

TO: Director, National Institute for Occupational Safety and Health

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

SUBJECT: A maintenance repairman dies when struck by a piece of metal in the chest.

SUMMARY
California FACE Report #00CA009

A 44 year-old male maintenance repairman died when a piece of metal struck him in the chest. The victim was working on an ironworker punch press after he removed a jammed piece of metal from the punch assembly. The victim did not follow his employer's policies and procedures when removing the jam. The victim removed the front cover plate of the punch slide assembly without first de-energizing, locking out, or blocking the machine. The machine went through a punch cycle after the victim removed the cover plate. A piece of metal from the punch broke off and struck the victim in the chest. It is not known how the cycle was initiated.

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 employees understand and follow documented company policies and procedures.
- Ensure employees are adequately trained and that workers' achievement of skills is verified through a testing program.

INTRODUCTION

On August 23, 2000, at approximately 10:15 a.m., a 44-year-old male maintenance repairman died from injuries received when struck by a piece of metal in the chest. The CA/FACE investigator learned of this incident on September 15, 2000, through the legal office of the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA). On September 21, 2000, the CA/FACE investigator traveled to the victim's place of employment and interviewed the company's safety supervisor, the victim's supervisor, and a punch press operator. Also present for the interviews was a safety consultant hired by the employer. The work site and ironworker machine were inspected and photographed. The CA/FACE investigator also obtained copies of reports from the responding Fire and Sheriff Department Stations.

The employer of the victim was a steel distributor and fabricator that had been in business for 35 years. The company had on average 50 employees, that were all working at various locations throughout the shop when the incident occurred. The victim worked for this employer for 1½ years but had 15 years of prior experience performing similar activities.

The employer of the victim had a safety program and a written IIPP with all the required elements. There was no employee or management safety committee although tailgate safety meetings were held weekly and a supervisor's safety meeting was held quarterly. Records of these meetings were not available.

Training was given on an as-needed basis. New machine training was given in a classroom setting by factory representatives. Additional training was accomplished on-the-job (OJT) by experienced co-workers and supervisors. According to documented training records, the victim attended training sessions on lock-out/tag-out and basic machine operation. There was no testing or other program to establish that the victim acquired the skills necessary to safely operate and maintain the machinery.

INVESTIGATION

The site of the incident was an iron works facility, with various types of steel formation machines located throughout the shop. The machine involved in this incident was a universal ironworker that combined five operations: shearing plates, sections, round and square bars, coping-notching, and punching. It also had three separate clutches and slides that allowed three employees to work independently of each other on the machine, at the same time. The punch assembly on this machine had a punch slide that moved in a housing called a guideway. The alignment for the punch slide was made by four adjustment screws located within the cover plate of the punch assembly. Access to these adjusting screws was through lock plugs on the cover plate. When the cover plate was removed, the punch was no longer being guided on one side and could easily become misaligned.

On the day of the incident, the victim was called by the punch press operator to remove a jammed piece of metal from the punch press. The punch press operator explained what had happened and observed the victim prepare to remove the jammed piece of metal. According to the punch press operator, the victim used a pry bar to force up the punch slide assembly. Once the assembly was up, the jammed piece of material was removed from the machine. According to the company's safety supervisor, whenever a jam occurs the company's procedure was to follow the lock-out, block-out, and tag-out policy, then saw or cut off the punch, and then replace the tool.

At this point, the punch press operator left the area as the victim was removing the punch slide assembly cover plate. When the punch press operator returned, he noticed the victim leaning against a table holding his chest. The punch press operator ran to the shop supervisor's office where 911 was called. The paramedics responded and found the victim to be unresponsive with extremely shallow respirations. They transported the victim to the hospital where he died from his injuries some 5 ½ hours after the incident.

CAUSE OF DEATH

The cause of death according to the death certificate was a wound to the chest.

RECOMMENDATIONS / DISCUSSION

Recommendation #1: Ensure employees understand and follow documented company policies and procedures.

Discussion: In this incident, the victim unjammed the punch press using a crowbar, and he removed the cover plate without de-energizing, locking, or blocking out the machine. These two actions were contributing factors to his death. It is unknown why the victim performed these

actions. The employer had documented procedures on how to perform hazardous functions safely. A procedure on how to properly remove a jammed piece of metal from a punch press was available. The company's policy was to saw or cut the punch, remove the punch and the jammed piece of metal, and then replace the punch. There was no procedure sanctioned that allowed the use of a crow bar to remove a jammed piece of metal. The use of the crow bar to force apart the punch and die most likely contributed to their misalignment.

The company also had a policy on lockout/tagout. Lockout/tagout was made available for all employees to use whenever there was a need. In this case, once the cover plate was removed from the punch assembly, the punch was no longer being guided and had the potential for punch and die misalignment during a punch cycle. Therefore, the machine needed to be de-energized, locked, blocked, and tagged out whenever the cover plate was removed. Employers can ensure worker compliance with safe work practices through programs of training, supervision, safe work recognition, and progressive disciplinary measures. Had proper procedures been followed, this incident might have been prevented.

Recommendation #2: Ensure employees are adequately trained and that workers' achievement of skills is verified through a testing program.

Discussion: Training employees in safely performing specific tasks, including machine operation and maintenance, is of paramount importance. The employer involved in this incident conducted much of their training "on-the job." This type of training is widely used throughout industry because the trainees can be productive while they are being trained. However, this type of training can be inadequate because often times the trainers may not employ effective training techniques that verify effectively the trainees' comprehension of the subject. A properly trained operator or maintenance worker would understand that removing the cover plate on the slide assembly removes the ability to properly adjust the punch to the die because the adjusting screws are part of the cover plate. Although this employer had documentation that training was given, there was no means to verify understanding and knowledge. Evidence of knowledge or skills can be obtained through testing and subsequent supervision. If there had been a means to verify the victim's knowledge and skills, this incident might have been prevented.

References:

California Code of Regulations, Vol. 9, Title 8, , Sections 3314, 4186, 4203, & 4215

Operators Manual and Parts List, Mubea KBL Universal Ironworkers

Accident Prevention Manual for Industrial Operations, Administration and Programs, National Safety Council, 8th Edition, 1983

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the California Public Health Institute, and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations on 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, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas, Washington, West Virginia and Wisconsin.

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

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