HIGH-IMPACT METAL WORKING

This easy-to-use Leader's Guide is provided to assist in conducting a successful presentation. Featured are:

INTRODUCTION: A brief description of the program and the subject that it addresses.

PROGRAM OUTLINE: Summarizes the program content. If the program outline is discussed before the video is presented, the entire program will be more meaningful and successful.

PREPARING FOR AND CONDUCTING THE PRESENTATION: These sections will help you set up the training environment, help you relate the program to cite specific incidents, and provide program objectives for focusing your presentation.

REVIEW QUESTIONS AND ANSWERS: Questions may be copied and given to participants to document how well they understood the information that was presented. Answers to the review questions are provided separately.

ATTENDANCE RECORD: Document the date of your presentation as well as identify the program participants. The attendance record may be copied as needed.

INTRODUCTION

Ever since the Industrial Revolution, machines have steadily become more important to modern industry. With this reliance on machines has come the need for better methods to operate them safely. Over the years, safety devices have been added to machines and work procedures designed so that we can work safely. While these safeguards continue to improve, the importance of each machine operator's good attitude toward safety has always stayed the same.

This program re-creates ten industrial accidents involving heavy machinery and metal work to illustrate the necessity of following proper safety procedures and maintaining a good safety sense. The program participant will learn how to safely operate brake presses, grinders, metal cutting shears and other machines.

The following four points are stressed to the viewer throughout the program:

❶ Understand the machine's operations and the potential hazards involved;

❷ Acquire proper training and authorization before operating any tool or machine;

❸ Always wear the correct personal protective equipment and clothing for the job;

❹ Follow safe operating procedures at all times and protect yourself from the machine's actions.

PROGRAM OUTLINE

USING SAWS SAFELY

- Don't work too closely to a saw blade's cutting action; an accident will occur eventually.
- Never operate a saw (or any machine) that has had the guard removed.
- Make sure that the guard is operating properly.
- Keep the blade from binding against the side of the work to avoid injury.

PRESS BRAKES

- Sometimes called a brake press or bending brake, the press brake is a powerful machine that has the ability to mangle or amputate fingers and hands.

- It is important to concentrate completely on the work when using the press brake.
- Consult the operator's manual for safe operating procedures for each type of press brake.
- While removing a long sheet of metal that must be held during forming, withdraw it whenever possible from the front of the die.
- Use your hands to support the sheet only if it is necessary and keep them out of the path of the piece being formed.
- Use suction cups, tongs or other devices to keep your hands away from the action during the insertion and removal of stock.

Use the back gauge stops to hold the parts aligned correctly; never adjust the back gauge by reaching through the dies or tooling.

- Make sure the foot control is properly placed and cannot be accidentally activated.

THE UNIVERSAL IRON WORKER

- The universal iron worker is a combination tool that is useful in performing cutting, shearing and punching operations.
- Always wear safety glasses, a hard-hat and other required PPE when operating one of these machines.
- Make sure that the die set is properly sized and in good condition before installing it on the worker.
- Before punching holes with the worker, make sure the dies are seated properly and matched correctly.
- Have an assistant help you or use material supports to handle long pieces while shearing with the worker.

METAL CUTTING SHEARS

- There are four main areas of concern when using metal cutting shears: body contact with blades or hold-downs, pinch points, cuts and abrasions from handling material, and body strains.
- Understand the functions of the machine and make sure all guards are in place and adequate for the job.
- Make sure the blades are sharp and that proper clearance is maintained.
- Keep work area clean and the shear table free of material and loose machinery.
- Wear clothing that fits your body closely and use all required PPE.
- When the work is complete, make sure the power is off and that the controls are inoperative.

USING GRINDERS SAFELY

- Before using any grinder, make sure it's safe to operate and that you are wearing your personal protective gear.
- Perform a ring test before mounting any grinding wheel.
- Make sure the glass shield is clean, there is ample light to see the work, and the speed is correct for the mounted wheel.

- The wheel should be evenly dressed with a star dresser to insure the wheel is true.

SANDING

- A ripped, torn or damaged belt is the most common cause of sanding accidents.
- Make sure the belt is in good condition as well as running in the right direction and at the rated speed.
- Make sure the guards are in good condition and in place.
- When off-sanding, always use a firm grip and be aware of sharp corners that can snag and pull the part from your hand or throw it into a co-worker.

HOISTS AND CRANES

- You must be trained and authorized to operate any crane or hoist.
- Make sure the area is clear of people and obstructions before attempting the job.
- Inspect all equipment for safe operating condition.
- To avoid side pulls, be sure the crane and hook are centered over the load and then balance it.
- Sound any alarms to warn others that you're about to begin moving the load.
- Control the swing to prevent damage to property and injury to co-workers.

WELDING AND CUTTING

- You must be trained and authorized before welding; you must also obtain the proper permit for the job.
- The type of welding to be done, the area in which you intend to weld, and what kind of safety equipment is required determines the appropriate permit.
- Good housekeeping can prevent sparks caused by the welding from igniting debris in the area.
- Follow all company policies and safety procedures during the welding process.

GENERAL SAFETY TIPS

- Be aware that loose clothing, jewelry, long hair and even gloves can be pulled into the action of many machines.
- When we are angry or upset, we must control our emotions so that we can control the hazards of the machinery we operate.
- Coated abrasives used in sanding, grinding and polishing operations pose these hazards: dust/vapors, breaking belts/disks, fire/explosion, personal contact and flying particles.

ACCIDENTS AND THEIR SAFETY LESSONS

ACCIDENT 1: Albert Taylor, a maintenance mechanic at a food packaging plant, loses several teeth and suffers a laceration to his face when a piece of stock strikes him in the face. Albert fails to use a clamp to hold down the work as he drills a hole in a motor mount.
LESSON: ***Always take the time to attend to the hazards of any machine and the work at hand. Maintain a good grip on your sense of personal safety to remain injury-free.***

ACCIDENT 2: John Kason, maintenance worker in a paper mill, measures the diameter of the shaft he is forming while his lathe is running. The odd-shaped piece of metal with which he is working catches his glove and pulls him into the machine, amputating his arm.
LESSON: ***When choosing to use gloves around actions, you need to decide which is the greater hazard: the machine's action or the rough materials you are handling. Turning off the lathe before measuring the shaft would have prevented the accident.***

ACCIDENT 3: Carroll Dice, a machine operator, uses a radial arm saw to cut a piece of pipe to length. While holding the stock against the guide as the blade makes its cut, the blade catches on the stock and Carroll's hand is severely cut when it is pulled into the unguarded blade.
LESSON: ***Working too close to a machine's action will eventually produce an accident. If a machine has a guard, use it.***

ACCIDENT 4: George Raskins, using a band saw without a guard to cut a piece of steel, places a sheet into the machine and turns it on before his hand clears the action. His finger is amputated by the blade.
LESSON: ***It's against all safe work practices to operate any machine that has had the guard removed. Always use a pusher if hands or fingers will come close to the saw's action.***

ACCIDENT 5: Andy Janowski, a maintenance mechanic in manufacturing, absent-mindedly tries to retrieve a fallen metal piece while joking with a co-worker. While reaching through the press brake he is operating, the ram comes down and crushes his hand.
LESSON: ***Using heavy machinery requires complete concentration and safe operating procedures, even if you have used the machine for many years.***

ACCIDENT 6: Greg Braxton, maintenance technician, is struck in the eye by a shattered die he has just installed on a universal iron worker for drilling purposes. He had removed his safety glasses to get a better look at the job.
LESSON: ***Always make sure the die set is properly sized and in good condition before installation. It is also important to wear the proper personal protection such as safety glasses at all times.***

ACCIDENT 7: Patrick Trammel, shop technician, learns the second shift at the plant has been shut down. Relying on the second shift for overtime and also having family problems, Patrick obviously becomes upset. While working with a metal shear, he furiously pushes down on the stock. His fingers accidentally travel under the guard and are severed at the knuckles.
LESSON: ***We must control our emotions and our sense of personal safety so that we can control the hazards of the machines we operate.***

ACCIDENT 8: Martin Kouch, maintenance mechanic, hurriedly grinds a brace he has just made so he can go home for the day. The grinding wheel is defective and shatters, striking him in his face and chest.
LESSON: ***Before using any grinder, take the time to make sure its safe to operate. Perform a ring test before mounting any grinding wheel.***

ACCIDENT 9: Earl Kasington, a new hire with no prior crane experience, impales a co-worker with a load he was attempting to move.
LESSON: ***Before operating a crane, you must be trained and authorized. Make sure the entire area where the load is being moved is clear of people and obstructions before attempting the job.***

ACCIDENT 10: Charles Batakis, maintenance technician, disregards his supervisor's request that he remove chemical drums and oily rags from the welding area. A fire flares up from the sparks of his torch after he begins welding. The fire consumes Charles and the building.
LESSON: ***Preventing hazards to people as well as protecting company property is imperative during welding operations. Always observe safe work procedures and company policy.***

PREPARE FOR THE SAFETY MEETING OR TRAINING SESSION
Review each section of this Leader's Guide as well as the videotape. Here are a few suggestions for using the program:

Make everyone aware of the importance the company places on health and safety and how each person must be an active member of the safety team.

Introduce the videotape program. Play the videotape without interruption. Review the program content by presenting the information in the program outline.

Copy the review questions included in this Leader's Guide and ask each participant to complete them.

Copy the attendance record as needed and have each participant sign the form. Maintain the attendance record and each participant's test paper as written documentation of the training performed.

Here are some suggestions for preparing your videotape equipment and the room or area you use:

Check the room or area for quietness, adequate ventilation and temperature, lighting and unobstructed access.

Check the seating arrangement and the audiovisual equipment to ensure that all participants will be able to see and hear the videotape program.

Place or secure extension cords to prevent them from becoming a tripping hazard.

CONDUCTING THE PRESENTATION
Begin the meeting by welcoming the participants. Introduce yourself and give each person the opportunity to become acquainted if there are new people joining the training session.

Explain that the primary purpose of the program is to show the viewer how to safely operate machines involved in metal work.

Introduce the videotape program. Play the videotape without interruption. Review the program content by presenting the information in the program outline. Lead discussions about dangerous situations that may occur while working with metal at your facility. Use the review questions to check how well the program participants understood the information.

After watching the videotape program, the viewer will be able to identify the following:

- The essential safety rules for operating all machines;

- How to safely use grinders, press brakes, the universal iron worker, metal cutting shears, cranes and other machinery;

- The correct work procedures for sanding and welding operations.

HIGH IMPACT METAL WORKING SAFETY
REVIEW QUESTIONS

Name_____Date_____

The following review questions are provided to determine how well you understand the information presented in the program.

1. **Which of the following is *not* one to the four safety points stressed throughout the program?**
a. Understand the machine's operations and the potential hazards involved.
b. Always wear the correct personal protective equipment and clothing for the job.
c. Lockout the power to all machines when not in use.
d. Acquire proper training and authorization before operating any tool or machine.

2. **What causes most sanding accidents?**
a. the sander belt running in the wrong direction
b. a damaged belt
c. not putting the guards in place
d. the belt running at an incorrect speed

3. **Which two of the following must you have before a welding operation begins?**
a. the appropriate training and authorization
b. permission from the fire department
c. a pair of safety goggles
d. a welding (hot work) permit

4. **What should the maintenance worker who was struck in the face while grinding done to prevent the accident?**
a. taken off his safety glasses so he could see the work better
b. performed a ring test before mounting the grinding wheel
c. used a sander to smooth the brace he was working on

5. **The worker who killed his fellow employee with the load of a crane committed which two of these mistakes?**
a. he wasn't wearing the proper head protection
b. he didn't check to see if the work area was clear of people or obstructions
c. he was untrained and unauthorized
d. he lifted the load too high

6. **Which of the following is *not* a main cause of the accidents in the program?**
a. using faulty power cords
b. failure to use the machine's guard
c. working to closely to the machine's action
d. failure to wear the proper personal protection

7. **The universal iron worker is useful in performing which of the following jobs?**
a. cutting
b. shearing
c. punching
d. all answers

ANSWERS TO THE REVIEW QUESTIONS

1. c
2. b
3. a & d
4. b
5. b & c
6. a
7. d