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HILL AND KNOWLTON, INC.

October 7, 1974

MEMORANDUM TO: VCM and PVC Producers Group
VCM Public Relations Committee
SPI Vinyl Chloride Group
Hill and Knowlton Vinyl Chloride Task Force

SUBJECT: OSHA VCM Standards -- Press Activities

OSHA's decision last Tuesday to release its long awaited permanent standard on vinyl chloride two days earlier than previously announced caught the industry and organized labor somewhat by surprise. Nonetheless, by a rapid mobilization of available manpower and resources, a plan decided upon by the VCM Public Relations Committee at a meeting in Washington on September 24 was put into effect. Representatives from SPI and Hill and Knowlton attended the Stender press conference in Chicago and reported back promptly on events at the conference. At the same time, personnel from Hill and Knowlton's Washington office and from Keller & Heckman were at the Department of Labor to pick up copies of the OSHA press release and the standards themselves. The release was telecopied to Hill and Knowlton in New York for immediate delivery to SPI.

Within a half hour of the announcement of the standards, an SPI press release, which had been prepared earlier in the day in anticipation of a promulgated standard stricter than that recommended by SPI, was issued simultaneously in Washington, New York, Chicago and Los Angeles, and to selected members of the plastics trade press (a copy of this release was sent to members of the VCM-PVC Producers Committee that evening by Keller & Heckman).

SPI-01714

In order to assure that papers received the release in time for inclusion in the next morning's editions, a summary of the standards was not added to the release as

prepared earlier in the day. Information that SPI had filed for judicial review was, however, telephoned that afternoon to various influential newspapers and wire services in Washington and New York.

The following morning (Wednesday, October 2), the original SPI press release was updated to include information on the contents of the standards package and on the law suit, and was sent to the SPI plastics trade press mailing list of some 300 publications. A copy of that revised press release is attached.

Later that afternoon, a completely new SPI press release dealing in some detail with the law suit was prepared and distributed throughout the country. A copy of that press release is also attached.

Press coverage of the OSHA standards was extensive. Attached for your information are copies of articles that appeared in The New York Times, Wall Street Journal, Journal of Commerce, The Washington Post, The Los Angeles Times, and wire stories from UPI and Reuters. Also attached is the two part series from The Wall Street Journal on VCM, an editorial from The New York Times of October 4, and an excellent article from the October issue of Fortune.

On Friday, October 4, a third SPI press release on the OSHA standards was issued, again nationwide. A copy of that release is also attached.

As a result of the numerous press releases issued by SPI during the course of last week, well over a hundred press queries were received by SPI in New York and by Hill and Knowlton in Washington. Once again, SPI has established itself as the prime source for industry comments on the new standard.

On Friday evening, October 4, CBS-TV evening news ran a segment on the new standards, in which feasibility was the prime topic. The SPI press release from last

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June with regard to the results of the Arthur D. Little study was quoted extensively.

A transcript of the show will be forwarded as soon as it is available.

It is to be anticipated that, as a result of the press queries received, numerous articles on VCM quoting the SPI position will be appearing in various publications over the next few weeks. Copies of these will be distributed when available.

Matthew M. Swetonic
Matthew M. Swetonic

/sr

attachment

SPI-01716



THE SOCIETY OF THE PLASTICS INDUSTRY, INC.
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FOR IMMEDIATE RELEASE, (Tuesday, Oct. 1, 1974)

PLASTICS INDUSTRY LABELS OSHA
VINYL CHLORIDE STANDARDS UNREALISTIC

NEW YORK, Oct. 1 -- The Occupational Safety and Health Administration (OSHA) permanent occupational health standard on vinyl chloride monomer announced today is unrealistic, probably will be impossible for most, if not all, of the industry to meet and appears to have been developed on some basis inconsistent with recorded facts, according to The Society of the Plastics Industry, Inc. (SPI).

The standard announced by OSHA calls for a limit of one part per million of vinyl chloride monomer as measured over an eight-hour working day, with a ceiling of 5 parts per million as measured over any 15 minute time period. The standard applies to fabricators of finished polyvinyl chloride products as well as to producers of vinyl chloride monomer and polyvinyl chloride resins, and is scheduled to go into effect January 1, 1975.

SPI President Ralph L. Harding said that "OSHA may believe that it has adopted a compromise position between organized labor on the one hand and industry on the other, but the result is a standard that does not take into account in a practical way the known medical and technological facts."

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Shortly after the OSHA announcement, SPI filed a petition for judicial review of the standard in the United States Court of Appeals for the Second District of New York. A similar suit was filed by Hooker Chemical Company of Stamford, Connecticut.

Vinyl chloride monomer (VCM), an industrial chemical used in the production of polyvinyl chloride (PVC), a widely used plastic resin, has been linked in recent months with a higher than normal incidence of angiosarcoma of the liver, a rare form of cancer, among previously highly exposed workers.

According to Mr. Harding, "the evidence presented at the OSHA public hearings in late June on VCM clearly showed that the employee deaths from angiosarcoma were a result of conditions existing decades ago, when exposure levels were many times greater than they are today. Furthermore, data developed by the Dow Chemical Company showed no excess mortality from any cause among long term workmen exposed to levels below 200 parts per million (ppm).

"OSHA apparently relied heavily on animal studies in setting its standard. This is quite incomprehensible, especially when more relevant human mortality data is available," Mr. Harding said.

At the OSHA public hearings the VCM-PVC Producers Committee of SPI recommended the establishment of a ceiling standard of 40 ppm and an eight hour time weighted average (TWA) exposure of 25 ppm for the PVC resin industry, and a ceiling of 25 ppm and a TWA of 10 ppm for the VCM producing industry, with additional phased reductions over the next few years. SPI also recommended that fabricators of finished PVC products be excluded from coverage under the standard altogether or that a separate, more relevant standard be considered for that part of the industry.

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(more)

"Our recommendations," Mr. Harding said, "were based on an honest evaluation of what the industry believed it could accomplish with known technology or with technology that could hopefully be developed within the next few years. Not one shred of evidence was presented at the public hearings or since which could have lead OSHA to the conclusion that a lower level was necessary or achievable throughout the industry at this time."

As to the net effect of the standards on the industry, he stated, "It would be inappropriate for us to comment on the overall impact until we have had time to study carefully the entire set of standards."

SPI

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FOR IMMEDIATE RELEASE (Wednesday, Oct. 2, 1974)

SPI FILES VINYL CHLORIDE
LAW SUIT CHALLENGING
NEW OSHA STANDARD

NEW YORK, Oct. 2 -- A lawsuit filed by The Society of the Plastics Industry, Inc., on October 1, following the announcement of the Occupational Safety and Health Administration (OSHA) permanent standard on vinyl chloride is intended to seek "prompt and complete judicial review of the standard in an appropriate legal forum," a spokesman for SPI said today.

The SPI suit was filed in the United States Court of Appeals for the Second Circuit in New York. A companion suit was also filed by Hooker Chemical Company and, it was announced today, Firestone Plastics Company joined the appellate court suit in New York and also filed individual action in the Sixth Circuit Court.

According to Ralph L. Harding, Jr., President of SPI, the action filed in the appeals court is simply a petition for the court to review the OSHA standard and to examine the important question of its feasibility.

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"We believe now, as we did when we presented our testimony to OSHA only two months ago, that an excessively strict standard cannot be met by the industry," Mr. Harding said. "We also believe that the standard announced by OSHA is so restrictive that it merits immediate appeal.

"In effect," Mr. Harding said, "OSHA has called for establishing operating standards for the vinyl chloride and polyvinyl chloride industries which are impossible to achieve technologically."

OSHA promulgated a standard of one part per million of vinyl chloride monomer as measured over an eight-hour working day, with a ceiling of 5 parts per million as measured over any 15 minute time period.

SPI said this standard is in effect the engineering equivalent of the "no detectable level" originally proposed by OSHA and therefore could have the effect of shutting down the industry with a resultant loss of 1.7-2.2 million jobs in consuming and related industries and a loss of domestic production value of \$65-90 billion annually.

Vinyl Chloride Rules Seek To Guard Workers' Health

Special to The New York Times 10/2/74

WASHINGTON, Oct. 1—The Department of Labor announced today final industrial health rules designed to reduce work-er exposure to vinyl chloride, a cancer-causing chemical widely used as a basic material in the manufacture of plastics.

The final rules, to become effective Friday, will continue the 50 parts per million level through Dec. 31 and require a reduction, thereafter, to only one part per million averaged over any eight-hour period and five parts per million averaged over any 15-minute period.

John H. Stender, head of the department's Occupational Safety and Health Administration, said the rules would protect workers by significantly reducing the amount of vinyl chloride to which they were exposed.

The chemical has been shown to induce incurable cancers of the liver in some workers exposed to it over substantial periods of time.

The dangerous effects of the chemical became a public issue last January when the B. F. Goodrich Company reported that several of its employees had died of relatively rare cancers of the liver called angiosarcomas. The employees had been exposed to the chemical over long periods of time during their work.

Because of these and other deaths, reported later, the Labor Department safety and health unit issued an emergency rule on April 5 lowering the permissible exposure levels from 500 parts per million to 50 parts per million. The emergency standard would have expired this Saturday.

These limits on the permissible concentrations of the chemical in the air of industrial work places would be tightened further on Jan. 1, 1976. In that third phase of the new rules, workers would be required to wear respirators if they were exposed to air containing more vinyl chloride than the one part per million and five parts per million limits.

During 1975, respirator use would be discretionary at air levels below 25 parts per million.

The industry objected immediately after the new rules were announced here and at a National Safety Congress Mr. Tender is attending in Chicago. Firestone Plastics Company said it was planning a legal challenge and declared that the new ruling "puts the vinyl plastics industry on a collision course with economic disaster."

The Society of the Plastics Industry Inc. said the occupational health standard was unrealistic and that it would probably be impossible for most of the industry to meet it.

SPI-01722

Health Hazards

Vinyl-Chloride Scare Points Up Dangers Of Other Chemicals

Substances Long Believed
Safe Now Are Regarded
With Greater Skepticism

A Hospital's Hidden Perils

By BARRY KRAMER

Staff Reporter of THE WALL STREET JOURNAL

It's a simple molecule: two atoms of carbon, three atoms of hydrogen and a single atom of chlorine. At room temperature it is a gas. The molecule is called chloroethylene by chemists, but it is more commonly known as vinyl chloride.

The chemical structure of vinyl chloride has been known since the 1830s. Since a decade after the Civil War, scientists have known how to link, or polymerize, the vinyl-chloride molecules like beads on a chain to form a plastic called polyvinyl chloride, or PVC. Since the late 1930s, when B. F. Goodrich perfected a commercial process for polymerizing vinyl chloride, the plastic has come to be a staple in thousands of household products ranging from kitchen food wraps to construction materials.

Last January, the world learned something else about vinyl chloride: It can cause

This is the second of two stories concerning implications of the discovery that vinyl chloride can cause cancer.

cancer in humans. Twenty-six cases of a rare liver cancer have been discovered among workers in polyvinyl-chloride plants. All of the workers were exposed over many years to large quantities of vinyl-chloride gas. In recent months, further evidence has come to light indicating that the gas is also responsible for an increase of other cancers among the workers in the PVC plants. As a result, there now are standards regulating vinyl-chloride emissions in factories. Vinyl-chloride gas has also been banned for use as an aerosol propellant, and the Food and Drug Administration is toughening restriction of the amount of vinyl-chloride in PVC food wraps.

Potential Dangers

Vinyl chloride, of course, is far from the only man-made chemical known to cause cancer or, for that matter, other human ailments. Industry regularly works with toxic substances of all types known to cause ill effects ranging from skin disorders to damaged lungs, kidneys and livers. In fact, the findings about vinyl chloride point up the potential dangers of an entire group of similar chemicals, which, like vinyl chloride, contain hydrogen, carbon and chlorine. The chlorinated hydrocarbons, as the chemicals are collectively called, are used in a broad range of products to which every human being has multiple exposures.

It would be difficult to find a person anywhere who hasn't come into contact with products such as plastics, anesthetics, insecticides and herbicides, solvents and pharmaceuticals, all of which can be made from chlorinated hydrocarbons. As a result of their widespread manufacture and use, molecules from these products can be found everywhere on earth and in the upper atmosphere. Such molecules are also commonly found in human tissues.

What is particularly concerning some scientists is the fact that the compounds are rarely found in natural systems unless those systems have been exposed to man-made pollution. "Although all living things contain considerable amounts of chloride ion . . . very few chlorinated organic compounds actually occur in living things," says Dr. Barry Commoner, director of the Center for the Biology of Natural Systems at Washington University in St. Louis.

Trial and Error

Dr. Commoner further notes that biologic evolution is a process of trial and error over millions of years; therefore, he says, the assumption can be made that since the chlorinated hydrocarbons are virtually absent from all living things, the compounds are likely to be "evolutionary rejects." And that means, he says, that if such compounds invade a natural system like that of man, they are likely to be toxic.

"This means that industrial operations that synthesize or make use of such substances, and agricultural and other operations that disseminate them into the environment, ought to be governed by the level of prudence that is demanded by the inherently dangerous situation," Dr. Commoner says. "That we now are discovering, with increasing frequency, health hazards due to dissemination of synthetic organic substances, both in the workplace and the general environment, is evidence that we have thus far failed to appreciate the need for such care."

It is interesting to consider that vinyl chloride, in the early days following its discovery, was actively considered as an anesthetic for surgery. But animal tests showed that the gas caused heart irritation, and it was abandoned for that use in favor of other substances. However, many anesthetics in use today are chemically related to vinyl chloride—and there is growing evidence that they aren't without harmful side effects.

For the past several years, for example, there have been scattered reports of ill effects suffered by those who administer anesthesia and among others continually exposed to anesthetic gases while working in hospital operating rooms. It has also been known for some time that there is greater-than-expected incidence of spontaneous abortion among female anesthesiologists and nurse-anesthetists and, more tellingly, a greater than expected rate of certain types of fatal cancer among anesthesiologists of both sexes. (There is no evidence that such anesthetics pose long-term dangers to surgical patients.)

One recent survey of nurse-anesthetists in Michigan showed that of those who worked in the operating room during preg-

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Health Hazards: Scientists Take Another Look at 'Safe' Chemicals

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nancy, more than 16% delivered infants with birth defects, compared with a birth defect rate of under 6% among nurse-anesthetists who stopped working during their pregnancy. Other surveys have found higher-than-expected rates of miscarriage and stillbirths among the wives of anesthesiologists, even though these wives presumably didn't enter an operating room until the time of their deliveries. One explanation advanced by observers is that the anesthesiologists somehow carried home sufficient amounts of anesthetic gas in their breath or on their clothes to affect their spouses.

Studies are currently under way to determine whether or not the wives of vinyl chloride workers have been affected by minute amounts of the gas unwittingly carried home by their husbands from the plants. Of particular interest is the rate of stillbirths and miscarriages among these women. The studies are by no means simple, since the true rate of fetal wastage throughout the nation isn't exactly known and therefore a basis of comparison is difficult. Furthermore, the women's husbands are also ordinarily exposed to a wide variety of chemicals other than vinyl chloride, hampering direct correlations.

There are, of course, other carcinogens, or cancer-causing agents, and toxic chemicals in widespread industry use that are even more dangerous than vinyl chloride. Before the Labor Department began setting standards for vinyl-chloride emissions in factories—by an emergency decree in May and then by a "permanent" standard effective next Jan. 1—it had issued standards last January for 14 other carcinogens.

The implications of all these studies and standards are clear: Industry will no longer be able to assume blithely that untested chemicals in the work environment are safe simply because they've never demonstrated any overt harm. Like vinyl chloride, which took years to take its toll on worker health, many chemicals thought to be harmless may be equally insidious. This may well mean that there will have to be extensive animal testing of new chemicals before they are introduced and that workers' health will have to be continually monitored to detect clusters of disease.

The task of such testing and monitoring would be mammoth indeed. There are currently 25,000 industrial chemicals. More than 500 new ones are introduced every year. With an array like this, it's likely that other vinyl chlorides are lurking in the background.

Allied Chemical Corp. and Dow Chemical Co., for example, recently reported to the Labor Department's Occupational Safety and Health Administration that they had found excess cancer mortality among workers at two plants that made pesticides with inorganic arsenic. One study, conducted by Johns Hopkins University's School of Hygiene and Public Health, found that of the 22 retired male workers from Allied's Baltimore pesticide plant who died between 1962 and 1972, 17 had died of cancer. At Dow's Midland, Mich., arsenical pesticide plant, which was closed down 20 years ago, Dow

researchers found that of 173 workers who died between 1940 and 1972, 57 died of cancer. Both studies show higher-than-expected rates of cancer death.

Based on previous, less-conclusive evidence linking arsenic with cancer, the National Institute for Occupational Safety and Health last January recommended reducing maximum levels of arsenic in the air of factories from the present 0.5 milligrams per cubic meter of air to 0.05 milligrams. Industry has opposed that reduction, but there is growing pressure on the Occupational Safety and Health Administration to impose a "no detectable" limit on arsenic.

Obviously, it isn't enough to learn that workers exposed decades before to vinyl chloride, arsenic and asbestos—to name a few carcinogens—are dying today of cancer or of other toxic effects of those substances. But the question of how to go about determining whether chemicals are indeed lethal in the long term is the subject of some dispute.

Suggested Solution

One suggested solution is to test all chemicals already in the workplace and to test other chemicals before they are used. However, Dr. Irving J. Selikoff, an expert on environmental carcinogens at Mount Sinai School of Medicine in New York, claims that this would be "unrealistic and scientifically impossible."

"Resources are limited," he says, "so we can't go charging off in all directions at once." Instead, Dr. Selikoff says that he and Dr. E. Cuyler Hammond, the chief health statistician of the American Cancer Society, have worked out some tentative testing guidelines. First, he says, chemicals to be tested should be those to which large numbers of workers are exposed. If many consumers are exposed to the chemical as well, he adds, the substance is an even likelier target for study.

An example of one such chemical is carbon black, an ingredient in rubber tires and, consequently, a widespread air pollutant. "We ought to be taking a look at what's happening to carbon-black workers," the doctor says. (Scientists currently know that massive doses of carbon black painted on the skin of mice has caused tumors.) Other prime study targets, he says, are substances whose chemical structure is "suspicious" (or not unlike the structures of known carcinogens).

A Complication

The testing envisioned by Dr. Selikoff would be a combination of animal trials, in which hundreds of animals would be exposed for long periods to the chemicals being studied, and statistical surveys of working populations that have handled the chemicals. "There are agents to which millions of people have been exposed which now can be evaluated in terms of long-term human experience," he says. "The human data is there waiting for us to evaluate it." (Because animal studies don't always predict what will happen in humans exposed to the same substances, he says, the human monitoring is essential.)

All this testing would be complicated by the possibility that some chemicals in the

workplace cause cancer only in combination with other chemicals. And the exposure of most workers to many chemicals at the same time would make it difficult to pinpoint the offending chemical.

The cancer danger of vinyl chloride was spotted only because it caused an exceedingly rare tumor, liver angiosarcoma, of which there are only slightly more than 100 cases in medical literature. If vinyl chloride were to cause a more common malignancy, such as lung cancer, it wouldn't have been so readily detected as a carcinogen.

But testing is only one part of the problem, the other part being what to do about toxic substances once their dangers are exposed. There's some risk in almost every activity, meaning that "acceptable" risks have to be determined for various substances. For example, even sugar, if injected in sufficiently large doses, will cause cancer in laboratory animals; yet no one is suggesting that sugar use be drastically curtailed among humans for that reason.

To arrive at a balance between risks and benefits, the risks must be fully understood. But very little is known about the dangers posed to workers by the thousands of substances they work with, and there is little optimism that such substances will be fully tested in the near future. Government agencies are understaffed and working with limited funds. A Toxic Substances Control Act, which the Labor Department says it needs to strengthen its hand in controlling industrial chemicals, is stuck in a House-Senate conference committee.

Of course, even if such an act were to be passed, even the most sanguine aren't suggesting that the workplaces of America's industry will be cleared of danger. Nevertheless, it is becoming more and more evident that there is less willingness to accept chemical dangers as simply as inescapable part of working life.

"Whatever happens," editorializes *Lancet*, the British medical journal, "the vinyl-chloride episode will have provided a salutary lesson. It will not be quite so easy in the future as it has been in the past for any chemical manufacturer to assume, until proved otherwise, that a chemical to which workers are exposed is carcinogenically safe. There must surely be more systematic evaluation of industrially used chemicals for carcinogenic risk to workers."

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(STORY BEGAN ON PAGE ONE)

Vinyl Chloride Regulations Set

By ROBERT M. LEWIN

Journal of Commerce Staff

Tough new standards regulating the amount of vinyl chloride gas to which workers may be exposed were announced by the Labor Department in Washington and Chicago yesterday.

The plan provides that on Jan. 1, 1975, the level of exposure may not be more than one part per million in factory air averaged over eight hours, or five parts per million in any period no longer than 15 minutes.

John H. Stender, assistant secretary of labor in charge of administering the Occupational Safety and Health Act, signed the new rules at a Chicago press conference yesterday and said that he expected lawsuits attacking the standards from both labor and employers.

It did not take long for Stender's prediction to materialize. A few hours later, the SPI filed a petition for a judicial review of the Labor Department's standard in the U. S. Court of Appeals for the Second District of New York. No injunctive relief was sought. A similar suit was filed by the Hooker Chemical & Plastic Co. in Stamford, Conn.

Ralph L. Harding, Jr., president of the Society of the Plastics Industry in New York, issued a blistering statement, saying that the proposed standard is unrealistic and probably will be impossible to meet for most, if not all, of the plastics industry.

"There will be no exceptions," Mr. Stender said, announcing that the rule would apply to all employers, even if they had only one employee.

Mr. Stender said that the existing provisional standard which permits 50 parts per million level will continue until Dec. 31, 1974 to give employers reasonable time to make changes in their plants.

After the new standards will have been in effect for one year — or by January 1, 1976 — it will be mandatory for workers who are exposed to either one or up to five parts per million of vinyl chloride gas to wear respirators. Until Jan. 1, 1976, the use of respirators will be optional, provided the exposure is to not more than 25 parts per million.

The rules apply to chemical plants making vinyl chloride monomer, to resin manufacturers making polyvinyl chloride (PVC), and to fabricators making products from vinyl — anything from an automobile top to a rock music record. Mr. Stender said that the rules apply to 7,500 manufacturing plants employing 350,000 workers, and to chemical production plants employing more than 6,500 workers.

Mr. Harding said that the Labor Department "may believe that it has adopted a compromise position between organized labor on the one hand and industry on the other, but the result is a standard that does not take into account in a practical way the known medical and technological facts." Some labor leaders had demanded a zero part per million standard.

During the June hearings in Washington, Mr. Harding said, "the evidence on vinyl chloride monomer clearly showed that the employee deaths from angiosarcoma were a result of conditions existing decades ago when exposure levels were many times greater than they are today."

Furthermore, data developed by the Dow Chemical Co. showed no excess mortality from any cause among long-term workmen exposed to levels below 100 parts per million.

OSHA apparently relied heavily on animal studies in setting its standard. This is quite incomprehensible, especially when more relevant human mortality data is available."

Labor Sets Tough Standards On Vinyl Chloride Exposure

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Economic Disaster Seen

OSHA Vinyl Standards Blasted

By WILLIAM H. LANDER
Journal of Commerce Staff

The stringent new government standards covering vinyl manufacturing put the vinyl industry on a collision course with economic disaster which could throw two million men and women out of work. Todd C. Walker, president of the Firestone Plastics Co., Pottstown, Pa., said yesterday.

The Office of Safety and Health Administration (OSHA) of the Department of Labor has decreed that effective Jan. 1, 1975, only one part per million of vinyl chloride gas may be permitted in areas where operators work eight hours a day.

The temporary standard of 50 parts per million, adopted in April, 1974, will prevail until the end of the year.

Legal Steps

Mr. Walker added that his company is initiating the necessary legal steps to challenge the OSHA order, thus joining the Society of the Plastics Industry and Hooker Chemical & Plastics Co., which had already filed suits. Hooker filed its petition in Stamford, Conn., and the SPI asked the U. S.

Court of Appeals for the Second District of New York for a judicial review of the order. Several SPI member companies are expected to join in its suit, as they did when the SPI successfully challenged the New York City tax on plastics containers in New York Supreme Court two years ago. Dow Chemical also said it will seek judicial relief.

On the other hand, Robintech Incorporated in Fort Worth, Texas, announced that on the basis of its understanding of the announcement by the Labor Department, all of its PVC pipe fabricating plants will meet the one part per million vinyl chloride standard. It also said that its new Shintech plant at Westport, Texas, will have little, if any problem in complying, but the Painesville, Ohio plant will require some modification in the reactor, slurry stripping and slurry drying areas. Robintech said it believes these changes can be made within the time frame indicated.

The Dow Chemical Co., Midland, Mich., which is a manufacturer of vinyl chloride

monomer, in a statement said that the OSHA standards were "unnecessarily stringent" and not supported by the data on Dow Chemical Co. workers which was presented at public hearings in Washington in June.

Mr. Walker, who heads a division of the Firestone Tire & Rubber Co., which is a major PVC producer with a capacity of some 400,000,000 pounds per year did not mince words in his reaction to the OSHA order.

OSHA Standard

"The permanent OSHA standard for vinyl chloride exposure," Mr. Walker said, "puts the vinyl plastics industry on a collision course with economic disaster."

"More importantly, it throws 2,000,000 jobs down the drain, according to an economic impact study made earlier this year by the Arthur D. Little Co."

"This study, other medical, scientific and engineering data submitted by the industry and individual companies in response to OSHA's request, appear to have been completely ignored in establishing this standard."

"The result is that it is economically unrealistic, technically unfeasible, politically motivated, and medically ridiculous, comparable to a law aimed at stopping automobile deaths by lowering the speed limit to one mile per hour."

In Midland, C. B. Branch, president of Dow Chemical, said that "our data based on nearly 25 years of experience without any cases of liver cancer indicates that the new standard is more restrictive than necessary to protect the health of our workers."

"We had as early as 1961 dropped from the then accepted exposure standard of 500 to 50 parts per million voluntarily as our Dow standard, and Dow Chemical U.S.A. is currently operating under conditions which generally limit worker exposure to less than 10 parts per million on an eight-hour time weighted average. These low levels of 10

p.p.m. or less, which are being experienced, can only be achieved through advanced engineering methods and good work practices on the part of our employees."

"We question the ability of the industry to develop the technology to meet the level of one part per million (time weighted average) and five parts per million ceiling in the time specified and we will seek remedies through the judicial process."

Robintech also took advantage of the commotion of the standards to announce that the Shintech plant at Freeport will have 150 million pounds more capacity than originally planned. This plant "is to accommodate the continued demand for PVC resin and should be completed by fall 1975," the company said. The plant belongs to Shintech Inc., a joint venture of Robintech and Shin-Etsu Chemical Industry Co., Ltd., Tokyo, which is a leader in the PVC field in the Far East.

It's just been learned that the original plan for the OSHA announcement was for it to be issued today, however the issuance was speeded up so as to provide John H. Stender, assistant secretary of labor in charge of OSHA, with a ready-made forum at the 62nd National Safety Congress and Exposition in Chicago sponsored by the National Safety Council.

The shift in government plans, however, did not catch the plastics industry sleeping, so that within minutes of the signing of the new OSHA standard, the SPI was at the courthouse asking for judicial review.

At the meeting of the Congress in Chicago yesterday, R. Heath Larry, vice chairman of United States Steel Corporation, said that there had been great potential values in the Occupational Safety and Health Act, "but they have been more potential than real." At one point he said:

"We have seen more than we ought to have of standards directed at 'conditions' — which either require the impossible, — or require the possible in an impossible time frame — or require the un-

Firestone Plastics Chief
Sees Vinyl Regulations
Courting a Major Disaster

reasonable because there has not been an opportunity for an adequate research of the relationship between 'dosage and response' — and the relative cost of reducing to different levels of dosage. . . ."

Reservations Voiced On Vinyl Health Rules

By ROBERT LEWIN

Journal of Commerce Staff

CHICAGO — Leaders of unions representing workers in plants producing and using vinyl chloride said yesterday that they have "cautious reservations" about the new health standards over the cancer-causing chemical.

They agreed that the new three-phase job rules applying to the gaseous chemical are "a step forward, toward a good standard."

But they emphasized that the new standard is not one that "protects every worker, which is our goal."

John H. Stender, assistant secretary of labor, in charge of administration of the Occupational Safety and Health Act, made public last Tuesday the "final job health rules" that are designed to reduce worker exposure to vinyl chloride.

In discussing the government's three-phase program, Jacob Clayman, secretary-treasurer, AFL-CIO Industrial Union Department, stressed that labor's goal is worker exposure to no particles of vinyl chloride at all.

"It could be that one part per million in air exposure to vinyl chloride means no detectable limit," said Mr. Clayman.

But we have not changed our view — there should be no worker exposure to vinyl chloride or any gaseous chemical that causes cancer."

Sheidon W. Samuels, the Industrial Union Department's director of health and environment, said that the department would consult with the doctors who have worked with the unions on the vinyl chloride problem.

Mr. Samuels also said that meetings would be held with health and safety specialists of the 13.5-million member AFL-CIO and affiliated unions and with doctors who have worked on the vinyl chloride problem.

The issue has alarmed union officials since Jan. 22, this year, when the National Institute for Occupational Health and Safety told the Occupational Safety and Health Administration (OSHA) that B. F. Goodrich Chemical Co. had reported the death of several employees "from a rare liver cancer (angiosarcoma) may have been occupationally related."

Asst. Labor Sec. Stender said that under the three-phase program, which is to apply to all employers, includ-

ing those with only one worker:

— The level of 50 parts per million in air exposure to vinyl chloride, now permitted, is to be continued through Dec. 31, 1974.

Mr. Stender said that would give employers "a reasonable amount of time to accomplish changes in their plants that will permit them to reduce exposures or provide employees protective equipment."

— Jan. 1, 1975, employers must reduce levels to one part per million in air exposure to vinyl chloride — averaged over any 8 hour period, and 5 parts per million averaged over any period longer than 15 minutes.

— Jan. 1, 1976 — the third phase — workers will be required to wear respirators if they are exposed to levels higher than the "1 and 5 parts per million" allowable limits.

However, until Jan. 1, 1976, the wearing of respirators is optional for exposure no greater than 25 parts per million.

Mr. Stender said that the new rule would cover the manufacture, packaging, repackaging, transportation, storage, handling or use of vinyl chloride or polyvinyl chloride.

They will not apply to the handling or use of products made of polyvinyl.

Mr. Clayman said that "something less than 50 parts per million has caused cancer."

"We don't know what levels are tolerable. We don't know whether engineering is so precise that zero can be attained," he added.

"We believe that it will be very difficult to monitor air exposure to one part per million over eight hours, and five parts per million over a period up to 15 minutes."

"Five particles for 15 minutes — the monitoring can be so easily circumvented."

Mr. Clayman said that Industrial Union Department officials would consult their specialists and doctors to determine whether lawsuits are to be filed to strengthen the job health rules.

Plastics Corner

By WILLIAM H. LANDER
Journal of Commerce Staff

The legal battle against the OSHA standards for vinyls which are scheduled to go into effect on Jan. 1, 1975 has gathered momentum. Started by the Society of the Plastics Industry, it has been joined by Hooker, Dow, Firestone, and now B. F. Goodrich announces that it plans to take legal steps.

The level of one part per million of vinyl chloride gas which will be permitted for an eight-hour exposure to the operator contrasts with the present level of 50 parts per million.

The new standards, Goodrich said in a statement issued in Akron, Ohio, were established arbitrarily and are not supported by the record of OSHA hearings conducted in February and this summer. Technology to attain these levels does not exist today. Therefore, the full-time use of respirators by all employees would be required by 1978.

A spokesman for Goodrich said that it plans to seek a legal review of the standards. "It is an intention, but we don't know exactly how or when we'll seek a legal review. We would like to point out that we are a member of The Society of the Plastics Industry, and that organization has already filed suit."

Goodrich said that it intends to do whatever is required to sustain operations at its plant. It said that the vinyl chloride exposure in them had been reduced to an average of 12 to 18 parts per million, from the previous 35 to 40 p.p.m.

In New York, the SPI provided additional details about the impending legal battle. It said that its suit is intended to seek "prompt and complete judicial review of the standard in an appropriate legal forum." An SPI spokesman said that Firestone had joined in the SPI suit in the Second Circuit, and had also filed an individual action in the Sixth Circuit. Hooker filed its suit in Stamford, Conn.

Ralph L. Harding, Jr., president of SPI, said that its action is a petition for the court to review the OSHA standard and to examine the important question of its feasibility.

"We believe now as we did when we presented our testimony to OSHA only two months ago that an excessively strict standard cannot be met by the industry. We also believe that the standard announced by OSHA is so restrictive that it merits immediate appeal."

"In effect, OSHA has called for establishing operating standards for the vinyl chloride and polyvinyl chloride industries which are impossible to achieve technologically."

The SPI said that the new standard is in effect the engineering equivalent of "no detectable" level originally proposed by OSHA and could therefore have the effect of shutting down the industry

with a loss of 1,700,000 to 2,200,000 jobs in consuming and related industries and a loss of domestic production value of \$65 to \$90 billion annually.

Meantime the instrument makers appear to be the ones who might profit from the need to accurately measure the minuscule amount of vinyl chloride gas which will be permitted.

One of the first to come forward with an announcement regarding a way to measure the air to meet the standards which go into effect on Jan. 1, 1975 is Applied Automation, Inc. of Bartlesville, Okla. It has a process chromatography system that it says can continuously monitor and record vinyl chloride levels lower than one part per million in air.

Robert E. Wightman, marketing manager, said the basic hardware required for this application is an optochrom 102 process gas chromatograph with solid state programmer and sample conditioning system.

Instrument Makers Offer Chromatographs as Judicial Opposition Takes Spurt

The system, employs two air pumps with automatic switch-over in the event of pump failure. This switch-over mechanism is linked to an alarm for instant notification at a remote location.

The analyzer is designed to monitor the normal ambient air for vinyl chloride. High concentrations of other components suspected of interfering with this measurement have been tested by applied automation and have been found not to interfere with the vinyl chloride in analysis, Mr. Wightman added.

Honeywell Inc. is also ready with a chromatograph, as reported in a UPI dispatch from Houston. Gene Manno, general manager of the Honeywell Process Analyzer Center there said that his company has developed a chromatograph that can measure less than one part per million maximum and can automatically set off an alarm when the concentration exceeds or nears that danger mark.

Mr. Manno said that the Honeywell chromatograph was first developed by NASA and the Jet Propulsion Laboratory in the 1960s for use in the Mariner program. He said at that time the unit had a very high speed, but did not measure as small amounts as it does now. "It was to have been in the hard module for crash landing on Mars. It had to deliver 50 measurements in 50 seconds before it crashed."

The Honeywell expert said that his group has already

shipped eight of the units to plastics manufacturers. He said they cost from \$8,000 to \$15,000, depending on their versatility.

New Rules Set to Reduce Vinyl Chloride Risk

From News Dispatches

The Labor Department yesterday announced new rules to drastically cut the amount of cancer-causing vinyl chloride gas to which factory workers may be exposed. One plastics company said the action threatens to throw 2 million workers out of their jobs.

The new rules from the Occupational Safety and Health

Administration (OSHA) came after several months of growing evidence that workers exposed to the widely used plastics industry gas were developing a rare but fatal form of liver cancer. Deaths around the world traced to workplace exposure now number more than 20.

The Society of the Plastics Industry, Inc., filed a suit in Second U.S. Circuit Court of Appeals in New York asking for the judicial review of the OSHA standard.

It said the standard announced yesterday is unrealistic and it will be impossible for most if not all of the industry to meet it.

Last April 5, OSHA announced that workers could be exposed to no more than 30 parts per million of vinyl chloride gas in the air and proposed eventually reducing the exposure level to zero.

During lengthy hearings on the matter, the industry claimed it would be impossible to meet a detectable level of the gas inside the factories.

Under the new regulations, effective Friday, the present 30-part-per-million exposure level will be allowed until Dec. 31. After next Jan. 1, workers may be exposed to no more than 1 part per million average over eight hours of exposure and no concentration higher than 5 parts per million over any 15-minute period.

After Jan. 1 of 1978, the same exposure levels will be required except that workers exposed to anything stronger will have to wear respirators.

Firestone Plastics Co. said the new rules put the industry "on a collision course with economic disaster." An official of the firm said the restrictions would "throw 2 million jobs down the drain."

Vinyl Chloride Rules Seek To Guard Workers' Health

Special to The New York Times

WASHINGTON, Oct. 1—The Department of Labor announced today final industrial health rules designed to reduce work-exposure to vinyl chloride, a cancer-causing chemical widely used as a basic material in the manufacture of plastics.

John H. Stroder, head of the department's Occupational Safety and Health Administration, said the rules would protect workers by significantly reducing the amount of vinyl chloride to which they were exposed.

The chemical has been shown to induce incurable cancers of the liver in some workers exposed to it over substantial periods of time.

The dangerous effects of the chemical became a public issue last January when the B. F. Goodrich Company reported that several of its employees had died of relatively rare cancers of the liver called angiosarcomas. The employees had been exposed to the chemical over long periods of time during their work.

Because of these and other deaths reported later, the Labor Department safety and health unit issued an emergency rule on April 5 lowering the permissible exposure levels from 500 parts per million to 50 parts per million. The emergency standard would have expired this Saturday.

The final rules, to become effective Friday, will continue the 50 parts per million level through Dec. 31 and require a reduction, thereafter, to only one part per million averaged over any eight-hour period and five parts per million averaged over any 15-minute period.

These limits on the permissible concentrations of the chemical in the air of industrial workplaces would be tightened further on Jan. 1, 1978. In that third phase of the new rules, workers would be required to wear respirators if they were exposed to air containing more vinyl chloride than the one part per million and five parts per million limits.

During 1975, respirator use would be discretionary at air levels below 25 parts per million.

The industry objected immediately after the new rules were announced here and at a National Safety Congress Mr. Tender is attending in Chicago.

Firestone Plastics Company said it was planning a legal challenge and declared that the new rules "put the vinyl plastics industry on a collision course with economic disaster."

The Society of the Plastics Industry Inc. said the Occupational health standard was unrealistic and that it would probably be impossible for most of the industry to meet it.

SPI-01729

Limits Set on Exposure to Chemicals in Plastics

Amount of Cancer-Causing Vinyl Chloride in Air at Factories Curbed by Government

LOS ANGELES TIMES
Wednesday, October 2, 1974

TO: DON WHITE
FROM: Peter J. Dowd

WASHINGTON — After nine months of heated controversy, the Occupational Safety and Health Administration issued new limits Tuesday on the allowable exposure of workers to cancer-causing vinyl chloride.

John H. Stender, assistant secretary of health, education and welfare, said new federal standards would be imposed in three states starting Oct. 4 and leading to a reduction of the toxic gas from 50 parts per million in the air to 5 parts per million, averaged over an eight-hour work day.

Meanwhile, the Society of Plastics Inc. filed a suit in New York City asking for a judicial review of the standard.

Stender said the standard is "unrealistic," probably will be imposed, but for most of the industry to meet, and appears to have been established on some basis.

Vinyl chloride and its numerous offspring, polyvinyl chloride, have been identified by medical researchers as agents capable of producing a rare form of liver cancer and causing other damage to internal organs.

Several deaths have been attributed to prolonged exposure to the chemical, which is a basic ingredient in thousands of everyday plastic products. The finished products themselves are not suspected of causing cancer.

The vinyl chloride exposure of workers at the B. F. Goodrich Chemical Co. in Troy, N.Y., plant had died of liver cancer.

In a series of hearings called by the agency, the government established the health hazard and issued a temporary standard amount of the gas to which workers could be exposed from 500 part per million to 50.

Under the permanent standard announced Monday, that same level will prevail until Jan. 1, 1975.

On that date, manufacturers will have to reduce the maximum allowable exposure to 1 part per million, averaged over an eight-hour period, and a 500-part-per-million level over any period no longer than 15 minutes.

The practical limit will be a reduction in exposure to 1 part per million, averaged over any period no longer than 15 minutes.

On Jan. 1, 1975, the government will require all workers who are exposed to vinyl chloride to wear gas mask-like respirators.

When construction and other practices continue to keep the exposure to vinyl chloride level, the government will require the use of respirators.

ions to the lowest practicable level with employee respiratory protection provided to meet the 1 p.p.m. and 5 p.p.m. limits, Stender said.

Worldwide, there are 21 known cases of liver cancer stemming from exposure to polychlorinated biphenyls. Thirteen of those cases have been reported in the United States. Only three of the American employees of the American rubber and plastics industry have died of liver cancer.

During hearings last winter and spring, plastic industry executives testified that stringent exposure standards would force a shutdown of vinyl chloride manufacturing plants.

Handing of the Society of Plastics Inc. said that as many as 1.6 million Americans could be forced out of their jobs if complete removal of the gas from the air in working places was required.

The industry level required is about 6,000 workers, Harding said, but many other industries are dependent upon the products made from vinyl chloride.

SPI-01730

UP-141

(VINYL CHLORIDE)

WASHINGTON (UPI) -- THE LABOR DEPARTMENT TUESDAY ANNOUNCED NEW RULES TO DRASTICALLY CUT THE AMOUNT OF CANCER-CAUSING VINYL CHLORIDE GAS TO WHICH FACTORY WORKERS MAY BE EXPOSED. ONE PLASTICS COMPANY SAID THE ACTION THREATENS TO THROW 2 MILLION WORKERS OUT OF THEIR JOBS.

THE NEW RULES FROM THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) CAME AFTER SEVERAL MONTHS OF GROWING EVIDENCE THAT WORKERS EXPOSED TO THE WIDELY USED PLASTICS INDUSTRY GAS WERE DEVELOPING A RARE BUT FATAL FORM OF LIVER CANCER. DEATHS AROUND THE WORLD TRACED TO WORK PLACE EXPOSURE NOW NUMBER MORE THAN 20.

LAST APRIL 5, OSHA ANNOUNCED THAT WORKERS COULD BE EXPOSED TO NO MORE THAN 50 PARTS PER MILLION OF VINYL CHLORIDE GAS IN THE AIR AND PROPOSED EVENTUALLY REDUCING THE EXPOSURE LEVEL TO ZERO.

DURING LENGTHY HEARINGS ON THE MATTER THE INDUSTRY CLAIMED IT WOULD BE IMPOSSIBLE TO MEET A DETECTABLE LEVEL OF THE GAS INSIDE THE FACTORIES.

UNDER THE NEW REGULATIONS, EFFECTIVE OCT. 4, THE PRESENT 50 PARTS PER MILLION EXPOSURE LEVEL WILL BE ALLOWED UNTIL DEC. 31. AFTER NEXT JAN. 1 WORKERS MAY BE EXPOSED TO NO MORE THAN 1 PART PER MILLION AVERAGE OVER EIGHT HOURS OF EXPOSURE AND NO CONCENTRATION HIGHER THAN 5 PARTS PER MILLION OVER ANY 15-MINUTE PERIOD.

AFTER JAN. 1 OF 1976, THE SAME EXPOSURE LEVELS WILL BE REQUIRED EXCEPT THAT WORKERS EXPOSED TO ANYTHING STRONGER WILL HAVE TO WEAR RESPIRATORS.

FIRESTONE PLASTICS CO. SAID THE RULES PUT THE INDUSTRY "ON A COLLISION COURSE WITH ECONOMIC DISASTER." AN OFFICIAL OF THE FIRM SAID THE RESTRICTIONS WOULD "THROW 2 MILLION JOBS DOWN THE DRAIN."

THE 2 MILLION FIGURE REPRESENTS THE TOTAL NUMBER OF PERSONS EMPLOYED IN THE PLASTICS INDUSTRY. ONLY SEVERAL THOUSAND WORK IN FACTORIES WHERE THE RAW GAS ITSELF IS MADE BEFORE IT IS TURNED INTO POLYVINYL CHLORIDE -- THE SOLID FORM WHICH LATER BECOMES EVERYTHING FROM SEAT COVERS TO SUITCASES.

THE GAS WAS FIRST LINKED TO FATALITIES AT PLANT IN LOUISVILLE, KY., AND STUDIES AT SIMILAR FACILITIES LATER SHOWED OTHER CASES.

OTHER GOVERNMENT AGENCIES HAVE SINCE MOVED TO ELIMINATE THE GAS FROM AEROSOL SPRAYS WHICH WERE TURNED OUT IN A VARIETY OF CONSUMER PRODUCTS RANGING FROM SPRAY PAINTS TO PESTICIDES TO HAIR SPRAYS.

UPI 10-01 03137 PCT

SPI-01731

PLASTICS GROUP CALLS GOVT VC RULING "IMPOSSIBLE"

NEW YORK, OCT 2 - THE SOCIETY OF PLASTICS INDUSTRY CALLED YESTERDAY'S RULING BY THE LABOR DEPARTMENT, ON THE AMOUNT OF VINYL CHLORIDE IN THE AIR WORKERS ARE ALLOWED TO BREATHE, "UNREALISTIC" AND "IMPOSSIBLE" TO MEET.

THE GOVERNMENTAL AGENCY SHARPLY REDUCED THE AMOUNT OF THE GASEOUS VINYL CHLORIDE PERMITTED IN THE AIR TO AN AVERAGE OF ONE PART PER MLN AS COMPARED WITH THE PRESENT INTERIM STANDARD OF 50 PARTS PER MLN.

THE RULING BECOMES EFFECTIVE JANUARY FIRST.

IN A PREPARED STATEMENT, THE INDUSTRY ASSOCIATION SAID THE RULING "PROBABLY WILL BE IMPOSSIBLE FOR MOST, IF NOT ALL, OF THE INDUSTRY TO MEET..."

VINYL CHLORIDE MONOMER IS A KEY INDUSTRIAL CHEMICAL USED IN THE PRODUCTION OF POLYVINYL CHLORIDE (PVC), A WIDELY USED PLASTIC RESIN THAT HAS RECENTLY BEEN LINKED TO A RARE CANCER OF THE LIVER AMONG HIGHLY EXPOSED WORKERS.

REUTER 0830

Sharp Drop in Vinyl Chloride Exposure Is Ordered by Labor Agency for Workers

By a WALL STREET JOURNAL Staff Reporter

WASHINGTON—The Labor Department ordered a sharp reduction in workers' exposure to vinyl chloride, a widely used industrial gas that has been linked to liver cancer.

The ruling, which comes after nine months of controversy, brought a lawsuit from the plastic industry, which contends the standard can't be met, and criticism rule contains loopholes. Vinyl chloride is a basic ingredient in making many everyday plastic products.

The new standard, issued by the Labor Department's Occupational Safety and Health Administration, requires that, starting Jan. 1, vinyl chloride levels in the air that workers breathe be held to one part vinyl chloride per million parts of air, averaged over an eight-hour period. Actual levels may exceed one part per million for short periods, but they must average out to no more than five parts per million for any 15-minute period within the eight-hour time span.

The standard also calls for regular monitoring of plant air, regular medical exams for workers and establishment of "regulated areas" where vinyl chloride exposure is high. It prohibits direct worker contact with liquefied vinyl chloride and requires posting of signs warning the chemical is a "cancer-suspect agent."

Since last April, companies handling vinyl chloride have been under an emergency restriction of 50 parts per million, without any time period.

The emergency standard was issued after the discovery, beginning last January, of cases of a rare and fatal liver cancer, angiosarcoma, among workers exposed to vinyl chloride. Nineteen deaths among such workers in the U.S. and other countries have been attributed to liver cancer caused by long exposure to the chemical.

Vinyl chloride is a gas that is processed to form a powdery substance known as polyvinyl chloride. Polyvinyl chloride, in resin or pellet form, is then fabricated into a wide variety of finished plastic products.

Though only about 6,500 workers are employed in plants that make vinyl chloride and polyvinyl chloride, about 350,000 others, who work in facilities that create finished products from the polyvinyl chloride, will also be covered by the new ruling. Workers who handle only finished products, and don't have any chance of contact with "raw" vinyl chloride or polyvinyl chloride, are the only ones exempted.

The Labor Department initially proposed that exposure be limited to "no detectable level," without any averaging over time. This proposal pleased organized labor and some key researchers in the field of occupational health. But the Society of the Plastics Industry, a trade group, and many companies using the chemicals, denounced it as technologically impossible and warned it would drive the industry out of business.

In selecting as its final standard one part per million over eight hours and five parts per million over 15 minutes, the department apparently was trying to reach a compromise between its original idea and the toughest proposal offered by the industry, which would have left exposures as high as 10 parts per million in some plants and 25 parts per million in others.

The department sought to smooth further until next January the drop from the present 50 parts per million. Also, it gave its enforcement staff discretion to determine how the companies must meet the standard. While the goal is to reach the new levels

through "engineering and work practice controls," such controls must be deemed "feasible," and companies can deal with any exposures produced by inadequate controls by giving workers respirators.

A date wasn't set in the ruling for improving plant engineering and practices to the point where respirators won't be needed. What's more, until January 1976 workers may refuse to wear the respirators when exposures don't exceed 25 parts per million, even if they exceed the one part per million over eight hours specified in the regulation.

Despite this attempt at compromise, however, the Society of the Plastics Industry and some producers sued the Labor Department to overturn the ruling only moments after it was issued yesterday. And Firestone Plastic Co., a unit of Firestone Tire & Rubber Co., said it will ask a court to stay enforcement of the standard while the suits are being tried.

Ralph Harding, president of the industry group, said the standard is "unrealistic, probably will be impossible for most, if not all, of the industry to meet and appears to have been developed on some basis inconsistent with recorded facts." The job-safety agency "may believe that it has adopted a compromise position," but the result is unacceptable to the industry, he added.

Industry sources also indicated displeasure at the inclusion of plants making fabricated products from polyvinyl chloride. The industry had proposed excluding these plants, contending they didn't present any hazard.

But the department said it decided to include them because polyvinyl chloride resin and pellets can give off vinyl chloride gas in small amounts during processing. It said, however, if the plants weren't exposing workers to more than half a part per million of vinyl chloride gas, they needn't undertake any control measures.

In Midland, Mich., Dow Chemical Co. said the standards were "unnecessarily stringent" and unsupported by the data on Dow workers that was presented at public hearings. Organized labor expressed some immediate reservations of its own.

In Akron, Ohio, Peter Bommarito, president of the United Rubber Workers union, which represents many vinyl chloride workers, said "it would appear this thing has a number of loopholes in it." Mr. Bommarito reserved final judgment until he has seen a full text of the regulations, but he was quick to take issue with the decision to let workers decline the use of a respirator until 1976.

"We can't make a guy put on a respirator, and while he's not wearing one, he may be endangering himself." What is more, he added, "The respirator situation is going to be even worse in nonunion plants."

The department defended its reliance on the use of respirators, saying definite dates couldn't be set for dealing with the problem solely through engineering and work rules because "we are presently unable to determine when it will be feasible." It added, "We would agree that respirators have many drawbacks" but said, in the absence of complete engineering control, they are needed.

The official explanation of the regulations also said that although a deadline wasn't set for completing engineering and work-rule changes, a continuing plan, available for government inspection, must be pursued by each company at a pace agreed on by safety inspectors, until respirators are needed only occasionally. It admitted, however, that at different plants this could take as long as "several years."

THE WALL STREET JOURNAL
WED., OCT. 2, 1974

SPI-01733

WED. OCT. 2, 1974

Health Hazards

Vinyl-Chloride Risks

Were Known by Many

Before First Deaths

Hindsight Shows Weakness

In Firms' Systems Aimed

At Protecting Workers

The Tip of a Large Iceberg

By BARRY KRAMER

Staff Reporter of THE WALL STREET JOURNAL

A few weeks before Christmas in 1948, Earl Parks, then 26 years old, signed on as a helper-trainee at the large B. F. Goodrich Co. plastics factory in Louisville, Ky. The plant had been making polyvinyl-chloride plastic from vinyl-chloride gas since before the war, using a process developed by Goodrich in 1937.

It was a growing industry that Mr. Parks joined. Polyvinyl chloride—dubbed PVC for short—had found special, but limited, applications in the war years, especially as a fireproof coating for electric wiring in fighter planes and ships. But in the late 1940s, so-called vinyl consumer products, made from PVC, began coming into vogue; and by the time the 1950s were under way polyvinyl-chloride products such as containers, phonograph records and curtains were staples in American households.

The basic Goodrich process, still in use today, pipes vinyl-chloride gas into large re-

This is the first of two stories concerning implications of the discovery that vinyl chloride can cause cancer.

actor vessels; there, the gas is agitated together with a liquid and catalysts. The process causes polymerization, a linking together of the molecules of the gas (a monomer) into the long chains that give PVC (a polymer) its strength and other desired characteristics.

In his first years with Goodrich, it was Earl Parks' job to crawl inside the reactors after each batch of PVC was drained off and to chip away that portion of the polymer that had congealed. During the hour-long task, repeated several times in the course of an eight-hour shift, Mr. Parks and other workers who performed the same function would unavoidably inhale the heavy, sweet-smelling fumes of vinyl-chloride gas that had escaped polymerization.

As the 1950s went by and the 1960s began, Earl Parks was working his way up to the job of foreman, a post that he had attained by the time that ill health forced his early retirement in the late 1960s. In the years that he had worked with Goodrich, the PVC industry flourished as thousands of new uses were discovered for the polymer.

On March 3, 1973, at the age of 50, Earl Parks died of angiosarcoma of the liver, a type of cancer that is invariably fatal. His death attracted scant public attention at the time, but today the significance of Mr. Parks' illness is unquestionable and shattering in its implications. For Earl Parks came to be one more statistic in turning a hypothesis into a reality: Vinyl chloride can cause

Deadly Statistics

The link between angiosarcoma and vinyl chloride is further buttressed by other deadly statistics. Seven of Mr. Parks' fellow workers at the Goodrich plant also contracted the disease, and five have died. In all, there have been 16 documented angiosarcoma cases in the U.S. in recent years, all of them linked to vinyl chloride. In addition, 10 other cases have been reported in Europe.

While the total number of cases is small, the industry has been shaken to its roots. The disease now is known to work insidiously, slowly, during decades of exposure, the implications being that the cases thus far are quite likely only the tip of an iceberg. Nine companies, with 14 plants and 940 employees, currently produce vinyl chloride monomer from ethylene, a petrochemical. The monomer, in turn, is used by 211 companies operating 36 major plants and employing 5,000 workers, to make more than five billion pounds of PVC annually. (World-wide production is some 18 billion pounds annually.)

Even the five billion pounds of PVC annually produced in this country isn't enough to meet the domestic demand for the plastic into which PVC is formed. From 3,000 to 4,000 processors, employing an estimated 700,000 workers, fabricate the plastic into a wide variety of products ranging from vinyl floor tiles to shower curtains. According to a study done for the Society of the Plastics Industry by Arthur D. Little Inc., as many as 2.2 million jobs depend on polyvinyl-chloride plastic. If PVC were banned, the study says, the annual loss to industry in sales and production would be some \$65 billion to \$90 billion. (The Manufacturing Chemists Association estimates the wholesale annual value of all PVC products is \$3 billion.)

Emergency Decree

At the moment, no one believes the industry will suddenly come to a screeching halt. However, after the first human cases of vinyl chloride-induced angiosarcoma were disclosed, the Labor Department's Occupational Safety and Health Administration imposed a temporary emergency standard for PVC factories; thenceforth, OSHA decreed, the permissible level of vinyl chloride in the air of such factories would be 50 parts per million. This level was far below the industry standard in effect for years, of 800 parts per million.

OSHA's emergency decree was made last May. Since then, animal research found that tumors develop at 50 parts per million. Yesterday, OSHA issued a new permanent standard requiring employers after Jan. 1, 1975, to reduce exposure to one part per million in factory air, averaged over eight hours, and five parts per million averaged over any period no longer than 15 minutes. (See story on page 22.) While considerably more stringent than the emergency decree, the new permanent standard—particularly with its five-parts-per-million provision and its allowance of averaging—nevertheless falls short of the "no detectable" limit advocated by many health experts.

Please Turn to Page 22, Column 1

SPI-01734

Health Hazards: Vinyl-Chloride Risk Was Known By a Lot of People Even Before the First Deaths

Continued From First Page

cated by unions, many medical experts and such groups as the National Institute for Occupational Safety and Health, and the American Chemical Society. This no-detectable limit would have constant, not average, adherence to one-part-per-million levels. Therefore, it seems certain that the argument won't abate.

As the controversy continues, it is revealing to examine how the link between vinyl chloride and cancer was established. If nothing else, such an examination points out the grave weaknesses of the present system—or lack thereof—of protecting workers and others from industrial hazards.

The judgment is made in hindsight, but the history of vinyl chloride shows that evidence of its toxicity was often ignored. What's more, the chemical companies knew, but kept secret for at least six months, the fact that Italian researchers had shown that rats develop tumors, including angiosarcoma, when exposed to low levels of vinyl chloride monomer. European companies, which paid for the animal research, knew of these research findings for more than a year before the first human cases were reported but didn't reduce the exposure of their workers to vinyl chloride.

But Dr. Irving J. Selikoff, an expert on environmental carcinogens, or cancer-causing agents, claims that blame shouldn't be placed at industry's door alone. "We're all a bit responsible," he says. "None of us did our homework." Culpability, he says, should be shared by scientists, government agencies and labor unions.

The Case of Earl Parks

The case of Earl Parks is illustrative. Mr. Parks first came to the attention of Goodrich medical people in 1964, when the company, concerned about the known liver toxicity of ethylene dichloride (a chemical from which vinyl chloride is made) tested the liver function of workers in the Louisville plant.

Mr. Parks's readings were abnormal. Nevertheless, he continued to work at the same job. In October 1964, however, he was hospitalized with what was initially diagnosed as a bleeding ulcer. Doctors treated the "ulcer" without surgery, and Mr. Parks was released.

He was readmitted to the hospital the following May, and the decision was made to operate. But when the operation was begun, surgeons, instead of finding an ulcer, found instead that Mr. Parks's problem resulted from severe liver damage, which had caused blood to back up in the portal vein leading into the liver. The surgeons corrected the vein problem with a shunt and took a sample of liver tissue for analysis. The analysis showed that the liver had been damaged by exposure to "chemicals." Cancer wasn't mentioned.

(According to testimony at OSHA's hearings on vinyl chloride, held last June and July, Mr. Parks received a total of almost

\$6,000 in workman's compensation from Goodrich before he died, but only after Goodrich protested that his illness couldn't have resulted from exposure to the chemical.)

It was an alert Louisville doctor who first made the connection between angiosarcoma and vinyl chloride. Dr. John L. Creech, who for years has treated workers sent to him by Goodrich on a fee-per-patient basis, had followed Earl Parks's case for some time, even though he wasn't treating Mr. Parks. Dr. Creech says he had been concerned about an abnormally high number of Goodrich workers who had liver disease. When he heard that Mr. Parks had died, he recalls, he asked to see the autopsy report.

It was in August 1973 that Dr. Creech learned that Mr. Parks had died the previous March of angiosarcoma of the liver. The doctor says he then realized that something was seriously wrong, since another Goodrich PVC worker, a private patient of Dr. Creech, had succumbed to the same type of cancer in 1971. Dr. Creech says he knew that liver angiosarcoma is exceedingly rare and that two cases among such a small plant population was abnormal. (In fact, medical men estimate that fewer than 30 cases occur each year in the U.S., striking only one in 900,000 persons.)

Dr. Creech met with Goodrich's occupational health director, Dr. Maurice N. Johnson, who subsequently decided to ask Tabershaw-Cooper Associates Inc., a Berkeley, Calif., epidemiological-studies concern, to do a survey of Goodrich death records. But the study was hardly needed; on Dec. 19, a third PVC worker at the Louisville plant died at the age of 58; he had been at the plant for 28 years.

Public Announcement

On Jan. 22 of this year, Goodrich officials met in Washington with officials of the National Institute for Occupational Safety and Health and informed them of the three angiosarcoma deaths. The following day, Kentucky occupational-health officials also were informed and Goodrich made its first public announcement.

Almost since its first commercial introduction, there have been reports that vinyl chloride is toxic above certain levels. Indeed, during World War II, vinyl chloride was rejected as a surgical anesthetic because animals developed heart irritation when exposed to it. In 1949, Russian scientists reported "hepatitis-like changes" in the livers of 25% of the workers in a small PVC plant.

Then, in the late 1950s, research toxicologists at Dow Chemical Co. showed that animals exposed to as few as 100 parts per million of vinyl chloride (or 100 molecules of vinyl chloride in every one million molecules of air) developed slight liver damage. Based on its research, Dow began a program in the 1960s to reduce the level of vinyl chloride monomer in the air of its plants to below 50 parts per million.

Dow published its results in 1961. But the rest of the industry chose to rely on a Yale University study that recommended 500 parts per million as a safe level. This same level had been recommended by the Manufacturing Chemists Association since 1954 and was affirmed in 1962 by the American Conference of Governmental Industrial Hygienists and was given the force of law by OSHA in 1971. However, evidence at the OSHA hearings indicates that this level was regularly exceeded until this year in many plants. (The hygienists' group didn't recommend lowering the level to 200 parts per million until 1972, four years after Dow concluded from further tests that repeated exposure by workers to vinyl-chloride monomer at an average of 300 parts per million or above for a working lifetime could cause changes in the liver.)

During the 1960s, there were reports of a disease called acroosteolysis among vinyl-chloride workers. The disease consists of skin lesions and changes in the blood vessels, leading to degeneration of the bones at the tips of the fingers and toes in those exposed to high levels of the monomer. (Emissions of vinyl chloride are generally lower at plants where the monomer, or gas, is made, since the process is less complex, and there is less chance for leaks than at the polymerization plants; none of the reported angiosarcoma cases in this country has occurred among workers making vinyl-chloride monomer, and only one of the 10 deaths in Europe was in a monomer plant.)

In early 1967, the Manufacturing Chemists Association arranged with the University of Michigan to study acroosteolysis among vinyl-chloride workers, particularly those who cleaned the reactor vessels and others who were exposed to large concentrations of vinyl chloride in the air. The Michigan scientists reported in 1970 that: although they couldn't pinpoint vinyl chloride as the cause of the disease, worker exposure to the monomer should be cut to 50 parts per million or below.

Other than Dow, which had already instituted reductions in air level of the monomer, the rest of the industry in the U.S. ignored the recommendation. Nor was there any significant reaction to findings by European industry that animals developed adverse effects from vinyl chloride. This was at least partly because the Europeans downgraded the importance of some of their findings. For example, Prof. Pier Luigi Viola, a medical director employed in Italy by Solvay & Cie., the Belgian chemicals company, found bone changes in rats exposed to air levels of 30,000 parts per million of vinyl chloride; even more important, he found that vinyl chloride at that level caused malignant tumors in the ear canals, lungs and bones of rats.

Prof. Viola reported his findings before an international cancer congress in Houston in 1970. It was the first reported link between cancer and vinyl chloride. But the professor expressed doubt about the purity of the vinyl-chloride gas he had used and stated that the rat cancer findings, because they occurred at such high levels of the monomer, had no human implications.

(Prof. Viola subsequently found tumors in rats exposed to 500 parts per million; but this fact wasn't revealed until well after the first human angiosarcoma cases were revealed.)

The Research Goes On

Based on Prof. Viola's early cancer findings in rats, Montedison S.p.A., the huge Italian chemicals company, in 1970 asked Cesare Maltoni, a respected researcher at the Institute of Oncology in Bologna, Italy, to do more extensive animal studies. By October 1972, Prof. Maltoni says, he had found that 250 parts per million of vinyl chloride produced tumors in rats in three parts of the body: the ear canals, kidneys and the liver. The liver tumors included angiosarcoma. The professor immediately informed his sponsors.

The Europeans offered their information to the Manufacturing Chemists Association in the U.S., but only if the Americans guaranteed confidentiality. With great reluctance, the association says, it finally agreed to the secrecy condition "because of the vital importance of learning of any indications from the European research . . . without the delay which could have resulted from duplication of effort."

On Jan. 30, 1973, a year before the first human angiosarcoma cases were reported by B. F. Goodrich, the MCA finally got the Maltoni data. For five months, the secrecy restrictions were such that government agencies, PVC workers exposed to vinyl chloride and even company doctors were kept in the dark. Then, in the late spring, the Europeans agreed that the Chemists Association could pass the information on to the U.S. National Institute for Occupational Safety and Health, the Labor Department agency that monitors worker safety. On July 17, 1973, representatives of the association and the agency met.

One Certainty

There is some dispute as to what transpired at the meeting. The Labor Department agency claims it wasn't given the full story; the chemists' association claims that the agency misunderstood the findings. But one thing is certain: The agency, and OSHA, made no move to change the standard of 500 parts per million and didn't do so until after the human angiosarcoma cases were announced. In Europe, by contrast, Great Britain had lowered the maximum level to 200 parts per million following the cases of acroosteolysis in the '60s; and West Germany had set a level of 100 parts per million in 1970, based on Dow's 1961 results with animals. According to New Scientist, the British science journal, "No other section of the U.S. or European industry followed Dow's lead. The reasons for this international confusion are obscure."

This all changed quickly, of course, once the first human cases of angiosarcoma were reported by Goodrich. Indeed, the swiftness with which new research has been carried out since Jan. 23 is perhaps without precedent in the world of medicine and science.

Much of this recent research is concerned with studies of the incidence of disease of all types among vinyl-chloride workers. Thus far, some studies show that workers exposed to high levels of vinyl chloride show greater than expected incidences not only of angiosarcoma but certain other cancers as well. The ramifications of these findings for the future of the industry and its workers remain to be seen. However, for the veteran PVC workers, whatever changes the findings produce will be useless in counteracting the insidious effects of working day after day, year after year, in what now is generally viewed as a contaminated atmosphere.

The New York Times

FRIDAY, OCTOBER 4, 1974

Try It—It May Be Safe

On three fronts, Government agencies are moving to reject the strange principle that an industrial process must be proved beyond doubt to cause cancer before any curb or control is warranted. That has been the contention of the Shell Chemical Company, makers of two pesticides suspected as carcinogens; of the Reserve Mining Company, accused of dumping possibly cancerous materials into Lake Superior; and of the Society of the Plastics Industry, whose member-companies have been using vinyl chloride, an industrial gas linked to liver cancer.

After prolonged testing of mice and some tentative findings involving rats, Russell E. Train, administrator of the Environmental Protection Agency, has ordered a ban, with minor exceptions, on the two pesticides, aldrin and dieldrin. Because the agency has yet to prove that they produce cancer in man—a process that could take twenty years—the manufacturers are appealing the action, despite the existence of adequate and safe substitutes for both products.

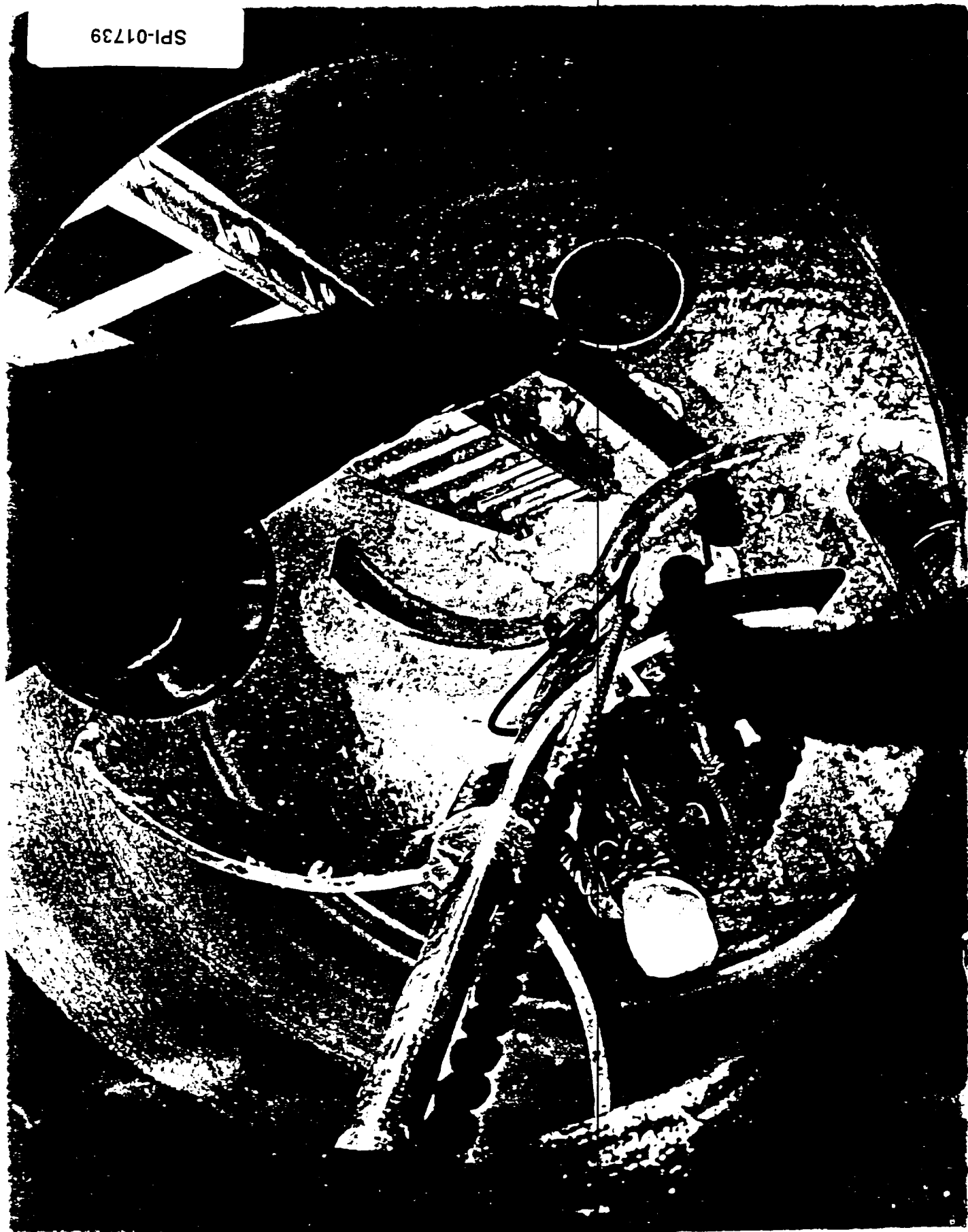
The states of Michigan, Minnesota and Wisconsin are united in appealing to the Supreme Court for an immediate end to the Reserve Mining Company's continued dumping of dangerous asbestos fibers into the greatest and last of the nation's still pure lakes. The company wants to go on with its daily deposits of 67,000 tons of tailings during the indefinite stay granted by a lower court.

In a more modest effort to cope with the ugliest threat of all, the Labor Department has issued regulations to reduce the exposure of workers to vinyl chloride. Six deaths from angiosarcoma of the liver, a rare form of cancer, have occurred in a single plastics plant, and this is believed only a grim forerunner of fatalities still to come. Recognizing the large number of people employed in the plastics industry, the department is not suggesting a ban on the gas but only rules to reduce the hazard—time limits on exposure, use of respirators, and the like. Yet even these are attacked by the industry as too stringent.

Industries where such health risks have been uncovered would do well to consider a legislative risk to themselves. Senators Gaylord Nelson of Wisconsin and Philip A. Hart of Michigan have already introduced a bill that, under specified circumstances, would prohibit "potentially dangerous" activity of this sort until it is proved to be safe or it is shown that "the benefit substantially outweighs the risk." The burden of proof would be placed where it belongs—on the shoulders of those who stand to gain from a risk otherwise confined solely to those who work for them.

SPI-01737

SPI-01739



If government allows workers to be exposed to the gas, some of them may die. If it eliminates all exposure, a valuable industry may disappear.

ON THE HORNS OF THE VINYL CHLORIDE DILEMMA

by Paul H. Weaver

Not long ago, cancer and plastic were associated with each other only in the writings of Norman Mailer, where they serve as symbols of decadence and self-destructiveness in the high-technology society. Since January of this year a series of medical reports has shown this association to be a real scientific fact as well. It is now clear that vinyl chloride, a gas from which the second most widely used U.S. plastic is made, causes a fatal cancer of blood-vessel cells in the liver; the gas is also implicated in a host of additional diseases, ranging from gastrointestinal bleeding to chromosome damage.

These discoveries have touched off a flurry of regulatory activity. The Food and Drug Administration, the Environmental Protection Agency, and the Consumer Product Safety Commission have all banned aerosol sprays using vinyl chloride as a propellant. But the measure that cuts deepest was taken by the Occupational Safety and Health Administration. OSHA has moved to reduce the permissible level of worker exposure to vinyl chloride in the plants where it is made or converted into plastic.

Preparing for the iceberg

In the course of these developments, it has become clear that our regulators have a hard time thinking sensibly about problems like vinyl chloride. The businessmen being regulated and the workers affected seem to find it no easier. The fact is that our society seems to have no agreed-upon standards for dealing with situations in which medical and economic considerations collide head-on. Since collisions of this sort will plainly be numerous in the years ahead—the vinyl chloride case is widely identified as the tip of an enormous regulatory iceberg—it seems useful to get clear on the issues involved.

If vinyl chloride were an unimportant substance, or if it were known to be dangerous only in very high concen-

trations, or if it were easy to keep human beings out of contact with it, there would be no particular problem. In that case the health danger could be completely eliminated at little or no cost, and the question of what to do would answer itself.

Unfortunately, the vinyl chloride issue isn't so simple. It seems to be very difficult and costly—and it may be impossible—to guarantee that no vinyl chloride worker will be exposed to the gas. Though no one knows for sure, it is possible that even very small exposures may cause sickness or death. Yet it is also true that the plastics made from vinyl chloride are extremely important to the American economy. The market value of the gas being produced this year, and of the resin made from it, is perhaps \$1.5 billion; the gas and resin industries together employ about 6,000 workers. But what most people think of as the "plastics industry"—the transformation of resins into products—is a far larger operation. The total number of jobs involved in polyvinyl chloride (PVC) alone is about 320,000; the sales volume runs to many billions. And there are no entirely satisfactory substitutes for PVC at hand. Banning it would be certain to cause grave economic dislocations.

Thus the regulators at OSHA are caught between the proverbial rock and a hard place. It is clear that their task should be to find the right "trade-offs"—to devise regulations in which the benefit of increased health for

The most hazardous job in polyvinyl chloride plants used to be the cleaning of the vats in which vinyl chloride polymerizes into PVC—that whitish resin at the worker's feet. Of the sixteen known U.S. cases of vinyl-chloride-related liver cancer, fourteen occurred in vat cleaners. The job is presumably a lot less hazardous since the introduction of the respirators, protective clothing, and air evacuation (provided by the dangling hoses) that are shown here. The stainless-steel-lined vat shown is in B.F. Goodrich's Pedricktown, New Jersey, plant, perhaps the most modern in the U.S. The vat is entered and cleaned manually only once a month. Until recently vats in most older plants were entered once or twice a day.

Research associate: Sidney Ledensohn Stern

The View from NIOSH: Make It Safe

On January 22, 1974, Dr. Maurice Johnson, environmental health director for B. F. Goodrich, called on Marcus Key, director of the National Institute of Occupational Safety and Health. Johnson had a discovery to report. Three workers in Goodrich's Louisville polyvinyl chloride plant had died from angiosarcoma of the liver since 1971. Key summoned his top aides, who agreed that they had an emergency on their hands. Two days later a small army led by NIOSH Standards Development chief Vernon Rose, invaded the Louisville plant to conduct the first of many "walk-through" inspections.

Within a week, Rose's task force had a list of recommendations for reducing worker exposure to vinyl chloride:

- protective coveralls, shoes, and gloves for workers exposed to PVC.
- airtight suits and respirators for reactor cleaners.
- daily showers for exposed workers.
- a 50 parts per million suggested ceiling on vinyl chloride monomer exposure.

Normally, writing a criteria document—NIOSHese for a recommended standard—is an eighteen-month process involving exhaustive study. In this instance, however, Rose relied on guesswork and precedent. Assuming that vinyl chloride causes cancer through inhalation and skin contact, he modeled his standards on those used earlier by NIOSH for industrial carcinogens.

Aiming for a mid-March deadline, NIOSH organized a hectic series of meetings and studies. By the end of February, its toxicology group had been unable to determine the carcinogenicity of VCM below 50 ppm. The medical group had suggested a battery of liver tests for PVC workers,

but industry and labor had split over the exposure ceiling. Industry urged 50 ppm, which it knew it could achieve; labor advocated "no detectable level," refusing to treat workers as guinea pigs.

In this situation, Rose simply toughened and expanded on his earlier recommendations. Most important, he decided that the ceiling for vinyl chloride be set at "no detectable level"—the only exposure he knew to be safe. "It is doubtful," he conceded in a memo to Key, "that *any* plant can show workroom levels of non-detected." To meet it, respirators would have to be worn at all times. He wasn't sure this was practical, but he was certain it was safe.

On March 11, Dr. Key submitted NIOSH's recommendation to Assistant Labor Secretary John Stender. When OSHA proposed its permanent standard two months later, it incorporated most of the NIOSH text verbatim, including the "no detectable level" provision.

The View from Firestone: Make It Practical

To Todd C. Walker, the towering, outspoken president of Firestone Plastics, OSHA's proposed standard was as much a crisis as the Goodrich bombshell had been to NIOSH. He was determined to resist the standard with "the maximum information" at the OSHA hearings in Washington, D.C., this summer.

Walker assembled four task forces—legal, engineering, financial, and medical—to develop a Firestone-recommended standard on a crash basis. Four alternatives were to be studied: the interim 50-ppm standard, "non-detectable," and two intermediate levels chosen arbitrarily—40 ppm maximum with a time-weighted average (TWA) of 25 ppm, and a 15-ppm ceiling with a TWA of 10 ppm. For each level the questions were: is it safe and is it feasible?

Weeks later, the medical group was unable to say positively that any of the levels was unsafe. An epidemiological study of Firestone's rubber and PVC workers showed no significant differences, suggesting that 50 ppm was not relatively unsafe.

The engineering group reported that the nondetectable level was unattainable. It also forwarded a critique of OSHA's proposed work practices. Protective clothing for all workers was unnecessary, it said, because PVC dust is not a carcinogen. VCM gas, which is, could be kept away from the skin only by air-tight suits, which would be "hot, cumbersome, expensive, and dangerous." OSHA's provision for air-supplied respirators for all exposed workers was also ill advised. These would be uncomfortable ("an instrument of torture"), fatiguing, probably hazardous, and would interfere with work. One portable type weighs twenty-eight pounds and would have to be changed three times an hour. Nonportable respirators could be

used, but workers would be attached to air hoses (themselves a workplace hazard) and confined to a radius of less than fifty feet.

The financial group reported that capital investment would have to double to attempt reaching a nondetectable level. The legal staff concluded that OSHA's proposed standard was unfeasible and therefore illegal.

When it came to deciding what level he *would* recommend, Walker had a problem. His medical evidence showed the three levels above nondetectable to be equally safe. His engineers said that the feasibility of the lowest of these (15-ppm ceiling with a 10-ppm TWA) was uncertain, and Walker ruled it out. Left with a choice between the two higher levels, he opted for the 40-ppm ceiling with a 25-ppm TWA to show that Firestone was willing to do more than the minimum. Thus, with a practicality reminiscent of NIOSH's decision to recommend a level it *knew* was safe, Firestone ended up recommending a level it *knew* it could achieve.

workers is balanced against the increased cost to the plastics industry and society as a whole. Unfortunately, this task has remained largely unacknowledged.

OSHA probably will end up compromising on the degree of exposure to the gas it will allow; its decision is apt to be announced this month. But the agency has been under terrific pressure to view the issue before it in absolutist terms, as if its only legitimate concern were the preservation of absolute security for the vinyl plastics industry, or the achievement of perfect safety for vinyl chloride workers.

For a while, it seemed a foregone conclusion that OSHA itself would opt for perfect safety. On May 10, it formally proposed that the new standard for vinyl chloride be set at "no detectable level," i.e., that no plant would be allowed to operate so long as any of the gas could be found in the air or in contact with workers. The industry replied, in effect, that any such standard would be technically impossible and economically disastrous, and that if OSHA went through with it, the polyvinyl chloride industry would be put out of business.

OSHA's final decision will affect more than this single industry and its customers. The vinyl chloride issue may be viewed as the first major test case for a new movement in government regulation. The leaders of the movement are three of the newest federal regulatory agencies, all created since 1970: EPA, CPSC, and OSHA. One general idea behind all of these agencies is that business can no longer promiscuously pass on to society all the indirect costs of running a modern economy. As Sheldon W. Samuels, health director of the Industrial Union Department of the A.F.L.-C.I.O., put it, "The free ride on social costs is at an end. In the plastics industry you're seeing a manifestation of social costs."

With jurisdiction over virtually every product and substance, these agencies, together with the FDA, are beginning to use their sweeping powers to reduce the public's risk of chronic disease, especially from industrial products. Some of the agencies are subjecting new substances to rigorous pretesting before they are allowed on to the market. And with the vinyl chloride case, they have tackled the first of a long list of basic substances on which our industrial economy is already built.

It could put you to sleep

During the first decades of its commercial existence, vinyl chloride seemed a most unlikely candidate for the role of heavy in a historic regulatory drama. Put into full-scale U.S. production in 1939, polyvinyl chloride was hailed as a "miracle" material: cheap, stable, fire-resistant, and able to assume an extraordinary range of soft and hard forms. Its major applications now include coated fabrics (like those used in automobile seat covers), wire insulation, floor tiling, pipe and conduit, phonograph records, and medical supplies, e.g., blood-storage bags.

In the beginning the vinyl chloride gas seemed to be

virtually harmless. The only apparent dangers were of explosion (at concentrations beginning around 36,000 parts per million) and narcosis. In fact, during the 1940's the gas was tried out as a medical anesthetic, but doctors abandoned it when it was found to cause heart arrhythmia. With low prices providing little incentive for conservation, producers paid no particular attention to workplace exposure levels so long as they were safely below the point of fire and explosion.

And yet exposure levels in plants producing the gas itself were probably not very high even in the early years. Vinyl chloride is synthesized from chlorine and petrochemical feedstocks (usually ethylene) in a continuous closed process. The plants, which resemble oil refineries (and in some cases are attached to them), are open to the air. Historically, the heavy exposures have occurred in the plants where vinyl chloride is polymerized into PVC, the whitish powdery resin from which actual plastics are made.

It could make you "high"

Polymerization is a batch process: vinyl chloride monomer (VCM) and other substances are put into a pressurized vat, heat is applied, and hours later, when polymerization is completed, the vat is emptied, opened, and cleaned for the next batch. The process is full of leaks. In most of the early plants the gas could be smelled almost constantly (VCM has a faintly sweet odor that seems to be detectable at concentrations above 2,000 parts per million), and workers occasionally got "high" from the fumes. It is widely agreed that in this early period, lasting into the 1950's, exposures of several thousand ppm were common.

During the 1950's, as the vinyl industry grew, a trickle of little-noted and often inconclusive medical reports began to raise doubts about the monomer's presumed harmlessness. In 1949 a Russian group found a hepatitis-like condition in more than one-fourth of seventy-three PVC workers examined, and over the next ten years European researchers encountered other symptoms: skin lesions, a circulatory disorder, gastritis, and dermatitis, to name a few. By the mid-1960's these had been confirmed and were described collectively as "vinyl chloride disease." Later in the 1960's, acroosteolysis, a disease involving a degeneration of the finger bones, was identified among workers who clean polymerization vats.

As these findings accumulated, producers began to reduce exposure levels. In 1961 the American Conference of Governmental Industrial Hygienists, a voluntary standards-setting organization, had put the maximum safe exposure at 500 ppm. During the 1960's industry began working to get much lower than that, and by the early 1970's exposure levels were generally in the 100-to-200-ppm range, with short-term "excursions" to levels many times higher.

In this general downward movement, Dow Chemical

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Vinyl Chloride *continued from page 153*

was far and away the leader. In 1961 it had conducted an animal experiment showing liver effects at levels as low as 100 ppm and had decided to get its own plants below 50 ppm. By the early 1970's, Dow had achieved average exposures in the neighborhood of 25 ppm in its copolymer plants (one of which produces resins for Saran Wrap).

In 1970, Dr. Pierluigi Viola, an Italian physician studying acroosteolysis for Solvay, a major European PVC producer, reported an unexpected discovery. After twelve months' exposure at 30,000 ppm, many of his experimental rats had developed cancers. Doubts about Viola's procedures led Montedison and other European producers to commission Dr. Cesare Maltoni to undertake a large-scale animal experiment to see if this carcinogenic effect could be replicated at lower exposure levels. By the end of 1973 Maltoni's well-executed study had shown that levels of VCM as low as 250 ppm induced a variety of cancers in rats, including angiosarcomas of the liver. In June, 1974, he reported angiosarcomas at 50 ppm.

American producers began to join the inquiry into vinyl chloride and cancer in 1973. Early that year the Manufacturing Chemists Association decided to commission two massive studies. One was an animal study somewhat like

Maltoni's (it has since confirmed his findings). The other was an epidemiological analysis of the morbidity and mortality history of American vinyl workers.

In December, Dr. John L. Creech, a Louisville, Kentucky, surgeon who is plant physician for B.F. Goodrich's massive PVC installation there, received a report that one of the workers had died of angiosarcoma of the liver. Remembering that another worker had died of the same cause two years earlier, he notified a superior. In mid-January, 1974, while a systematic mortality study of Goodrich workers was being organized, Creech received a report of a third angiosarcoma death. On January 22, B.F. Goodrich announced the three deaths and their cause. To date, a total of eight persons employed at the Louisville plant have been found to have contracted this disease.

They blew the whistle themselves

As of January, 1974, literally all the information linking vinyl chloride to cancer had been developed by the industry on its own initiative. As Ralph L. Harding Jr., president of the Society of the Plastics Industry, observed, "This is a unique situation. Industry financed the studies, and industry blew the whistle on itself."

But this was quickly forgotten in the furor that arose during the weeks following B.F. Goodrich's
continued page 202

announcement. Within days, regulators, public-health doctors, and union officials had begun to dominate public discussion of the vinyl problem. Within weeks, the Louisville *Times* initiated a series of stories alleging that industry had engineered a Watergate-style cover-up of the angiosarcoma discovery, which it abandoned only when it saw that the information was about to leak anyway. This charge was symbolic of the manner in which the initiative passed out of the hands of industry.

It was seized, rapidly, by a loose but not uncoordinated network of regulatory agencies, government research institutes, academic medical teams, labor unions, and other groups united by a common commitment to eradicate environmental causes of disease. This "regulatory-medical complex" is largely the creation of a decade's federal legislation in the medical and environmental fields. Its unofficial leader is Dr. Irving J. Selikoff, professor of community medicine at the Mount Sinai School of Medicine in New York City.

The one-man power elite

White haired, gracious, and preternaturally energetic, Selikoff is best known as the man who explored the hazards of asbestos and who fought for many years to get them reduced. But a glance at his credentials shows him to hold so many other distinctions and positions that he constitutes a virtual power elite all by himself: a recipient of the Albert Lasker Award of the American Public Health Association, he is also director of Mount Sinai's Environmental Sciences Laboratory, governor and past president of the New York Academy of Sciences, editor in chief of *Environmental Research*, president of the Society for Occupational and Environmental Health, and consultant to the A.F.L.-C.I.O. as well as to an almost endless list of medical organizations and government institutes. He seems personally as well as professionally close to nearly everyone who matters in government occupational medicine, and has excellent contacts in the press, which he uses skillfully. Though he insists that he is only a scientist, Selikoff is also a crusader and reformer, and the weapons he takes into battle, aside from his many personal talents, are research and publicity.

Within a month of B.F. Goodrich's announcement, half of Selikoff's staff was working on a series of medical and epidemiological studies of workers at three older PVC plants. Researchers from the Harvard School of Public Health began an analysis of morbidity and mortality in Goodrich's Louisville plant. The National Institute of Occupational Safety and Health, which does research and standards development for OSHA, began a major epidemiological study of workers at four older plants, and together with OSHA sent out numerous teams to conduct "walk-through" inspections of PVC production facilities across the nation. In May, Selikoff convened in New York City a large international working

group on vinyl chloride, held under the auspices of the New York Academy of Sciences. As Dr. Joseph K. Wagner of NIOSH described the position of the many researchers who entered the field, "'Seek and ye shall find' is where we're sitting right now."

What they found was a great deal of information that linked vinyl chloride ever more closely to a variety of diseases, and this information in turn generated newspaper copy. To an attentive reader, the cumulative impression conveyed was of a hidden crisis slowly uncovered. With each passing week, the discovery of yet another angiosarcoma case or the release of a new report seemed to show the crisis to be graver and more widespread than it had been the week before. The tacit message was that industry had failed, and that government would have to step in and do something fast.

Federal regulators were quick to respond. By early February NIOSH and OSHA were actively at work on the problem of workplace exposure. (See the report on page 152.) By the beginning of April OSHA had issued an emergency temporary standard of 50 ppm and in May it proposed "no detectable level" as a permanent standard.

But during the summer, the plastics industry, which had maintained a low profile during the preceding months, reassumed the initiative under the leadership of S.P.I.'s Ralph Harding and Jerome H. Heckman. The burden of the industry position was that OSHA's proposal was not required on medical grounds and was technically and economically unfeasible. In its place S.P.I. advocated a phased reduction to 10 ppm as an average and 25 ppm as a ceiling by 1976. The industry case was set forth in considerable detail and with much documentation during the OSHA hearings that began on June 25.

Making policy in a desert

It was clear at the hearings that, in the end, the vinyl chloride decision was going to be made in an informational desert relieved by only the most occasional oasis of knowledge. It was established that vinyl chloride causes cancer and other diseases. It was also established that, over the course of two decades, industry had reduced exposure levels in its plants by a factor of something like 50 without experiencing notable hardship or burdensome expense. But beyond that almost everything was uncertain.

One large area of uncertainty concerns the shape of the so-called "dose response" curve for vinyl chloride between 0 and 50 ppm—the range within which, presumably, OSHA will set the permanent standard. To date, no animal experiments have been completed at exposure levels below 50 ppm, and since historic exposure levels in most existing plants have been above that level, it is extremely unlikely that epidemiological studies can reveal anything about human response below the level. The data for Dow Chemical's Midland, Michigan, copolymer plant,

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where exposures have been monitored for upwards of a decade, are difficult to interpret. Dow's own studies suggest no adverse health or mortality effects for workers at exposures below 200 ppm; however, Dr. Selikoff's group reports a significant incidence of abnormal symptoms even among Dow workers.

Where data are unsatisfactory, one must fall back on inference and theory—but these have proved even less satisfactory, and much more subject to dispute. At the theoretical level, there is disagreement over how cancer is caused. Advocates of the "no detectable level" argued for the so-called "one-hit" theory of cancer causation, which holds that there can be no such thing as a risk-free exposure to a carcinogen. The theory implies that *any* identifiable exposure to vinyl chloride is certain to cause angiosarcoma, at however low a rate.

But there is another theory of cancer causation, which emphasizes the role of the body's immune system in combating cancer. According to this theory, cancers appear when the immune system breaks down. If what a carcinogen does is to weaken the immune system, and if the weakening process requires a certain level of dose, then it is possible that there is a risk-free level of exposure.

At the present time, there is no definitive way to evaluate the truth of these competing models. Thus when OSHA chooses a standard, it will do so in almost total ignorance of the different rates of cancer and other diseases to be expected at different exposure levels.

The cost of approaching zero

The agency will be just as uncertain about the other major point in dispute—the level below which it is not economically feasible for industry to reduce exposure. "No detectable level" advocates point to the huge exposure decreases that industry has already achieved, to the fact that many producers got below 50 ppm soon enough after the emergency standards were issued on April 5, and that not a few were far below that. To many regulators, it seemed obvious that industry could get to a near-zero level if it really wanted to.

Industry representatives argued vehemently that a nondetectable level simply could not be attained. "Even a system that doesn't leak, leaks," thundered Todd C. Walker, president of Firestone Plastics, at the OSHA hearings. The companies also argued that efforts to approach zero would be extremely expensive. Firestone, for instance, detailed every capital expenditure that would be necessary if it tried to reach "nondetectable" exposure levels and concluded that the total cost would equal the entire value of its existing plant. Even then, Firestone insisted, it would not ultimately achieve a "nondetectable" exposure and would be forced to go out of the plastics business.

By the end of the summer, it appeared that even the OSHA staff felt the standard might be unjustified. An August, 1974, report by the agency's Division of Program

Evaluation and Research observed: "First, it is not clear that it is technically feasible to comply with the proposed standard without a shutdown of the entire vinyl chloride industry. Second, it is not clear from existing experimental and other historical data that a 'no detectable level' standard is justified. And third, it is quite clear that compliance with the proposed standard will require substantial capital investments and lead times."

They'd call it a sellout

If these findings should lead OSHA to compromise—to set an exposure standard of, say, 25 ppm—the agency should not expect to be praised for its moderation. It may even be assailed for violating its charter. The Occupational Safety and Health Act of 1970 states that OSHA, in regulating toxic materials, "shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure . . . for the period of his working life."

Members of the regulatory-medical complex would surely insist that a compromise was incompatible with these words—and would see it as an unprincipled sellout, sacrificing lives for dollars. Industry, meanwhile, is apt to view whatever level is allowed as an arbitrary intervention, reflecting political emotionalism rather than reason. And whatever the level, it is hard to believe that the new vinyl chloride standard will do much to end the confusion and uncertainty that currently prevail in many different industries subject to regulatory power.

The vinyl chloride hearings have made it clear that practically nobody in government, industry, or labor is willing to discuss these regulatory issues in trade-off terms. "We don't equate lives with dollars and cents—not at the Department of Labor," John Stender, Assistant Secretary of Labor in charge of OSHA, declares.

Even spokesmen for industry seem unwilling to challenge Stender's formulation head-on. "If we know we're exposing our workers to a known health hazard, we get out of the business," says Dr. Ben Holder of Dow. In the course of the long argument about vinyl chloride standards, businessmen have shied away from asserting that some level of mortality might actually be "worth it." Instead, they have tried to smuggle some practical considerations into the discussion by pointing to problems of "engineering and economic feasibility"—as if feasibility were an absolute.

One reason for the general reluctance to think in cost-benefit terms is to be found in the language of the Occupational Safety and Health Act itself. But another reason lies in the ethos of the regulatory-medical complex, which has something more on its mind than the rate at which people get sick or die. It is committed as well to a larger conception of the good society.

In this society the idea of health is central. Ever more

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remote causes of disease would be eliminated. The role of medicine in this society would be different; it would no longer merely cure, but would actively redesign the environment and ways of living to prevent disease. Inevitably, it would be a society in which doctors, by virtue of their expertise, possessed considerable power. The role of markets would be sharply curtailed, inasmuch as they often lead people to make decisions contrary to their best medical interests. In this sense the regulatory-medical complex is a political movement. As such it perceives in issues such as the vinyl chloride standard a symbolic importance that transcends the particular merits involved.

They don't like business

And, of course, it is an antibusiness movement in its underlying commitment. American regulatory agencies seem to reflect the times in which they were founded; the new regulation was established in an era of intense conflict and hostility to business, and there is little prospect of the movement's suddenly acquiring another personality. For all its unattractive implications for regulatory equity and consistency, this fact is not entirely without its redeeming aspects. By pressing industry hard, these agencies will hasten economic modernization. It is clear that they have long since achieved immense success in raising health consciousness in industry and labor alike. As Dr.

Ralph Langner, an industrial hygienist at Dow Chemical, says, "Vinyl chloride is to industrial hygiene what Rachel Carson was to the environmentalists."

In any case, if Americans are now going to assume the responsibility of deciding what is a "socially acceptable risk," and thus of implicitly putting a price on human life, surely it is desirable that the critical decisions not be left entirely to business—or to any one group or center of authority. A process of indeterminate struggle between business and antibusiness forces, yielding decisions more political than rational, seems preferable to a system in which a single cooperative establishment coolly announces the exact going rate at the close of every business day.

Even so, it seems clear that the process of consciousness-raising could usefully flow in the other direction as well. The regulatory-medical complex would not be any the worse if it had a clearer sense of the novelty of the concept of health it is promulgating and of the uneasiness of its relationship to the existing economic system. And it could take more fully to heart the potential consequences of its regulatory interventions for ordinary living standards. As G.J. Williams, vice president of Dow Chemical, remarked recently, "You could probably not find a single thing in the world that's essential, but they all go towards making life pleasurable. You can do without almost anything, but not without everything." **END**

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cooperation. Ironically, there's a good chance that the U.S. will be leading the trend to unilateral action.

Interpretations of innocence

Because of the diversity of its interests in the sea, the U.S. had been expected to play a keystone role in locking together a compromise among all the divergent points of view represented at Caracas. In fact, however, the conference was one of the first manifestations of a remarkable reversion in the international posture of the U.S. From a preoccupation with the politics of peace, we have moved to a preoccupation with resources and revenues. The clash between this new U.S. stance and the ideological preoccupations of the less-developed nations brought the sea-law negotiations to a standstill at Caracas.

To be sure, American economic concerns originally began the erosion of

the freedom-of-the-seas principle. In 1945, President Truman unilaterally declared the U.S. to be sole owner of the mineral resources on its underwater continental shelf, where oil and gas had recently been discovered. This move was quickly followed by a rash of unilateral claims by other nations, not merely to offshore resources but also to territorial waters wider than the traditional three miles. In most cases, the new limits were set at twelve miles, but some countries, beginning with several in Latin America, claimed absolute sovereignty over areas extending as much as 200 miles to sea.

At that point, the U.S. woke up to what it had set in motion, in particular the implications for shipping and aviation. Traditional maritime law recognizes the right of "innocent passage" through any nation's territorial waters but has always been vague as to what the term meant. With the advent of new kinds of traffic, including airplanes, missile submarines, nuclear-powered ships,

and supertankers, various states have adopted their own interpretations of innocent passage—such as prohibiting aircraft overflights, requiring advance notification of warship passage, making submarines travel on the surface, or forbidding passage to tankers in order to avoid the danger of oil spills.

Planners in sore straits

When combined with the almost worldwide adoption of territorial limits greater than three miles, these constraints on innocent passage had serious implications for all maritime nations, but they especially worried the U.S. Navy and its Soviet counterpart. The heart of the problem was the "straits issue": with even twelve-mile limits, more than 100 important international straits fall entirely within national jurisdiction. Cold-war military planners were appalled by the prospects of emergency ship and aircraft deployments being held up by a straits nation or of ballistic-missile submarines being obliged to



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FOR IMMEDIATE RELEASE (Friday, October 4, 1974)

SPI SAYS OSHA WORKPLACE
SAFETY STANDARD PLACES
BURDEN ON PLANT WORKMEN

WASHINGTON, Oct. 4 -- Workplace safety regulations announced today by the Occupational Safety and Health Administration (OSHA) for the vinyl chloride and polyvinyl chloride industry place a tremendous burden on industry workers to protect their health, The Society of the Plastics Industry, Inc. (SPI) charged.

Ralph L. Harding, Jr., president of SPI, said the standard formally published in today's Federal Register runs contrary to the spirit of the 1970 Williams-Steiger Act which created OSHA, in two ways:

1. It seeks to impose operating standards which are technologically impossible to achieve industry-wide.
2. It requires workers to wear uncomfortable respirators for extended periods of time while at the same time giving them discretion to take off the masks under certain conditions prior to Jan. 1, 1976.

SPI-01746

Harding said the OSHA regulation states that beginning Jan. 1, 1976 wearing of respirators shall be mandatory for workers exposed to levels greater than 1 part per million of vinyl chloride monomer (VCM) averaged over an eight-hour

period and five ppm over any 15 minute period.

"Until that date," Harding said, "the same regulation says wearing of respirators is 'discretionary' for exposures no greater than 25 ppm. Since OSHA's own expert witnesses have testified that respirators are 'instruments of torture', it appears workers are first being told that there is a level of vinyl chloride exposure which doesn't require donning a respirator but that ultimately those respirators will be mandatory whenever VCM levels reach 25 parts per million."

Harding said that in effect, the OSHA regulation sentences the worker to imprisonment in a cumbersome and uncomfortable respirator, since industry contends that it is an engineering impossibility to reduce VCM levels in plants to the point required by OSHA.

"As we read the OSHA act and the legislative intent expressed prior to passage, the law was never intended to eliminate the worker's job in order to make it safe nor was it intended to make the worker's eight-hour day the equivalent of a shift on the rack," Harding added.

The SPI president said this is why the trade association, whose members account for more than 95 percent of the vinyl chloride and polyvinyl chloride production in the U.S., have asked the U.S. Court of Appeals for judicial review of the standard.

Meanwhile, he said the regulatory agencies of the Federal Government also have a responsibility to assure the general public that products made from PVC are completely safe.

(more)

SPI-01747

"Even the OSHA regulation does not apply to the handling or use of end products made from polyvinyl chloride," Harding said. "Further, officials of agencies like the Food and Drug Administration and U.S. Senators have publicly stated there is no hazard in these end products because the vinyl chloride content of such products is either non-existent or so infinitesimally small as to be unmeasurable.

"But they need to tell the public that. In today's shaky economy the nation cannot afford a public loss of confidence in plastic products which are among the most omni-present in society. Unfortunately, the cumulative effect of federal pronouncements could have this effect.

"What needs to be stressed is that the hazards related to vinyl chloride and the manufacture of polyvinyl chloride involve the direct inhalation of unreacted vinyl chloride monomer gas by workers. Many, many articles in common usage involve hazardous materials at the early fabrication stages.

"We don't stop drinking water because it is purified with chlorine," Harding said. "Chlorine is, of course, an ingredient of vinyl chloride. In any case, The Society of the Plastics Industry believes appropriate federal agencies should make these distinctions clear to the consuming public."