Air Products

Memorandum from M. R. Chmura

3 November 1980

DISTRIBUTION:

J. W. Gentile
R. W. Ormsby
W. O. Smith
W. J. Stueben

Re: Page 5. I discussed reporting with Ray Schenck. He suggested we draw up in-house guidelines for where and when not to report to OSHA and run them past him.

M. R. Chmura

CHEMICALS GROUP
P.O. Box 538, Allentown, Pennsylvania 18105

Air Products

19)

Date 30 October 1980

INTEROFFICE
MEMORANDUM

Subject 1980 Vinyl Chloride Safety
Association Meeting

To A. E. Greene

(Location, Organization, or Department)

From J. T. Barr — Regulatory Response

(Location, Organization, or Department)

cc: A. R. Adams
P. P. Aguila
L. A. Allan
J. J. Baliker
P. L. T. Brian
T. L. Carey
A. F. Cantor
M. Chmura
R. E. Duggan
B. Helm
J. H. McMakin
A. H. McMillan
E. A. Primeau
R. C. Sander
R. H. Schenck
W. Silowka

The following report covers the proceedings at the annual Vinyl Chloride Safety Association which met in Bermuda on October 23-24, 1980. Attendance was about 60 persons representing 33 companies, 19 from the U.S., and 14 from abroad, an all-time high. Membership is now 44 companies. A complete attendance list will be available later.

Officers for next year will be:

Jack Zimmerman, Diamond-Shamrock, Chairman
Glenn Schaaf, B. F. Goodrich, Vice Chairman
T. Moore, Tenneco, Program Chairman
Herb Olsen, Ethyl, Secretary
Jim Hager, Stauffer, Treasurer

The next meeting will be in October 1981, at Hilton Head, South Carolina.

The program followed the attached agenda, which was developed from a survey of company interests last spring. Please distribute this report to any non-recipients in your group whom you think may be interested. More detailed notes, and in some cases, full copies of the presentations are available.

J. T. Barr

JTB:jas
attachment

(320)

AP00031677

REPORT

VCM Monitoring System Evaluation
H. Smith, Ethyl Corporation

Ethyl originally installed the MIRAN infrared monitor, but found excessive interference and low sensitivity, and replaced it with chromatographs. It is primarily an OSHA-related device, to warn when resirators must be worn or the type changed. It is used as a part of the EPA leak patrol also, but the points were not relocated from the breathing zone for this application. They are concentrated in the heavier work zones and areas of likely release. There are two 10-point units in the PVC area, and two 10-point units in monomer production. Data are processed by a computer which give summaries on a shift, daily, and monthly basis. There are provisions for quick reprogramming in the event of power loss. Each point is on a 15-minute cycle. They had difficulties with both black and white polypropylene sample lines, and now use Teflon; stainless steel was not tried. Calibration is automatic daily at the instrument, and is done each 3-6 months at each point to check for leaks. OSHA once questioned the calibration procedure, but was satisfied with their explanation. In response to a question, the representatives agree unanimously that the present EPA requirement for daily calibration is unnecessary, and that no more than weekly would be adequate.

Their present results show an average of 0.7 ppm in the polymer area and 0.2-0.3 ppm in the monomer area. In the poly section about 93% of the results are below 1 ppm, 6% from 1-5 ppm, 0.8% between 5 and 25 ppm, and 0.2% above 25 ppm. In the monomer area, 97-98% are below 1 ppm, 1% are at 1-5 ppm, 0.1% are between 5 and 25 ppm, and "very few" are above 25 ppm, about 3-12 per month. The EPA leak patrol is triggered at two conservative readings above 25 ppm.

These results correspond very well to the personal monitoring results. For 1979-1980 the reactor floor operators averaged 0.7 ppm, with a mean of 0.4, and a range of 0.2-1.6. Manual reactor cleaners, without regard to respirator protection, averaged 9.7 ppm, with a mean of 2 and a range of 0.4-6.0. The monomer loaders and compressor operator both averaged 1.4 ppm. Loaders wear respirators during hook-up steps, but not continually. Reactor cleaners must wear respirators.

Alarms are set as follows: 1 ppm, amber light; 10 ppm, red light and audible alarm. The 3M cartridge respirators are used at 10 ppm. The leak patrol carries a respirator for use if needed.

This system is very similar to those used in the APCI plants. In the ensuing discussion it was found that Pantasote is the only company not now using chromographic systems. All companies now find 90% or more of the readings below 1 ppm, and feel that the reliability of the system is acceptable. Sixteen of the U.S. companies installed the system primarily for OSHA, two for EPA. Only six have plant boundary points; the rest are in the usual work areas. No company indicated that there were any significant changes planned. Six plants had backup or alternate systems.

Redundancy of Emission Controls

T. Moore, Tenneco

This paper described some of the steps taken at the Houston plant, which utilizes 30M gal. reactors with computer control. Their current program is based on their accident experience, and a non-rigorous fault tree analysis, with due allowance for the increased severity potential with large systems. It is their feeling that operator error is involved in some way in almost all incidents. They have concluded that simple redundancy is adequate, in that it provides an order of magnitude reduction of risk, and that triple systems are not needed.

Some examples of the redundancy employed at their plant are:

Reactor control - two computers with battery/generator backup for them and the instruments.

Charging - meter plus level/orifice flow checks.

Shortstop - three pressurized tanks
- dual charging commands
- manual addition available
- computer plus hard-wired and interlocked systems.
- manual valves plus manual intervention on automatic valves.

Temperature Control - computer plus analog
- recheck by pressure
- dual transmitters

Agitation - dual contact status and output

Emergency - four levels of response, plus manual.

Pressure - dual auto release to flare at 87% of design on separate nozzles.
- relief valve set at 95% of design with a capacity of 460% of heat release at 18°F overpeak and 25% initiator overcharge.

Valve Lockout - manual plus auto.
- individual reactor supply, with lockout.

Reactor Drop Valve - manual plus auto.
- nuclear level device on leg.
- monitor agitator load.

Monomer Tank Levels - analog and nuclear.

Gasholder Level - analog, physical high level.
- dual low level and pressure.

Cooling Water - electrical and diesel drives.
- 250M gal. cold storage.

Incinerator - dual, plus flare.

They feel that diligent maintenance, monthly simulation testing, and very close cooperation between engineering and operations are necessary for proper functioning of the system, especially follow-up on changes and/or activation of the safety devices.

VCM Absorption in EDC
Zwinkel, Akzo

An EDC scrubber was installed on their Dutch plant to reduce emissions from operations and loading. It uses a packed tower 0.6 x 6 m, filled with Pall rings, through which is circulated on a one-through basis 50 t/hr EDC at -20°C. The loaded EDC is sent to the cracking furnace. It is capable of reducing the VC content of 1,000 m^3/hr gases containing 1 t of VC to less than 40 ppm, or about 1-5 kg/hr of VC. The off-gas is sent to a water scrubber where 5% sodium hydroxide is sprayed into a 5 m diameter chamber 50 m tall for removal of HCl and chlorine, and reduction of the EDC vapors.

Respiratory Protection
G. Schaaf, B. F. Goodrich

There are six primary considerations in the BFG respiratory protection program:

1. Selection. They have settled on two only of the six possible types permitted by OSHA; the half-face supplied air mask for all concentrations up to 1000 ppm, and the self-contained units above that. They have alarms at 2 or 3 ppm for the use of the half-face type, and at 100-1,000 for the other. There are air lines connections at 20-30 feet intervals in the work areas. Half-face was chosen for comfort and visibility, and operator acceptance.

2. Testing. Individual respirators are tested at the time of issue. They are used frequently, and this serves as a check on the half-face type. The self-contained units are on a six-month pm-program, which is audited.

3. Fit Testing. Quantitative fit testing is expensive, costing $10-20M per plant for equipment, thus is not used by BFG. Three companies do so, including Dow, who has a trailer for visiting the plants. There are stated to be many problems in establishing a good quantitative test program.

   Qualitative tests are done with the MSA stannic chloride generator, once a year normally, but twice a year for those with beards. Those who fail have the choice of shaving or transfer.

4. Medical Approval. The normal OSHA medical report form has a place for the doctor to indicate suitability for respirator work.

5. Inspection. Foremen inspect the masks at each monthly safety meeting, and a record is kept.

6. Cleaning and Storage. The operator is held responsible for the condition of the mask. Several companies identify the mask in some permanent method and keep records of assignment. Cleaning stations and lockers are provided. Unassigned respirators are cleaned in a dishwasher without the drying cycle. They are stored or carried in plastic bags.

A bibliography was provided:

a. NIOSH "Respiratory Protection - An Employee Manual," 78-193 A, available from the Superintendent of Documents at $2.30.
b. OSHA 1910.1017 VC standard
c. OSHA 1910.134 respirator standard
d. OSHA Industrial Hygiene Manual, Chapter III (for compliance officers).

Points developed in later discussions:

A two-respirator system is used by 13 companies, and a three-respirator system (cartridge type at low concentrations) by 10.

Court and enforcement positions on beards are mixed. Ten plants do require workers to be clean-shaven, in the area of contact, and PPG has had this upheld in Appellate Court. OSHA is expected to issue new regulations on this point.

There was general agreement that a worker would not be disciplined if he entered an area in an emergency with the wrong or no respirator to stop a release. Workers would not be sent into a possibly explosive mixture except for lifesaving reasons, but the problem is more likely to arise of how to stop workers from going in. These problems were generally rated as judgement calls to be decided outside the regulatory question.

Vessel Entry Procedures
G. Schaaf, B. F. Goodrich

Entry into confined spaces is considered a most hazardous job at Goodrich, and they use a checklist entry form as do we. A routine entry requires the approval of the foreman, the operator or the maintenance man, and the standby. Non-routine entry also requires the safety engineer to approve. Items on the checklist include:

Lockout and keys	Air mover in place
Vessel condition	Respirator, if needed
Inerts blanked	Hoist for personnel
Hazardous lines blanked	Buddy/Safety cart
Other lines valved off	Low voltage or GFI
Atmosphere check	Lifeline/Safety harness

The safety cart, which we once had in Calvert, is used in an area where there normally are other people for routine entry, otherwise a standby person is required. He is forbidden to enter the vessel, but to call for help.

Some companies also lock out the steam line to jackets, primarily for the physiological problem.

A new OSHA rule is under development, and a NIOSH recommendation is available.

Several companies use either the safety cart or radios. All companies have lifelines available, but not all require their use. About two-thirds blank and break all hazardous lines, while about one-third permit double block and bleed, none just valve out the lines. About two-thirds require low-voltage or GFI systems inside vessels.

Luncheon Guest Speaker

John Davenport, Assistant Chief Research Engineer at IRI, was the guest speaker at lunch. A copy of his talk will be available and will be circulated to those who express an interest. In brief, he pointed out that explosions caused two-thirds of the chemical industry losses from only about one-fourth of the events. The most likely cause of an explosion was an accidental release of a batch reaction in an enclosed area, which corresponds to many PVC plants. He gave many statistics on the causes of loss from fire and explosion.

U.S. Regulatory Update
J. T. Barr, Air Products and Chemicals, Inc.

The attached outline was used to review the current status of regulatory action relating to vinyl chloride. In response to a question, it was indicated that eight companies reported 0-2 emergency releases per year to EPA, nine reported 3-6, four reported 7-10, and one had greater than 10.

No company had any data on the health effects of PVC dust on employees. Two companies in addition to APCI had measured the dust exposure in the bagging/loading areas, and both found that respirable dust was within OSHA limits, but one found, as did we, that total dust was high.

No company indicated that it would report a release to OSHA unless there was reason to believe that a worker had actually been exposed to concentrations above 100 ppm.

European Regulations
H. Deuschl, Wacker

The European rules were reviewed. There have been no substantial changes since last year, and the rules are summarized in Table I. The EEC proposals are in place, but are not yet implemented by the member states.

Germany has local options as to environmental rules, and Bavaria is moving to put VC in Class I rather than II, which will make the limit 20 mg/m^3. The definition of "source" is variable.

High Pressure Cleaning
W. Clark, Dow

Two accidents were discussed from the use of a 2,500 psi water blasting operation. In 1976, a pump was left on with the valves shut and when the operator turned on the lance the steam in the line burned his hands badly. In 1978 an operator dropped the lance. The deadman handle failed and destroyed his left eye and cut his face badly. (Note: we have heard other reports of operators being injured by these high-pressure streams.)

A safety team measured the time to fall of a lance and decided that any cut-off system must reduce the pressure to zero in less than 0.43 seconds. No available dump valve would do that. They felt that streams at even 30 psi or lower were dangerous (city water pressure). They then added a constant bleed of low volume off the pump discharge, limited hose length to 25 feet to reduce the stored energy, and added a microswitch to the trip lever that activated a 3-way valve on the pump discharge which dumps the output.

They have a very detailed checklist for each cleaning job, and require trained employees to wear distinctive decals on their hats. Lance tips less than 48" long are not permitted, nor are contractors used for this duty.

Vent Relief Systems
G. Schaaf, B. F. Goodrich

A survey of U.S. members was made in September as to relief systems, and reported here. The results are shown in Table II, where APCI is company 9. The question was for the area of the relief nozzle, and not the relief valve orifice, so the data are not complete. Another survey will be made later which includes European companies, and does ask the orifice area. On the basis used here, APCI is about average for small reactors and near the top for large reactors. The Shinetsu-designed plants have very small relief nozzles for the 35,000 gallon reactors (companies 11 and 12).

Another question to be in the new survey is whether any event had caused all reliefs to lift on large reactors with manifolded valves. The indication was that this had not happened.

All companies reported a means to vent overpressure to the recovery system. Most had manual vents to vessels, gasholders, and some to the atmosphere. Almost 100% had automatic shortstop and manual backup. Most also had a means of relieving hydrostatic pressure to an internal system (we have not had fast enough reaction for this to save the rupture disk).

The ordinary sequence of events in case of overtemperature was:

1. added cooling
2. shortstop
3. Vent to recovery or other vessel
4. Manual vent
5. Relief device

The design bases reported by the members were:

1. ASTM, fire involvement
2. Exotherm with no cooling
3. Twice the exotherm at relief temperature
4. Boyles paper, or -
5. Kinetics and multiphase flow

A number of companies still do not have emergency power generators but rely on dual power grids or similar alternate supplies.

VCM Monitoring System
M. Rodnicki, Shell

The Deer Park monomer plant installed two 10-point chromatographs for OSHA in 1975, and two more systems for EPA in 1977. The latter are generally along the perimeter of the plant, 100-150 feet from the process. They alarm at 0.5 and 1.5 ppm. The installation of a process vent incinerator in 1978 gave a substantial reduction in readings.

The OSHA system in 1979-1980 had about 1% of the readings above 0.5 ppm, 0.3% above 1, and very few over 5 ppm. The EPA system had about half as many readings in the same ranges. Personal monitors show 98-99% below 1 ppm for process operators, and 99-100% for maintenance men.

Their report forms, for two successive high readings at a point, require logging of the alarm point, reading, wind directions, cause, and action taken.

Risk Analysis for PVC
J. Ytreeide, Norsk-Hydro

An analysis was made on a 20-year old manual PVC plant for the risk of fire and explosion. The ICI procedures were used for fractional dead time and demand after a conventional qualitative analysis for unwanted events.

The results of this study are difficult to interpret because the human factor that was assigned (arbitrarily) was so much greater than the mechanical failure that it swamped the latter events. It truly was their conclusion that human error was a primary contributor, and that an overfilled reactor was the primary unwanted event, but no hard data were given to support the assigned rate.

The conclusion was that a small release with little risk of fire or explosion would occur 1-2 times per year, and that the probability of a large release was "very low."

Recommended preventative measures included better instrument sequencing, periodic loop testing, better instructions and enforcement of procedures.

VCM Safety Audit
J. Cizek, Diamond-Shamrock

A five-man visiting team, made up of members from safety, loss prevention, engineering, environmental, and divisional operations, together with local personnel, made three-day inspections of the safety program at the two PVC plants, the monomer plant, and the pilot plant of Diamond Shamrock. They reviewed operations from monomer receipt through recovery at the polymer plants and from the cracking furnace through loading at the monomer plant.

The primary findings were that the emergency procedures needed to be updated and tested, particularly in regard to the notification of neighbors.

Failure of Excess Flow Valve on a Tank Car
J. King, Firestone

An unloading operator failed to insert the hold-down clip on the locking ear pins for a flexible hose while unloading a tank car. The coupling pulled apart and about 5,000 pounds of VC was lost when the excess flow valve failed to activate. One operator who shut off the valve suffered some frostbite burns. They are now contesting a $13,000 fine from OSHA for failure to protect the employee and failure to provide protective clothing.

A review of monomer suppliers showed no routine PM procedure for excess flow valves. Most said that they were serviced only after complaints or at the five-year shop schedule.

They now are changing to Weco hammer unions for their hoses, of the type we are installing at Calvert City.

A show of hands indicated that 10 companies use flexible hoses, five use swing joints, and the rest were not sure.

There was general agreement that unloading operations do not require workers to stand by the car throughout the entire unloading period.

Electrical Accident
G. Schaaf, B. F. Goodrich

In October 1979, a contractor's engineer and a maintenance mechanic were attempting to install a 1,600 amp circuit breaker in an energized 480V distribution center when an electrical flash burned the engineer badly. All standard safety rules were being obeyed.

It developed that they had tried to insert a fused breaker in a space that was designed for unfused breakers, and a projection on the breaker had made a short from bus to ground. The two types of Allis-Chalmers breakers are not well differentiated on the breaker cover nor on the compartment.

They have identified and color coded the breakers and compartments, and have insulated the back cover of the compartment. Contact with the manufacturer obtained a promise to notify customers of the danger.

Power Loss and VC Release
J. Zimmerman, Diamond-Shamrock

The automatic shortstop system at Deer Park had been out of service several days for repair to the nitrogen system. One of two redundant transformers was tagged out of service, and an employee drained the oil from the wrong unit, which flashed over as the oil was removed, causing a total loss of power to the polymerization line. Six reactors and six blowdown tanks released a total of 42,000 pounds of VC over an hour, despite use of manual shortstop and manual venting to the gasholder limit. (There was NO venting to the air.) The shortstop was not effective because of lack of agitation.

The Texas Air Control Board sent a notice of violation and requested a report of corrective action. There was no response from OSHA or EPA.

Water hoses were directed at the relief valve piping in an effort to disperse the VC emitted. There was no fire, and a group discussion indicated that the only known case of ignition of a relief valve discharge was in France in 1978.

VCM Charge Pump Fracture
J. Miller, Esso

In October 1979 a cast iron charge pump fractured into about 20 pieces and spread debris over about 75 feet. There were no injuries or fire. The pump had been blocked in and the control room notified. An operator had started it by error for about one minute before he was told that it was the wrong pump. Over an hour later another operator restarted that pump and it failed in 1-3 minutes.

Calculations showed that a heat rise of 60-80°F/minute could result from operating this pump deadheaded, and that a pressure of over 1000 psi could be obtained in three minutes. Now, the inlet valve is interlocked with the starter so that the pump cannot operate if the inlet valve is closed.

Other members reported similar occurrences with a cast iron condensate pump and a stainless slurry pump. This is almost identical to the ICI report of last year.

TRUE CONFESSIONS

Great American Explosion

R. Asti

In preparing to clean #9 reactor on September 19, 1980, an operator blocked off the drop header and removed the blind flange on the cross. When the cleaner hosed the reactor the water didn't drain well, so he went down and did the same for #8 reactor, which was freshly charged. He then opened the bottom valve by a remote button. Only a minimum amount of water came out at the time, but he smelled VC, and the area LEL monitor alarmed. Soon the contents started to discharge. Other operators heard the alarm and noise and began an emergency shutdown. An approaching foreman saw a blue glow just before a fireball ignited well above ground level. The vapor cloud burned over a wide area, then an explosion occurred in the 120 ft. chimney where the ventilator system discharged. This knocked about 90 feet of bricks onto the roof of the reactor building, and did most of the damage.

It is believed that a plug of slurry from a previous batch formed a temporary bridge over the drop valve, holding up the release for a moment. Ignition was by static discharge after the liquid was through flowing. Sprinklers were in operation in the top floor, but not in the area of discharge. A higher humidity there may have prevented that source of ignition, but the vapor cloud was very large (300 yards) and had entered the adjacent compound plant, although little damage was done there.

All other batches in process at that time were contained or terminated safely. Two men were burned on their exposed skin surface when the cloud ignited. Two small leaks on a reactor and the charge tank were contained. A total of about 15,000 pounds of VC was involved. Damage is over $1MM for repairs, and the plant is not yet back in operation.

This sequence of events is almost identical to the Tenneco explosion of 1966.

Keysor-Century Explosion

K. Law

An unauthorized change was made in this plant to a Jamesbury wafer sphere valve series 800 as reactor drop valves in this plant. On May 6, 1980 an operator found vapors in the slurry room of the Saugus plant. (The reactors are outside but the drop headers lead to an enclosed room.) He checked the bottom valve of a reactor that was charged about 1.5 hrs. before and thought that it was "cracked" open. Shortly, there was an explosion and fire that destroyed the electrical and instrument systems. All power was lost, and two reactors relieved and did torch (see above). Fires continued 11 hours but were controlled with spray. There were no deluge heads, and inadequate water supply for firefighting. The operator did not make an orderly shutdown.

It is believed that the valve was not securely positioned in the full shut position, and vibrated into the first notch of the positioner. The characteristics of the wafer valve allowed the contents to flow out, and the reactor was found

empty after the event. Ignition occurred in a switch box 50 feet from the pump room in an area that it was not considered necessary to have an electrical classification.

Borden Incidents
Ray Landon

I. The pedestal gasket on an old Pfaudler 5,200 gallon reactor failed. It has been in service about nine years, and the Teflon envelope was breached and the steel inner sandwich had corroded away, forming a path for escape of gas. The bolts were not uniformly torqued. He can find no standard industry practice on maintenance of this type of gasket, and now plans to replace it every five years and to check the bolts frequently.

II. They replaced the lead sheath gaskets on the step bearing fitting of their 3,750 gallon Pfaudler reactors with Teflon envelope gaskets, found the bearing area too small, and went back to lead, to have almost immediate failure. The holding flange "slipped down" and half a charge was lost. A second gasket was also "loose" after a short time. Pfaudler suggested that galvanic action between exposed steel and the lead may be responsible.

Tenneco Injury

An operator was injured when the cover of the magnetic gauge on a 105-300 W vinyl car blew off during removal because of pressure due to a leak.

PPG reported that they had seen this defect on a new car. There is no established method of relieving pressure if it should develop. Operators should be alert to covers that are hard to remove.

ICI Fatality
J. Vaught

An experienced operator was suffocated when he put his head into a column to check on the results of drying it out after a rain. He had used nitrogen rather than air or rags to remove the water that entered through an open manway.

MISCELLANY

No one yet has had experience with use of the CGA emergency tank car kit.

Esso Sarnia has continued to follow up on their study reported last year on chloride-induced stress cracking at welds and believes that pH is the controlling factor. They feel that a pH above five is safe. This suggests that we be careful about our use of buffer, in slurry as well as the reactor.

Akzo and Noury are proceeding with their development of water dispersions of initiators. Some people in this country are planning to use them for automatic charging. Lucidol is not as far along, but state that they could be made available.

VINYL CHLORIDE SAFETY ASSOCIATION

Meeting Dates - October 23 and 24, 1980

AGENDA

OCTOBER 23

8:00 - 8:30	Registration and Coffee Social	
8:30 - 9:00	Chairman's Welcome and Official Business	Jim Gabbett, Georgia Pacific
9:00 - 9:30	VCM Monitoring System Evaluation	Henry Smith, Ethyl Corp.
9:30 - 10:00	VCM Emission Controls and Redundancy	Tom Moore, Tenneco
10:00 - 10:20	Coffee Break	
10:20 - 10:50	VCM Emission Reduction by Absorption in EDC	Mr. Zwinkel, AKZO
10:50 - 11:20	Respiratory Protection	Glen Schaaf, B. F. Goodrich
11:20 - 12:00	Preparation for Vessel Entry	Glen Schaaf, B. F. Goodrich
12:00 - 1:30	Luncheon Speaker - VCM and Safety	John Davenport, Industrial Risk Insurers
1:30 - 2:15	Regulatory Update Including Solid Waste Disposal	John Barr, Air Products
2:15 - 2:45	European Regulatory Update Discussion	Dr. Herbert Deuschl, Wacker-Chemie
2:45 - 3:00	High Pressure Cleaning System	Warren Clark, Dow
3:00 - 3:15	Coffee Break	
3:15 - 3:45	Vent Relief Systems, Survey and Design	Glen Schaaf, B. F. Goodrich
3:45 - 4:15	VCM Monitoring System Improvements for Safety	Mike Rodnicki, Shell
4:15 - 4:45	Risk Analysis for PVC Polymerization	Jens Ytreeide Norsk Hydro

OCTOBER 24

8:30 - 9:00	VCM Safety Audit	J. G. Cizek Diamond Shamrock
9:00 - 9:20	Failure of Excess of Flow Valve on Tank Car	Joe King, Firestone
9:20 - 9:40	Electrical Accident	Glen Schaaf, B. F. Goodrich
9:40 - 10:00	Power Loss and VCM Release	J. E. Zimmerman, Diamond Shamrock
10:00 - 10:20	VCM Charge Pump Fracture	J. Miller, Esso Canada
10:20 - 10:40	Coffee Break	
10:40 - 12:00	True Confessions	

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.

Rate Retention
Lead standard upheld

Medical Records Access
Issued 23 May. Exposure and health data
Litigated by La. Chem. Assn.

Fire Brigade Standard
Issued 12 September

Walk-Around Pay
Remanded by courts

Labeling
Proposal past due

Refusal of Inspection
Court cases mixed
OSHA proposed ex parte warrants

General Duty Citations
None known in PVC/VC industry, but used in others

Women in Work Place
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
Strong effort to implicate similar compounds and PVC dust, but no new data.
Maltoni data showed NOEL
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.

EPA (cont'd)

Record still open
Carcinogen list released (150/100)

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

TABLE I

EUROPEAN RULES FOR VC

	WORKER	ENVIRONMENT	FOOD PACKAGING
Belgium	5 ppm/wk, 15 ppm action*	---	50 ppb in food
Denmark	1 ppm/8 hr.	---	1 ppm in film, 50 ppb/food
Germany	existing: 5 ppm/yr., 15/hr., 40 max. new: 2/yr., 6/hr., 40 max.	150 mg/m^3, 3 kg/hr/source 0.3 mg/m^3 at nearest house	1 ppm in film
Finland	none	---	50 ppb in food
France	existing: 5/week, 15 max. new: 1/week, 15 max.	regional officer set	50 ppb in food
Italy	none, using 3/yr, 15 action	monitoring only	50 ppb in food
Norway	1 ppm/8 hr.	60 kg/hr/100t to go to 20 kg June '82.	1 ppm in film, 100 ppb in food
Netherlands	10 max.	regional authority	50 ppb in food
United Kingdom	10/8 hr, 30 max.*	monitor only	going to 1 ppm in film
Spain	3/yr, 15 action*	---	50 ppb in food
Sweden	1/8 hr, 15/5 mins.	0.5 kg/t for suspension 13 kg/t emulsions	100 ppb in food
Switzerland	2/8 hr	---	100 ppb in food
EEC	3/yr, 15 max.*	---	1 ppm in film, 100 ppb in food

*Proposed

TABLE II

PVC POLY SIZE RELIEF AREA COMPARISON

COMPANY AND LOCATION	POLY SIZE GAL	RATING PSIG	RELIEF NOZZLE SIZE	NUMBER	TOTAL AREA AVAILABLE	RELIEF AREA PER 1000 GAL
1.	1,100	200	2"	1	3.14	2.85
2.	2,500	200-400	4"	1	12.56	5.02
3.	3,300	250	4"	1	12.56	3.81
4.	4,300	300	4"	1	12.56	2.9
5.	16,500	240-300	10"	1	78.5	4.75
6.	2,000	180	3"	1	7.07	3.53
	4,000	180	3"	1	7.07	1.77
7.	4,000	200	4"	1	12.56	3.64
	6,000	200	4"	1	12.56	2.09
8.	2,400	200	4"	1	12.56	5.2
	3,500	185-200	4"	1	12.56	3.5
9.	4,000	200	4"	1	12.56	3.14
(APCI)	6,000	220	4"	1	12.56	2.09
	24,000 Calvert	200	18"	1	254.34	10.59
	24,000 Pace	180	16"	1	200.96	8.37
10.	20,000	260	16"	1	200.96-	10.05

TABLE II, cont'd.

PVC POLY SIZE RELIEF AREA COMPARISON

COMPANY AND LOCATION	POLY SIZE GAL	RATING PSIG	RELIEF NOZZLE SIZE	NUMBER	TOTAL AREA AVAILABLE	RELIEF AREA PER 1000 GAL
11.	35,000	172	8"	2	100.48	2.87
12.	35,000	185	8"	2	157	4.49
			6"	2		
13.	2,200	200	4"	1	12.56	5.71
BFG	5,000	225	6"	1	28.26	5.65
	7,000	200	6"	1	28.26	4.04
	20,000	225	8"	2	100.48	5.02
14.	3,500	300	6"	1	28.26	4.07
	7,400	250	6"	1	28.26	3.82
15.	4,200	200	4"	1	12.56	2.99
	5,700	200	4"	1	12.56	2.20
	4,500	200	3"	1	7.07	1.57
16.	3,700	200	4"	1	12.56	3.39
	5,200	200	6"	1	28.26	5.43
	17,000	165	8" x 12"	2	213.52	12.56
17.	20,000	200	6"	2		
			8"	1	107.16	5.34

Note: Total relief area is based on full nozzle size for comparison and does not include the reduction of area if a relief valve is used.

2376E/wp/4

Background and Facts

Basis of design of new PVC Plant was that the new plant would not be a regulated area. BUT PENSACOLA IS REGULATED AND PENSACOLA PLANT WAS NOT DESIGNED TO BE NON-REGULATED.

At Calvert 3/13/80 works management discontinued use of access roster and enforcement of 45 minute rule until area monitoring indicated the need. Management under intense start-up and production pressures.

Results of personnel exposure monitoring between 2-15% of exposures show VCl levels greater than 1 ppm. Escambia also sees occasional levels above 1 ppm. The difference is the number of upsets.

Escambia local management has chosen to maintain the PVC Plant as a regulated area and continue sign-in and access control.

Medical program is adequately carried out at both plants. Auditors found difference in medical program (number of tests used), but this is of no significance. Both doctors satisfy minimum required tests, but Escambia's physician, as part of his prerogative to practice medicine, employs an additional test also.

The question of regulation or non-regulation has been discussed at length. There are differences of opinion, and the regulations are vague in specifying precise criteria.

The proposed sale of the PVC facilities has impacted resolution of procedural questions.

The primary fact is that Escambia and Calvert City had been operating under different interpretive criteria. The decision has been made to apply uniform work practices and criteria to both plants (to operate both plants as regulated areas).

Joe Smith Here are my Questions/comments/goals. Why needed? 8/27

TO: R.E. Varilek and N.J. Weber — SHEET 1 OF 22

PROJECT Breathing Air System — DATE July 28, 1980

PROJECT NO. GEF-468

PLANT LOCATION Emulsion/PVOH Plants — CEA NO.

	CAPITAL $	EXPENSE $
ALTERNATE 1 Nash Air Compressors, Air Dryers and Gas Chromatograph located in the Emulsion Plant Truck Alley	$261,000	
ALTERNATE 2		
ALTERNATE 3		

Basis For Estimates:

1. Attached scope/GEF-0468 file information
2. Compressed Gas Association/OSHA Standards
3. No activated carbon bed for VCM removal - based on air quality sampling. ?
4. Adds 85 HP additional load (MCC #5-1A, MCC #6-3E & 5E)
5. All work on straight time, no shutdowns required.
6. Provides for separate gas chromatograph to monitor air quality - $25,000

Reference Material and Assumptions:

1. Vendors equipment quotations
2. Richardson Process Plant Construction Estimating Standards
3. Cost manual for piping and mechanical construction
4. Cost of process equipment chemical engineering report
5.
6.

Remarks: Alternate location for equipment - S.E. corner Emulsion Whse.

DISTRIBUTION	ATTACHMENTS
J.J. Baliker	1,2,3,7
R.C. Lietzau	1,2,3,7
R.J. Lomicky	1,2,3,7
R.E. Davis	1,2,3,7
H.W. Barnett	1,2,3,7
B.O. Helms	1,2,3,7
E.E. Anderson	All
T.R. Low/GEF-0468	All
K.H. BRUMBAUGH	ALL

ESTIMATE CLASSIFICATION Definitive

ESTIMATE BY: E.R. Zimlich

CHECKED BY: E.E. Anderson

APPROVED BY:

ATTACHMENTS:

1. Scope of Work
2. Estimate Summary
3. Expenditure & Construction Schedule
4. Control Budget
5. Fixed Asset Summary
6. S-H-E Summary
7. Sketches - SK 80-160, SK 80-170, SK 80-180
8. Details & Design Basis