are aware of their presence before workers perform any tasks near operating equipment**
- **consider equipping machinery with devices that will elimi- nate blind spots behind the machinery.**

INTRODUCTION

On November 18, 1992, a 31-year-old technical engineer (the victim) died after being struck and crushed by a 12-ton bulldozer/earth compactor. On November 19, 1992, officials of the county coroner's office notified the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), of the fatality. On November 20, 1992, a DSR safety specialist traveled to the county coroner's office and the incident site to conduct an investigation. A videotape of the scene immediately following the incident, including removal of the victim, was viewed in the coroner's office. A copy of the coroner's report and the videotape were obtained.

The employer in this incident was a technical service facility that provided the landfill with soil sample analyses. The facility had been in operation for 10 years and employed 4 workers, including 2 technical engineers. The employer had written work procedures for obtaining soil samples, but no safe work procedures. Training was conducted on the job and at

technical schools. The employer had no previous fatalities.

INVESTIGATION

An equipment operator at a privately owned landfill was preparing to bulldoze an access road to a new dumping site 100 yards from the existing site. He was using a 12-ton bulldozer/earth compactor to accomplish the job. The steel compactor-type wheels on the bulldozer were 36 inches high, 30 inches wide, and were equipped with 3-inch-round, 1-foot-long cleats over their entire surface. The cleats compact the soil as the equipment moves forward and backward.

The victim arrived at the landfill in his pickup truck as the machine operator began to bulldoze the road in the direction away from the existing dumping site, landfill office, and entrance. The victim drove his pickup truck to the new road and parked along the side, where he prepared to extract a soil sample. The victim's back was to the bulldozer and he was not in view of the equipment operator. A second landfill employee stated that the last time he had visual contact with the victim, the victim was facing away from he bulldozer.

The equipment operator drove the bulldozer forward for approximately 150 feet, then began to back over the same ground to compact it further. As the bulldozer traveled back toward the landfill office, the victim was caught and crushed between the right rear compactor wheel and the body of the bulldozer. The victim was dragged approximately 15 feet before other landfill employees alerted the equipment operator to stop the bulldozer. The bulldozer was pulled forward to free the victim. The emergency medical squad (EMS) was summoned by telephone from the landfill office. Landfill employees could detect no vital signs from the victim. When the EMS arrived 10 minutes later, personnel detected no vital signs and provided no emergency care. The coroner's office was notified and the deputy coroner pronounced the victim dead at the scene.

Investigation at the scene revealed that the bulldozer was equipped with a rear view mirror mounted on the driver's side of the cab. The equipment operator stated that he did not see the victim or his truck which were located to the right rear of the bulldozer. The bulldozer's back-up warning alarm was not operational at the time of the incident.

CAUSE OF DEATH

The coroner listed the cause of death as major crush injuries to the chest and pelvis.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure that safety features incorporated into the design of machinery are operable at all times.

Discussion: At the time of the incident, the bulldozer's back- up warning alarm was inoperable. Equipment back-up alarms are designed to alert pedestrians and other equipment operators that equipment is moving in reverse.

Recommendation #2: Employers should instruct workers to ensure that equipment operators are aware of their presence before workers perform any tasks near operating equipment.

Discussion: Workers performing tasks in the vicinity of operating heavy equipment should alert the equipment operator of the location of their work area prior to beginning work. This should eliminate inadvertent contact between the operating equipment and workers in the vicinity.

Recommendation # 3: Employers should consider equipping machinery with devices that will eliminate blind spots behind the machinery.

Discussion: The bulldozer involved in this incident was equipped with a rear view mirror at the front left side of the cab. The mirror afforded the operator a clear view of the area around the left side of the machine; however, the operator had a limited view of the area to the right rear side of the bulldozer. A rear view mirror could be mounted on the front right side of

the cab to allow the operator to view the area around the right side of the bulldozer. An additional mirror could also be mounted on the left rear of the cab to afford the operator a view directly behind the bulldozer.

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