CHEMICAL SECTION

newsletter

NATIONAL SAFETY COUNCIL • CHICAGO, ILLINOIS 60611
A NONGOVERNMENTAL, PRIVATELY SUPPORTED, PUBLIC SERVICE ORGANIZATION

APRIL 1977

Implement, Maintain Respiratory Protection Program

THE successful implementation of a respiratory protection program is primarily dependent upon the employers' belief in the need for the program and the employees' acceptance of the program. This requires that both employer and employee thoroughly understand the plant processes and the possible hazards (both routine and non-routine or emergency) arising from these processes.

Obviously, control of respiratory hazards should start at the process in the form of engineering controls. In fact, the Occupational Safety and Health Act states that respiratory protection shall only be used when effective engineering controls are not feasible (with no consideration toward costs), or while engineering controls are being instituted.

When respirators are required to protect the health of the employees, a full and complete respiratory protection program is imperative to the successful attainment of this objective. Naturally, the elements of a complete and successful respiratory protection program will differ from plant to plant. However, we can list some of the minimum requirements of an effective program.

1. A written set of standard operating procedures governing the selection and use of respirators should be established.

2. Respirators should be selected on the basis of the hazards to which the worker is exposed.

3. The respirator user should be instructed and trained in the proper use of respirators and their limitations.

4. Each respirator wearer should be fit-tested and subsequently provided with a respirator that fits properly.

5. Where practicable, the respirators should be assigned to individual workers for their exclusive use.

6. Respirators should be regularly cleaned and disinfected. Respirators used by more than one worker should be thoroughly cleaned and disinfected after each use.

7. Respirators used routinely should be inspected during cleaning. Worn or deteriorated parts should be replaced. Respirators for emergency use should be thoroughly inspected at least once a month and after each use.

8. Respirators should be stored in a convenient, clean, and sanitary location.

9. Appropriate surveillance of work area conditions and degree of employee exposure or stress should be maintained.

10. A regular inspection and evaluation procedure should be implemented to determine the continued effectiveness of the program.

11. Persons should not be assigned to tasks requiring the use of respirators unless it has been determined by the respirator program administrator, using the guidelines of a physician, that they are physically and psychologically able to perform the work and use the equipment. This determination should be reviewed at least annually.

12. MESA/NIOSH certified respirators should be used for protection when they are available. Non-approved respirators generally are not recognized as providing adequate protection.

Now that the standard operating procedures and policies have been outlined, the real task begins: implementing the procedures and maintaining an effective program. Again, it should be emphasized that this can only be accomplished with the full support of management and full acceptance and understanding by the employees.

Let us list the employers' and employees' responsibilities. It is the employers' responsibility to provide respiratory protective equipment when such equipment is necesary to protect the health of the employee, to provide respirators which are applicable and suitable for the purpose intended, and to establish and maintain an effective respiratory protection program.

It is the employees' responsibility to use the provided respiratory protection in accordance with instructions and training received, to guard against damage to the respirator, and to report any malfunction of the respirator to the responsible person for correction.

First, we must make sure that the standard operating procedures include:

All the information and guidance necessary for the proper selection, use, and care of the needed equipment.

Designation of the correct respirator for each job and an inventory system to identify the respirators and the employees to whom they were issued.

Written procedures covering safe use of respirators in dangerous atmospheres.

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Fire Warning Equipment Fills a Household Need

HENRY KAISER, the founder of Kaiser Industries, defines *marketing* as the "finding of a need and filling it." Such a need exists in the field of household fire warning equipment.

There are so many different manufacturers of so many different types of home alarms that the situation is confusing. To further complicate this market, some manufacturers are making household fire warning devices for other distributors. Approximately 30 companies have introduced detectors in the last couple of years under 50 to 60 brand names.

Two big companies, North American Phillips Corp. (Norelco) and Honeywell recently have moved into the detector field and are distributing their products nationally. Norelco did not even go into a test market. The company felt this market was so huge that the saturation factor was nil.

That such detector devices are needed is beyond question. NFPA data estimates 12,000 lives are lost each year in fires. The majority result from the effects of smoke and toxic gases before being exposed to flames.

Another 300,000 people are injured annually in fires. Early warning from home fire warning equipment provides a high potential for reduction of these injuries. To be effective, home fire warning equipment must possess a high degree of reliability over a long period of time (30 years does not seem unreasonable).

There are essentially two types of home fire warning equipment. One type is activated by heat, the other is a smoke detector.

The 1974 edition of NFPA no. 74, however, recognizes the fact that smoke detector technology had advanced to the point where the judicious installation of one or two smoke detectors could be more effective than a house full of heat detectors in alerting occupants of fire.

Further, from available statistical data, it appears that most dwelling fires start with smoldering. The first combustion product is smoke, thus, it would be valid to select a smoke detector rather than a heat detector as a more suitable early warning fire detection device.

Essentially, two different sensing modes are used by single station smoke detectors. In one type of detector (referred to as a photoelectric smoke detector) the principle of scattered or reflected light is used. Under no-smoke conditions the chamber is dark and the light shines across the chamber and is received in a light trap on the far side. When smoke is present in the chamber, a photocell located on the side of the chamber at right angles to the light source sees the light scattered off the smoke particles and, at a suitable illumination level, triggers the alarm.

In the other type of detector (referred to as an ionization chamber smoke detector) a radioactive source material is used to ionize the air within the sensing chamber. The ionization of the air results in a very small electrical current flow, and smoke particles from a fire enter the chamber. This reduces current flow and the reduction in current actuates an alarm horn.

There is no lack of discussion regarding the relative merits of these two types of smoke detectors. For every point on one side, there seems to be a point for the other. Current usage is greater in photoelectric, so this type should be permanently wired into the dwelling's electrical circuit. The power consumed by the ionization chamber type is very low and for this reason battery power can be used safely. In no case should either type be used when no UL or FM listing appears on the unit. At present, it is the ionization chamber battery power which seems to be gaining in favor.

Two types of batteries are now used in the battery-operated detectors: alkaline and mercury. Alkaline batteries have almost a descending straight line deterioration voltage graph and need some method of avoiding a reduction in sensitivity as the battery voltage declines.

The mercury batteries have a fairly constant voltage during their useful life, hence the detector has a uniform sensitivity during the life of the battery. This, certainly, is a point in their favor.

All types of household fire warning equipment are constantly improving. An improvement under development at this time would produce a longer life source for the photoelectric detector, such as a lightemitting diode. Another example is utilization of a solid state, semi-conductor crystal sensitive to combustible gases.

It is assumed that the owner of the home will take care of regular maintenance. Maintenance should include the following:

Replace batteries at least once a year, even if the warning device for weak batteries has not sounded.

Replace photoelectric bulbs once a year.

More and more these devices are being required by law and/or building codes. For example:

FHA now requires the installation of at least one smoke detector in homes which it finances.

Various local building codes throughout the nation are ordering the detectors in all new construction.

All mobile homes built henceforth will require these devices.

At the low cost of these devices and considering their proven reliability, no householder should fail to protect his family from fire. They are a safety precaution that should be utilized today.

—*R. T. Ferree, Safety Manager*
DeSoto, Inc.
Des Plaines, Ill.

Annual Conference

THE American Industrial Hygiene Association Annual Conference will be held at the Fairmont Hotel in New Orleans, May 22-27, 1977. □

Introductory Class

AIHA/NIOSH Course 510, "Introduction to Industrial Hygiene" will be given April 25-29, 1977 in Ann Arbor, Mich. and June 6-10, 1977 in Philadelphia, Pa. For information or registration call or write AIHA, 66 S. Miller Rd., Akron, Ohio 44313 (telephone 216-836-9537). Fee is $250. □

Program

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Provisions fo[illegible] by a qualified individu[illegible] respirators are prope[illegible] cleaned, maintained, [illegible]

Periodic training/retraining sessions to insure that users are familiar with the proper use of the respirator and its limitations.

Specific procedures on the maintenance and care of respirators to include inspection (including leak testing), cleaning, and disinfecting, repair and storage.

Next, the responsibility and authority for the respirator program must be assigned to a single person. This administrator should have sufficient knowledge of respiratory protection to properly supervise the respirator program. Further, he should have the authority to make the necessary decisions to attain successful implementation of the program.

After completely outlining our respiratory protection program, elaborating on our standard operating procedures to the point of pinning down all possible loose ends and spelling out responsibilities, we now have to motivate the employee to use the respirator he has been provided. This motivation can be accomplished effectively through training/retraining the employee in the understanding of the hazards being faced and the problems arising from the lack of the proper use of appropriate respiratory protection. Having motivated the employee to use the respiratory protection provided, we must periodically reinforce this need on a continuing basis.

Finally, with the full cooperation, understanding, conviction, and assistance of both the employer and the employee, we can implement our viable respiratory protection program. But in order to successfully implement our program on a continuing basis, we must maintain an ongoing surveillance and evaluation of the program and its effectiveness. This will necessitate continual assessment of the respiratory hazards encountered and immediate changes in the program when needed.

If we have the full cooperation and assistance of everyone involved in implementing the procedures we have outlined above on a daily basis, we can successfully implement a complete and successful respiratory protection program.

—Harry W. Rapp, Jr.
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The Travelers Insurance Companies

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Survival Test To Be Televised May 1

DON'T MISS television's "Big Event" on Sunday, May 1. The National Disaster Survival Test, a 90-minute NBC program, will be aired at 8:00 p.m. Eastern Time.

The program will be produced for NBC by Bush Productions, Inc., in cooperation with the National Safety Council. It was Warren Bush, president of BPI, who wrote and produced the National Drivers' Test for CBS in 1965. The program won the coveted Peabody Award and generated more mail than any TV program before or since. But unlike the Drivers' Test, which focused strictly on traffic safety, The National Disaster Survival Test will be concerned with all types of safety.

For more details, check the March and April issues of the *National Safety News*. □

In Proper Perspective

EVEN IF you are a less than average reader, you have no doubt noticed the increase in articles concerning toxic substances in our environment, both at work and at home. Many of these articles mention ppm (parts per million) ppb (parts per billion) and even ppt (parts per trillion). These terms are used to indicate the amount of contaminants in the air we breathe.

Dr. Warren B. Crummett of the Dow Chemical Co. has provided the following table so that lay people can better understand the terms. The table was published in the October 1976 issue of *MCA News*, published by the Manufacturing Chemists Association. □

TRACE CONCENTRATION UNITS

UNIT	1 part per million	1 part per billion	1 part per trillion
LENGTH	1 inch/ 16 miles	1 inch/ 16,000 miles	1 inch/ 16,000,000 miles (A six-inch leap on a journey to the sun)
TIME	1 minute/ 2 years	second/ 32 years	1 second/ 320 centuries
MONEY	1 ¢/$ 10,000	1 ¢/$ 10,000,000	1 ¢/$ 10,000,000,000
WEIGHT	1 ounce/ 31 tons potato chips	1 pinch salt/ 10 tons potato chips	1 pinch salt/ 10,000 tons potato chips
VOLUME	1 drop vermouth/ 80 "fifths" gin	1 drop vermouth/ 500 barrels gin	1 drop vermouth/ 250,000 hogsheads of gin or 1 drop vermouth in 520 30,000 gal tank cars of gin
AREA	1 sq ft/ 23 acres	1 sq ft/ 36 sq mi	1 sq in/ 250 sq mi
ACTION	1 bogey/ 3,500 golf tournaments 1 lob/ 1,200 tennis matches	1 bogey/ 3,500,000 golf tournaments 1 lob/ 1,200,000 tennis matches	1 bogey/ 3,500,000,000 golf tournaments 1 lob/ 1,200,000,000 tennis matches
QUALITY	1 bad apple/ 2,000 barrels	1 bad apple/ 2,000,000 barrels	1 bad apple/ 2,000,000,000 barrels
RATE	1 dented fender/ 10 car lifetimes	1 dented fender/ 10,000 car lifetimes	1 dented fender/ 10,000,000 car lifetimes

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Safety Classes Tailored To Fit

A NEW occupational health training course tailored to the needs of individual companies has been introduced by the American Industrial Hygiene Association.

The five-day course on "Recognition of Occupational Health Hazards" was inaugurated recently for 28 representatives of Diamond Shamrock Corp. from its plants throughout the country.

"By conducting the course for employees of our company only, we were able to tailor the course to Diamond Shamrock's specific needs," says Jim Laurence, a Shamrock corporate industrial hygienist.

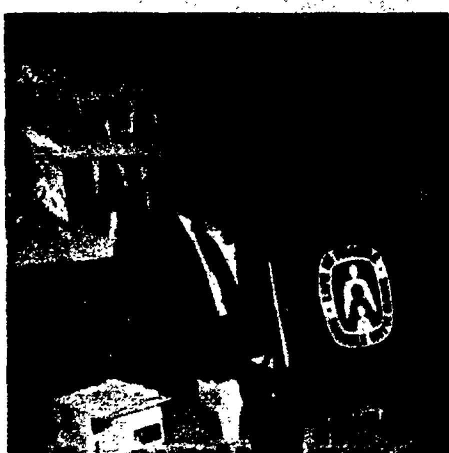
"We spent less time on certain subjects and techniques which we would not encounter or need at our plants," he explains, "and we expanded our study in other areas important to us."

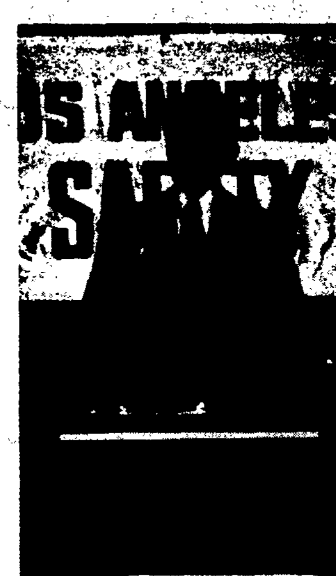
The course is aimed at plant management personnel who aren't occupational health specialists but whose responsibilities include insuring proper health and safety procedures in the workplace.

Practical techniques are emphasized for identifying biological, chemical, environmental, and physical hazards in industrial surroundings. Diamond Shamrock's school met in Akron, but AIHA says it can present the course anywhere in the country, according to client needs.

For more information about the course, contact William E. McCormick, AIHA, 66 S. Miller Rd., Akron, Ohio 44313. □

Chemical Section Holds Seminar





A Chemical Section Safety Seminar, held January 27 in Los Angeles, Calif., was co-sponsored by the National Safety Council and the Greater Los Angeles Safety Council. The LA Council promoted the meeting and the NSC's Chemical Section procured speakers for the seminar.

The photos, show clockwise from top right, Joe Kaplan, president of the Greater Los Angeles Safety Council welcoming guests to the seminar; Roger Carley, Chemical Section vice chairman of Programs addressing the seminar; National Safety Council President Vincent Tofany, Chemical Section General Chairman-elect T. A. Yoder, and General Chairman Owen Kubias; and Harry Edwards of Dow Chemical addressing the seminar on respiratory protective equipment.

Take It Easy

HOW MUCH time is saved by a driver who weaves in and out of traffic? That was the question posed recently by a builder of precision instruments and a tire manufacturer.

In a joint effort to find the answer, they equipped two identical cars with instruments to record driving details.

Over half of the 1,000 mile test route was on freeways.

Driver number one was instructed to travel the route in the shortest possible time. Driver number two was advised to avoid all risks, maintain the traffic tempo, and relax.

Driver number one crossed the finish line after twenty hours and twelve minutes driving time. The driver of car number two arrived 31 minutes later.

Although the fast driver took considerably more risks, his average speed was less than 50 mph compared to the slower driver's average of 48-plus mph. Other statistics follow:

	Fast Driver	Slow Driver
Panic stops	4	0
Applied brakes	1335	652
Passed others	2004	645
Passed by others	13	142

In addition to the greater wear and tear on car number one it consumed ten gallons more gasoline than car number two.

—*Safeco* Loss Controller