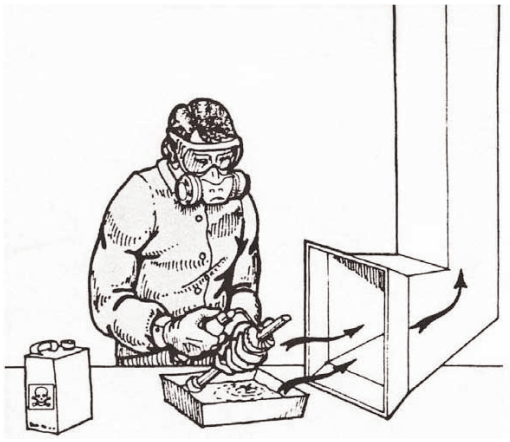
8. Insist on Protective Measures



After identifying hazards, the next step is to remove or reduce them. Protective measures eliminate or limit exposure to a hazard. While there are many different types of hazards, there are general protective principles that apply to them all.

PROTECTIVE MEASURES: MANAGEMENT'S RESPONSIBILITY

The responsibility for designing jobs safely in the first place, or redesigning them when a hazard is detected, lies with management. It is the role of workers and unions to make sure that employers are providing the most effective protective measures possible to reduce or eliminate the hazard.

Sometimes short-term solutions are needed until resources are obtained for longer-term repairs. Critical to any plan of action is a commitment from management to a deadline for each proposed improvement.

FIX THE WORKPLACE, NOT THE WORKER

The best way to control a hazard is to eliminate it. If a hazard can not be eliminated altogether, there are several other ways to limit worker exposure. Some of these ways are more effective than others. When all of these different hazard control methods are put in a chart – from the most effective to the least effective – the chart portrays what is known as the "hierarchy of controls."

PROTECTIVE MEASURES – BEST TO WORST

Most Effective

1. Eliminate the hazard
2. Substitute something less dangerous for the hazard
3. Engineering Controls (safeguarding technology)
4. Administrative Controls (training and procedures, like moving workers away from dangerous conditions)

Least Effective

5. Personal Protective Equipment

EXAMPLES OF PROTECTIVE MEASURES

ELIMINATE HAZARDS

The best way to control a hazard is to eliminate it and remove the danger. This can be done by mechanizing a work process in a way that will get rid of a hazard, eliminating a toxic substance, having workers perform tasks at ground level rather than working at heights, and implementing intravenous systems without needles in health care facilities.

SUBSTITUTE

The second best way to control a hazard is to substitute something else in its place that would be non-hazardous or less hazardous. This can be done by asking the question "Why is it used?" and then brainstorming alternate ways to meet the requirement. For example, a water-based paint or adhesive could be substituted for a more hazardous solvent-based material. Or the same chemical can be used in a different form. For example, liquid slurry can be substituted for a dry powder. Or a different process with less potential for exposure can be substituted. For example, water blasting can be used instead of abrasive blasting.

ENGINEERING CONTROLS (SAFEGUARDING TECHNOLOGY)

If a hazard cannot be eliminated or a safer substitute cannot be found, the next best approach is to use engineering controls to keep the hazard from reaching the worker. This could include methods such as using noise dampening technology to reduce noise levels; enclosing and isolating a chemical process in a "glove box;" isolating workers in a control room; guarding machines to eliminate pinch points; using needles that retract after use; using mechanical lifting devices; or using local exhaust ventilation that captures and carries away air contaminants.

WHAT IS LOCAL EXHAUST VENTILATION?

Local Exhaust Ventilation (LEV) is an important protective measure. The chemical laboratory hood is a familiar example. LEV captures contaminants at or near the point where they are generated and removes them before they can by inhaled by workers. Such systems are usually permanently installed; portable units are also commercially available. LEV has these basic elements:

- Hoods that capture contaminants as close as possible to their source.
- Ducts that transport contaminants.
- Air cleaning devices that remove contaminants.
- Fans that move the air through the ventilation system and discharge the exhausted air outside.
- Outdoor air that replaces the exhausted air.

LEV must be properly designed, constructed, operated, and maintained in order to be effective.

ADMINISTRATIVE CONTROLS (TRAINING AND PROCEDURES)

If engineering controls do not completely control the hazard, administrative controls should be considered. They can include such things as:

- Warning alarms.
- Labeling systems.
- Reducing the length of time of worker exposure.
- Increasing the distance between the worker and the hazard.
- Training.
- Restricting access to hazardous areas.
- Performing a hazardous operation on a shift when few people are present.
- Standard Operating Procedures (SOPs) for performing dangerous tasks.
- SOPs for First Aid, spill clean-up, good housekeeping.

For example, workers can be rotated in and out of a hot work area rather than spending eight hours per day in the heat. Lockout/Tagout refers to SOPs that safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities.

Back-up alarms on trucks are an example of effective warning systems. However, using a warning sign instead of correcting a hazard that can and should be corrected is not an acceptable form of hazard control. For example, it is neither effective nor acceptable to post warning signs by an unguarded machine cautioning workers to work carefully!

PERSONAL PROTECTIVE EQUIPMENT

Use of personal protective equipment (PPE) limits hazards by placing protective equipment directly on workers' bodies. Examples of personal protective equipment are respirators, gloves, protective clothing and boots, hard hats, steel-toed shoes, goggles, and ear plugs.

Personal protective equipment, while a useful additional safeguard in some high-hazard jobs, is the *least effective* method for overall worker protection. PPE should be used only when there are no other more effective solutions. This is because:

- PPE does not eliminate the hazard.
- If the PPE is inadequate or fails, the worker is not protected.
- No PPE is foolproof. For example, respirators leak and hard hats protect against only very small falling objects.
- PPE is often uncomfortable and places a physical burden on a worker. For example, using a respirator for a long time can put a strain on the heart and lungs and chemical-resistant clothing can cause workers to become overheated.
- PPE can actually create hazards. For example, gloves can make hands clumsy.

There are some jobs, such as removing asbestos, that are so dangerous that adequate personal protective equipment, in addition to engineering controls, is essential and even life-saving. Yet for every job like this, there are many more where employers hand out PPE when they should provide more effective hazard control methods.

In some OSHA/NJPEOSH standards (for example, Respiratory Protection, 1910.134) the employer is required to provide protective equipment at no cost to employees. Under these standards, the employer would be required to pay for the PPE. Otherwise, 2007 OSHA/NJPEOSH policy is that paying for PPE is a matter for negotiations between workers and management. This may change with new rulemaking.

WHAT TYPE OF RESPIRATOR IS BEST?

Respiratory protection equipment consists of devices that cover the mouth and nose to prevent chemical inhalation. If respiratory protection is essential, it is important to know what type of respirator is best to use. There are two major types:

- Air-purifying respirators: particulate masks, cartridge style respirators, gas masks, and Powered Air Purifying Respirators (PAPR). These all filter the workplace air before it is inhaled. Of these, PAPRs offer the best protection because they supply air at positive pressure.
- Supplied air respirators: Self Contained Breathing Apparatus (SCBA), airline systems, and Emergency Escape Breathing Apparatus (EEBA). These provide clean air from an air compressor or bottled compressed air. Many of these supply air at positive pressure. Supplied air respirators offer more protection to workers than do air-purifying respirators.

PUBLICATIONS WITH MORE INFORMATION

Controlling Chemical Exposure; Industrial Hygiene Fact Sheets; Concise guidance on 16 components of industrial hygiene controls, DHSS, 2000

Phone: 609-984-1863, DHSS Occupational Health Surveillance Program
www.state.nj.us/health/eoh/survweb/ihfs.pdf

BEST CONTROL PRACTICES

OSHA Topic Pages contain good information on the best practices to regulate specific hazards. NIOSH Hazard Controls and other sources of best control practices are also available on the web.

WEBSITES WITH MORE INFORMATION

OSHA Topic Pages www.osha.gov/SLTC/index.html

NIOSH Hazard Controls and Hazard IDs
www.cdc.gov/niosh/hazcomm-hazid.html

OSHA eTools www.osha.gov/dts/osta/oshasoft/index.html

Worksafe™ Best Practices booklets
www.wcb.ab.ca/workingsafely/worksfbooks.asp

OSH Answers: Hazards associated with specific tasks, occupations and workplaces - with recommendations for reducing the risks
www.ccohs.ca/oshanswers/

Best Practices Report and Inventory
www.hre.gov.ab.ca/cps/rde/xchg/hre/hs.xsl/2992.html