



MANUFACTURING CHEMISTS ASSOCIATION

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February 5, 1974

To: AIR QUALITY COMMITTEE
LABELS AND PRECAUTIONARY INFORMATION COMMITTEE
OCCUPATIONAL HEALTH COMMITTEE
SAFETY AND FIRE PROTECTION COMMITTEE
SOLID WASTES MANAGEMENT COMMITTEE
TECHNICAL TASK GROUP ON VINYL CHLORIDE RESEARCH
WATER RESOURCES COMMITTEE

Subject: NIOSH Investigations and Recommendations
with Regard to Vinyl Chloride (VC) and
Polyvinyl Chloride (PVC)

Gentlemen:

The attached correspondence from NIOSH Director Dr. Marcus Key reports their activities consequent to the report by the B. F. Goodrich Chemical Company of four cases of angiosarcoma of the liver among the employees of their Louisville, Kentucky vinyl chloride operations. At Dr. Key's request, we are helping to provide wide distribution of NIOSH's recommendations among those industries handling vinyl chloride.

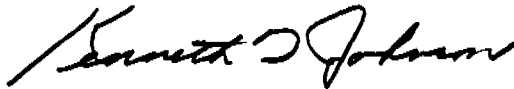
As you may know, a group of ^{VC}~~PV~~/PVC companies has been supporting MCA-administered studies involving chronic inhalation exposures of laboratory animals to vinyl chloride monomer vapors, and a mortality study of workers in the industry. Both programs are as yet incomplete, and MCA will continue to cooperate with NIOSH as it seeks to resolve the questions raised by these events.

The Occupational Safety and Health Administration will hold hearings, starting February 15, 1974, to determine whether an emergency standard should be promulgated for vinyl chloride,

ASI 000010418

or whether it should proceed directly to develop a permanent standard pursuant to section 6(b) of the Act. MCA plans to submit a statement.

Sincerely,



Kenneth D. Johnson, Ph.D.
Secretary, Technical Task Group
on Vinyl Chloride Research

KDJ:mb

Distribution "C"

cc : Medical Contacts
Management Contacts of Companies Supporting the Vinyl
Chloride Research Program
D. P. Duffield, M.D.
Mr. D. M. Elliott
Dr. Tiziano Garlanda



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL

JAN 31 1974

NATIONAL INSTITUTE FOR OCCUPATIONAL
SAFETY AND HEALTH
8600 FISHERS LANE
ROCKVILLE, MARYLAND 20852

MANUFACTURING CHEMISTS
ASSOCIATION, INC.

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Mr. George E. Best
Manufacturing Chemists Association
1825 Connecticut Avenue, N.W.
Washington, D.C. 20009

Dear Mr. Best:

On January 22, 1974, representatives from the B. F. Goodrich Chemical Company, met with myself and other staff of the National Institute for Occupational Safety and Health (NIOSH) to present their concerns that recent deaths of several of their employees at their Louisville, Kentucky plant might be related to occupational conditions. Had not the Company taken the initiative it did in following up on suspicions aroused by the occurrence of the rare type of liver cancer (i.e. angiosarcoma) discovered in several of its employees at autopsy, it is entirely possible that the significance presently attached to the appearance of those tumors would not have been realized for several more years.

As a result of this information, a walk-through survey was conducted on January 24 in the Company's facility in Louisville by NIOSH. Also participating in the survey at the specific request of NIOSH were representatives from the Department of Labor of the State of Kentucky, the Occupational Safety and Health Administration of the U.S. Department of Labor and the Epidemic Intelligence Service (EIS) of the Center for Disease Control (CDC).

We were most pleased with the Company's excellent cooperation with the survey team in providing access to Company employees, union representatives and Company records of medical and employment history significance. The agreement of officials of the Louisville facility to provide continuing cooperation with the organizations participating in the survey demonstrates the sincerity and concern of the B. F. Goodrich Chemical Company in determining the significance of past and present conditions of employment which may have either precipitated or initiated the induction of tumors in certain of its employees.

On February 1, NIOSH will brief representatives of the National Cancer Institute (NCI), the Food and Drug Administration (FDA),

ASI 000010420

Page 2 - Mr. George E. Best

and the National Institute for Environmental Health Sciences (NIEHS), as to the results of the initial survey of the Louisville plant and also review the results of the investigation thus far. Subsequent to this meeting, NIOSH will develop a protocol for further field studies as well as recommendations for medical diagnosis and follow up.

At this time the etiologic role of vinyl chloride in the induction of the observed liver tumors is not certain. The occupational exposure of the deceased workers to over 50 other chemicals at the Louisville facility precludes a clear definitive role for this substance as a carcinogenic agent until the degree of exposure to other chemical substances and work histories of deceased employees can be evaluated. However, the implication of vinyl chloride as the possible etiologic agent is not readily dismissable and, unless an association with another of the chemical substances is revealed, vinyl chloride must remain as the principal etiologic agent of suspicion.

Until well-documented recommendations to OSHA can be developed, we are recommending that the preliminary work practices and monitoring and control procedures for the polymerization of vinyl chlorides (Enclosure 1) be instituted as interim measures. These preliminary procedures are based, in part, on the information on hand concerning the operation of the Louisville facility and on the results of the walk-through survey conducted by members of the Institute's staff. These recommendations in more specific detail have been transmitted to the B. F. Goodrich Chemical Company for implementation at their Louisville facility.

Mr. Vernon E. Rose, Acting Assistant Institute Director for Research and Standards Development will provide NIOSH coordination in development of controls and/or standards to be recommended to OSHA.

Mr. Rose or members of his staff may be reached by telephone at (301) 443-3680. They will insure that all requests for technical information or assistance concerning this situation are directed to appropriate NIOSH staff or members of the other Federal agencies involved with the ongoing study.

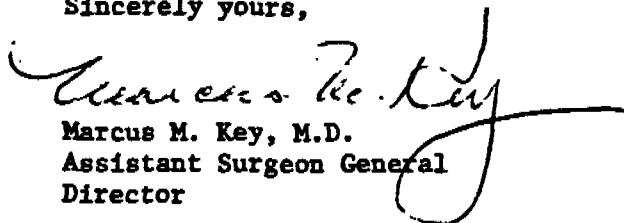
The possible significance of vinyl chloride as a carcinogenic substance requires close cooperation between the vinyl chloride industry and State and Federal agencies. Consequently, it is my hope that through your organization the above information and

ASI 000010421

Page 3 - Mr. George E. Best

enclosed recommendations can receive the widest distribution to other companies using these processes.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Marcus M. Key". The signature is written in dark ink and is positioned above the printed name and title.

Marcus M. Key, M.D.
Assistant Surgeon General
Director

Enclosure

ASI 000010422

Enclosure 1

NIOSH Recommended Precautionary Monitoring and Control Procedures for Polymerization Processes Involving Vinyl Chloride

I. General Housekeeping Procedures

one/n
A. The spillage of Vinyl Chloride and Polyvinyl Chloride in and around the production facilities should be controlled as follows:

- These seem to be directed toward monomer spillage or spillage of high molecular weight polymer.*
1. Housekeeping procedures should be implemented to assure immediate removal of VC and PVC material around polymerization operations including drying, packaging and loading operations. *spillage material?*
 2. Recovered PVC material *powder, pellets?* which is to be packaged should be stored in closed containers. *outdoors*
 3. Waste PVC material *(powder, pellets, scrap?)* should be stored in closed containers and consideration should be given to the adequacy of its disposal and/or destruction. Care should be taken in the storage of closed containers to insure that unsafe conditions do not result from an internal build-up of pressure in the container.
- To be done on rubber background*

Weight balance
B. Inventories of beginning and recovered quantities of VC and quantities of PVC produced, packaged and recovered should be made to determine losses and probable areas affected.

C. PVC material should be removed from overhead structures and? conduits where it tends to collect.

Storage and
D. Consumption of food should be permitted only in separate facilities provided for this purpose, and no food products should be permitted elsewhere in the polymerization facility.

II. Protective Clothing

A. A daily change of protective clothing including full coveralls, or the equivalent, should be provided each employee in areas where possible exposure to VC/PVC could occur. Clothing contaminated by accidental spills *monomer or polymer* should be changed as soon as feasible.

B. Protective gloves and footwear, or footcovers, should be worn as appropriate in those PVC operations where exposure to PVC material is possible.

C. Protective head covers should be worn during PVC operations as appropriate (e.g. hard hats in those areas where physical protection of the head is necessary and hair coverings, or the equivalent, in

Not air supply suits

operations such as cleaning of polymerization reactor tanks and packaging operations).

D. Where employees are engaged in maintenance or cleaning operations of polymerization reactors tanks they should wear full impervious suits to guard against skin contact of PVC material and VC vapors. Procedures for safe entry to confined spaces should be observed.

III. Showers

Washing hands & face before lunch and .

^ Showers at the termination of an eight-hour work shift should be mandatory for all workers with possible contact with VC-PVC.

IV. Monitoring

A. Environmental Monitoring

1. In-plant environmental monitoring programs should be implemented; and where workers are required to enter polymerization tanks, a survey of the VC concentrations should be made in the reactors immediately after opening, immediately prior to entry of maintenance personnel and during the tank cleaning operation. *OK*

2. Data obtained from the environmental monitoring program should be used to indicate those areas where efforts should be directed to reduce airborne levels of VC. *OK*

3. Positive programs to initially control VC levels well below the present Federal Standard of 500 ppm should be developed (some companies are targeting at 50 ppm) and efforts to further reduce levels should be given consideration concomitantly with the necessary modifications in engineering and design controls. *OK*

4. The concentration of VC in exhaust ventilation should be determined to estimate the amount of VC lost during operations and the possible exposure of personnel immediately outside the facility. *OK*

5. Monitoring for PVC particulate material should be accomplished to estimate the degree of exposure to this substance throughout the facility. *and determine VC level outside of PVC process*

B. Personal Monitoring

1. Integrated, eight-hour personal monitoring samples should be obtained from those employees considered to receive the greatest exposure to VC or PVC. *Can this be done?*

To be made for those having highest exposure

2. Breathing zone samples should be obtained to complement environmental monitoring program for VC, and similar samples should be obtained for PVC.

V. Respiratory Protection (*for all transfer operations*)

Because VC is a gas under ambient conditions and PVC is a solid under these conditions, it is recommended that respiratory protection for employees take these circumstances into consideration.

A. Where employees are engaged in cleaning and maintenance operations inside polymerization reactors they should be equipped with an atmosphere-supplied respirator in order to protect against both VC vapor and PVC particulates. c.k.

B. During housekeeping procedures and packaging operations ^{*of feed rooms*} where the possibility of PVC dust inhalation is a factor, it is recommended that an air-purifying respirator equipped with a mechanical filter designed to remove particulate material be worn. Respiratory protective devices which meet this requirement, as well as protect against VC vapors in concentrations less than 0.1% have been approved by the NIOSH Testing and Certification Laboratory and bear the numbers: TC-23C-40, TC-23C-47, TC-23C-48.

C. Where employees are engaged in transfer operations of VC from railway tankcars to storage facilities or at any similar transfer point which requires manual operations, they should wear a self-contained breathing apparatus (SCBA) during such operations to guard against unexpected release of VC during such operations.

D. Other operations involving possible exposure to VC or PVC should be evaluated as the individual situation exists and respiratory protection provided as appropriate.