

newsletter

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

RUBBER &
PLASTICS
SECTION



Editor:
Michael S. Masinick
Safety Director
Uniroyal Inc.
6600 E. Jefferson
Detroit, Michigan 48232

JUNE 1975

Vinyl Chloride Health Program

With the advent of the Occupational Safety and Health Administration, industry in the United States entered a new era of awareness about possible harmful effects from excessive exposure to chemicals.

This does not mean industry was negligent prior to OSHA. In fact, many companies had excellent programs in this area for years. Others, however, did not. Furthermore, the long-term subtle effects of some chemicals are only now coming to light. Nevertheless, once industry becomes aware of a problem, it has an obligation to take action for the future.

Vinyl chloride fits into this category. Because it is so widely used, this chemical has received much attention lately. While one can argue the details of the proposed standards (see February 1975 issue), everyone recognizes

that the primary goal is to protect the worker from any serious health hazard.

One manufacturer disclosed the program being implemented in its plants that manufacture and process vinyl chloride. This does not imply that this is a perfect program or the best in the industry, of which this company represents only a small segment. What is intended is a picture of how one company has developed a program by following five basic steps:

1. Recognizing the hazard.
2. Monitoring carefully to locate sources of exposure.
3. Reducing exposure as much as possible.
4. Monitoring frequently to insure that the plant is operating under optimum conditions.
5. Requiring physical examinations for all employees, with special emphasis on tests for exposures.

All of the above steps recognize that we are still learning and that further changes may be necessary from time to time.

This company's program began almost immediately after the January 1974 announcement that vinyl chloride might be the cause of angiosarcoma, a rare liver cancer.

At first, all areas of the company's vinyl chloride plants underwent extensive monitoring with a continuous infrared monitor equipped with a chart recorder. Once a source of exposure was identified, technicians and engineers immediately tried to reduce or eliminate emissions. In some instances, the solution was simply fixing

RBB

or replacing a leaky valve. Other areas required better ventilation, such as removing wall sections or installing fans to increase circulation.

Major engineering changes have taken place in cleaning the vessels where vinyl chloride is converted into polyvinyl chloride. Traditionally, this has been the area of the highest concentration of fumes.

Since some vinyl chloride escapes polymerization, steps have been taken to reduce these vapors before the vessel is opened. The insides are steamed down, washed out, and aired with high-pressure water hoses and vacuum pumps.

Even with improved cleaning techniques, however, some PVC sticks to walls and pipes inside the vessel. A tank cleaner then climbs inside the reactor and scrapes off those deposits, which can retain some unreacted gas. During this operation, workers use supplied air respirators to protect themselves from the vapors.

Under the proposed standards,

workers exposed to vapor levels above the allowable limit must be supplied with a respirator. Until 1976, however, they may choose not to wear a respirator as long as the vapor level doesn't exceed 25 ppm. Vessel cleaners, for instance, breathe fresh, clean air from outside the building while chipping away at a reactor's inside surfaces.

Other protective equipment includes coveralls and gloves, which reduce skin contact.

Meanwhile, the plants continue to monitor for employee exposure to vinyl chloride. This involves taking numerous air samples. Several workers carry small plastic bags into which a pump pushes air from wherever the employee works. These samples are then injected into a gas chromatograph, which measures the amount of vinyl chloride in each bag. From this information a "job profile" can be put together, indicating typical exposure levels for each job.

Other employees, carrying sensitive instant reading instruments, make

daily checks at selected points around the plants. These devices instantly indicate the presence of any vapors and are used to detect leaks or faulty operations.

Another instrument, a portable gas analyzer, is set up at various locations to take continuous readings. It produces a graph showing fluctuations in the vapor level.

All vapor levels are recorded and posted for employees to read.

Furthermore, all employees and recent retirees from these plants undergo extensive medical checkups. These evaluations consist of a personal medical questionnaire, a physical examination, and five blood tests designed to spot abnormal liver conditions.

Roughly 12 percent of the workers had one or more results outside the normal range. Liver specialists agree that 10 percent to 25 percent of the general population would show such random abnormalities. These can be caused by many things, including too much liquor days or weeks before.

Most of these employees passed a second screening held two weeks later. Those who did not went through more elaborate tests conducted by the plant physician. A few still had persistent and unexplained abnormalities. They went through an extensive medical examination by a private liver specialist who found a variety of causes but none related to vinyl chloride. After more than a year, not a single case of angiosarcoma has been found among these employees.

This entire medical surveillance program has become a way of life for vinyl chloride workers, who must be rechecked at least once a year.

This program, of course, goes considerably beyond what is normally necessary, simply because vinyl chloride is a gas that permeates the entire plant. Most of the materials used in the rubber and plastics industry are not so volatile. If they are not inhaled as mists or dusts and are kept off the skin, there is no exposure. A good shower at the end of the workday is further insurance against exposure.

In conclusion, each process must be looked at carefully and proper work practices and medical programs established in recognition of each material's specific chemical, physical, and toxic properties.

Safety Spells Sense

Safety Angles For Anglers

To help prevent drownings and other accidents among the nation's amateur Izaak Waltons, the Red Cross recommends these pointers:

1. All fishermen should know how to swim, how to give first aid, and carry a first aid kit with them on fishing trips.

2. Fishing enthusiasts should listen to weather forecasts and not go on the water when threatening weather is forecast.

3. Fishhooks can catch anglers as well as fish, so fishermen should carry needlenose pliers, wire cutters, and a pocketknife in their tackle boxes. Always keep hooks in covered containers.

4. When casting, make certain there is room to do so without hooking someone else. Always look before casting and use an overhead cast while in a boat with others.

5. If you go on a fishing trip alone, leave word where you will be and

when you plan to return. However, it is much safer to fish with a companion.

6. Stay away from water where there are swimmers, water skiers, and skin and scuba divers.

7. Along the shore, wade cautiously to avoid slipping on hidden rocks or stepping unexpectedly into deep water.

8. Learn how to hold a fish properly while extracting a hook. Many species of fish have sharp teeth or fins that can cause painful hand wounds.

9. If you snag yourself deeply with a hook, cut off the line, bandage the wound, and go immediately to the nearest doctor or hospital.

10. When fishing in channels or rivers, never tie your boat to channel buoys.

11. Never stand up in a boat while fishing, and always have a properly approved personal flotation device for every person.

12. While fishing from the bank in snake-infested country, watch where you step and sit and what you touch. Wear high boots, because most snake bites are below the midcalf.

Solvents

The rubber fabricating industry has traditionally been a heavy user of solvents. In the early years of the industry, fire hazards were much better understood than long term or chronic health hazards. Benzene and carbon tetrachloride were largely eliminated in the years following World War II when it was realized that they could have serious chronic toxic effects.

In recent years, the science of testing chemicals on animals for chronic effects has grown rapidly. With large volume use of many solvents, new information on harmful effects on workers has come to light. This has led to a lowering of some threshold limit values (TLV's), and thus it is very important to keep alert to these changes and to make certain that your practices conform to the new standards.

Because of its low cost and good solvency for rubber, gasoline has been a preferred rubber solvent. Special grades such as "Rubber Solvent," "Textile Spirits," ligroin, and petroleum ether are used. All these vary somewhat in composition depending on their source and economic conditions. All of these are mixtures of many materials, and in some cases the content of a minor ingredient may dominate the toxicology of the mixture. Benzene, toluene, and hexane may all be minor components. With changing standards, it can easily happen that the precautions which were judged adequate when the process was set up are no longer adequate to meet the current standards.

At present there is no TLV for gasoline as such. Consequently, it is necessary to measure the separate components and check to see that their total does not exceed unity (1.0) when calculated by the formula:

C1 / T1 + C2 / T2 + ... Cn / Tn

C₁ is the concentration of one component and T₁ is its TLV. Likewise C₂ is the concentration of the second component, etc.

With shortages of petroleum there may be a considerable pressure on purchasing agents to buy different grades which vary substantially.

There is some discrepancy between OSHA standards and TLV's set by the American Conference of Governmental and Industrial Hygienists (ACGIH), as shown in Table I. (All figures are parts per million by volume on a time weighted average (TWA) basis for an 8 hour day.)

OSHA adopted the 1968 TLV List. The procedure for making changes is cumbersome. For this reason, it is wise to use the most conservative figure even though OSHA may not yet have adopted it.

In order to measure these separate components in mixed solvents, it is necessary to use sampling and analytical methods which are capable of identifying each component in the parts per million range. For this purpose, the gas chromatographic method is the best. Obviously, explosion meters or methods which give an overall reading on a dial are useless because they do not identify the separate components. The lower explosive limit is far above the TLV for almost all chemicals, as shown in Table II.

The designation "Skin" following a chemical means that contact through the skin, mucous membranes, or eyes can also contribute to toxicity. The "ceiling" concentration allows excursions up to the stated level so long as the time weighted average value is not exceeded.

Excursion Factors. The American Conference of Governmental Industrial Hygienists has recognized that for most chemicals the time weighted average exposure for an eight hour day is the significant factor. It follows that if the TLV is an average, a range of concentration between zero and some value higher than the TLV should be

TABLE II

Chemical	1974 ACGIH TLV	LEL (ppm)
Benzene	25	13,000
Toluene	100	12,000
Hexane	500	11,000
MEK	200	18,000

permissible. However, too high concentrations may be rapidly toxic. For this reason, the ACGIH has adopted excursion factors, as shown in Table III.

These factors do not apply to substances preceded in the TLV booklet by a C (ceiling values; see below).

Ceiling Values. When a C precedes the chemical name in the TLV booklet this is referred to as a ceiling value, a value which should not be exceeded for periods over 15 minutes. Such concentrations might cause intolerable irritation, chronic or irreversible tissue damage, or narcosis of a sufficient degree to increase accident proneness, impair self-rescue, or materially reduce work efficiency. The C designation is really a maximum allowable concentration (MAC).

Other solvents and rubber chemicals for which changes in TLV are intended are listed in Table IV with their old values and the proposed new values.

In addition, NIOSH has completed criteria documents on ammonia, asbestos, benzene, carbon monoxide, chloroform, chromic acid, cotton dust, crystalline silica, hot environments, inorganic lead, mercury, noise, sulfur dioxide, toluene diisocyanate, trichloroethylene, and ultraviolet radiation. They have submitted recommended standards for inorganic arsenic (0.05 mg/M³), crystalline silica, sulfur dioxide, and sulfuric acid. Documents are in process for several other chemicals. It will require considerable vigilance to keep up with the changes

TABLE I

Material	1974 TLV ACGIH	Intended Change	OSHA	
			TWA	Ceiling
Benzene-Skin	25	10	10	25
Toluene-Skin	100	-	200	300
Hexane	500	100	500	-

TABLE III

TLV	Factor
0-1 (ppm or mg/M ³)	3
1-10 "	2
10-100 "	1.5
100-1000 "	1.25

URL 16817

on a mandatory weekly basis for the first three months and at the discretion of the counselor thereafter.

3. Your industrial relations manager will be continually informed of your status in the Health Support Program and will work closely with your supervisor.

4. Your spouse and/or family members will be requested to come for an interview with the counselor in order to be advised of the objectives of the Health Support Program. Family members will be advised of existing agencies which offer assistance to families of alcoholics.

5. Participation in the Alcoholics Anonymous Program is strongly encouraged, except for drug abusers.

6. Drug dependent employees will be referred to appropriate clinics.

7. Should a medical leave of absence be necessary, normal insurance benefits for which you are eligible would apply as they would for any medical leave of absence.

8. Should you fail to cooperate with the Health Support Program and referral agencies, and your job performance or attendance continue to suffer, your benefits will be in jeopardy and you will be subject to normal disciplinary action.

The next step was the development of a written program. Uniroyal chose to implement it at the plant level through the existing industrial relations managers. They were asked to begin surveying area facilities for the rehabilitation of alcoholics and also to search for fee-for-service counselors. While this was going on, the Corporate Medical Department developed and made available a step-by-step guide for the plant program administrators (industrial relations managers) showing them how to set up an effective plant program.

The guide was complete with the statement of policy, the list of program requirements and benefits, a section describing the specific roles of the health support team members (plant program administrators, supervisors, the plant physician, union representatives, and the outside rehabilitation counselor), a referral route for health support candidates (stemming from supervisor, family, co-worker or self-referral), and an employee participation signature statement, as well as a list of some thirty anticipated ques-

tions—with answers.

The Corporate Medical Department has begun a series of supervisory film-discussion presentations. Keys to the success of the Health Support Program fall on the shoulders of supervisors, and great emphasis is placed upon giving all levels of supervision a basic knowledge of alcoholism and the do's and don'ts in confronting alcoholic employees, along with an understanding of the absolute necessity for basing such confrontations on job performance criteria and only on job performance criteria.

Uniroyal's Health Support Program, while in its infant stages, is already showing evidence of employee rehabilitation, improved job performance, and cost savings. Employee brochures will soon be mailed to all employees, and supervisory information brochures are on the drawing boards.

At a time when the economy dictates elimination of unnecessary expenses, this program is regarded as a cost savings that directly benefits both the company and the employee.

Smaller companies who are interested in setting up employee assistance programs for alcoholic employees need not back off due to the size of the company or the number of employees. While a full-time administrator is not necessary, counseling services may be obtained from a local or regional alcoholism/drug council. Such councils can be instrumental in aiding medium and small sized businesses by:

1. Designating an operational employee assistance program.
2. Training supervisors in the implementation of an alcohol program.
3. Providing counseling services.
4. Arranging for the evaluation and referral of employees for appropriate treatment and rehabilitation based on individual need.
5. Working with existing plant program personnel in the best interests of the afflicted employee.

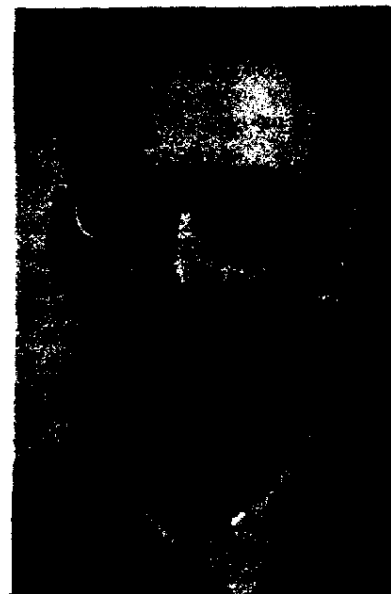
Whatever procedure and program method best fits a given company or plant situation, the obvious, initial accomplishment is the acceptance of the fact that alcoholism does exist within the plant or business and placing it out in the open where it can be dealt with. By utilizing a very persuasive motivational tool — the either/or approach — companies can rehabilitate alcoholic employees and help them

become productive members of the work force — assets, not liabilities, to their employers, their communities, and certainly to their families and themselves.

Does it work? We've found it does!

—John V. Howland
Coordinator, Health Support
Uniroyal, Inc.

Meet Your New Section Administrator



Phil Schmidt

The main thing that's wrong with bucket seats is that not everyone has the same size bucket.

The doctor told him to slow down, so now he's chasing older women.

THE WAY YOU DO YOUR JOB SHOULD NEVER BE AUTOMATIC. ALWAYS THINK ABOUT EACH PART OF YOUR JOB. DON'T LET AUTOMATIC ACTIONS CAUSE AN ACCIDENT.

—Safety Slants, Lloyd Stabb, Editor
Grain Processing Corporation

TABLE IV

Chemical	Old TLV	Proposed TLV
Butane	500	600 ppm
n-Butyl alcohol	100	50 "
Heptane	500	400 "
Isophorone	25	5 "
Methylene chloride	500	100 "
Nonane	—	200 "
Octane	400	300 "
Pentane	500	600 "
Resorcinol	—	10 "
Stoddard solvent	200	100 "

likely to take place in the next few years.

Of course, not all the chemicals or agents mentioned in the preceding paragraph are solvents. However, solvents create a special problem because they are volatile. There will be a strong trend toward eliminating solvents wherever possible. Thus, use of water-based paint as a dip eliminates the need for expensive ventilation equipment and the need to do extensive monitoring of worker exposure.

By completely reformulating, it will often be possible to reduce material costs, energy use, ventilation, and monitoring while creating a safer work place with less air and water pollution.

—W.D. Harris, Ph.D.

Corporate Industrial Toxicologist
Uniroyal, Inc.

Oldies But Goodies

(Continued from May issue)

PREVENTION COMES BEFORE AN ACCIDENT

Injuries do not occur every time somebody does something wrong. A man doesn't get hurt every time he lifts something while standing in an awkward position. He may trip over a misplaced object many times and not be hurt. He doesn't bark knuckles every time a poorly fitted wrench slips. He may fail to wear eye protection on many occasions when the exposure is momentary and not get hurt.

BUT — if he continues to do these things which are contrary to good practice, a serious injury will eventually occur.

Prevention is the work that is done before an accident occurs. It is the process of knowing what the probable causes of accidents are, recognizing their existence, and actually doing something to obliterate or control the causes.

The work that is done after an accident is not prevention. It is an attempt to derive some good from the loss that has occurred by definitely establishing the cause of the accident so that other employees using the same improper procedure may be corrected.

Thus it becomes preventive work for the future.

—Rubber Newsletter—May 1964

WHY WEAR SAFETY HATS? HEAD PROTECTION

Despite the fact that most head injuries are serious, there are a few workers who seem reluctant to wear safety hats.

Everyone should take advantage of such valuable protection as the safety hat. Men give various reasons for refusing to wear these hats. Here are some of the common objections and the reasons they do not hold true:

TOO HEAVY

Safety hats are a few ounces heavier than conventional headgear, but the extra protection is worth the extra weight. Actually, a safety hat is less than one-third the weight of any army helmet and liner.

TOO HOT

On a hot summer day with the temperature about 100° F it may not be as comfortable as you'd like it to be, but it would still be three to nine degrees cooler than inside an ordinary hat.

TOO COLD

Could be, but the problem is solved by wearing a winter liner. It'll keep head, neck, and ears warm without lessening the protective value.

CAUSES HEADACHES

There's no medical reason why properly adjusted safety hats would bring these complaints. More than likely there's another reason such as hunger, thirst, or eyestrain.

WON'T STAY ON

In a high wind, you'll need a chin

strap on your safety hat. Normally, however, that hat will stay on despite a lot of stooping and bending you may do in your work.

NOISY

Not at all. In fact, tests show that properly worn safety hats have a shielding effect on the wearer's ears. Noises are not intensified by the hat.

—Rubber Newsletter—July 1967

HOW DO YOU RATE? A LIST TO IMPROVE YOUR SUPERVISORY ROLE

How many times do you give thought to the many things you might be doing to improve your performance as a supervisor?

As a starter, take a look at this list of activities presented by the NSC Construction Section Newsletter as some of the many functions of a good supervisor:

- Takes the initiative in telling management about ideas for safer lay-out of equipment and keeping it safe.
- Is a professional when it comes to taking care of equipment and keeping it safe.
- Knows the value of machine guards and makes sure that proper guards are provided and used.
- Takes pride in knowing how to use equipment safely.
- Takes charge of operations that are not routine to make certain that safety precautions are determined and observed.
- Arranges for adequate storage and enforces good housekeeping.
- Knows what materials are hazardous and how to handle them safely.
- Works with every person under him without favoritism and helps them work together.
- Establishes good relations with union stewards and with the safety committee.
- Sets the example in safety.
- Uses judgment in criticizing or praising and knows the value of public praise.
- Not only explains how to do a job but shows how and observes in order to ensure that it continues to be done safely.
- Studies the seemingly unimportant accidents and takes corrective measures.
- Keeps everyone informed of the safety policy.
- Knows what personal protective

equipment is necessary on each job, and sees that such equipment is used.

—The Supervisor
Kemper Insurance
May 1971—Rubber Newsletter

A Program For The Alcoholic Employee

**Pretending It Isn't So Is Passe.
Meeting the Fact Head On Is In.**

The average alcoholic is a man or woman somewhere in his or her thirties who holds a job. That is to say that the average alcoholic is definitely not the derelict or skid row bum.

Alcoholism is an insidious, progressive illness that ranks third behind heart disease and cancer as a national health threat. It destroys health, homes, and families, as well as social relationships.

On the job, the alcoholic costs his employer a small fortune before being eventually discharged, having become simply unemployable. Each line worker costs at least \$3,500 annually in absenteeism, sick leave, wasted time and materials, as well as accidents. It is difficult to estimate the executive alcoholic's cost to his employer, but it is considerably higher than that of the line worker in terms of poor decision making, missed appointments, poor impression, and excessive travel and expense accounts.

The alcoholic is usually the last person to admit to the problem in spite of domestic upheaval which often results in broken homes. The alcoholic becomes progressively engrossed with just one objective — obtaining alcohol — and must hide, as best as he or she can, the problem from his or her employer, for alcohol cannot be obtained without income.

What does it take to motivate the alcoholic to admit to the problem and to accept help for it? Many businesses and industrial firms have found that once-valuable employees who have become alcoholics can be motivated

by threat of job loss along with assurance of help. When threatened with job loss, the alcoholic employee has a most painful choice to make. An interesting concept of a "marriage" begins to develop. The alcoholic employee desperately needs a job. The employer needs a productive employee. Hiring a new employee is normally far more expensive than rehabilitating the alcoholic employee. Rehabilitation makes good economic sense.

The logical answer, then, for maximum mutual benefit is to offer the employee an opportunity to be rehabilitated. Once rehabilitated, the ex-alcoholic often becomes a better-than-average employee.

Necessary to offering assistance to an alcoholic employee is the backing of top management and the cooperation of unions. Management must be convinced that sizeable losses due to employee alcoholism will be more greatly reduced by rehabilitating rather than replacing alcoholic employees.

Many persons, including those active in the field of rehabilitation, are surprised that the highest reported rates of recovery from alcoholism stem from company alcoholism programs. These rates are higher, by far, than those in hospitals, clinics, councils, or halfway house programs. Industry, today, is achieving recovery rates among employees in the 60 to 75 percent bracket — a remarkable figure for a very difficult task.

The way to achieve a high rate of recovery is to institute an employee assistance program for alcoholic employees. The financial cost of such a program is minimal compared to the economic and human savings.

The first step in launching an employee assistance program is to establish a management-endorsed statement of policy regarding a program for alcoholic employees. The Corporate Medical Department at Uniroyal developed such a statement of policy with endorsement from corporate management. This set the stage for implementation of Uniroyal's new Health Support Program.

Uniroyal's statement of policy reads as follows:

1. The company recognizes that alcoholism and drug abuse are medical illnesses.

2. We believe that the best interests

of the individual and the company are served when problem drinking and drug abuse are recognized and treated in their early stages.

3. Alcoholism and drug abuse cannot be treated successfully if the individual does not want to be helped.

4. Each employee is accountable for his own behavior, job performance, and attendance. These factors are frequently impaired by problem drinking and drug abuse which, once recognized by management, are regarded as company problems.

5. No employee who misuses alcohol or drugs will have his job security or promotional opportunities jeopardized by his seeking diagnosis and treatment. However, if an employee is uncooperative or indifferent to a rehabilitative program, and his job performance or attendance continue to suffer, then normal disciplinary action will be taken.

6. Employees who feel that they may have a problem with alcohol or drugs are encouraged to seek confidential assistance from the Health Support Program before their home, social, or job lives begin to deteriorate. The troubled individual himself holds the key to increasing his own chances of recovery.

7. When an employee who misuses alcohol or drugs deteriorates to the degree that his problem is evident to others, we believe that it becomes a responsibility of the observer, whether a family member, fellow employee, labor representative, or supervisor, to talk to the employee and urge that medical help be sought.

8. For the illnesses of alcoholism and drug abuse, the company makes available the same benefits as for other medical conditions which are under appropriate treatment. We believe that many employees with alcohol and drug dependency problems can be treated, rehabilitated, and returned to physical and emotional well being as valuable members of the work force and the community.

A simple but effective list of program requirements and benefits was quickly formulated:

1. Upon entering the Health Support Program, you will be offered (or will have already received) a physical examination by a company-designated physician.

2. Rehabilitative counseling will be