A computer support technician at a communications company in Texas died after being crushed in a stationary trash compactor.

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SUMMARY

A 52-year-old, male computer support technician (the victim), at a communications company died after being crushed in a stationary trash compactor. The victim had gone to the company loading dock to look for a computer shipping box which had been mistakenly thrown into the trash compactor. He turned on the compactor using the key located in the switch. The compactor started its normal cycle and the ram inside the charging chamber raised to the up position. While the ram was at the top of its stroke, he leaned over the compactor's loading sill to look inside the machine. The ram moved down to complete its cycle, struck him on the back and crushed him against the loading sill. A co-worker who was nearby heard the victim groan, went to the compactor and found him. With the assistance of another co-worker, the victim was lifted out of the compactor while another co-worker called 911. The incident occurred at 10:00 a.m. EMS personnel arrived within minutes and found the victim was dead from his injuries.

The TX FACE Investigator concluded that to reduce the likelihood of similar occurrences, employers should:

**** ensure that workers are protected from the unexpected movement of machine parts by developing lockout/tagout procedures as required by OSHA regulation 29 CFR 1910.147 - Control of Hazardous Energy (lockout/tagout)***

**** establish an operating policy for trash compactors that includes training in safe operating procedures, identification of authorized operators, and measures to prevent unauthorized operation.***

Additionally, employers and owners of trash compactors should:

**** ensure that the machines are properly equipped, inspected regularly, and maintained according to ANSI Z245.2 - Stationary Compactors Safety Requirements.***

INTRODUCTION

On February 5, 1998, a 52-year-old computer support technician died when he was crushed by the ram of a stationary trash compactor. The TX FACE program officer learned of the incident on February 12, 1998, through a newspaper article. On April 27, 1998, the TX FACE program officer visited the job site. The company's human resource manager and the Administrator of Facilities, Safety and Technical Training were interviewed. The OSHA compliance officer assigned to the case was also interviewed.

The employer is a communications company that has been in business for 20 years. There are

525 employees, three of whom are in the same occupation as the victim. The safety program is managed by the employer's Administrator of Facilities, Safety and Technical Training. There was a written safety program, but trash compactor safety is not addressed in that program. Safety meetings are conducted on a monthly basis. New hire training includes safety program requirements and refresher training is conducted annually. Task - specific training is conducted informally at the job site.

The victim had been employed for 17 years. His familiarity with the operation of the trash compactor was limited to the two control switches. Maintenance personnel usually operated the compactor, but sometimes they trained others in its operation. There was no record the victim had been trained. Since there were no written materials available, training was informal and accomplished on-the-job. The machine involved in this incident had been leased for 10 years from a refuse collection company which picked up refuse and maintained the trash compactor as needed. Employees who were interviewed could not remember what kind of training if any, had been provided by the machine's owner.

INVESTIGATION

The stationary compactor involved in this incident was controlled by a key-operated switch similar to the ignition switch of a car. As originally built, the compactor was designed to operate automatically. When the switch was placed in the on position, the compactor ram raises from its midpoint position until it reaches the top of its stroke where it pauses for 20 seconds before continuing downward in the cycle, compacting the refuse and returning to the midpoint. A 27-inch high by 52-inch wide access door was located on the side of the machine through which refuse was loaded into the charging chamber. When the compactor is operating correctly, opening the loading chamber access door stops the compacting cycling so that refuse may be loaded into the charging chamber. Shutting the door allows the machine to resume the cycle. The compactor was located next to a loading dock with the bottom of the access door 31 inches above the loading dock floor. Workers normally left discarded cardboard boxes and other refuse on the dock to be loaded by the maintenance personnel.

On the day of the incident, no other employees were in the immediate vicinity, but a security surveillance camera recorded the incident. The victim went out to the loading dock to retrieve a cardboard box which had mistakenly been thrown away. Using the key-operated switch, he turned the machine on. At this point, the access door was open. When the machine started the ram moved upward. The victim saw the box inside the charging chamber. While standing on one leg, he leaned over the loading sill. He was able to enter his upper body throughout the door. At this point, the machine continued the compaction cycle and the ram started downward striking the victim on the back and crushing his chest against the loading sill. An employee nearby heard the groans of the victim and went over to investigate. When he saw the victim caught in the machine, he activated the emergency stop switch and raised the ram to the up position. Another worker assisted in lifting the victim out of the compactor and placing him on the ground. The co-workers determined the victim had severe chest injuries, and rescue breathing was performed.

The incident occurred at 10:00 a.m. EMS personnel were immediately notified. They arrived

within minutes and found the victim dead from his injuries.

After the incident, investigators found that the access door interlock switch was not operating correctly which allowed the compactor to operate with the door open. Based on the victim's actions as observed on the security camera videotape, the victim either did not expect the ram to resume moving or believed that he had enough time to retrieve the box before the ram started down.

CAUSE OF DEATH

The autopsy report stated the cause of death was due to a crushed chest, crushed abdomen, and a broken back.

RECOMMENDATIONS/DISCUSSION

Recommendation #1 - Employers should ensure that workers are protected from the unexpected movement of machine parts by developing lockout/tagout procedures as required by OSHA regulation 29 CFR 1910.147 - Control of Hazardous Energy (lockout/tagout).

Discussion: Lockout/tagout procedures required by OSHA regulation 29CFR 1910.147, had not been developed for the trash compactor. Lockout/tagout procedures are designed to protect those workers, usually maintenance personnel, who must service, inspect, clean, or maintain equipment for the unexpected release of hazardous energy. At a minimum, lockout/tagout procedures should include the following elements:

* a statement of how the procedure will be used;

* training for workers in the specific hazards of each machine;

* the steps required to shut down, isolate, block and secure the machines;

* the steps designating the safe placement, removal, and transfer of lockout/tagout devices and who has the responsibility for them;

* the specific requirements for testing machines or equipment to determine and verify the effectiveness of locks, tags, and other energy control measures; and

* the employer or an authorized employee must notify affected employees before lockout or tagout devices are applied and before they are removed from the machine.

The compactor in this incident was equipped with a key activated start switch, similar to the ignition switch of a car. An effective lockout/tagout program would have included a policy requiring the key to be removed from the switch and maintained in the possession of an authorized operator trained to recognize the specific hazards of the machine.

Recommendation #2 - Employers should establish an operating policy for trash compactors

that includes training in safe operating procedures, identification of authorized operators, and measures to prevent unauthorized operation.

Discussion: The evaluation of the circumstances surrounding this incident suggests that the victim did not recognize the hazard of entering the compactor without first turning off the machine. Since the compactor's ram had stopped at the top of its stroke, he may have thought that no further movement would take place or may have believed that he had sufficient time to retrieve the box before the compacting cycle resumed. The investigation also revealed that other employees were unaware of the correct operation of the loading chamber access door. Further, since the key was routinely left in the start switch, the machine could be operated by any employee, including those who may not have been familiar with compactor hazards and correct operation. A safe operating policy would require that the start switch key would remain in the custody of authorized operators who are trained to understand the correct operation of the machine and recognize the hazards. The policy would also require that all employees be trained to recognize the hazard of entering an operating compactor and the need for authorized operation only. The policy should also require the compactor to be removed from service and the owner notified when safety systems are not operating correctly. The machine should remain out of service until repairs are completed.

<u>Recommendation #3</u> - Employers and owners of trash compactors should ensure that the machines are properly equipped, inspected regularly, and maintained according to ANSI Z245.2, Stationary Compactors - Safety Requirements.

Discussion: The American National Standards Institute (ANSI) has developed standards for compactor safety. The ANSI Z245.2 - 1992, Stationary Compactors - Safety Requirements provides guidance in safe design, operation, and maintenance of stationary compactors. These requirements include:

Access Door Interlock

According to ANSI Z245.2, section 7.2, charging hopper access doors on automatic cycling compactors must be equipped with an interlock that stops the cycle while the door is open. One type of interlock consists of an electrical switch that is mounted on the door so that when the door is opened, the switch turns off the power to the machine. Although the access door on the machine in the incident had an interlock switch, it was not working properly and allowed the machine to continue operating while the victim reached through the open door.

Safety Signs

Signs intended to warn workers of specific hazards and safety precautions for working around the compactor as specified by ANSI Z245.2, section 7.10, had been placed on the machine by the manufacturer. However, these warning signs had been painted over and could not be read. These signs may have alerted the victim to the danger of entering an operating machine.

Point of Operation Protection

The loading sill of the compactor in this incident was 81 inches above the ground. However, the machine was located beside a 50-inch high loading dock. This reduced the height of the loading sill to only 31 inches above the loading dock floor and made it much easier for a person to enter the charging chamber. Section 6.1.f of ANSI Z245.2 specifies methods to protect workers at the point of operation when the loading height is less that 42 inches. One method specified is to equip the machine with control switches that must be held in the on position by the operator for the machine to work. These switches, known as sustained manual pressure controls, should be located so that the operator cannot reach into the machine while it is working. The second method specified is to provide a guard that will prevent entry into the machine during operation. The guard should be interlocked to prevent the machine from operating if the guard is removed. This is similar to the system applied to the access door, which as previously, mentioned was not operating correctly.

Inspection Program

A program of periodic inspection to ensure that the compactor is operating correctly and that all safety systems and safeguards are in place is specified by ANSI Z245.2, Section 6.1.e, would detect any operational or safety defects. As previously noted, the safety interlock on the charging chamber access door was not operable and the manufacturer applied warning signs were unreadable. The ANSI Z245.2 standard is a comprehensive document that addresses all issues of safe procedures for trash compactors including manufacturer, owner, employer, and employee responsibility. The full text of the standard should be consulted before using a compactor.

REFERENCES

American National Standard for Refuse Collection, Processing, and Disposal Equipment - Stationary Compactors - Safety Requirements. ANSI Z245.2 - 1992, American National Standards Institute, New York, New York.

29 CFR 1910.147, Code of Federal Regulations, Washington, D.C.; U.S. Government Printing Office, Office of the Federal Register.