

disease, I recall one plant where the employees of a heat-treating department had discovered that they could have nicely toasted sandwiches by floating them on a piece of steel on the lead pot. This is one of the better methods for developing chronic lead poisoning by ingestion of lead.

Since this sort of thing is rather unusual, the major problems in the engineering control of occupational disease have to do with preventing various kinds of dusts, vapors, gases, or mists from getting into the air in a place where men can breathe them. There are a variety of methods available.

SUBSTITUTE MATERIALS

It is sometimes possible to substitute a less toxic material for the one which is being used and avoid the problem. A rather common example would be the substitution of a water emulsion paint for a lacquer made up with solvents. This solves the problem of control of solvent vapors with no further effort. It does not necessarily solve the whole control problem since the pigment may also be toxic.

Occasionally, it may be possible to avoid the hazard by putting it somewhere where people do not go in the normal course of work. It should not be overlooked that isolated operations almost always require supervision and maintenance and the people who do this work must be protected. An isolated operation which is a serious source of air contamination is very apt to become a neighborhood nuisance.

A more generally applicable device is the enclosure of the process. This is more readily seen in the chemical industry where many processes are carried out in a completely closed system from the raw material tanks at one end of the packaged product at the other. When thoroughly carried out, enclosure of the process unquestionably provides the most complete and most fool-proof protection for the workmen.

The type of control which is most common is removal of the contaminant, either from the general atmosphere by ventilating or at the source by local exhaust ventilation or by other means, such as wet operation, which will prevent contamination from being dispersed into the atmosphere.

The industrial hygienist will generally consider protective equipment to be pretty far down the line as a primary method for controlling a hazard. It is useful as a primary means when the hazard is of short duration or occurs infrequently. The main use of personal protective equipment is as a second line of defense after the hazard is pretty well controlled by engineering means.

The main problem, in a great many instances is to recognize the exact nature and extent of the hazard. When this has been done, the appropriate means of control are apt to be fairly obvious. The fact that the particular condition has never been controlled by a particular procedure which looks correct is not an adequate reason for deciding that it never can be.

SAFETY—A MORAL RESPONSIBILITY

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Like the two bit coin in your pocket, safety has two sides. One side deals with what we do when safety fails; the other side concerns what we do to promote safety. Specifically, we are to dig beneath the program and method, beneath the device and technique to the moral basis for why we should do even more than we are in pushing

our safety record higher and higher. At this safeguard-end of the safety problem religion has a place as significant as at the breakdown-end. A concern for safety measures is fed by a lively sensitivity to the welfare of the individual that is at the heart of the religious life of this nation. Judaism and Christianity are together in affirming

this living truth: the individual is of worth because he is of worth to God. What we as a people do to express in practical terms the worth and dignity of the individual is a moral responsibility upon each of us as an individual and together in groups.

You are intimately involved in all the problems and interests of organized labor. Safety is one of these, but it is not isolated from your other issues which are also moral issues. So before I plunge into the moral responsibility, I want to stress that safety is part and parcel of other labor programs which are also shot through with moral responsibility.

For instance, safeguards against unemployment are an accepted moral responsibility. We have the Full Employment Act of 1946, which makes the avoidance of unemployment a public policy. That a man may lose an opportunity to work is a moral issue; that industry, labor and the public join in putting a floor beneath the chance to be employed is a moral responsibility. When technological advances, such as automation, are introduced which threaten the availability of jobs, counter measures are promoted by labor, and receive a good hearing among us. Why? Because dealing with threats to unemployment is accepted as a moral responsibility in our American way of life.

UNEMPLOYMENT—A MORAL ISSUE

But whence come major threats to a man willing to work being unable to work? Cyclical, technological, and other causes, to be sure, stand out. But men are often—all too often—out of a job because they have been hurt or maimed or disabled as well as fired because of some overall economic or technical squeeze. Loss of job and income is due in large part to failure in safeguards against accidents. Safety is a moral responsibility because assuring the opportunity for employment is a moral responsibility.

Again, ethical practices by both labor and management are recognized as a moral responsibility of both. This phrase—"ethical practices"—has taken on specific reference to the right of the individual union member to protection against the misuse of union and welfare funds. But certainly he is equally entitled to protection from unnecessary accidents—through education and training, on the one hand, and through

physical safeguards on the other hand. Blindness by a union toward, or tolerance by an employer of, any carelessness in safety measures is an unethical practice toward union members and other workers—it is a failure in moral responsibility.

SAFETY PROMOTES FREEDOM

And thirdly, American labor is out in front in helping bring the strength of the United States into the free world. A sense of moral responsibility for safety is at the heart of what the free world stands for—the worth and dignity of the individual. Many tests that we Americans have to meet before world opinion have to do with safety—tests that we are far from passing with the grade that we can always be proud of. Last fall, we had to expose to the world the hazard to their safety of nine Negro children in going to an Arkansas school. That kind of hazard to safety is a failure in our moral responsibility toward the worth of a child.

But turn to another aspect of our national life. Our march to ever greater abundance, ever greater productivity, ever greater technological prowess is impressive, even breathtaking. But we should be equally concerned with the pace we are setting in on-the-job, occupational safety. And beyond this we now stand on the threshold of the nuclear energy industry, with its reactors and isotopes, its fissionable fuels and their radioactive wastes. The hazards of radiation in this new industry give to moral responsibility for safety a new dimension and urgency.

Let me just mention three characteristics of the potential harm there is in radiation: 1. when you are hurt by over-exposure, you do not know it at the time and so start caring for it; you learn of it—later; 2. the harmful effects are not transitory; instead, they add up—accumulatively; 3. radiation can reach into the human reproductive system and hence blight later generations. While these dangers are near the surface in the use of radio-active materials, they can be kept under control by vigilance. Certainly safeguards against these risks should have top priority in a safety program.

When a stranger, say from the relatively underdeveloped countries in Asia and Africa, or from behind the Iron Curtain, should ask of us, "In your impressive rush toward mounting economic prosperity, and now into