

Firestone
INTEROFFICE

TO C. J. KLEINERT

DATE October 12, 1977

FROM D. M. CONNOR

REFERENCE

RECEIVED

OCT 16 1977

W. W. MADDELL

SUBJECT VINYL CHLORIDE SAFETY ASSOCIATION MEETING

On October 6, 1977, the Vinyl Chloride Safety Association meeting took place in Valley Forge, Pennsylvania. There were 84 attendees representing approximately 30 PVC and VCM organizations. Representing Firestone were R. S. Frain, R. R. Smith, F. R. Swavely, B. A. Walker and the writer. Pertinent items are as follows:

1. Vinyl Chloride Physiological Effects

Dr. McBurney of Diamond, whose background is surgery and pathology, gave the best dissertation that I have heard on the clinical effects of vinyl chloride monomer. In summary, the VCM focuses in the linings of small blood vessels which can then manifest themselves as (a) a skin thickening or fibrosis; (b) reduced blood flow through the fingers and toes (Reynaud's Phenomena) which is a forerunner to acroesthyolosis; (c) detoxification in the liver due to sulfur enzymes produces the metabolites which can lead to a cirrhosis condition, an enlarged spleen or ultimately, AGS.

Medically, VCM would be considered a weak carcinogen in that only approximately one case occurs per 3400 individuals who have had prolonged high exposure.

He feels that there is adequate evidence of a mutagenic effect on females particularly during the first month of pregnancy. Diamond limits any exposure for susceptible females and expects to have a confrontation with EEO in the near future.

2. Medical Surveillance

There was not much new in this area, but some discussion did center around handling of casual visitors such as outside service people or employees who do not normally receive periodic physicals. Several companies in this category allow up to 45 minutes at less than 5 ppm.

3. OSHA Enforcement Action

The Goodrich representative described four recent OSHA visits to their facilities at Calvert City, Long Beach, Pedricktown and Louisville. The length of the inspections was from 2-12 days. The inspection at Louisville was triggered by a union complaint, apparently because the employees believed that their monitoring results were not valid. BFG believes that the inspection at Pedricktown was because they reported two massive releases within a three-week period. They do not expect any citations

OCC 2848

for VCM exposure but believe that they will be cited in their compound area for dust exposure and improper mask usage, and drinking coffee in the control room. Noise testing was done in several areas.

Goodrich proposed that the following information should be circulated to the member companies of the Safety Association:

(a) Any policy letter from the Federal agencies.

(b) Any citations related to VCM problems.

There was general agreement to this effect. H. Waltemate of Goodrich will coordinate.

Nineteen plants have been inspected within the past two years and thirteen of these included monitoring for VCM. Three companies received non-serious citations for 8-hour TWA greater than 1 ppm, even when the employee was wearing a mask.

The comment was made that around New Orleans, 60-70% of the inspections result from employee complaints.

4. OSHA Compliance Practice Review

At least six companies claimed that the VCM exposure in their polymerization plants averages 0.5 to 1 ppm. Ten companies (including 3 VCM plants) say that 90% of the time their area monitoring shows less than 1 ppm.

5. EPA Up-Date

The Conoco representative brought everybody up-to-date on the new EPA proposals and SPI counter-proposals.

6. Emission Control Methods Review

The Air Products representative presented the methods of chemical and physical control of VCM emissions. Incineration is the most popular method followed by carbon adsorption. Invariably, incineration requires a scrubber for HCl control and there have been reliability problems. It was pointed out that carbon adsorption may have a tendency to recycle impurities. Catalyst destruction appears to be a viable way but there is not as much existing information in this area.

"Reportable" releases came under some discussion. There is no established lower limit for reporting but there was general agreement that rupture discs or relief valve discharges are reported.

7. VCSA History

Nothing new to report in this area.

8. Transportation Up-Date

HM-144 as proposed by DOT was passed on 9/15/77 to go into effect 10/19/77. This covers all flammable, compressed gasses transported by railcar. There were three major items concerning 112A, non-insulated tank cars:

- (a) The coupler is to have a vertical restraint system. Existing cars would have to be retrofitted by 7/79 at the cost of \$900-\$1000 per car.
- (b) Additional head protection would be required by 12/81, consisting of either a trapezoidal shield on each end or a full 1/2 inch thick head.
- (c) By 12/81 thermal protection will be required either in the form of a spray-on coating or a one-inch thick insulating board with jacketing.

Some of these revisions could amount to as much as \$11,000 per car and decrease the payload of the car by as much as 17,000 lbs.

Type 105A railcars (insulated) are not affected by the bill. New "Flammable Gas" placards and dome notations will be necessary for VCM cars. Also new wording on shipping papers will be required. Those people involved should refer to Title 49, Code of Federal Regulations, DOT 172.200, 174.2456 and 172.203(g).

9. Reports of Incidents

PRIMEX

(a) The PVC plant at Primex (80 miles East of Mexico City) with a rated capacity of 80 million lbs. had an incident on 6/19/77 in their tank farm area. They had seven horizontal storage tanks with a total capacity of 4.4 million lbs. VCM. At 11:00 am, a maintenance man who had been sent to repair an automatic valve actuator on one of the storage tanks inadvertently removed the bolts from the 4-inch Tufline valve bonnet. There was virtually no wind to disperse the subsequent massive leak. Within 35 minutes they had shutdown their plant and the neighboring plants. One hour and 20 minutes later, there was a visible cloud approximately 1100 feet long, 800 feet wide and 5 feet high. The cloud ignited, probably from a plant which was 500 feet away. The storage area went up like a torch. Within 2-3 minutes, the safety valves started operating and subsequently there were four explosions as the tanks ruptured. Ultimately, the entire inventory of 2.9 million lbs. of VCM was consumed in the fire which lasted until the following day.

There were four serious injuries including one mortality due to burns. Equipment lost was estimated at \$3 million. They had no excess flow valves and their available water storage of only 114,000 gallons cooled three of the storage tanks for only 50 minutes. The direct cause of the incident was human error, a maintenance man who had been on the job for 10 years and had successfully performed the same job many times.

(b) At 2:35 am on 9/5/77 (Labor Day) a non-solvent reactor exploded at Union Carbide, Texas City. This is a bulk process unique to Union Carbide and no details could be given. Two employees were about 75 feet away. Both were critically burned, one has died. The resultant fire lasted for only about one hour but the immediate area was severely damaged. The 6,000 gallon reactor was at a normal level but no details could be given on the pressure at the time of the incident. Normal operating pressure is 92 psig. The reactor contained VCM but may have been a copolymer type. This was a commercial batch--not a scale-up trial.

(c) Air Products, Pensacola, Florida, was starting up their computer control operation on 1/20/77 following a shutdown due to a plant freeze-up. The operator opened a monomer valve through the computer spilling an estimated 500 lbs. (seems low) of VCM to a welding machine approximately 50-100 feet away. The resultant fire damaged instrumentation but caused no structural damage and was brought under control within an hour. Thirty-four people were sent to the hospital for blood tests following the VCM exposure and 8 construction people were treated for burns and smoke inhalation.

(d) ESSO Chemical of Canada reported their observations on chloride stress-corrosion cracking adjacent to the welds on 304 stainless steel in PVC service. The equipment was in continuous service since 1966. They have seen this through their entire plant within temperatures of 120-185°F, in the vapor phase as well as the liquid areas, at chloride levels as low as 10 ppm, and ph of 3-5. They have not seen any corrosion in their 316 stainless steel equipment. This was also confirmed by other representatives in the room.

(e) The Norsk Hydro representative reported the results of additional chromosome studies. They had repeated the studies which two years ago showed that VCM workers had excessive chromosome aberrations. The conclusions of the study wherein they tried to examine the same people as had previously been examined, was that chromosome deviations were now back to normal for the VCM workers compared to the control. They claim their plant now operates at less than 1 ppm VC.

10. Industry Injury Review/Survey

The major point as outlined by the Goodrich representative was that in their company, five times as many injuries occur off-the-job as compared to on-the-job injuries. To present the industry in a positive manner, H. Waltemate of BFG wants to compile a report on injury statistics within the VCM/PVC industry. He has supplied a form (attached; note W. W. Madden), or alternatively we could send a copy of the OSHA 102 or 103 form to him.

11. Planning for Disasters

- The Diamond Gulf Coast Safety Director presented this topic and gave some good suggestions: (a) Planning must revolve around the shift people and first-line supervision because they are the ones on the job at the time of any incident; (2) Training is a vital necessity and should take place in the form of drills rather than merely establishing proper procedures; (3) Security personnel must have guidelines before an incident occurs because, in case of emergency, the reporters and TV cameras can show up even before any emergency assistance has arrived.

OSHA has had hearings and their new standard on fire protection will soon be issued in the Federal Register.

Texas is pushing to require formal certification to be an industrial fireman.

There is a case in Texas that has come to arbitration on the issue of whether a company can force an employee to be on an emergency team.

12. Catalyst Handling

Apparently we are the only company that dissolves the peroxi-dicarbonate in a solvent. Judging from the comments of the other representatives, I believe that our system is safer. There have been incidents recently at Goodyear and Tenneco involving catalyst that resulted in unsafe situations and loss of materials even though the proper safeguards had been built into the catalyst storage systems.

13. Open Discussion

(a) Maryland appears to be the only State trying to establish a 0.01 ppm fenceline concentration. Texas has proposed a fenceline concentration, according to the Diamond representative, but he was uncertain of the figure. California, which is usually a leader in this area, has not made any moves in this direction.

(b) John Barr of Air Products commented that NIOSH is proposing a 0.04 ppm VCM maximum exposure for 15 minutes. Everyone was so stunned that this elicited very little comment. He mentioned that Dr. A. Milford of NIOSH, Rockville, could be contacted for further information.

14. Mr. H. Waltemate, Safety Engineer for Goodrich, was elected chairman of VCSA for the forthcoming year.

D. M. CONNOR

DMC/mmnr
attachment

OCC 2852

DISTRIBUTION: Mr. R. W. Arnold
Dr. R. S. Brookman
Mr. C. W. Engblom
Mr. P. J. Foley
Mr. R. S. Frain
Mr. K. H. Garner
Mr. F. F. Hoy
Mr. C. D. Karnes
Mr. J. A. King
Mr. J. R. Laman
Mr. G. D. Lloyd (2)
Mr. W. W. Madden
Mr. T. E. Moses
Mr. H. Oberlander
Mr. K. L. Rauscher
Mr. S. W. String
Mr. T. C. Walker

EXTRA COPIES: Mr. R. R. Smith
Mr. F. R. Swavely
Mr. B. A. Walker
Mr. W. F. Tyson
Mr. P. J. Eldreth

DMC/mmr
10/12/77

OCC 2853

VINYL CHLORIDE SAFETY ASSOCIATION

Company Name _____
 Location _____
 Date _____

RETURN TO: H. Waltemate
 BFGoodrich Chemical Division
 6100 Oak Tree Boulevard
 Cleveland, Ohio 44131

YEAR	NON-RECORDABLE CASES	TOTAL CASES	DEATHS	LOST WORKDAY CASES				NONFATAL CASES WITHOUT LOST WORKDAYS	TERMINATIONS OR PERMANENT TRANSFERS	TOTAL CASES RECORDABLE INC. RATE *	LOST WORKDAY CASES INCIDENCE RATE **	CASES INVOLVING DAYS AWAY FROM WORK INC. RATE ***	DAYS AWAY FROM WORK ****
		Number of entries in Col. 7 of the log. (1)		Total Lost Workday Cases Number of checks in Col. 9 of the log. (3)	Cases Involving Days Away From Work Number of entries in Col. 9A of the log. (4)	Days Away From Work Sum of entries in Col. 9A of the log. (5)	Days of Restricted Work Activity Sum of entries in Col. 9B of the log. (6)						

Case Histories:

OCC 2854

* $\frac{\text{No. In Column (1)} \times 200,000}{\text{No. Man-Hours Exposure}}$ ** $\frac{\text{No. In Column (3)} \times 200,000}{\text{No. Man-Hours Exposure}}$ *** $\frac{\text{No. In Column (4)} \times 200,000}{\text{No. Man-Hours Exposure}}$ **** $\frac{\text{No. In Column (5)} \times 200,000}{\text{No. Man-Hours Exposure}}$

NOTE: On the reverse side include a brief description of accidents, injuries, fires, etc., having experience value.