



Interoffice Communication

To R. D. Gamblin, Westlake, Louisiana

From Charles L. Whetstone, M. D., Ponca City, Oklahoma

Date September 24, 1974

Subject Physical Examinations

I have reviewed all the reports received to date of physical examinations of Lake Charles VCM employees performed by Dr. Bennerscheidt. The employees were:

✓ Daniel C. Aaron (terminated)	✓ James R. Holcomb
✓ Joseph Adams, Jr.	✓ Berl T. Hooper
✓ Horace O. Adkison	✓ Athen C. Hughes
✓ Bryan B. Baker	✓ Harvey J. Istre
✓ Thomas B. Barton	✓ Bobby J. Landers
✓ George M. Ben	✓ Clarence H. Landon
✓ Willie R. Berzas, Jr.	✓ Phillip J. Leger
✓ Jerry Wayne Boudreaux (terminated)	✓ John C. Lunn, Jr.
✓ Henry Dwayne Broomes (terminated)	✓ Douglas E. Michels
✓ Bruce B. Brown	✓ Monroe C. Miertschin
✓ Johnny R. Burk	✓ Carl M. Morris, Jr. (terminated)
✓ James H. Brunson	✓ Homer R. Moseley
✓ Richard T. Buller	✓ Larry J. Ogea
✓ Kenneth C. Cash	✓ Charles G. Parker
✓ Thomas M. Cholley	✓ Bernie J. Richard
✓ Leon E. Cole	✓ Luther L. Riley
✓ James C. Como	✓ Kermit J. Ryder
✓ Elzie L. Cooper	✓ Louise I. Sappington
✓ James D. Davis, Sr.	✓ Gordon E. Spencer
✓ Darryl J. Derouen	✓ Betty J. Stine
✓ Davis J. Farris	✓ Robert L. Trahan, Jr.
✓ Arvil L. Feemster	✓ Nelson Trent
✓ Paul L. Fetzer	✓ Andrew L. Thibodeaux
✓ Michael J. Fogleman	✓ Larry B. Thompson
✓ Richard Dale Going	✓ Joseph D. L. Vincent
✓ Thomas Joe Gross	✓ Kenneth Wayne Vincent
✓ Freddie Guillory	✓ Larry N. West
✓ Cleo B. Haney	✓ Lawrence L. Woodhatch
✓ Charles R. Heddins	

There was no evidence of industry-related toxicity in any of the above employees.

Each active employee has been written about the findings of his physical examination, with a copy of the letter going to Gordon C. Monroe, R. N. for his file on the employee. We did not write the terminated employees.

Charles L. Whetstone, M.D.

Charles L. Whetstone, M. D.
Assistant Medical Director

VVC 000002262

Carbon copies to KRG LNV GCM

CIRCULATE TO:

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RETURN TO PLANT
MANAGER'S OFFICE

VVC 000002263

September 23, 1974

Copy for: LNV ~~WOG~~ RTF EMS RSM
DVP RGW WRS FK

VCM Emissions From Plants Slated For EPA Controls

Environmental Protection Agency discloses that it intends to issue emission standards specifically applicable to producers of vinyl chloride monomer and polyvinyl chloride resins and is investigating the need for a standard that would apply to the 8,000 polyvinyl chloride fabricating plants.

EPA estimates that emissions from VCM plants can be reduced about 90 percent, and from PVC plants about 75 percent at a cumulative increase in the cost of PVC of about 4 percent or one cent a pound. EPA finds that there is a material loss of vinyl chloride and polyvinyl chloride of about 6 percent during the polymerization process.

EPA MAKES DECISIONS

The decision to issue emission standards was announced by EPA Administrator Russell Train on the basis of recommendations contained in a report of a special task force formed last February soon after public disclosure that several workers at vinyl chloride production plants had died from angiosarcoma of the liver, a rare but fatal form of cancer.

Mr. Train says the process of setting an air emission standard under the Clean Air Act would probably require several months of monitoring and other investigations, data collection, public hearings and other required regulatory steps under the act.

Bernard Steigerwald, deputy assistant administrator in charge of developing air quality standards, estimates that it will take six to eight months to develop the standard. He says also that in addition to meeting VCM emission ceilings, industry will be required to undertake additional maintenance, adopt new processing practices and install additional equipment.

The task force report estimates that

"substantial amounts of vinyl chloride - probably exceeding 200 million pounds annually - and large quantities of polyvinyl chloride - probably exceeding 50 million pounds - are being discharged into the environment during the polyvinyl chloride polymerization process. Most of the vinyl chloride escapes directly into the atmosphere, with lesser amounts dissolved in water effluent streams and entrapped in sludge and solid wastes."

It is estimated that the available control technology, which includes a variety of measures applicable to the multiple emission points within the plants, could be in place from within several months to two years after promulgation of the appropriate regulations.

Meanwhile, Department of Labor extended the period for submitting comments on the vinyl chloride economic impact statement to September 25. This statement was prepared for the department by Foster D. Snell, Inc. and estimated the costs per pound of vinyl chloride for plants to meet various levels of vinyl chloride contamination at the workplace. Copies of the report became available August 28.

VVC 000002264

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.

The First Years

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. Park's 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 cancer.

Deadly Statistics

The link between angiosarcoma and vinyl chloride is further buttressed by other deadly statistics. Seven of Mr. Park's fellow workers at the Goodrich plant also contracted the disease, and five others died in

What's News—

* * *

Business and Finance

ENERGY-SAVING MOVES are being studied by the administration in preparation for President Ford's economic speech. Possible conservation moves suggested to him include boosting sharply the tax on gasoline and seeking standby authority to ration the fuel, encouraging car pools and discouraging unnecessary auto commuting, and taxing nonessential use of electricity and natural gas. The resurgence of interest in conservation comes as officials warn further production cuts and price increases by oil exporters are possible.

(Story on Page 3)

High oil prices don't threaten world depression or financial collapse, Treasury Secretary Simon said, backing away from the administration's tough line. There isn't any immediate need for new mechanisms to handle huge oil-money flows, he added.

(Story on Page 2)

Shelving the tax bill until after the elections is planned by House Ways and Means Chairman Mills. That further dims chances of such legislation clearing this Congress.

(Story on Page 2)

Higher freight rates will be sought again by railroads, except for the Chessie System. Other Southern, Western and Eastern lines want boosts up to 7% as of Jan. 1, but expected shipper protests could delay the effective date.

(Story on Page 3)

Volkswagenwerk and other companies have been discussing sharing an equity stake in a car plant that VW is thinking of opening in the U.S. Some of these companies are understood to be American.

(Story on Page 4)

American Motors and United Auto Workers bargainers tentatively agreed on a two-year contract that seems to meet almost every union demand. Workers, on strike since Sept. 16, could be back on the job Monday.

(Story on Page 5)

North American Philips officials were charged by the Securities and Exchange Commission with using insider knowledge for their own gain in buying Magnavox shares before North American announced its offer for that stock. The three defendants are corporate-staff members.

(Story on Page 7)

SEC pressure on the securities industry to create a single national entity to clear stock transactions appears about to be eased. Many in the industry seem unhappy with the Se-

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World-Wide

A CAMPAIGN-FINANCE BILL advanced; the Watergate cover-up trial opened.

House and Senate conferees cleared a way for passage this month of a bill to finance presidential elections with public funds. Agreement was reached on all key issues after Senate delegates gave up the fight for partial public funding of congressional races. Besides full funding of presidential primaries and general elections, the compromise bill would limit spending on congressional races and put ceilings on contributions. A commission with subpoena power would be set up to enforce the law.

Ford opposes public funding of elections, but chances that he might sign the bill anyway were improved by deletion of such financing of congressional races.

The Watergate cover-up trial of Haldeman, John Mitchell, John Earl Hunter, Robert Mardian and Kenneth Parkinson opened in Judge Sirica's court in Washington. Sirica told prospective jurors they might have to serve beyond the Christmas season. The case of one other defendant, Gordon Strachan, has been severed. Charges against Charles Colson, who was dropped when he pleaded guilty to a charge in the Ellsberg case.

Ford's decision to testify in person before a House Judiciary subcommittee about the Nixon pardon was applauded by many members of Congress. But Senate Majority Leader Mike Mansfield said he hoped presidential testimony "wouldn't become a habit."

WEAPONS COST ESTIMATES were raised by the Pentagon due to inflation.

The Defense Department increased its estimate of the cost of 42 major programs \$16.91 billion, or about 13%. Most of the boost resulted from the Pentagon's switching to a "more realistic" inflation factor of 11%; inflation has been figured at only about 4%. Two key programs, the B1 bomber and the Trident missile submarine, were up more than \$3 billion each. The estimates were given in the Pentagon's April-June quarterly report to congressional armed services committees.

The higher estimates will force the Pentagon to cut back some weapons programs. It also will prompt defense planners to raise their budget request for next year, making Ford's anti-inflation effort more difficult.

A TURKISH ARMS CUTOFF was retained by the Senate despite a veto threat.

President Ford warned that he won't sign a bill containing an unconditional ban on military aid to Turkey because it would "destroy any hope" that the U.S. could help arrange a Cyprus peace. The Democratic and the Republican leaders in the Senate both urged their colleagues to reconsider the ban, voted Monday, but Senators refused the plea. The provision would end U.S. arms shipments to any country using them offensively. It was attached to a resolution to continue funding at last year's level for programs awaiting new appropriations, including foreign aid.

The Senate sought to spur action on a new foreign-aid bill by requiring monthly cuts in the amount provided by the continuing resolution.

A cutoff of arms aid to Chile also was adopted. Senators approved an amendment by Sen. Edward Kennedy (D., Mass.) stating that the Chilean military junta was en-

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7 Deadly Statistics

The link between angiosarcoma and vinyl chloride is further buttressed by other deadly statistics. Seven of Mr. Park's 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 21 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. That level was far below the industry standard, in effect for years, of 500 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 14.) 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 unions, many medical experts and

Please Turn to Page 14, Column 1

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(Story on Page 17)

Merrill Lynch's net was "up sharply" in the third quarter from the year-earlier \$4.5 million, the securities-firm holding company's top officer said. The surge is in contrast to the industry's current financial pinch.

(Story on Page 17)

Construction spending in August fell 1.3% from July and 2.2% from a year before to a \$134.4 billion seasonally adjusted annual rate. It was the third consecutive monthly drop as the home building slump continued.

(Story on Page 17)

Virginia Electric was awarded a \$97.7 million temporary emergency rate increase; it had sought a \$127.3 million boost.

(Story on Page 21)

A Shell Oil unit was ordered by the Environmental Protection Agency to stop making Aldrin and Dieldrin for most uses because of evidence the two pesticides may cause cancer.

(Story on Page 7)

Vinyl chloride levels in the air workers breathe must be reduced sharply, the Labor Department ordered. The ruling for the gas, which has been linked to liver cancer, brought a suit from the plastics industry and protests from organized labor.

(Story on Page 14)

Markets—

Stocks: Volume 16,890,000 shares. Dow Jones Industrials 604.82, off 3.05; transportation 127.48, off 1; utilities 60.49, off 0.67.

Bonds: Dow Jones 40 bonds 64.29, off 0.15.

Commodities: Dow Jones futures index 359.51, off 4.38; spot index 381.71, up 1.72.

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The Senate sought to spur action on a new foreign-aid bill by requiring monthly cuts in the amount provided by the continuing resolution.

A cutoff of arms aid to Chile also was adopted. Senators approved an amendment by Sen. Edward Kennedy (D., Mass.) stating that the Chilean military junta was engaging in "gross violations" of human rights. About \$15 million of assistance will be affected.

South Vietnamese President Thieu assailed the cut in U.S. aid as a broken promise. Congress has reduced arms aid to \$700 million this fiscal year from the \$1.2 billion budgeted, and the administration request of \$750 million of economic aid is expected to be halved. Thieu, in a broadcast speech, also denied corruption charges and said he will seek a third term next year.

Deputy Defense Secretary William Clements arrived in Saigon to assure Thieu the Ford administration will continue to push for more aid. Clements flew in from Bangkok, where Thai officials asked for U.S. help in setting up local munitions factories.

Republican Representatives would be permitted to hire more staff members and younger GOP Congressmen would have a say in the hiring, under a proposal approved by the House. It is considering alternative plans to reorganize its committees, and the vote was seen as a victory for backers of a less-drastring revision.

A Democratic Congressman from New York, Bertram Podell, pleaded guilty on the ninth day of his trial on charges of using his position to help a small airline in return for \$41,350. Sentencing was set for Jan. 9.

Nelson Rockefeller's nomination to be Vice President has been opposed by the great majority of letters received by the Senate panel considering him, Chairman Howard Cannon (D., Nev.) said. He added that much of the letter writing appeared to be organized.

A new and potent flu from New Zealand called the Port Chalmers Flu is likely to strike all of the U.S. except the Northeast and Middle Atlantic regions this winter, the National Center for Disease Control said in Atlanta.

American couples plan smaller families than they did a year ago, the Census Bureau reported. It said every 1,000 married women aged 18-39 surveyed expect to have a total of 2,550 children. Such expectations a year ago were 2,838 children, and in 1967 they were 3,118 children.

Federal employees got a 5.5% pay increase, reluctantly ordered by President Ford after the Senate refused to let him delay it three months to fight inflation. Ford was free to set the amount, and he chose the figure proposed by the budget office rather than two other organizations' higher recommendations. The raise is supposed to keep federal pay on a par with that in industry.

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

Continued From First Page

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 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, 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 ves-

sels, 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 change 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 Malloni, a respected researcher at the Institute of Oncology in Bologna, Italy, to do more extensive animal studies. By October 1972, Prof. Malloni 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 delays 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 Malloni 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

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

By a WALL STREET JOURNAL Staff Reporter

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lowing 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

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, 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 ves-

this fact wasn't revealed until well after the first human angiosarcoma cases were revealed.

The search 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 delays 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.

Kansas-Nebraska Natural Gas Closes Purchase of 3 Firms

HASTINGS, Neb. — Kansas-Nebraska Natural Gas Co. said it concluded the acquisition of three privately owned Wyoming gas companies, Northern Utilities Inc., Northern Gas Co. and Northern Mountain Gas Co.

The transaction involves the purchase of all the stock of the companies in exchange for 693,000 shares of Kansas-Nebraska. Based on a recent closing price on the New York Stock Exchange of \$14 a share, the shares have a value of \$9.3 million.

Agreement on the acquisitions was disclosed last May. Completion of the acquisitions followed clearance from regulatory agencies and registration of the shares with the Securities and Exchange Commission.

The three Wyoming concerns serve some 33,000 residential, commercial and industrial customers in 12 communities through pipeline and distribution systems in central and southern Wyoming.

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The ruling, which comes after nine months of controversy, brought a lawsuit from the plastics industry, which contends the standard can't be met, and criticism from organized labor, which contends the rule contains too many 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.

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 the adjustment for industry by delaying until next January the drop from the pres-

ent 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.

Todd C. Walker, president of the Firestone unit, asserted that the standard "puts the vinyl plastic industry on a collision course with economic disaster." He said it "is comparable to a law aimed at stopping automobile deaths by lowering the speed limits to one mile per hour."

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."

Union safety experts have been heavily involved in the rule-making process, and one of their major contentions has been that protection from the gas should be derived primarily from controlling exposure through engineering and work-rule changes rather than from respirators, which workers often balk at wearing because they can be bulky and unreliable.

The unions are expected to study the ruling in depth, and they, too, could file a lawsuit if they conclude the final standards are inadequate.

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