MANUFACTURING CHEMISTS ASSOCIATION
1825 CONNECTICUT AVENUE, N. W.● WASHINGTON, D. C. 20009● (202) 483-6126

Safety and Fire Protection Committee
Conference of
Technical Representatives of Vinyl Chloride Monomer Manufacturers
MCA Offices, Washington, D. C. January 14, 1970

PRESENT

S. M. MacCutcheon (Chairman)	The Dow Chemical Company
M. M. Anderson	Union Carbide Corporation
H. D. Butter	Continental Oil Company
L. B. Crider	B. F. Goodrich Chemical Company
R. L. Daniel	The Dow Chemical Company
D. L. Dowell	B. F. Goodrich Chemical Company
W. O. Harris	Uniroyal, Inc.
W. M. Iliff	Uniroyal, Inc.
G. Kitazawa	Borden Inc./Chemical Division
A. L. Kling	Society of the Plastics Industry
R. D. Kogler	Continental Oil Company
J. E. Newell	Uniroyal, Inc.
R. E. Phillips	Ethyl Corporation
G. M. Reed	Tenneco Chemicals, Inc.
M. E. Sutherland	Union Carbide Corporation
T. G. Taylor	PPG Industries
B. M. Barackman (a.m. only)	Manufacturing Chemists Association
V. H. Peterson (a.m. only)	Manufacturing Chemists Association
F. G. Stephenson (Secretary	Manufacturing Chemists Association

URL 17873

1. Mr. S. M. MacCutcheon opened the meeting at 9:00 a.m. He congratulated the task groups on the energetic manner in which they had proceeded with their appointed tasks.

2. Task Group Reports

I. Task Group A - Case Histories of Transportation Accidents Involving VCM

Mr. Daniels reported that participating companies had submitted a number of case histories. It was agreed that these will be abridged and names of company employees eliminated before copies are reproduced for distribution by MCA.

II. Task Group B - Handling of VCM Transportation Emergencies

Mr. D. L. Dowell reported that the task group had held two meetings - in New Orleans on November 7, 1969 and at MCA offices on January 13, 1970.

Copies of the minutes of the January 13 meeting containing the task group's recommendations were distributed and reviewed in detail. An amended version (see attachment) was unanimously approved for inclusion

in the report on the overall activity to be submitted to the Safety and Fire Protection Committee.

Mr. B. M. Barackman discussed legal implications of the recommendations.

Continuation of the activities of Task Group B was approved. These activities will include:

a. Evaluation and testing of safety valve closure kits.

b. Completion of list of emergency phone numbers (see attachment)

c. Consideration of maritime problems including a review of the MCA Water Information Card for VCM (see attachment).

d. Consideration of industry standardization of VCM tank car domes and fittings.
(NOTE: Any recommendation in this area would be processed through the MCA Transportation Equipment Committee.)

III. Task Group C - Products of Combustion of VCM

Dr. L. B. Crider distributed copies of a draft report prepared by Task Group C on the combustion products of vinyl chloride monomer.

The following conclusions were included in the report:

"Phosgene is a very minor combustion product from VCM. Very small quantities of phosgene (40-200 ppm) can be produced when VCM is burning under very specific conditions which involves premixing of VCM with O_2. Without premixing, no detectable amount of phosgene is produced.

should not be in literature made available to public. Calculations based on VCM not on ambient air.

"The detection of phosgene, in the presence of the gross quantity of HCl produced from the burning of VCM, is an extremely difficult analytical task.

"When VCM is burned in the presence of air, an almost quantitative yield of HCl is obtained. The only other combustion products of any consequence are CO, CO_2 and H_2O. Under diffusion conditions, the combustion of VCM produces a very sooty flame. Approximately 10% of the available carbon is converted to carbon black.

"A computer program has been developed that calculates a profile of combustion product concentrations at ground level at various distances from a VCM fire. Ten windspeeds from 2 to 35 mph are used. The turbulence of the air is also taken into account. The program selects at each of three atmospheric conditions, the maximum ground level concentration of the pollutant and the resulting windspeed at which this concentration took place. Using this windspeed, the program calculates a profile of pollutant concentration, at various distances, to a maximum of 20,000 ft. from the fire.

"The results obtained from this program show that the burning of a single tank car of VCM (200,000#), under the most unfavorable conditions of atmosphere and wind, will produce a ground level concentration of HCl, above the MAC value (5 ppm), up to a distance of 10,000 ft. (approximately 2 miles).

"From the data collected it appears that carbon monoxide should not be a cause for concern in the vicinity of burning vinyl chloride. Insufficient oxygen and large quantities of HCl seem to be the chief hazards. Hazardous quantities of phosgene may be produced in the immediate vicinity of vinyl chloride fire.

"The Drager tube, when equipped with a zinc scrubber tube, would be valuable for monitoring phosgene levels at the site of a vinyl chloride fire."

It was agreed that Task Group C should

a. Prepare a recommendation regarding necessary area evacuation in case of VCM transportation accidents involving more than one tank car.

b. Complete the report.

c. Prepare a non-technical article for possible release to trade magazines.

3. Next Meeting

Mr. S. M. MacCutcheon stated that he would make a preliminary report to the Safety and Fire Protection Committee at its meeting on January 26-27, 1970. He asked chairmen of the three task groups to keep in touch with him so that a further meeting can be called at an appropriate time.

FGS:cm
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Attachments:

Minutes of Meeting of Task Group "B"
List of Emergency Phone Numbers
Water Information Card WIC-20

TASK GROUP "B" ON VINYL CHLORIDE MONOMER TRANSPORTATION SAFETY

Minutes of January 13, 1970 Meeting

The scheduled meeting of Task Group "B" was called to order by D. L. Dowell, Chairman, at 9:00 a.m., January 13, 1970 in the MCA Conference Room, Washington, D. C.

The following members were present:

H. D. Butter	Continental Oil Co.
R. E. Phillips	Ethyl Corporation
D. L. Dowell	B. F. Goodrich Chemical
R. D. Kogler (for J. D. Little)	Monochem, Inc.
T. G. Taylor	PPG Industries
P. M. Reed	Tenneco Hydrocarbon
M. E. Sutherland	Union Carbide Corp.

After introductions, Mr. Dowell stated that the purpose of the meeting is to review all aspects of the Task Group's activities and to formulate final recommendations to be presented to the general meeting on January 14.

The minutes of the November 7, 1969 meeting were approved with the following corrections:

1. "Subgroup" to read "Task Group" throughout.

2. Page 7, Item D (c) revised to read "Keep unofficial personnel away."

A. Emergency Kits as Baggage

Mr. Paul Reed's report on carrying an emergency kit on commercial airlines as baggage was received. There is no restriction other than the size and weight limits of 62" length plus width, and 70 lb., respectively.

B. Safety Valve Emergency Closures

The emergency closure devices prepared for use on ACF and Midland safety relief valves were reviewed in detail.

Mr. Kogler noted that the top O-rings of both types of valves could be replaced in the field, and in many cases valve seepage can thus be controlled. The proposed kit is intended to control more serious leakage.

Monochem will revise the sketches to take into account the suggestions of the Task Group and will build a sample of each for field check. Ethyl will assist as needed. As-built drawings of a successfully tested unit will be sent to the members.

The safety valve kits remain under development at this time. Problems exist in pluggage of safety valve housing drain holes, and the question of

auxiliary pop valve or rupture disc on the kit, must be resolved.

C. Report on Task Group "C" Studies on VCl Combustion

No formal data on combustion products was available at this meeting. Dr. Crider is reported to have run computer simulations of 200,000 lb. of VCl under severe wind velocities. The results indicate desirability of evacuating up to 12,000 ft., downwind. Charts will be made available.

The only significant area for phosgene concentration is at the fire. Work is underway on a Draeger tube detector. Final conclusion: DON'T WORRY ABOUT PHOSGENE.

D. Recommendations to General Meeting

(These do not relate to the maritime environment.)

1. CONSENSUS #1

Spilled vinyl chloride should not be deliberately ignited.

2. CONSENSUS #2

A vinyl chloride fire should not be extinguished. Large volumes of water or fog can dissipate fumes.

3. Handling of Leaks

See Bureau of Explosives Pamphlet 22. It constitutes recommended practice for derailments involving tank cars.

A. No leaks

This situation is usually competently handled by railroad personnel.

It is noted here that the railroad's prime object is to reopen traffic and that railroad people are in charge. Shipper representatives are only advisers. Proper procedures in handling vinyl chloride must be emphasized as the only means of expediting the clearing of the scene.

B. Controllable leaks

a. Small holes: Drive wooden plugs.

b. Larger holes: Neoprene patch, bonded or chained to tank.

c. Jagged holes are difficult to close.
Special rigs should be left to the judgment of the man at the scene.

d. Ansul Purple K will extinguish a vinyl chloride fire but re-ignition often occurs. Use around valves if it appears that a leak can be subsequently controlled.

e. Safety relief valve kits are being developed by the Task Group.

C. Uncontrollable leaks - no fire

a. Evacuate and isolate area (see Task Group "C" report)
b. Remove sources of ignition.
c. Control spread of vapors by water spray.

D. Uncontrollable leaks - fire

a. Evacuate and isolate area.
b. Keep adjacent cars cool, if possible, with monitor nozzle.
c. Keep unofficial personnel away.
d. Treat a non-burning tank car in vicinity of fire as if it is about to rupture.
e. If vinyl chloride gets to a sewer, evacuate area and flush sewers with fire hoses.

4. Personnel at the Scene

Personnel sent to an accident should be capable, knowledgable with VCM and not restricted by title.

The individual should be at each company's option, but technical qualification is recommended.

It is suggested that MCA consider providing data for, or conducting a training course for police, railroad employees, etc.

5. Suggested Emergency Kit Contents

Each company is responsible for the preparation of its emergency kit. The following are considered essential:

a. Explosion meter
b. Self-contained air supply
c. Wood plugs and wood mallet (see B of E 22)
d. Data sheet and pencil
e. Camera and film
f. Flashlight (Bureau of Mines approved)
g. Rubber gloves
h. Slicker suit
i. Rubber overshoes
j. Safety line (braided stainless, plastic covered) and rescue harness
k. Goggles
l. Safety hat
m. O-rings
n. Strap wrench
o. 10" adjustable wrench (spark resistant recommended)
p. Screwdriver
q. Ground continuity meter (Note: Anderson Co. - P5 Continuity Meter is approved by UL)

r. Safety relief valve kit
s. Copies of: SD-56 Vinyl Chloride
CC-46 Vinyl Chloride
Bureau of Explosives Pamphlet 22
t. Take back-up man
u. Avoid wearing woolen or nylon clothing
v. Obtain pipe plugs from local sources

6. Spilled Vinyl Chloride

Spilled vinyl chloride should not be deliberately ignited.

7. Recovery or Removal of Vinyl Chloride

Depending upon circumstances and extent of car damage, vinyl chloride may be recoverable.

a. If car condition permits, transfer contents to empty tank car using inert gas.

b. If car is ruptured, attempt to use pump with flooded suction.

c. If pumping is impractical, use water or oil to float out remainder of VCM.

d. Fill empty tank car with water or nitrogen.

e. If a vinyl-ice mixture forms, keep a water stream to the tank until it dissipates.

f. Handling of vinyl chloride in a damaged car can be influenced by weather conditions. At low temperatures, since vaporization is reduced, patch tank, if possible, so that it can be moved.

g. Before permitting the railroad crew to use a cutting torch, fill the tank with water; empty; steam the tank, if possible; then check with explosion meter.

h. The railroad may be able to supply a water car, if advised to do so.

8. First Technical Contact Recommendations

Recommendations depend upon the information received. Give fire/no fire advice and information on products of combustion:

a. If burning - let it burn. Spray fog into fume area.

b. If not burning - don't ignite.

c. Never puncture a car.

d. Evacuate and isolate area. (see Task Group "C" report)

e. Clear area of ignition sources.

f. Avoid concentrations of fumes or combustion products.

g. Be sure Bureau of Explosives inspector has been contacted.

h. Advise that a company representative is on the way with technical advice. Give name, if possible.

i. Determine exact location of accident in terms of cities, highways, streets,etc.

j. Find out proper railroad contact and phone number.

9. Press Releases

The company representative at the scene must be guided by his company's policy. The following are suggestions:

a. At the scene - refer the press to Bureau of Explosives inspector. Be honest.

b. Away from the scene - put off comment until company representative reports back. Be honest.

c. If asked "where" or "when" - give answer, if known.

d. If asked "how did it happen": do not give an answer, even speculative. This is the responsibility of the railroad representative.

e. If asked "what are the burning products": mostly HCl (muriatic acid) and carbon dioxide.

f. If asked "what about phosgene": No danger. Traces, if present, will dissipate.

g. If asked "what is vinyl chloride": colorless like water, unless frost forms; sweet odor; used to make ordinary vinyl plastics.

10. Cooperative Efforts

Task Group "B" recommends the establishment of a mutual aid system for vinyl chloride accidents under the coordination of MCA. This system should see that the nearest qualified man gets to the scene as an adviser until the shipper's representative arrives.

Corporate approval of this recommendation from the companies represented on Task Group "B" is being sought by the members.

The members are urged to submit their emergency phone numbers and statement of willingness to provide advice, to F. G. Stephenson. Current listing is attached to these minutes.

11. MCA Publications

The Task Group suggests that the above recommendations be incorporated in revised editions of SD-56 and Chem-Card 46 on vinyl chloride.

Objectives for Future Activities of Task Group

1. Complete the evaluation and test of safety valve closure kits.
2. Complete the submittal of emergency numbers to MCA.
3. Subject to approval of the General Meeting and MCA Staff Representative, consider maritime problems.
4. Consider industry standardization of VCl tank car domes and fittings, subject to MCA staff approval.

MANUFACTURING CHEMISTS ASSOCIATION

Vinyl Chloride Monomer Manufacturers
Transportation Emergency Telephone Numbers

Borden Inc / Chemical Division
350 Madison Avenue - Room 601
New York, N. Y. 10017

Business hours:	212	573-4396
Non-business hours:	203	322-4454

Continental Oil Company
Petrochemical Department
Park-Eighty Plaza East
Saddle Brook, N. J. 07662

Vinyl Chloride Monomer Plant, Lake Charles, La.	318	882-0554
	601	369-8111
		or 8112
		or 8113
		or 8114

Will participate in mutual assistance program

The Dow Chemical Company
Texas Division
Freeport, Texas 77541

24 hours service	713	238-2112

Will participate in mutual assistance program

B. F. Goodrich Chemical Company
Calvert City, Kentucky

Business hours:	504	395-4151
Non-business hours:	504	443-7455
		or
	504	442-8555

Will participate in mutual assistance program

Monochem Inc.
P. O. Box 488
Geismar, Louisiana 70734

24 hours service	504	348-6681
		Ext. 151

PPG Industries
Chemical Division
P. O. Box 1000
Lake Charles, La. 70601

318 882-1200

Will participate in mutual aid program

Tenneco Chemicals Inc.
Hydrocarbon Chemicals Division
P. O. Box 849
Pasadena, Texas 77501

24 hours service 713 479-3411

Tenneco Plastics Div. 609 386-9200

Ethyl Corporation
451 Florida St.
Baton Rouge, La. 70801

504 344-7147

Will participate in mutual aid program

Union Carbide Corporation
Chemicals and Plastics Operation Div.
South Charleston, W. Va.

304 744-3487

Will participate in mutual aid program