Investigation: #96-MA-011-01

Massachusetts Temporary Laborer is Crushed in Baler at Recycling Facility

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SUMMARY

On March 10, 1996, a 43 year old male temporary laborer was fatally injured when he fell into a box/can horizontal baler and was crushed. The laborer had been pushing boxes into the vertical feed hopper of the baler when he climbed onto the edge of the hopper to push with his foot. He fell into the baler and was unable to climb out. He yelled for help, but co-workers could not tell where the sounds were coming from. The baler cycles automatically and the victim was crushed by the horizontal ram. Finally, the foreman realized what must have happened and ran over and shut down the machine. Emergency medical services were called immediately. The victim was removed from the machine by emergency personnel and was pronounced dead on the scene by a Medical Examiner. The MA FACE Program Director concluded that to prevent similar future occurrences, employers should:

- **(together with temporary agencies) ensure that all operators of equipment are trained in the proper operation and potential hazards of that equipment.**
- **establish safe procedures, including a lockout/tagout program, for removing jammed material from balers.**
- **investigate work process or technological changes that would minimize the hazards of machine jams.**
- **provide training to all workers on machine safety and responding to emergency situations.**

INTRODUCTION

On March 11, 1996 the MA FACE Program was notified by through the 24-hour occupational fatality hotline that on March 10, 1996, a 43 year old male laborer was fatally injured when he fell into a box/can baler and was crushed. An investigation was immediately initiated. The MA FACE Program Director traveled to the jobsite and met with the employer on March 11, 1996. The police report, death certificate, corporate information, witness interviews and photographs were obtained during the course of the investigation.

The employer was a can and bottle recycling facility and was in business approximately 4 years at the time of the incident. Between 12 and 15 persons were employed by the company full-time. Between 10 and 30 persons were engaged as temporary workers at any given time. Ten persons were working at the incident site when the victim fell into the machine. The victim was a temporary laborer who had been working on this particular job for 10 days. He had worked at this same facility off and on for a period of a few months during the previous year. The temporary agency was located in a town approximately 25 miles away and transported workers to this facility daily. The recycling facility employer would under some circumstances designate the foreman, who was a full-time regular employee, as the person in charge of safety on the site. There were no written safety procedures in effect for the job which the victim was performing, nor had the victim received any training on the operation of the machine.

INVESTIGATION

On March 10, 1996, seven temporary laborers were working the second shift on a Sunday evening at a bottle and can recycling facility. Three other persons on site were employed directly by the facility. These were two maintenance persons and one supervisor. Sunday was regarded as the first day of the workweek at this facility. The victim was working at the baler which was crushing and baling cardboard boxes at the time. Large cardboard boxes would be placed on a conveyor belt which fed into the vertical hopper of the machine. Smaller cardboard boxes, known as "suitcases" holding 24 cans, were loaded by dumping them in with a forktruck. The forktruck was fitted with a metal box between the forks which was capable of being inverted. This device was filled by hand with the smaller cardboard boxes. The forktruck driver would then dump the boxes from this container into the hopper of the baler. The baler hopper had been retrofitted with a wooden conduit to better enable the forktruck to get more boxes into the hopper. This conduit extended out into the aisle from the hopper, which was also fitted with wooden boards around the perimeter to raise the height of the sides and to keep boxes poured from the forktruck from falling to the floor.

The vertical hopper of the baler was eight feet high from the floor, plus the height of the built-up wood sides, approximately 6 inches. (see Figure 1) The opening of the hopper was 28 inches by 42 inches. Materials placed in the hopper were crushed by a horizontal ram which cycled automatically, through use of an internal electric sensor. Therefore, the start button did not have to be pressed to cycle the machine. The stop-start buttons were located at the side of the machine by the door where the bales came out. The bales made by the machine were 36 inches high by 30 inches wide by 48 inches long. The machinery had been manufactured in 1986 and purchased used by the current owner in 1994.

The victim was standing on a plastic crate, the type used to carry milk cartons, on top of the chamber that would contain the completed bale. His job was to feed boxes into the hopper and to prevent jamming of the cardboard boxes by using a pole to push them. Sometimes he climbed up onto the edge of the hopper, which was built up with boards, and used his foot to force boxes down into the machine. Although nobody saw him fall into the machine, the victim had last been seen pushing boxes with his foot. Co-workers heard a cry for help, but could not see the victim since he was inside the machine. Finally, the foreman realized what must have happened and ran over and shut down the machine. By then the machine had automatically cycled at least twice.

The investigation revealed that many of the temporary workers did not know how to shut the machine down. They had also seen other workers pushing boxes into the hopper with their feet. Sometimes a worker would shut off the machine before clearing a jam with his foot, but there had been no training for workers in procedures for removing jams. There was no side door to the hopper from which to clear jams, which is a feature on many balers. It seemed that the machine jammed frequently as evidenced by holes made in the side of the hopper in which to insert poles.

The temporary agency had been used many times by this particular employer. The manager of the agency had visited the work site in order to know what her workers would be expected to do. She had been advised that the temporary workers would be sorting materials for processing and not operating any machinery.

CAUSE OF DEATH

The medical examiner listed the cause of death as multiple injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers and temporary agencies should ensure that all operators of equipment are trained in the proper operation and potential hazards of that equipment.

Discussion: Balers are very dangerous machines. Almost all operate in a continuous mode where the ram is actuated by an electronic sensing device in the chamber. Materials are fed through the hopper into the chamber by gravity. In this case, the victim was using his own weight to force cardboard boxes into the baler. Therefore, when the boxes fell into the baler, the victim did also. Workers must be trained to understand that they can and will fall into the baler under these circumstances. They should not be allowed to stand on the feed hopper and be provided with an alternative means for feeding material. Supervisors are responsible for assuring that unsafe work practices are stopped immediately. Periodic checking of worker performance is necessary so that bad habits are not formed.

Although the victim had worked in this facility before, he was not trained to operate the baler. Training for the operation of mechanized equipment should at least include:

- how to start and stop the machine, including how to shut the equipment down in an emergency and location of all emergency stop buttons;
- what to expect the moving parts of the equipment to do; (in this case, that the ram operates automatically upon "seeing" materials in the chamber)
- how to load materials into and move materials out of the machine safely;
- what are the possible hazards associated with operating the machine and performing the job;
- what procedures and operations should be performed by persons with more training or experience, such as maintenance or repair persons.

Although the victim was employed by the temporary agency, the company at which he was working was responsible for training him on the machinery. Temporary agencies and host employers share responsibility for generic training, but the employer at the site is responsible for specific training on equipment. Temporary agencies share a responsibility for assuring that workers are performing only the tasks for which they were hired and that any necessary training is being completed.

Recommendation #2: Employers should establish safe procedures, including a lockout/tagout program, for removing jammed material from balers.

Discussion: Many balers, such as the one in this incident, operate automatically by an electric eye sensor. The person loading the material into the hopper is not truly "operating" the machine as much as the machine is operating itself. The person loading the machine in this incident (the victim) was neither trained nor experienced as an operator of baling machinery. When materials were caught in the hopper, he was not aware of nor instructed in any special procedure to follow. In circumstances such as this,

with an inexperienced operator, management should institute a procedure whereby the operator notifies an experienced maintenance person who is qualified to unjam the machine.

If it is necessary to enter the machine to remove jammed material, entry should be allowed only after all power is removed, possible stored energy is blocked and the power source is tagged or locked. Lockout/tagout is a procedure, required by OSHA (29 CFR 1910.147) for insuring that power is not inadvertently restored by one person while the machine is being worked on by another person. The main power switch must be closed and locked with a lock controlled by the person working inside the machine. Tags may be used in the place of locks under special circumstances.

Recommendation #3: Employers should investigate work process or technological changes that would minimize the hazards of machine jams.

Discussion: In this case, there had apparently been a problem with materials becoming stuck in the infeed hopper to the baler. The work process should be examined for ways to eliminate this problem. One possible solution might be to cut up large cardboard boxes before they are fed into the baler.

Additionally, a modification might be made to the feed hopper adding a side access door. If an access door is added it must comply with ANSI Z245.5-1990, Section 5.4.1 which states, "Baler feed hopper access door(s) shall be equipped with a control circuit interrupt to prevent operation with the door open."

Owners of equipment should check with the manufacturer for recommendations before making any modifications to that equipment. Also, purchasers of used equipment, such as in this case, should check with manufacturers for any safety improvements which may have been made in newer models.

Recommendation #4: Employers should provide training to all workers on machine safety and responding to emergency situations.

Discussion: Other temporary workers in the work area did not know the location of the emergency stop button on the baler. Training in basic machine operation should not be limited to those workers who actually operate the machinery, but should include all workers in the immediate vicinity. In addition, such workers should receive broad training in machine safety to enhance employee awareness and encourage safe work practices. Such instruction and any written materials should be provided in languages understood by the targeted workers.

REFERENCES

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

Code of Federal Regulations, Labor 29 Parts 1910.147 Lockout/tagout; 1910.212 Machinery guarding.

U. S. Dept. of Labor OSHA, OCIS, Standard Interpretations and Compliance Letters, Information on Temporary Workers (Letter B), 4/30/1996.

To contact Massachusetts State FACE program personnel regarding State-based FACE reports, please use information listed on the Contact Sheet on the NIOSH FACE web site Please contact In-house FACE program personnel regarding In-house FACE reports and to gain assistance when State-FACE program personnel cannot be reached.

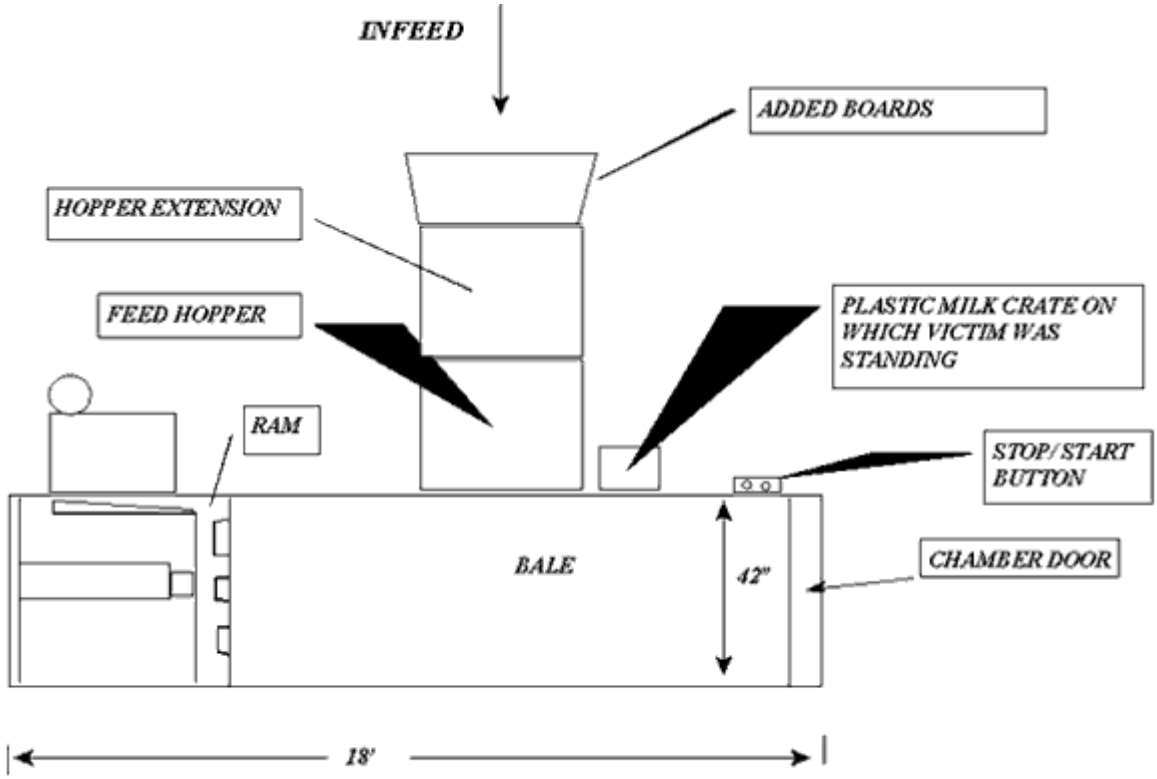

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Figure 1. Horizontal Baler
(not to scale)