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Temporary Worker Dies When Crushed in Screen Printing Press

Massachusetts FACE 94MA018

SUMMARY

On May 6, 1994, a 19 year old, male, production assistant was fatally crushed in a screen printing press at a Massachusetts printing company. The victim was a temporary worker, and had worked for 2 weeks at the shop. The victim and the press operator had finished a printing job and were preparing to clean the press. The press operator depressed the foot treadle to raise the frame of the press, and as it lifted, the victim reached under the reciprocating arm from the right side of the press. Although the press had an infrared emergency stop system, the frame reversed itself and came slamming down at a speed faster than normal. It caught the victim across the chest, pinning him to the bed. Hearing the crash and the victim's groan, coworkers immediately summoned local firefighters. The victim was rushed to a local hospital and then airlifted to a major metropolitan hospital; however, he died en route.

To prevent future similar occurrences, the FACE Project recommends that employers:

- **ensure that lockout and tagout procedures are strictly followed when machines are serviced or cleaned**
- **ensure that temporary employees are fully informed of potential jobsite safety hazards**
- **specify in their contracts with temporary agencies who is responsible for providing both general and job specific health and safety training to temporary workers.**

In addition, machine manufacturers should:

- **ensure that new semi-automatic and fully-automatic machinery undergoes extensive safety review prior to placing it in production.**

INTRODUCTION

The company was a screen printing operation in business since 1928. It employed 43 union workers, 7 of whom were press operators. The company also employed up to five temporary workers who worked in shipping, or as production assistants. The company had a safety officer who devoted less than 25% of his time to safety, and a joint labor and management safety committee. The committee met monthly. The company had a written lockout tagout plan. The plan covered all the required elements, but did not fully explain the procedures for each machine. Furthermore, the only employees authorized to perform lockout tagout were the company's maintenance man, the president, and one other employee who was not a press operator. The plan did not require the presses to be locked out during cleaning. Presses were cleaned between printing jobs up to five times a day.

The victim was a Vietnamese immigrant. He had been employed by the temporary agency for several months, and had worked as a production assistant at the company for 2 weeks. He did not receive any safety training from the temporary agency, and he received minimal training from the company. He did not have prior experience with printing presses. His English was poor, and he reportedly had difficulty communicating with his coworkers.

The temporary agency had been in business for one year. It placed an average of 15 to 20, primarily Vietnamese, workers each day. The company did not have a safety program.

INVESTIGATION

Shortly before 9 am on May 6, the victim and a press operator had completed printing one color on a job and were preparing to clean a screen press at a Massachusetts printing company. The press was a modern, semi-automatic machine with a horizontal frame lift system. It produced prints up to 4 feet wide by 8 feet long. The reciprocating, or lift, arm for the print head was located at the back of the machine. Press operators loaded material from the side or front of the press. After the material was printed, it was passed on to a conveyor on the side of the press where processing was completed.

The sole power source of the press was electric. A foot treadle raised and lowered the print head, which did not cycle continuously. The machine had an infrared beam emergency stop system, which prevented the head from coming down if there was an obstruction in the press. The infrared beams were located on the front and sides of the press.

Earlier in the morning the machine had apparently cycled on its own; the head had come right back down after the press operator had raised it by depressing the foot treadle. This was apparently an intermittent problem, although it had not happened during the six months prior to the incident. The maintenance man had reportedly spoken to the manufacturer of the machine, but had not been able to find the source of the problem.

Just before the incident occurred, the press operator and maintenance man were checking the press to ensure it was running properly. Standing at the backside of the press, the victim tripped the machine by cutting across the light beam. The victim was warned to step back, and the press operator reset the press. The maintenance man and operator then tested the head and found it to be functioning properly. The operator then depressed the treadle to raise the head to its full height. As the head lifted, the victim reached under the lift arm from the right side of the press. The head then reversed itself and came slamming down at a speed faster than normal. It caught the victim across the chest, pinning him to the bed. Although no one knows why the victim reached into the press at that time, company employees speculated that he had reached in to pull a piece of tape off of the bed.

Hearing the crash and the victim's groan, coworkers immediately summoned local firefighters. The head had stopped approximately 6 inches from the bed; however, in order to raise it to its full upward position, it was necessary to first reset the machine, which

brought the head all the way down to the bed. Once the head was lifted, the victim was extricated from the press; however he did not regain consciousness. The entire incident reportedly lasted no more than 40 seconds. The victim was rushed to a local hospital and then airlifted to a major metropolitan hospital. He died en route.

Three days after the incident, the machine manufacturer, their USA representatives, and a consultant for the company ran a series of tests on the machine to look for the failure. The OSHA compliance officer was also present at the failure analysis. Initially the machine functioned as designed on all the tests that were conducted. However, when the exact circumstances of the incident were recreated, (that is, the press was tripped from the right hand side as the frame was lifting) the press reversed itself and came down as it had done in the incident.

No written report on the failure analysis was available; however, the general consensus was that the press had failed due a flaw in its design. Apparently the infrared stop system was designed to stop the head of the press as it was coming down, but not as it was lifting up. The press manufacturer replaced the company's machine with a new, fully automatic press with additional light beams, plastic safety chains, two emergency stop buttons, and other safety features. The new press is completely controlled by PLC (Programmable Logic Control).

CAUSE OF DEATH

The Medical Examiner listed the cause of death as blunt chest trauma.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure that lockout and tagout procedures are strictly followed when machines are serviced or cleaned.

Discussion: The company had a written lockout tagout plan; however, it did not apply to the routine cleaning of the presses. Furthermore, the plan authorized very few employees to perform the lockout procedures. Employers of printing operations should ensure that presses are locked out when routine cleaning procedures are performed. If lockout and tagout procedures had been followed, as specified in U.S. Department of Labor 29 CFR 1910.147, this incident could have been prevented.

Recommendation #2: Employers should ensure that temporary employees are fully informed of potential jobsite safety hazards.

Discussion: This incident stresses the importance of basic training in hazard awareness. Temporary labor personnel are frequently placed into potentially hazardous jobsites without the benefit of fundamental hazard awareness training. Both permanent employees and temporary personnel have the right to be fully trained and informed of potential work area hazards on all job sites. Furthermore, temporary workers should be trained in their own language if they do not understand English. If it is not feasible to train a temporary worker in their native language, then the worker should not be required to work with heavy machinery, or in other potentially dangerous situations.

Recommendation #3: Employers should specify in their contracts with temporary agencies who is responsible for providing both general and job specific health and safety training to temporary workers.

Recommendation #4: ;Machine manufacturers should ensure that new semi-automatic and fully-automatic machinery undergoes extensive safety review prior to placing it in production.

Discussion: The design of the infrared stop system on the screen press was flawed. Apparently, the infrared system had been (unknowingly) programmed to stop the head of the press as it was coming down, but not as it was lifting up. Machinery that is partially or fully automated should undergo extensive safety testing, including manual testing of safety devices, to ensure that there are no design flaws in the logic which could result in serious injury to the machine operators. Furthermore, employers may want to run their own tests on the machinery to ensure that automated control systems do indeed function as claimed by the machine manufacturer.

REFERENCES

1. Office of the Federal Register: Code of Federal Regulations, Labor 29, July 1, 1990: Parts: 1910.147

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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