

Shielding is one of the best protective measures employed to reduce or eliminate exposures to ionizing radiation. Lead and concrete are two materials commonly employed to shield high-energy sources such as high-voltage X ray, particle generators, and radioisotopes. Shielding is also used to protect against exposure to a radiant heat source. For example, heat-treating furnaces can be shielded with aluminum panels. Nonreflective sheet metal is not effective for it is a "black body," which absorbs heat and then acts as a secondary source of radiation.

Reduction of work periods is another method of control in limited areas where engineering methods are too costly or impracticable. In the job forge industry, especially in hot weather, a shorter work day and frequent rest periods are used to minimize exposures to extremely high temperatures, thereby lessening the danger of heat exhaustion or heat stroke. For workmen who must labor in a compressed air environment, schedules of maximum length of shift and length of decompression have been prepared. The higher the pressure, the shorter the shift and the longer the decompression period.

Proper illumination of the work area is necessary to prevent eyestrain leading to increased accidents or loss of visual acuity and to eliminate glare that may interfere with vision. Lighting is discussed in Chapter 16, "Industrial Buildings and Plant Layout," and some levels of illumination are given in Chapter 46, "Safety Engineering Tables."

Training and education

Proper training and education are supplements to the engineering controls. The nurse and safety professional sometimes can be key figures. Perhaps by getting a workman, for example, to change his manner of weighing a toxic material, or of handling a scoop or shovel, there will be no dust exposure.

The worker must also know the proper operating procedures that make engineering controls effective. If he performs an operation away from an exhaust hood, he will not only defeat the purpose of the control but also contaminate the work area. Workers can be alerted to safe procedures through booklets, instruction signs, labels, safety meetings, and other educational devices. (See Chapter 9,

"Safety Training")

Since new materials are constantly being marketed and new processes developed, re-education and followup instruction must also be part of the training program.

Setting Up an Effective Industrial Hygiene Program

A typical company program to minimize occupational health hazards is described in the following section.

The success of any safety and industrial hygiene program requires the cooperative effort of the engineering, medical, industrial hygiene, safety, and purchasing organizations, and the supervisor and the individual employee.

Engineering organization

The introduction of new plant processes and operations begins with the engineering organization. For this reason, the engineering group plays a most important role in the control of occupational health hazards. Their responsibilities are

- To plan all operations using established engineering procedures to prevent unnecessary exposure to harmful environmental factors or stresses
- To notify the medical, industrial hygiene, and safety organizations, whenever it is planned to introduce new operations or processes
- To request an industrial hygiene survey of new installations before permitting shop personnel to operate the equipment

Medical organization

The responsibilities of the medical organization in the industrial hygiene program are

- To recommend the placement only of those employees whose physical and emotional health capacities meet the minimum job requirements
- To cooperate in the development of adequate, effective measures to prevent exposure to harmful agents
- To examine periodically those employees