

## Part ejections from power presses

### Initiative

Power presses, also known as punch presses or blanking presses, are common in a wide variety of manufacturing industries. However, they are also associated with a large number of amputation injuries and fatalities nationwide. While the main hazards associated with power presses are the point-of-operation guarding and noise, this document focuses on a lesser-known hazard: the ejection of parts and scrap material.

### Description of the hazard

The National Institute for Occupational Safety and Health (NIOSH), through its Fatality Assessment and Control Evaluation (FACE) program, has identified several incidents resulting in fatalities where metal parts or pieces of scrap have shot out of the press as the machine is running. This phenomenon occurs when a finished part is left on the lower die after the part is finished and the press cycles to punch or form the next part. Build-up of scrap and slugs between or under the dies can have a similar effect. The upper die comes down with such force that the part can shoot out of the press and strike the press operator or another employee, causing grave injuries to the head, neck, chest or abdomen. Other accidents have occurred when the die is improperly installed in the press and the operator or maintenance personnel tries to readjust it without locking out the press. The press can then cycle and the punches on the misaligned die can break off and be ejected in similar fashion.

### Controlling and eliminating the hazard

The most preferred way of protecting employees from this hazard is to build in automatic ejection of parts and scrap from the press. The ejection in this case would be controlled, and the parts and scrap could be ejected into separate containers, thus reducing the amount of handling by the operator. Some of the most common methods for mechanically removing parts from dies include:

- positive stripper plates;
- spring pressure pads or pins;
- latch-type mechanical lift dogs;
- compressed air jets; and
- pneumatic or hydraulic lift pins or pick-up fingers.

Beveling the edges in a die can further facilitate automatic removal of the parts and the scrap. Chutes and slides not only can move parts away from the press but can sometimes be used to move parts on to subsequent operations in an orderly fashion. Chutes should be free of sharp corners or objects that can block the flow of parts from the die.

Employees working in power press areas should wear eye protection and safety shoes. Because metal stock, scrap and formed parts can have sharp edges, gloves are also recommended. Glove material can be canvas, terry cloth, leather or synthetic.

Based on their investigations, the NIOSH FACE program adds the following recommendations.

- Create and implement a written safety program, such as an AWAIR program.
- Conduct a job hazard analysis for power press operations.
- Guard power presses as specified in the 1910.217 Mechanical Power Presses standard.
- Install electrically interlocked safety blocks and barrier guards on all presses.
- Follow established lockout/tagout procedures whenever clearing jams in the presses.
- Place two-hand trip buttons an appropriate distance from the point-of-operation and each other.
- Conduct regular maintenance on the presses according to the manufacturer's recommendations.
- Write machine-specific operating procedures.
- Conduct frequent and regular safety inspections.
- Ensure employees understand and follow the safety program.
- Train employees about safe work practices and the safety program, including the employees' roles in the program.

### **For more information**

NIOSH FACE reports can be found on the NIOSH website at [www.cdc.gov/niosh/face](http://www.cdc.gov/niosh/face). Further information about machine safeguarding measures can be found in the National Safety Council's Accident Prevention Manual: Engineering and Technology, 13th edition (2009), and the NIOSH Current Intelligence Bulletin 49: Injuries and amputations resulting from work with mechanical power presses (1987).

### **Acknowledgements**

Much of the information for this hazard alert was derived from the National Safety Council Data Sheet 534: Handling finished pieces at power presses (1963).