

TO: Director, National Institute for Occupational Safety and Health

FROM: California Fatality Assessment and Control Evaluation (FACE) Program

SUBJECT: A helper on a steel-slitting machine died when caught in between some sheet metal and the rewind cylinder

SUMMARY
California FACE Report #05CA003

A 37-year-old Hispanic helper on a steel-slitting machine died when he was caught between some sheet metal and the rewind cylinder. The victim went underneath the machine to pick up scrap pieces of sheet metal when the incident occurred. The victim entered the machine through an area which was not guarded. The CA/FACE investigator determined that, in order to prevent future occurrences, employers, as part of their Injury and Illness Prevention Program (IIPP), should:

- Ensure machines with moving parts are properly guarded.
- Ensure employees do not place any part of their bodies into areas where they might become entangled with machinery when it is running.
- Ensure that workers follow established lockout/tagout procedures for control of hazardous energy during cleaning procedures.

INTRODUCTION

On April 25, 2005, at approximately 9:45 p.m., a 37-year-old Hispanic helper on a steel-slitting machine died when he got caught in between the rewind cylinder and the sheet metal. The CA/FACE investigator learned of this incident on May 12, 2005, through the Division of Occupational Safety and Health (Cal/OSHA). Contact with the victim's employer was made on May 17, 2005. On June 1, 2005, the CA/FACE investigator traveled to the facility where the incident occurred and interviewed company managers, supervisors, and co-workers of the victim. The machine involved in the incident was photographed, and the area where the incident took place was examined.

The employer of the victim was a nationwide manufacturer of cold-formed light gauge steel framing. The company had been in business for over 50 years. The facility where the incident took place had 250 employees. Sixty employees were working at the time of the incident. The victim had been employed with the company as a temporary employee for about two years and as a permanent employee for nine months before the incident occurred. The victim was born in Mexico and had been in the United States for 15 years. According to his employer, he spoke both English and Spanish.

The company had a written safety program. The program had generic procedures that were

not task-specific for employees to follow. Safety meetings were held monthly and were documented. The company had a training program that provided generic training to its employees for all the machines being operated. The machine-specific training consisted of a combination of classroom and on-the-job training for some classes of employees, but the victim's class of employees only received on-the-job training. Training was measured by the supervisor's observation of each employee's job performance. According to his supervisor, the victim was receiving this on-the-job training and was in the process of continual evaluation from his supervisor, although this was undocumented.

INVESTIGATION

The site of the incident was a steel manufacturing plant. The machine involved in the incident was called a "slitter" and was used to cut sheets of thin gauge steel into different lengths depending on the customer's order. On the day of the incident, the victim was working as a helper on the slitting machine, performing his prescribed duties that include helping the operator and assistant operator set up the machine and performing constant clean-up.

At approximately 7:45 p.m., the victim was picking up scrap pieces of material coming off the machine. This was part of his normal duties. His instructions were to pick up the scrap pieces that fell away from the machine while it was running, and not to reach into or go under the machine. Scrap formation was a normal byproduct of the process. As he was picking up the scrap, he placed himself underneath the machine where the product was being wound on the rewind cylinder. The employer said that this area was not supposed to be entered when the machine was running, but there was no guarding or barrier in place to prevent entry.

The victim was caught in the cut steel sheets and pulled into the rewind cylinder. The operator of the machine said he felt a surge in the machine and immediately shut the machine down. The operator also stated he did not see the victim prior to the surge. The operator found the victim wrapped in the steel sheets on the rewind cylinder and called his supervisor for help. With the help of co-workers they removed the victim from the rewind cylinder. The paramedics arrived and when they did not find spontaneous respirations or a pulse, they pronounced the victim dead.

CAUSE OF DEATH

The cause of death, according to the death certificate, was multiple blunt impacts.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Ensure machines with moving parts are properly guarded.

Discussion: Machines with pinch points should have guarding for the time they are running. Because of the ever-present danger of entanglement when working near moving machinery, employers should continually strive to protect employees by providing machine guarding in the areas where work is actually performed. The machine involved in this case was operating with the guarding as it had been originally set up but some moving parts remained unguarded. Employers should consider contacting machine manufacturers and retrofit, if applicable, guards that prevent workers from contacting the machine's moving parts. Proper guarding and barricades strategically placed around all moving parts can prevent accidental contact.

Recommendation #2: Ensure employees do not place any part of their bodies into areas where they might become entangled with machinery when it is running.

Discussion: The slitter machine is a fast-moving machine that takes thin rolls of steel stock and

cuts it into strips for customer use, and then rewinds the finished product on another cylinder. All precautions need to be taken when working around this machine to prevent entanglement from occurring. Although guarding would normally protect workers from entanglement, as an additional layer of safety, employers should establish safety and training policies and maintain programs to ensure employees never place their bodies where they could become entangled in the pinch points of moving machines. Such programs may have helped to keep the victim away from the rewind cylinder while it was operating. If an employer determines that a machine must be capable of movement during some operation and determines that no guarding can be provided, then the employer needs to minimize the hazard by providing and requiring the use of extension tools or other methods or means to protect employees from injury due to such movement. Employees also need to be made familiar with the safe use and maintenance of such tools, methods, or means, by thorough training. Employers can enhance worker compliance with safe work practices through programs of task specific training, supervision, recognition, and progressive disciplinary measures.

Recommendation #3: Ensure that workers follow established lockout/tagout procedures for control of hazardous energy during cleaning procedures.

Discussion: Employers have the option to determine how a particular machine will be operated in order to meet their particular needs. However, when that decision affects the ultimate safety of their employees, then another course needs to be considered in order to provide every employee with a safe work environment. A lockout/tagout program addresses all the forms of hazardous energy that needs be de-energized, isolated, blocked, and/or dissipated before workers begin any installation, maintenance, service, or repair work. The method of energy control depends on the form of energy involved and the available means to control it. Although the employer in this case had a lockout/tagout program, it was not being used when the clean-up of scrap metal was done. Lockout/tagout programs should address the following issues:

- All forms of hazardous energy have been de-energized, isolated, blocked, and/or dissipated before work begins.
- Workers are able to secure energy control devices with their own individually assigned locks and keys, and that there is only one key for each lock the worker controls.
- Locks used to secure an energy control device be clearly labeled with durable tags to identify the worker assigned to the lock.
- There is verification by test and/or observation that all energy sources are de-energized before work begins.
- All workers are clear of danger points before re-energizing the system.
- There is a hazardous energy control program with any confined-space entry program.

Additionally, employers can encourage manufacturers to design machines and systems that make it easy to control hazardous energy.

References:

California Code of Regulations, Vol. 9, Title 8, Sections 3314 (a) (f), 3999(b), 4002, 4186

NIOSH FACE Reports (<http://www.cdc.gov/niosh/face/In-house/full9502.html>)

NIOSH-Issued Publications (<https://www.cdc.gov/niosh/docs/99-110/>)

Investigation Reports (<https://archive.cdph.ca.gov/programs/ohb-face/Documents/04CA011.pdf>)

EXHIBITS:



Exhibit 1: A picture of the slitter machine involved in the incident showing the cut steel being wound on the re-wind cylinder. The “X” marks the spot where the victim was caught in the steel sheet.



Exhibit 2: A picture of the rear of the slitter machine showing where the product is mounted on the machine, then fed into the knives for cutting.



Exhibit 3: A picture of the slitter machine showing the product after it is cut into strips by the knives and then dropped into a pit to equalize the pressure on all strips.



Exhibit 4: A picture of the slitter machine pulling the product out of the pit and feeding it onto the rewind cylinder. The arrow is pointing to the rewind cylinder.



Exhibit 5: A picture of the product being wound on the rewind cylinder. The “X” marks the area where the victim entered the machine from the other side and got entangled in the cut steel sheet.



Exhibit 6: The arrow is pointing to the location where the victim went into the machine. The barricade was placed after the fatality.

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the Public Health Institute and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations of work-related fatalities. The goal of this program, known as the California Fatality Assessment and Control Evaluation (CA/FACE), is to prevent fatal work injuries in the future. CA/FACE aims to achieve this goal by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact. NIOSH-funded, state-based FACE programs include: Alaska, California, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, Nebraska, New Jersey, New York, Oklahoma, Oregon, Washington, West Virginia, and Wisconsin.

Additional information regarding the CA/FACE program is available from:

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