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Cancer Deaths Verified for First Time For Polyvinyl Chloride Industry Workers

By BARRY KRAMER

Staff Reporter of THE WALL STREET JOURNAL

A second death from angiosarcoma of the liver, a rare form of cancer previously linked to vinyl chloride occupational exposure, has been discovered in the polyvinyl chloride plastic fabricating industry, the Connecticut Health Department announced in Hartford.

The two deaths increase concern that the occupation danger of cancer from vinyl chloride, a gas used to make polyvinyl chloride plastic, may be more widespread than had been thought. Since January, 13 cases of liver angiosarcoma have been detected among vinyl chloride workers from plants that manufactured the gas or that polymerized the gas into the plastic. Six other cases have been reported abroad.

But the Connecticut cases are the first known in the polyvinyl chloride fabricating industry, which turns the plastic into a myriad of finished products ranging from furniture to coated fabric to electric cable covering. German scientists recently reported finding "precursors" of angiosarcoma in the livers of six workers in a plant that turned polyvinyl chloride plastic into floor tiles.

But the Connecticut cases, confirmed as angiosarcoma by the National Cancer Institute in Bethesda, Md., are the first actual cases. In the U.S. an estimated 6,500 persons work in the vinyl chloride industry, while the number working in the polyvinyl chloride industry numbers in the hundreds of thousands.

The Connecticut Health Department announced the first case last week, and General Electric Co. disclosed that it was a 60-year-old employee who for 30 years had operated machines at a Bridgeport cable manufacturing plant that processed various plastics, including polyvinyl chloride. The man died last July, GE said.

The second case involved a man who worked as an accountant in a polyvinyl chloride fabricating plant in the same part of the state. A health department spokes-

man declined to identify the factory involved, and a Labor Department spokesman in Washington identified it only as a Stratford plant that makes polyvinyl-coated fabrics. A further investigation is being undertaken to learn if the accountant ever worked on the production line.

Although a definite relationship between occupational exposure and angiosarcoma in the two polyvinyl chloride workers cannot be made, the Labor Department spokesman said contact with all other chemicals, drugs and diseases that can affect the liver had been ruled out in the two cases, leaving only polyvinyl chloride as a known possibility.

Connecticut's cancer registry, which uncovered the two cases and which is one of the oldest and most accurate in the nation, lists six confirmed cases of angiosarcoma of the liver since the registry was begun in 1935. The other four cases didn't have known exposure to either vinyl chloride or polyvinyl chloride, according to Dr. Barbara Christine, chief of the health department's chronic disease section. She said the link between polyvinyl chloride and the two angiosarcoma deaths "might just be chance."

The link between vinyl chloride gas and liver angiosarcoma is strong, and scientists believe that if a link is determined between exposure to polyvinyl chloride plastic and the rare cancer it will be because the plastic contains pockets of unpolymerized vinyl chloride monomer that are liberated in heating the plastic when it is fabricated into different products.

Labor Department hearings designed to set permanent standards for vinyl chloride atmospheric concentrations in factories are scheduled to begin June 25 in Washington. A temporary ceiling of 50 parts vinyl chloride per million parts of air is currently in effect and the Labor Department has proposed a limit at levels too small to be detected, a requirement the industry has said would be impossible to meet.

Cosmo: mixed reviews

It was cosmetics show time at the New York Coliseum last week. On stage: CosmoExpo 2, the second annual trade show and conference for the cosmetic, fragrance, toiletry and proprietary industries. And like many a show on Broadway, it received mixed notices.

The primary reaction was that this year's show was bigger and better attended than last year's. According to Robert Grayson, of sponsoring Grayson Associates, registration of exhibitors was up to 180, from about 120 last year.

But some exhibitors were disappointed by the product mix. They felt there was too much emphasis on packaging—glass and plastic bottles, caps, tubes, aerosols, labels and decorating materials. Exhibits by manufacturers of cosmetic and toiletry items and suppliers of raw materials were relatively few. Others, however, noted that there were more of these exhibitors than there were last year and saw this as an encouraging sign.

Grayson Associates has been working to broaden the appeal of the show, conceived to bring suppliers and marketers together (*CW*, Sept. 27, '72, p. 37). For example, a small "machinery row" for packaging, processing and labeling equipment made its debut. And seminar sessions in the morning were expanded, to include technical and research and development topics as well as marketing.

New Products: Some companies found the show a good time to introduce new products:

- The Lacquerite Division of Supronics Corp. (Livingston, N.J.) showed off its new nail enamel technology. The enamels are "seashell" finishes—include pink in the bottle but with a blue flash on the nail, and orange with a red flash.

- Both Richford American Corp. (New York) and Bakan Plastics (Kansas City) exhibited mechanical aerosols capable of producing fine mists.

- NL Industries touted the benefits of Bentone-gelled perfume systems, said to help prolong fragrance release.

- Meyercord Co. (Carol Stream, Ill.) showed a high-speed decal application process for cylindrical glass containers for cosmetics and pharmaceuticals.

Other companies found the show an opportunity to reinforce corporate marketing. Among them: Union Camp Chemicals, out to boost its stake in the cosmetics industry, and Gentry International (Fair Lawn, N.J.), an essential oils house beefing up its work in compounded fragrances.



EXPLOSION AND FIRE at Nypro plant caused 29 deaths, \$96 million in damage.

Blast will hurt nylon

The explosion and fire that last week destroyed the Nypro plant in Flixborough, England, killing 29 persons and injuring more than 100, virtually wiped out the U.K.'s sole supply of caprolactam—the chemical intermediate essential for producing nylon-6.

Moreover, according to Britain's National Coal Board, which owns 45% of Nypro (Dutch State Mining owns the rest), the destruction of the 70,000-tons/year plant may have significant repercussion on world nylon production. It accounted for one-seventh of total world caprolactam output.

Courtaulds was Nypro's biggest customer (about 35,000 tons/year), and British Enkalon, a subsidiary of Holland's Azko, was No. 2 (25,000 tons/year). Production of caprolactam at Flixborough was below capacity.

Only last June, Nypro had brought a new, \$36-million, 50,000-tons/year caprolactam unit onstream at the six-year-old, \$48-million complex. The explosion is being tentatively blamed on a cyclohexane leak—one of the highly flammable materials used in making caprolactam—but Nypro officers say they are still uncertain about the origin.

Although Courtaulds and British Enkalon are reluctant to comment on the effects of the explosion on their nylon production, both companies are scrambling for alternative sources. So far, neither company is willing to say how much is available and at what price, although DSM, which has a reported caprolactam

capacity of 336,000 tons/year, "would do everything possible" to assure supplies to the British nylon makers, according to London sources.

Although it will take two years to rebuild the Flixborough plant, at an estimated cost of \$96 million, the benzol-based cyclohexane that was supplied by Staveley Chemical (45% owned by the National Coal Board, 45% by British Steel, 10% Continental Oil) could be shunted to other caprolactam facilities.

VCM probe goes outside

The Environmental Protection Agency last week asked 27 producers of vinyl chloride monomer and polyvinyl chloride to supply detailed information on VCM emissions into the air from their plants. EPA says the data will be used to help it decide whether rules to restrict the emissions are necessary.

Acting under the Clean Air Act of '70, EPA already is taking air samples outside some of the 14 VCM and 35 PVC plants on which it has requested data. A spokesman says the agency also expects to study liquid and solid wastes from the plants.

EPA has asked the 27 companies to supply information about:

- Points in the manufacturing process where there may be vinyl chloride emissions and in what quantities.

- Emission control procedures that have been or could be instituted, and cost estimates for installation and operation of necessary equipment.

- Any results of ambient air studies the firms may have made by using their own monitoring equipment.

For several months before the EPA air study began, workplaces had been the major areas of concern in investigation of the possibility of a link between VCM and angiosarcoma, a rare liver cancer. Nineteen cases of angiosarcoma had been confirmed among health records of dead and living VCM and PVC plant workers. Now, the focus has broadened to include the possibility of health hazards to persons living near the plants. The *New York Times* reported last week that New York state lists six cases of angiosarcoma—three of them are persons who had worked in Goodyear Tire & Rubber's Niagara Falls PVC plant, and three are women who had lived in the Niagara Falls-Buffalo area. Goodyear, however, says its own monitoring of air around the plant has turned up no measurable amount of VCM contamination. It also disputes the *Times'* assertion that one victim had lived downwind from the plant.

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28 Charleston Daily Mail TUES., JUNE 11, 1974

Examiner Hopeful Industry Can Solve Chloride Problem

By RICHARD HAAS
Daily Mail Business Editor

If the chemical industry cannot reduce the cancer risk to its employees, it should be shut down, the director of a medical team studying workers at Union Carbide's South Charleston plant said Monday.

Dr. Irving Selikoff, director of the Mount Sinai School of Medicine unit which conducted four days of medical tests at the plant, added, however, that he was impressed with the industry efforts being made to reduce worker exposure to vinyl chloride.

Dr. Selikoff's team is one of the leading research groups studying the possible link between exposure to vinyl chloride and angiosarcoma, a rare form of liver cancer. Carbide and the Local 598, International Assn. of Machinists and Aerospace Workers invited the New York group to the plant after concern developed earlier this year over the possible dangers of the chemical. A review of plant medical records revealed that one South Charleston worker died of angiosarcoma in 1968 and one other former employee is seriously ill of a liver disease which has not been definitively diagnosed.

Following a tour of the production units at the plant where vinyl chloride monomer is converted to polyvinyl chloride, Dr. Selikoff said the technical progress made in reducing levels of vinyl chloride in the workplace and the good will shown by Carbide were hopeful signs that the problem could be solved.

The South Charleston plant is the fourth major U.S. chemical facility visited by the Mount Sinai team this year, but the clinical data on the effect of vinyl chloride under actual working conditions is very limited. Dr. Selikoff said. Researchers working with laboratory animals have found they can produce the liver tumors associated with angiosarcoma in rats by exposing them to very limited quantities of vinyl chloride, he said.

The problem, he noted, comes in transferring the animal findings to the human situation. "If you ask me what is a safe level of vinyl chloride, I can't answer that," Dr. Selikoff said. "No one can. I can tell you what an unsafe level is, and I can tell you that if you want to be absolutely certain you should eliminate exposure completely, but I can't say whether there is an in-between level that is safe."

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The goal of industry and its government regulators should be to reduce the cancer risk of chemical workers to the same risk level of the population in general. Eliminating the risk completely would be impossible, Dr. Selikoff said, since some cases of angiosarcoma are not linked to vinyl chloride.

Since the adoption of the Occupational Safety and Health Act of 1970 the law of the land has been that industry must

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—Dr. Irving Selikoff

offer its employees a workplace that is free from exposure to accidents and disease. Dr. Selikoff said. If the chemical industry cannot reduce the risk from vinyl chloride, government would be forced to close the affected operations, he said.

Dr. Selikoff rejected the contentions of some chemical industry officials that the cancer risk involved in exposure to vinyl chloride is less than

that associated with cigarette smoking and thus does not warrant strong government action. "The correlation is strong in both cases," he said, "but cigarette smoking is strictly voluntary."

Because widespread use of various chemicals is a fairly recent phenomenon, Dr. Selikoff said he expects other problems similar to the vinyl chloride situation to develop. "Those of us involved in cancer research are asking ourselves: 'How many other vinyl chlorides should we be looking for?'"

If any of the tests conducted on the Carbide workers produce suspicious findings, he said, the workers and their physicians will be encouraged to arrange further testing.

A statistical report which does not reveal names will be sent to both the union and the company, Dr. Selikoff said. If any of the workers tested give their approval more detailed findings will be disclosed to Carbide medical officials, he said.

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