



THE UNIVERSITY OF IOWA
Iowa City, Iowa 52242

TO: Director, National Institute for Occupational Safety and Health

FROM: Iowa FACE Program

Date of Report: April 6, 1999

SUBJECT: Female machine operator killed when working on a punch press.

SUMMARY

A 43-year-old female machine operator died while operating a punch press on June 25, 1998. When the punch press operates, small sections of the metal sheet, called knockout, slugs, or scrap, drop below the press and accumulated on the die bed directly below the die. During one cycle, the press struck a pile of slugs ejecting them towards the operator. Many of the slugs struck the victim in the neck, while other pieces were scattered on the floor. The victim was transported to a local hospital and died in the emergency room.

RECOMMENDATIONS based on our investigation are as follows:

- 1. Ensure that machines are guarded as specified in 29CFR 1910.*
- 2. Designate a competent person to conduct frequent and regular site safety inspections.*
- 3. Develop, implement, and enforce a written safety program. The safety program should include task specific safety procedures and employee training in hazard identification, avoidance, and control.*

INTRODUCTION

At 2:00 p.m. on June 25, 1998 a 43-year-old female died while working on an inclinable mechanical power press at a machining facility. The victim was transported to a local hospital and died at 3:43 PM. The Iowa FACE program was notified of the fatality on October 20, 1998 by the Iowa Department of Public Health. The incident occurred on the first day she worked on that press, although she had worked for the company for six months. She received training on operating the press but was not instructed in scrap removal. First shift employees work from 7-4:30 p.m. On the day of the incident the outdoor weather was hot and humid. Indoors, the victim was tired and requested to take a break. She was told to finish the next set before break. Since she was tired and hot, the victim put a chair in front of the press to sit on. Other environmental conditions did not contribute to the incident.

INVESTIGATION

In the punch press operation, the die presses down onto the metal and punches out a section in the middle of the sheet, called a knockout, slugs, or scrap. The scrap drops below the die, into a tray with a front portion, which contains a mesh guard. For cleaning purposes, the employee should remove the tray, dump the scrap into a container for disposal, and replace the tray into the machine.

If the scrap is not removed the die may break or the machine will jam. In many machining processes, however, the scrap removal may get backlogged. It is not unusual for the tray or basket to get full, and for staff to get behind in scrap removal. If the operator must continually stop the process to remove the scrap, the employee can get behind, or run out of places to put the scrap. Resources are typically given to the machining process, and scrap removal or other housekeeping duties may not be emphasized.

Removal of parts and scrap should be designed into the operation. Accumulation of scrap within the die makes the guard difficult to use and may discourage their use. A fully guarded die eliminates access to the point of operation and efficient, reliable part and scrap removal is important. Unless scrap and parts removal is positively assured, the removal of guards may be encouraged.

The inclinable press was not used in the inclined position, and a metal piece was used to remove the scrap. The facility procedure specified that the area should be cleaned out after 20 punch presses. Since the scrap was not cleaned out, it accumulated below the die, and the scrap pieces shot out from below the front portion of the machine. Several scrap pieces struck the victim in the neck and the remaining pieces were scattered on the floor.

The purpose of guarding was defeated, since the scrap tray was not used to guard the point of operation. There are a number of common danger zones or 'point of operations' on punch press machines that should be guarded.

Punch press operation requires the undivided attention and good judgement of the operator. One method to assure protection is to use a die that has attached to it its own complete guard that covers every hazard and allows only sufficient opening for the material to pass through. This would still allow the operator to position the material close to the die for maximum yield.

CAUSE OF DEATH

The medical examiner's report stated the cause of death as severe hypovolemic shock, a consequence of a severe penetrating wound of the left neck.

RECOMMENDATIONS / DISCUSSION

Recommendation #1: *Employers should ensure that machines are guarded as specified in 29CFR Part 1910.*

Discussion: Any machine part, function, or process, which may cause injury, must be safeguarded. Employers must provide one or more methods of machine guarding to protect machine operators and other employees in the machine area from hazards such as those created by point of operation, in-running nip points, rotating parts, flying chips, and sparks. All such hazards located seven feet or less above the ground floor or working platform must be guarded to prevent accidental contact. Guards or fixed barriers may be attached to the frame, die, or base of a press to prevent the operator from the point of operation. Guards must be attached to the machine, or secured elsewhere if attachment to the machine is not possible. Additional recommendations for power presses are contained in 29 CFR 1910.217. In this case, the purpose of guarding was defeated and scrap was not removed properly.

Recommendation #2: *Employers should designate a competent person to conduct frequent and regular site safety inspections.*

Discussion: Regular inspections of the work site by a competent person ensure that safety procedures are being followed, and demonstrate that the employer is committed to the safety program and prevention of injuries. Scheduled and unscheduled inspections of the jobsite, materials, and equipment should be conducted to identify hazardous conditions. In this case, the punch press guarding was not adequate. Regular inspections would have identified the problem and noted whether this practice was common in the facility.

Recommendation #3: *Employers should develop, implement, and enforce a written safety program. The safety program should include task specific safety procedures and employee training in hazard identification, avoidance, and control.*

Discussion: The implementation and enforcement of a comprehensive safety program is designed to prevent worker injury. The safety program should include task-specific safety procedures and employee training. Training is a critical element in an integrated safety program and should include the communication of task-specific safety procedures and training in the avoidance and abatement of these hazards. Employees should have the knowledge, training, and experience to perform the job that he/she is designated. In this case, the victim worked at the facility previously. Re-training is essential and each employee should work under the close supervision of a designated person until the employee is able to demonstrate the ability to safely perform the new job independently.

Lois Etre PhD.
Industrial Hygienist/Investigator
Institute for Rural & Environmental Health
The University of Iowa – Iowa City, Iowa

Wayne Johnson MD.
Chief Trauma Investigator
Institute for Rural & Environmental Health
The University of Iowa – Iowa City, Iowa

REFERENCES

National Safety Council. Accident Prevention Manual for Business & Industry: Administration and Programs. Tenth Edition. Chicago, IL. 1992.

Office of the Federal Register: Code of Federal Regulations, Labor 29 Part 1910. Washington, DC: U.S. Government Printing Office, 1996.

NIOSH Current 49. Injuries and Amputations Resulting from Work with Mechanical Power Presses. Publication No 87-107, 1987.

Fatality Assessment and Control Evaluation FACE

FACE is an occupational fatality investigation and surveillance program of the *National Institute for Occupational Safety and Health* (NIOSH). In the state of Iowa, *The University of Iowa*, in conjunction with the *Iowa Department of Public Health* carries out the FACE program. The NIOSH head office in Morgantown, West Virginia, carries out an intramural FACE program and funds state based programs in Alaska, California, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas, Wisconsin, Washington, and Wyoming.

The purpose of FACE is to identify all occupational fatalities in the participating states, conduct in-depth investigations on specific types of fatalities, and make recommendations regarding prevention. NIOSH collects this information nationally and publishes reports and Alerts, which are disseminated widely to the involved industries. NIOSH FACE publications are available from the NIOSH Distribution Center (1-800-35NIOSH).

Iowa FACE publishes case reports, one page Warnings, and articles in trade journals. Most of this information is posted on our web site listed below. Copies of the reports and Warnings are available by contacting our offices in Iowa City, IA.

The Iowa FACE team consists of the following: Craig Zwerling, MD, PhD, MPH, Principal Investigator; Wayne Johnson, MD, Chief Investigator; John Lundell, MA, Coordinator; Lois Etre, PhD, Co-Investigator; Risto Rautiainen, MS, Co-Investigator.



Additional information regarding this report or the Iowa Face Program is available from:

**Iowa FACE Program
105 IREH, Oakdale Campus
The University of Iowa
Iowa City, IA. 52242-5000**

**Iowa Toll Free 1-800-513-0998
Phone: (319)-335-4351 Fax: (319) 335-4225
Internet: <http://www.public-health.uiowa.edu/face>
E-mail: wayne-johnson@uiowa.edu**