

UNION CARBIDE CORPORATION
HEALTH, SAFETY & ENVIRONMENTAL AFFAIRS

39 OLD RIDGEBURY ROAD
DANBURY, CT 06817

TO: R. C. Wise

DATE: November 7, 1985

COPY: M. G. Ott

SUBJECT: Vinyl Chloride Study

Dear Dick,

The following is a "brief" history of the Vinyl Chloride (VC) Study:

In January 1974, B. F. Goodrich Chemical Company reported that angiosarcoma of the liver was the cause of death of three employees at the company's Louisville, Kentucky plant. Because of the rarity of this disease, such a clustering suggested a possible occupational etiology. Each of the deceased had had similar assignments for long durations which had potentially exposed them to high concentrations of VC in the polymerization stage.

By March 1974, with knowledge of the Goodrich deaths, NIOSH and OSHA had concluded factfinding hearings, a petition had been filed with OSHA for an emergency temporary standard, and NIOSH had recommended a standard that covered virtually all locations manufacturing VC, producing polyvinyl chloride (PVC), and fabricating or storing the resins.

At the time, there were no data from which to determine the prevalence of angiosarcoma of the liver in the plastics industry. On further investigation, other cases of the disease were found, but the pattern of occurrence suggested that they were associated with those processes which involved high concentrations of VC monomer (VCM), primarily residues in polymer reactors. Thus, there remained the question of possible adverse effects on employees engaged in fabrication where potential exposures were thought to be low and to result only from the release of unreacted monomer trapped in the resin.

The original study was performed under contract by Tabershaw Cooper Associates (TCA)/Equitable Environmental Health, Inc., administered and directed by Organization Resources Counselors, Inc. (ORC). That study was an historical cohort mortality study which followed a cohort of 10,173 male employees who had accumulated at least one year of potential VC exposure by virtue of job assignments held prior to December 31, 1972. The designation of jobs which involved such exposure to VC was made by staff members at individual study plants or by corporate industrial hygienists. The cohort was provided by 37 individual plants operated by 17 separate companies. Approximately two-thirds of the cohort members were selected by TCA personnel through searches of plant records. Selection was based upon assignment to in scope job titles (identified by plant personnel) within the appropriate time periods. The remaining one third of the cohort members were selected by plant personnel through similar searches using selection criteria provided by TCA.

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The vital status of each employee in the study was ascertained as of December 31, 1972. Death certificates were obtained and underlying cause of death was determined for the deceased. The observed mortality (overall and cause-specific) was compared with that of the U.S. male population during the time period of the study. The all cause standardized mortality ratio (SMR) was 89, the all cancer SMR was 104. Although no cases of angiosarcoma of the liver were found, the final report concluded ". . . There is, nevertheless, still some support for the hypothesis that vinyl chloride may increase the incidence of cancer slightly in sites other than the liver. The principal evidence for this is the observation that the incidence of lung cancer and miscellaneous cancers appears to be higher in individuals with higher maximum exposures and those with longer exposure periods.

"Brain tumors were found to be in excess, 12 observed vs. 5.9 expected (significant at the 0.05 level) but the incidence was not related to either duration of exposure or to intensity of exposure to VCM.

"This population should be studied again within the next 5 years. Since the time of observation after first exposures will be longer, and more deaths will be available for analysis, it is possible that some of the questions about cancer in sites other than the liver may be resolved."

The study update began in late 1982. All companies that had participated in the original study were asked to supplement the work histories of their included employees with data through December 31, 1980. One thousand two hundred eighteen (1218) worksheets for South Charleston employees and 274 worksheets for Texas City employees were submitted to UCC Epidemiology for work history updating. Updated worksheets were returned to the present contractor (Environmental Health Associates (EHA)) by May, 1983.

The Vinyl Chloride Research Coordinator meeting with EHA will take place on November 8, 1985. Dr. Otto Wong will provide an update on the study. Prior to going to EHA, the epidemiology task group will meet to review the contract and the scope of work.

I'll report the results of the meeting to you when I return. If you'd like to know more about the study, give me a call. I have the final report of the original study, the proposal for the update, etc. in my office.

Sincerely,

Howard Greenberg
H. L. Greenberg/pm

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