



INTER-OFFICE CORRESPONDENCE

To: J. M. Denison

Date: November 10, 1980

From: Roy E. Stack

Location: 20 North

Subject: Vinyl Chloride Safety
Association Meeting
October 23-24, 1980
Bermuda

The meeting was initiated by the Chairman's welcome, who commented that although the attendance only amounted to approximately 80 people, the number of companies represented at this meeting were greater than any previous meeting. These included 40 domestic and 20 foreign individual plant sites.

I. VCM Monitoring System Evaluation - Henry Smith - Ethyl Corp.

Mr. Smith commented that Ethyl initially started with the Miran infrared unit, but because of interference with other compounds, found it unacceptable. They then switched to GLC and have used that for compliance with OSHA and EPA regulations. The GLC unit uses a 15-minute cycle with a computerized print-out every 8 hours. It is used in both PVC and VCM areas. For the pickup tubing to their sampling points, polypropylene was initially used, but found to be unsatisfactory. They have opted for Teflon tubing and reportedly have had no problems. The average concentrations of VCM picked up were 0.7 ppm over 20 points in the PVC area and averaging .2 to .3 ppm in their VCM area.

On questioning from the Chairman, it was found that 11 companies have received OSHA inspections in the last 12 months. These were primarily PVC producers. A subsequent survey showed that at this meeting we had 17 PVC USA representatives and 10 PVC producers from outside the USA. Regarding the Vinyl Chloride producers, we had six from the USA and seven from foreign countries.

II. VCM Emissions Controls and Redundancy - Tom Moore - Tenneco

Mr. Moore stated that in Tenneco's Pasadena plant, they operate with 30,000 gal. reactors. The objective of their redundancy program is the reduction and prevention of mistakes such as operator errors. An example of this follows:

<u>Objective</u>	<u>Primary Device</u>	<u>Redundant Device</u>
Reactor Sequence Control	Operator	Two computers
Computer Electronic Power	Utility System	Battery System and Diesel Generator

Mr. Moore explained that this type of redundancy system has prevented several accidents and although expensive, they certainly consider it worthwhile.

III. VCM Emission Reduction by Absorption in EDC - Mr. Zwinkel - AKZO

Mr. Swinkle explained that their VCM plant is located in Rotterdam, Holland. Most of their VCM is loaded into ships, barges, and railcars. The plant was built in 1970 with a capacity of 300,000 metric tons now expanded to 475,000 metric tons. As in the case of the US, the Netherlands must have environmental permits. For instance, they are allowed an emission of 10 kilograms per hour of VCM.

The feed to the EDC purification system primarily originates from the vent lines, from their storage tanks, from their VCM loading operations, and from the ship and tankcars involved. Temperature of the EDC scrubber is maintained at -23°C and it is cooled with propylene. Capacity is 1 ton per hour of VCM absorption. The VCM concentration from the scrubber to a subsequent vent has been maintained at less than 40 ppm. The remaining VCM is exited to a cracking furnace.

IV. Respiratory Protection - Glen Schaaf - B. F. Goodrich

Glen stressed that before you decide on a particular type of respiratory apparatus, you should try it yourself; that is, management, should try it themselves before forcing it on employees. Some of the items he covered as important in this choice are selection, training, fit testing, medical examinations, inspections and cleaning, and storage. He gave a brief review on the OSHA VCM standards as it applies to respirators.

Goodrich uses a self-contained breathing apparatus type for concentrations of 1000 ppm or greater. (Scott Air-Pak type respirator.) Supplied air respirators (air line) are used for VCM concentration of less than 1000 ppm. The problem experienced by a lot of the industry i.e., fitting respirators to people that have beards, has been approached by the Goodrich Company by only allowing this type of person to use a positive pressure respirator.

V. Preparation for Vessel Entry - Glen Schaaf - B. F. Goodrich

Goodrich considers vessel entry to be the most hazardous job done by their firm. Permits are required and an area supervisor must be present. They use a checklist for routine entry; for example, in their preparation for entry, they have the following items:

1. Standby (Mechanical Type standbys are sometimes used) that is, the person entering the vessel must pull an alarm cord every three minutes or an alert is sounded.
2. Lockout
3. Check to make sure the reactor is completely drained
4. Check to make sure that nitrogen lines are disconnected
5. Isolate hazards lines
6. Make sure the valves are off both hazardous and non-hazardous lines
7. Wash out and steam purge the reactor
8. Check for tank vapor levels and oxygen content
9. Assure that adequate ventilation is maintained
10. Provide a safety belt and lifeline
11. Airline respirator is required for entry to PVC reactors
12. Provide a means for extracting the operator in event of an emergency
13. Low voltage lights must be used (12-volt or less)
14. GFI or Air tools must be used (GFI stands for "ground fault interruptor")

VI. Regulatory Update Including Solid Waste Disposal - John Barr
Air Products

John, in reviewing the OSHA regulations, claims that 2-1/2% of their inspectors (that is 1400 cases a year) have been refused entry access to the various plants. These, of course, are not limited to PVC - VCM operations. One PVC producer, in response from an inquiry from the audience, said that he was cited on a general duty clause involving his electrical facilities rather than any specific citation covered by the regulation. John also mentioned that the Maltoni report has shown levels of VCM where no effect was observed on the animals tested. The SPI report has a copy of these reports.

In discussing some of the EPA regulations, he covered the current carcinogen policy and brought up the point that the Science Advisory Board in a recent report had absolved trichlor, perchlor, and other compounds as being suspect carcinogens. In conjunction with this, supposedly the EPA will do nothing to revise the current VCM standard until a final carcinogen policy is established.

VII. European Regulatory Update Discussion - Dr. Herbert Deuschl
Wacker-Chemie

Dr. Deuschl reviewed the VCM standards through out the various countries in Europe as summarized below:

Belgium - 5 ppm with a 15 ppm maximum for 15 minutes

Denmark - 1 ppm TWA

Germany - 5 ppm with a 15 ppm max.

Finland - 5 ppm with a 15 ppm max.

France - 5 ppm with 15 ppm max and an additional restriction of 1 ppm on new plants built.

Italy has no regulations but informally uses a 3 ppm

Norway - 1 ppm TWA

Netherlands - 10 ppm

Spain - product is not regulated but an informal 10 ppm value is used

Sweden - 1 ppm TWA with 5 ppm max

Switzerland - 2 ppm TWA

European Economic Community (EEC) regulation (proposed regulation) is 3 ppm TWA and a proposed action level of 15 ppm.

As far as the environmental group goes (as compared to our EPA) Germany currently has a 3 kilogram per hour per individual source. France has not regulated VCM in this respect currently. Norway, the UK, and Sweden do have regulations, but these were not specified.

VIII. High Pressure Cleaning System - Warren Clark - Dow

Dow had a relatively serious accident using high pressure steam to clean reactors with a spray lance. One employee suffered severe burns in a related incident, and another employee was blinded in the left eye by the pressure. As an illustration, steam pressure lines operate at almost 300 psi and in comparison, the typical spray lance from a car wash would be about 175 psi. In the investigation of the incident, they found that for the operator to drop the hose in case of an emergency, it took 0.43 seconds to hit the floor, at which time, of course, the operator would have no control of the direction. They use a 25-foot maximum length of hose in this operation. As a corrective measure, they now use a three-way valve, plus a Partek valve actuated at the nozzle by an electrical signal.

IX. Vent Relief System, Survey and Design - Glen Schaaf -
B. F. Goodrich

Glen reviewed the survey sent out to both PVC and VCM people regarding their vent release systems. He did not go into detail on this survey although he did mention that the response was good, including about 70% of those questioned. We understand that our Lake Charles people sent data in on this and the report is available. Goodrich was primarily concerned with PVC reactors and in consensus, the majority of people used the combination of rupture disks and relief valves. If venting is required in an emergency situation, all companies vent to the atmosphere.

X. VCM Monitoring System Improvements for Safety - Mike Rodnicki -
Shell

Shell, in their monitoring system uses GLC strictly, with a five minute sequential pickup. They use this to comply with both OSHA and EPA regulations, and while the OSHA system is a portable unit, the EPA system is fixed at six pick up points. The alarms are set at 0.5, 1, and 5 ppm VCM. Their experience has been that they have had alarms at about 1% of all samples taken. The alarms are logged by the sample point, wind directions, and specific cause, if known. Individual employees are notified if over-exposure has occurred.

XI. VCM Safety Audit - J. G. Cizek - Diamond Shamrock

This was primarily a slide presentation where Diamond Shamrock claimed they audit various areas where VCM is handled. They compile an audit team consisting of members of the Safety Department, who is the chairman of the audit team; also included are representatives from Engineering, Loss Prevention, Division Group Operations, Environmental, and Plant personnel. Primarily, they check various vulnerabilities and recommend corrective action. Typical areas audited include: their pipelines, railcars, tankcars, storage areas, and reactors.

XII. Failure of Excess Flow Valve on Tank Car - Joe King - Firestone

This incident occurred, from what I understand, at their Pottstown plant where an unloading hose came loose and an estimated five thousand pounds of VCM were lost. Although this was potentially a very serious situation, no major damage or injuries occurred. The accident was caused by not completely locking the ears of an Evertite fitting. The incident was reported both to OSHA and EPA. The potential fine from OSHA may amount to \$13,000. As a corrective measure, they have changed to WECO fittings.

In a followup investigation, they checked several VCM suppliers including their current one, (which is not PPG by the way) and found that they had various policies on checking excess flow valves. The policies vary considerably; from every five years, to only when malfunctions occur and are reported. I questioned them on whether the manufacture of the flow valve was checked to determine the original cause of malfunction, and Mr. King said he believed this was not done. I also asked if he had checked with the VCM supplier so that they could follow up on this particular incident on their own with the manufacturer of the flow valve. We said that as far as he knew, he had no report that this had been done.

XIII. Electrical Accident - Glen Schaaf - B. F. Goodrich

This is an incident that occurred in their Pedricktown, NJ plant and was caused by an electrical short circuit that resulted in a flash fire. Both an electrician and an assistant mechanic were relatively severely injured. The cause of the accident was due to a fuse type 480 volt breaker, 1600 amp, which was not the proper type breaker to install at this particular breaker box. The proper breaker, as visually shown on slides, appeared to be identical to this, except for an ear on the breaker which contacted the breaker box itself and caused a short circuit.

This is an obvious weakness in the design of the unit. When they contacted the manufacturer, they were non-committal, although they agreed with the results of the investigation and appeared to have encountered this type of situation in the past. Hopefully, the design modifications will correct this problem in the future.

XIV. Power Loss and VCM Release - J. E. Zimmerman - Diamond Shamrock

Diamond experienced this accident at their Deer Park facility. It involved two transformers, one which was in maintenance. Their short stop system to prevent run away reaction was in repair at the time. The power loss occurred when a wrong transformer was actuated; the one that was in maintenance. This shut everything down and, consequently, they lost agitation on their hot PCV reactors. Twelve relief valves were actuated and approximately 42,000 lbs of VCM were released to the atmosphere. This could obviously have been a very serious problem. The people were evacuated in the surrounding area. The local fire brigade, as well as their own fire brigade responded to the situation, and no fire or injuries occurred. The incident was reported to OSHA, EPA, and the Texas Air Pollution Control Board. They have heard from the Texas Board citing a violation, but as yet have heard nothing from either OSHA or EPA.

XV. VCM - Charge Pump Fracture - J. Miller - Esso Canada

This accident occurred due to the fracture of a back flange of a Durco cast-iron pump casing, which threw projectiles approximately 75 feet inflicting relatively serious damage to surrounding construction. Fortunately, there were no injuries, but there were personnel in the immediate area. It was brought up by a member in the audience that this type of cast-iron pump accident has occurred in the past and the VCSA had recommended many years ago that this type of pump should not be used for this service. It was also mentioned that unfortunately, because of the many new members of the group and the fact that some of these topics are relatively new to them and rehashed, that possibly the information obtained at these meetings are not passed on adequately to their engineering and safety personnel. The cause of the accident was thought to be thermal expansion of liquid VCM, trapped in a rotating impeller of the pump.

Under Accident Reports, Ray Asti of Great American Plastics reviewed the serious accident that recently occurred at their PVC facility in Massachusetts. The accident started when a very experienced and reliable operator for some reason took off a blind flange to the reactor without locking a block valve. As a consequence, the full reactor was drained of VCM that was contained in it. The VCM did not initially ignite and actually spread outside the operating area where it was thought to have ignited by a static charge. Two operators standing outside the operational area were severely burned. The resulting explosion due to VCM concentrations along with air in one of their chimneys shattered half the chimney (approximately 50-feet of it). Bricks were then broken and fell down on their condenser headers also collapsing the roof of the building.

The burning vapor cloud damaged a large section of the plant and surrounding area, but did not hit their VCM storage tank. The alarm had sounded prior to the ignition, and duration from the first alarm to detonation was estimated to be two minutes. There was approximately a 200-yard radius involving damage caused by the fire. It was estimated that 10,000 lbs of VCM was lost from the reactor and 5000 lbs from their charging lines. EPA personnel were notified, and approximately one-hour after the fire, took vapor measurements and got less than 0.5 ppm in the area. As part of the emergency reaction, short stop solutions were added to all reactors to eliminate any further polymerization.

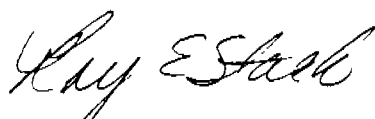
An additional accident was reviewed by Ken Lau from Keysor Century Company in California. This occurred on May 6 of this year. Essentially what happened; the reactor valve was partially cracked, an alarm sounded as VCM was released, and they believe it was

ignited by an electrical switch. This was followed by an explosion which occurred in their slurry transfer area. Estimated time was three to four minutes from the start of the leak to when ignition occurred. All personnel were evacuated within 300 yards of the plant location. The dump valve in the reactor had been changed for maintenance. The failure occurred on a Jamesbury valve which did not seat in a fully closed position. Pressure in the reactor built up and blew the valve off within one-half hour from start of operation resulting in a fire that was restricted to the operating room area. I did not get any reports of any injuries occurring.

The last accident was reported by Ray Juston from Borden Chemical. This accident occurred at their Leominster plant and was due to a failure of a pedestal gasket on a 5200 gallon PVC reactor. They got a sudden release from this 18 inch gasket and also had failure of an agitator gasket where 5000 lbs of VCM was lost. Fortunately, no fire or injuries occurred. They have adopted a policy to gasket these reactors on a five-year basis. In response to injuries, they found that no one else has a routine schedule for this type of maintenance.

Of special interest to John VanHoozer, both Lucidol and Noury, as usual, had hospitality suites available to the attendees. Lucidol's suite was open for two nights, Noury's for a single night.

As in the past, PPG did not participate because of our position in VCM and the fact that PPG personnel attend these meetings whereas, both Lucidol and Noury did not attend them in the past. However, it should be noted that in this meeting, AKZO, Noury's parent company did attend the meeting. I think our position on offering hospitality suites should be re-evaluated, especially in light of our competitor's activities and the fact that key members of both domestic and foreign companies are available for discussion regarding initiators during these meetings. In addition, the promotion of our frozen emulsions would be timely in October 1981.



Roy E. Stack

/maw

cc: C. M. Smith
B. Lynch - Lake Charles
R. L. Finocchio
J. VanHoozer

Recent Regulatory Action
Related to Vinyl Chloride/PVC 9/29/80

OSHA

Carcinogen Policy

Issued 22 January

Candidate list of 250 issued August 11

Priority lists due next

In litigation, courts have ruled it a standard, but retained in 5th circuit.

Benzene standard overturned - requires some proof of need. No comment

on cost benefit. Coke oven case withdrawn, cotton dust standard

review granted. *only hope for guidance*

Rate Retention

Lead standard upheld *18mg*

Medical Records Access

Issued 23 May. Exposure and health data *(200K retention)*

Litigated by La. Chem. Assn. *(200K, unions)*

Fire Brigade Standard *done in Virginia, fire lanes*

Issued 12 September

Walk-Around Pay

Remanded by courts *OSHA didn't do correctly*

Labeling

Proposal past due

Refusal of Inspection

Court cases mixed

OSHA proposed ex parte warrants *1 cover general warrant*

General Duty Citations

None known in PVC/VC industry, but used in others

Women in Work Place *technicality*

Am. Cyanamid charges dismissed, Bunker Hill charged

DOL/EEOC proposal on reproductive hazards - comment period over

Reopening of Standard

NIOSH/OSHA Symposium at Bethesda in March - *3 days for 1000 products - not much*

Strong effort to implicate similar compounds and PVC dust, but no new data.

Maltoni data showed NOEL - *no observation effect levels* threshold??

Project officer assigned

EPA

Carcinogen Policy

Hearings in March

Two-track activity

- Scientific principles and 6 candidates under review by SAB

- Using philosophy in VC, radio nuclides, water quality criteria, labeling, etc.

Record still open

Carcinogen list released (150/100)

EPA (cont'd)

Vinyl Chloride Revisions

Five-year review underway by TRW

EPA still says depends on carcinogen policy decision

Emergency Releases major issue

General Fugative Emissions Rule

Due soon - similar to VC

Labeling

Proposal due soon

List released (100)

Water Quality Criteria

No further action

RCRA

Now effective - manifest system

Many chlorinated materials listed

Reactor scraps due to be listed in November

DOT

Identification System

Adopted - VC = UN1086

Retrofit of Tank Cars

HM-175 would bring 105 cars up to same standard as 112 type

Hazardous Wastes

Memo of Agreement with EPA - Proposals in May 22 FR

FDA

No action on PVC packaging.

Monsanto/Acrylo decision prompted SPI to reapply for liquor bottles.

NCI

Phthalates and adipates found carcinogenic in rodents

IRLG Agencies

Agreement for cross-inspection by agents