white lead, and using a xylol vehicle, were sprayed on metal panels then moved through banks of infra-red lights with natural ventilation only.

The fumes from the infra-red oven were rising and moving into the upper area of one end of a large bay. The work in this portion of the bay necessitated the use of a crane and operator for extended periods. The crane operator was affected by headaches, loss of appitite, plus the problem of poor and sometimes dangerous crane operations.

Since you undoubtedly have formulated an answer for this problem and know the results, this will merely be a confirmation of your solution. A large blower, pending more adequate control ventilation was placed near the top of the infra-red oven and the contaminants moved out of the building.

Result—No more ill health and a safer crane operation.

CASE 2. High noise levels were being caused by the air noise from an air hoist. The overall noise level was 114 decibels. A muffler was installed on the air release of the hoist and the noise level dropped down to 87 decibels, or a reduction in noise level of 27 decibels, which is in noise talk a whale of a reduction and in this case economical.

CASE 3. A crane operator was being affected by vapors from a fluoride salt being dumped into a steel ladle containing molten steel. This was solved rather ingeniously by changing the size and shape of the fluoride salt crystals. At any rate, there were no more complaints from the crane operators.

There is no end to the number of successful source control cases that could be cited. However, it is not always possible to control the hazard at its source so the next best thing to do it to supply protection to the employees who may be affected by the hazard. Such was the case of the crane operator over a soaking pit operation in a steel mill.

The temperature of the soaking pit was 2,200F. The steel in the pit was removed by the crane and placed on a conveyor. Some infra-red heat was radiated and when this infra-red was considered, temperatures ranging upward to 140F. were found in the crane cabs.

A new crane cab was designed having double glass walls, insulated floors and ceiling and covered on the outside by aluminized paint. An air conditioned unit supplied air to the inside of the cab at the rate of 720 cubic feet per minute with a velocity through the grill inlet of 300 feet per minute.

After this crane was placed in operation the crane cab temperature ranged from 86 to 90F. Quite a reduction from 140F. maximum to a 90F. maximum with a subsequent drop in heat fatigue.

Briefly, there is a second phase of industrial health at high plant levels.

In machine shops, and other metal processing industries, you will find solvents of all kinds, some much more toxic than others; you will find plastic resins and their catylists, new cooling and new coating materials are common place.

The supplier, for the most part, recognizes the hazards of these materials and issues instructions designed to minimize or eliminate the danger of injury from the use of his product. We have been asked by many plants to determine the source of health injuries and in the course of our surveys, would find that the cause of the injuries were due to violations of the instructions from the supplier. In many of the instances, the safety engineer had not been informed of the presence of the offending material.

Based on field experience, you, as a safety engineer, should continue to ask yourself these questions:

1. Do I have a knowledge of the materials being used in my plant?
2. Have I checked the list of materials recently to see if new ones have been added?
3. Have I checked my plant to see if new toxic materials are being used that have not been called to the attention of the safety department?
4. Are the toxic materials in my plant being used in accordance with the suppliers instructions or as prescribed by Industrial Hygiene personnel?

If you can answer these questions in the affirmative, you have eliminated a sizeable number of your industrial health problems. You will also find that in this case your overhead will be coming down which in my way of thinking is Industrial Health at a high plant level.

Joint Meeting with the Power Press and Forging Section

Machining Metal with Safety

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What does metal machining mean to you? Metal machining can be defined as an operation or operations, performed most commonly by machine tools, in which metal is cold worked by progressively removing metal in the form of chips.

Injuries that result from the operation of these machine tools most often result from unsafe practices or because of incorrect procedures which are basically problems of training and supervision. In general, the three causes of accidents and injuries are unsafe practices, unsafe conditions, and unsafe attitudes.

Before going into the methods of accident prevention on machine tools, we should first explain some of the different types of operations and some of the most common causes of accidents on each. The National Association of Machine Tool Builders has classified some two hundred types of machine tools into five basic groups:

I. Milling
II. Turning
III. Planing
IV. Grinding
V. Boring

Milling Machines

Milling consists of machining a piece of metal by bringing it into contact with a rotating cutter with multiple cutting edges. The work is held on a table and fed past or into the cutter.

Statistics reveal that milling operations are generally low in accident frequency, but high in severity. About two thirds of the milling machine accidents occur when operators are unloading or attempt to make adjustments. Other causes of injuries experienced with use of this type of machinery include:

1. Measuring or calipering the work when the machine is operating.
2. Using a rag to clean excess oil off the table while the cutter is turning.
3. Wearing gloves, ties, or loose clothing.
4. Failure to draw the job back to a safe distance when loading or unloading.
5. Adjusting the coolant flow while cutter is turning.
6. Using a jig or vise which prevents close adjustment of the guard.
7. Failure to clamp the work securely.
8. Leaving hand tools on the work table.

Turning Machines

Turning consists of shaping a rotating piece by means of a cutting tool, which is mounted on a carriage that provides infeed or cross-feed of the tool. Work is commonly rotated between centers or while held by a chuck, face plate, or fixture.

Some of the most common causes of injuries resulting from this type of operation are:

1. Using calipers or gauge on the work while the machine is in operation.
2. Using the hand instead of a stick to hold emery cloth against the work or filing the rotating piece right-handed.
3. Flying metal chips or attempting to clean chips when machine is in operation.
4. Contact with projections on face plates, chucks, or lathe dogs.
5. Hand braking of machine.

Planing Machines

Planing operations are primarily intended for machining flat surfaces but can be arranged for machining many kinds of curved, odd, or irregular surfaces also.

Shapers although generally classified as planing machines, differ slightly from the planer machines in that the work is fastened into a vise or fixture and the cutting tool is passed back and fourth over the work.