

Recycling Center Laborer Crushed In Baling Machine-- Tennessee

SUMMARY

On July 31, 1996, a 20-year-old laborer (the victim) at a recycling center died as a result of injuries he received after he was caught between the platen and the top of the baling chamber door of a vertical-downstroke baling machine. There were no eyewitnesses to the incident. Upon arrival at the work site, a co-worker noticed the victim leaning over the top of the baling chamber. When the victim did not return the co-worker's greeting, the co-worker went to investigate and found that the victim had been caught between the platen and the baling chamber door edge. He notified the local volunteer fire department/emergency medical service which responded in 5 minutes. The victim was removed from the baling machine and transported to a local emergency room where he was pronounced dead. Subsequent examination by investigators revealed that the machine's safety gate interlock had been bypassed, allowing the machine to operate with the gate in the raised position.

NIOSH investigators concluded that, to prevent similar occurrences, employers should:

- ensure that all safety features on baling machines are functioning correctly
- ensure that employees, including management personnel, know and understand the importance of the machine's safety features
- consider instituting "buddy" rules so that workers do not perform potentially hazardous jobs alone.

INTRODUCTION

On July 31, 1996, a 20-year-old laborer for a small nonprofit recycling corporation died of injuries he received when he was caught by the platen of a vertical-downstroke baler. On August 6, 1996, officials of the Tennessee Occupational Safety and Health Administration (TOSHA) notified the Division of Safety Research (DSR) of the incident and requested technical assistance. On September 4, 1996, a DSR safety engineer reviewed the incident with the TOSHA compliance officer and traveled to the incident site. While onsite, the president and secretary/treasurer of the corporation were interviewed, and measurements and photographs of the baling machine were taken.

The victim's employer was a small nonprofit recycling corporation, employing two workers, one full-time (the victim) and one part-time. The recycling center had been incorporated for about 2 years and was open to the public 2 days each week to receive recyclables including steel and aluminum cans, plastic, and various types of paper. The

victim worked a 40-hour week processing these recyclables, and had been at the recycling center for about 1 year prior to the incident.

There was no written safety policy or program, or training program. The victim had some experience in material handling having operated a forklift during a previous employment. It appears that he had not operated a baling machine prior to working at the recycling center. This was the corporation's first fatality.

INVESTIGATION

The victim's normal duties included loading recyclables into the baling machine with a fork lift, and operating the machine to produce bales. To produce a bale, it was necessary to first place a sheet of cardboard on the floor of the baling chamber. The baling chamber was then loaded with recyclables which were compressed into a bale. Once the bale was formed, another sheet of cardboard was placed on top and the bale was then bound and ejected from the machine. The bale would then be removed to a storage area, using the fork lift.

On the day of the incident, the victim had begun work at 8:00 a.m. Around 9:30 a.m., the part-time employee arrived at the center. As he entered the building and walked by the baling machine he saw the victim leaning inside the baler, over the top of the baling-chamber door. Thinking that the victim was positioning the cardboard on the baling chamber floor, he spoke to him as he walked by and went to another area of the building. A few minutes later, he realized that the victim had not responded to his greeting and he went to the baling machine to check on him. He found the victim in the same position, crushed between the platen and the door edge. He left the facility to contact help and notified the local fire department/emergency squad, which responded within 5 minutes of notification.

Upon arrival, an emergency medical technician disconnected the machine from the power source and removed the victim from the machine. The victim was transported to a local emergency room where he was pronounced dead.

Immediately after the incident, investigators discovered that the safety gate interlock had been bypassed, allowing the machine to operate with the gate open.

CAUSE OF DEATH

The cause of death was recorded as fatal crushing injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure that all safety features on baling machines are functioning correctly.

Discussion: The baling machine involved in the incident was built in 1993 and was equipped with safety features in compliance with ANSI Z245.5-1990 standards for Refuse Collection, Processing, and Disposal-Baling Equipment-Safety Requirements. Specifically, the machine is equipped with a loading chamber closure consisting of a vertically sliding expanded metal gate. The weight of the gate is balanced by a counterweight suspended from a roller chain attached to each top corner of the gate. The gate is interlocked with the hydraulic pump motor controls by a proximity switch located on the side of the machine. The switch senses the position of the right side counterweight and stops the movement of the ram after the gate is opened 2 inch, as specified by ANSI Z245.5.2.2.2 (ref). A spring-loaded push-button switch is mounted on the back of the ram's platen, which removes the proximity switch from the control circuit as the ram clears the baling chamber on the upstroke of the baling cycle, permitting the ram to automatically lift the gate in preparation for continued loading. Just prior to the incident, the activating linkage for this switch was sticking and it was necessary to actuate the switch by hand to permit operation of the ram on the compression stroke. Further, in order to prevent the ram from stopping on the upstroke once it had cleared the baling chamber, the victim had raised and secured the counterweight in front of the proximity switch and had blocked the gate in a raised position. It could not be determined how the compression stroke had been initiated during the incident; however, the bypassed interlock system allowed exposure to the ram and baling chamber during compression. During the site visit on September 4, 1996, the machine was operated. The push-button switch located on the back of the ram's platen was found to be sticking.

However, the gate-interlock system had been restored and was operating correctly, preventing the initiation of the compression stroke unless the gate was closed and immediately stopping the ram movement upon 2 inch of opening.

Recommendation #2: Employers should ensure that employees, including management personnel, know and understand the importance of the machine's safety features.

Discussion: Reportedly, on the day prior to the incident, the victim had demonstrated the operation of the machine to the corporation's president after the interlock system had been bypassed. Both agreed that the machine was operating satisfactorily. In this case, the malfunctioning safety features had become a hindrance to efficient operation of the machine. Bypassing them was one method of removing this hindrance and as long as workers did not enter the loading or baling chamber of the machine during its operation, no danger of injury existed. However, bypassing these features increased the potential for exposure during operations and in this case resulted in a fatality. When the safety features are operating correctly, they pose no hindrance to efficient operation and protect against the inadvertent exposure of persons to the movement of the ram. Additionally, an

operating manual for the machine was not available and neither workers nor management had adequate experience or knowledge of this type of equipment. Consequently, neither the victim nor management fully comprehended the potential for injury.

Recommendation #3: Employers should consider instituting "buddy" rules so that workers do not perform potentially hazardous jobs alone.

Discussion: The victim routinely worked alone during part of the week, including the day of the incident. Although the exact time of the occurrence is unknown, the victim normally started work about 8:00 a.m. Had co-workers been present, it may have been possible to respond immediately to the incident.

REFERENCES

ANSI Z245.5-1990, American National Standard for Refuse Collection, Processing, and Disposal-Baling Equipment-Safety Requirements, American National Standards Institute.