

2-12

Monsanto

MONSANTO POLYMERS & PETROCHEMICALS CO.
730 Worcester Street
Indian Orchard, Massachusetts 01051
Phone: (413) 788-6911

September 10, 1975

Mr. Rudolph Bayerle, Director
Occupational Safety & Health Administration
Room 501
436 Dwight Street
Springfield, Massachusetts 01103

SUBJECT: Regulated Areas
Regulation 1910.93q VCM

Dear Mr. Bayerle:

In accordance with paragraph n of OSHA regulation 1910.93q, Vinyl Chloride, please be informed that Monsanto Company has ceased vinyl chloride operations at its Springfield Plant, 730 Worcester Street, Indian Orchard, Massachusetts. The two regulated areas established in accordance with paragraph e, OSHA regulation 1910.93q, and reported to you in my letter of April 22, 1975 were cleared of VCM and PVC as follows: manufacturing area (regulated area No. 1) effective August 8, 1975; and warehouse area (regulated area No. 2) effective August 28, 1975. Therefore, these areas have been deregulated as regards OSHA regulation 1910.93q.

Cordially,



G. M. Ellsworth
Plant Manager
Monsanto Company

/pjc

bcc: D. V. Bierwert
R. L. Bourget
R. W. Bueker
G. W. Fletcher (2)
D. L. Gendron
P. S. Park
G. L. Smith

Monsanto

D-12

TO D.L. Gendron **cc** R.L. Bourget
G.W. Fletcher
DATE August 15, 1975 R.B. Gibb
D.H. Howe
SUBJECT Rail Cars Containing RVCM & VCM J.A. Tierney

REFERENCE**TO** R.W. Bueker

Following is a status list of VCM tank cars remaining in the plant.

<u>Car No.</u>	<u>Contains</u>	<u>Amount (Est. Amt.)</u>
33008	RVCM	.220 MM lbs.
33021	RVCM	.220 MM lbs.
33028	RVCM	?-heel from #2 tank
33023	VCM	(.140 MM lbs.)

Please arrange to store these cars elsewhere than in Tank Farm K-1, as the 84 Bldg./Tank Farm regulated area will be de-regulated effective 8/12/75. Also, until disposition of this material can be arranged, please have the RVCM cars sampled and tested for phenol and peroxide content once a week. Significant changes in phenol content or the appearance of any peroxides should be reported to me immediately.


D. L. Gendron

/hs

Monsanto

D-12

FROM D.L. Gendron cc: R.L. Bourget
DATE August 15, 1975 R.W. Bueker
SUBJECT End of VCM Storage in 84 Bldg/Tank Farm
Regulated Area
REFERENCE
TO File

Bulk storage of VCM and PVC was ended in the 84 Bldg/Tank Farm regulated area on August 12, 1975. As of that date, entry logs for personnel entry into that regulated area are no longer being maintained.


D.L. Gendron

/hs

Monsanto

D-12

FROM Springfield, Massachusetts

DATE July 24, 1975

SUBJECT TANK FARM K-1 - VCM SHUTDOWN

cc: D.V. Bierwert
R.W. Bueker
E.E. Scully
C.A. Taylor

REFERENCE

TO D.L. Gendron
R.F. Sackett

SUMMARY

84 building will empty #1 and #6 tanks of all VCM they need to complete kettle charges. All RVCN to be pumped by 84 to #2 RVCN tank. #1 and #6 tanks is to be pumped to tank car by T&M. RVCN from #2 tank will be pumped to tank car by T&M. #1, #6, and #2 tank will be removed from VCM service by T&M with Maintenance pipers. All tanks and lines water flushed and drained, steamed, blanked, pressure relief valves removed and compressors and pumps locked out.

DETAIL

1. When 84 building has finished draining all liquid VCM needed, close all valves to and from 84 building from #1 and #6 VCM tanks. Lock out 84 building charge pump.

Responsibility: 84 Building

2. Pump all liquid VCM from #1 and #6 tanks to tank car. Disconnect tank car.

Responsibility: T&M

3. Fill #1 tank with water to 100%, vapors to #6 tank through overflow line. Close valves. Open vapor line - vent to air to prevent water pressure buildup. Remove pressure relief valves. Drain tank. Check for VCM vapors. Steam tank until no VCM vapors detected.

Responsibility: Maintenance and T&M

4. Fill #6 tank with water to 90%, vapors to #2 tank through overflow line. Compress vapors from #6 to #2 0lbs. pressure. Check for liquid vaporization. Continue filling slowly to 100% vapors to #2 through vapor line. Close all valves. Open vapor line. Vent to air to prevent pressure buildup. Remove pressure relief valves. Drain tank. Check for VCM vapors. Steam tank until no VCM vapors detected.

Responsibility: Maintenance and T&M

5. Be sure 84 building has pumped all RVCM to #2 tank. Pump all RVCM liquid from #2 tank to tank car. Compress vapors from #2 VCM tank to tank car to 0lbs. Close valves and check for vaporization. Repeat vapor compression if necessary.

Responsibility: T&M

6. Fill #2 tank with water to 90%. Compress vapors to tank car. Continue filling with water to 100% venting to stack. Close valves, vent tank, remove pressure relief valves. Drain tank. Check for VCM vapors. Steam tank until no VCM vapors detected.

Responsibility: Maintenance and T&M

7. Check gauge in tank car. Take four sample bombs. Disconnect tank car.

Responsibility: T&M

8. Flush all dock lines and pumphouse lines and manifolds - vent to stack at KO tank. Flush KO tank. Steam until no VCM vapors detected. Blank all open lines. Vent two compressors to stack - lock out.

Responsibility: T&M


J.A. Tierney

/mp

Monsanto

FROM C. D. Riggs CC:

DATE December 13, 1974

SUBJECT

REFERENCE

TO R. L. Bourget M. A. Kulig
~~R. W. Bueker~~ M. A. Petronino
P. Dugan D. E. Philpott
D. L. Gendron

Per the OSHA VCM health standard, the establishment of "regulated area" is required where PVC or VCM is "manufactured, reacted, repackaged, stored, handled, or used." Attached are the instructions which will be posted at the sign-in entrance point of the "regulated area" which includes 84 Bldg. and K-1 tank farm.

Note that the 84 blowdown room, 82 pumphouse, and RVCM compressor room are not listed as "required" respiratory areas. One or more of these areas may be changed to "required" respiratory areas if VCM concentration data warrants by December 31.

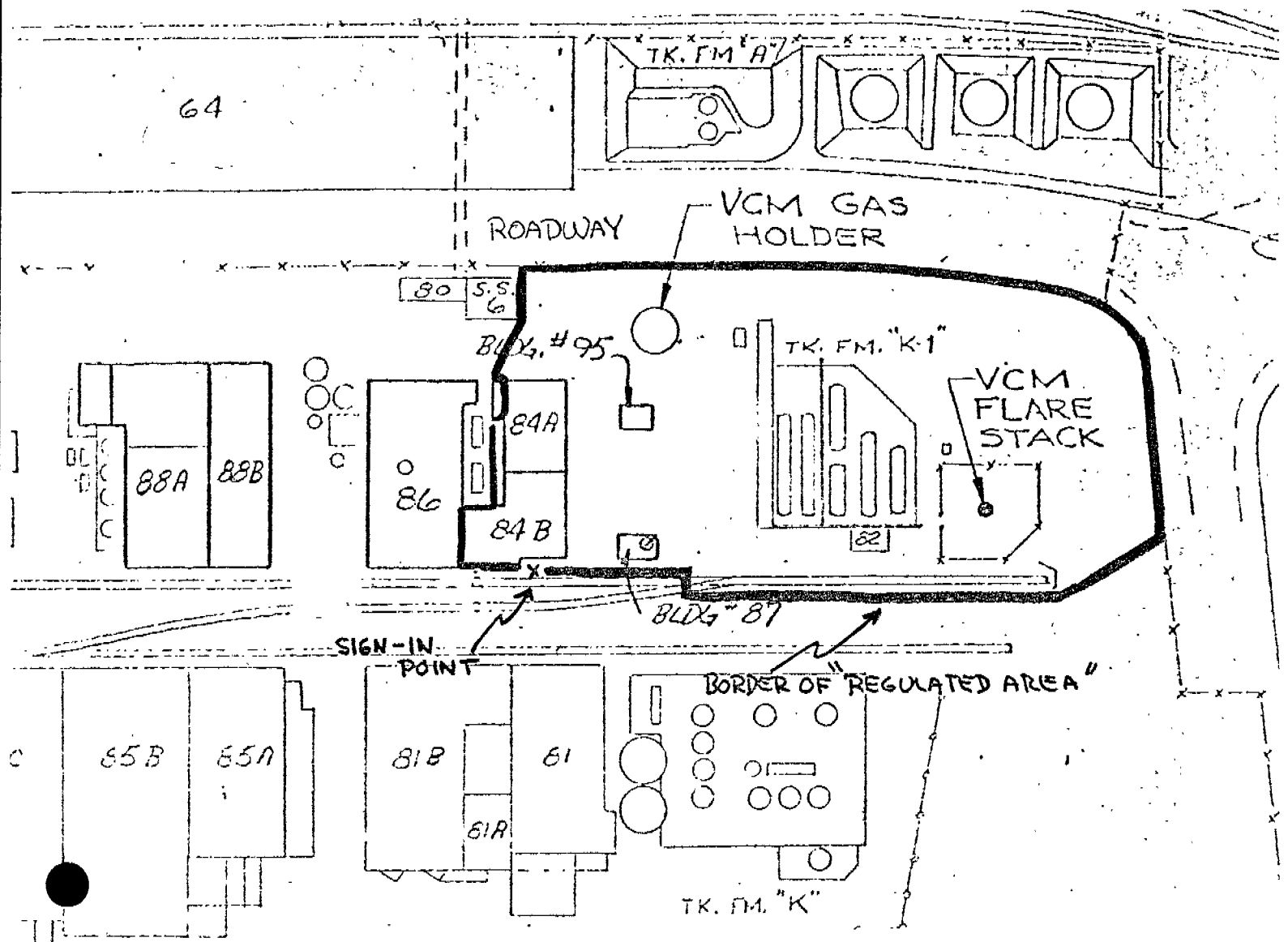
Please return comments by 12/20.


C. D. Riggs

/m

NOTICE

All persons entering this area: The PVC 84 Bldg. and K-1 tank farm area as shown on the diagram below is a "Regulated Area" as described in the OSHA Standard for Exposure to Vinyl Chloride. This area is a cancer suspect agent area and only authorized personnel may enter. All persons who enter must read the adjacent list of requirements and comply accordingly.



REQUIREMENTS FOR VCM "REGULATED AREA"

- 1) Authorized personnel only may enter this area--you are authorized if you have Monsanto related business in the area. Passers-by are not permitted to enter.
- 2) All persons who enter for the first time on a given day must enter at this point and sign in name and date on the log sheet. Once you have signed in for the day you may come and go from the "Regulated Area" at locations other than this sign-in point and you do not have to sign in. It is not necessary to sign out upon leaving the "Regulated Area".

The following persons are exempt from the above sign-in regulation:

Monsanto Dept. 80 PVC wage employees

Monsanto PVC Department Supervision

Monsanto South Plot Area Mechanics and Oiler

- 3) Some areas within this regulated area are "hazardous" because they contain vinyl chloride vapor. These areas are posted with signs reading:

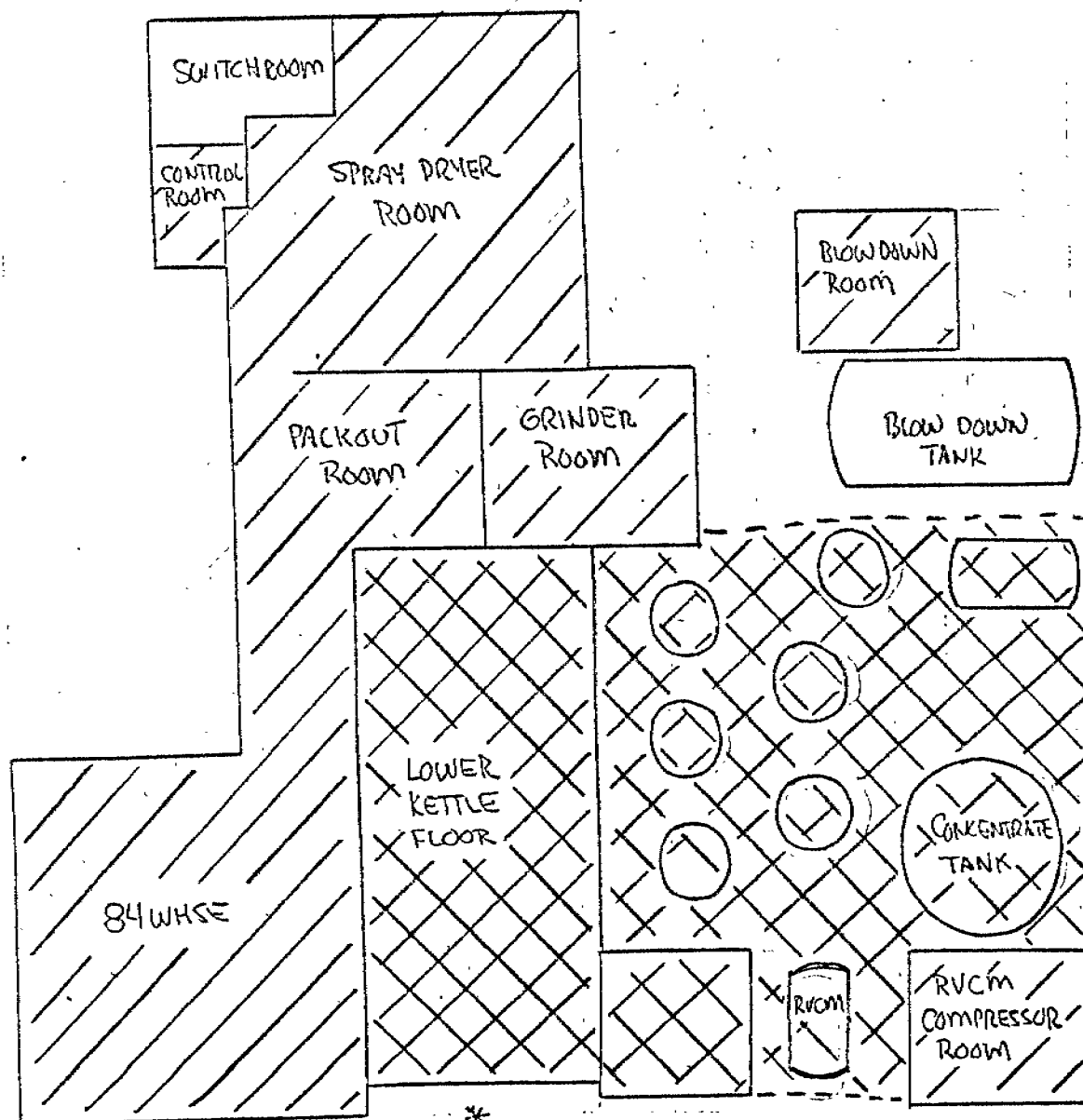
Cancer-Suspect Agent In This Area

Protective Equipment Required

Authorized Personnel Only

These "hazardous" areas are shown on adjacent Figs. 1 and 2. Some of these "hazardous" areas require that air respirator protective equipment be worn and the areas are so posted. Respiratory protection is voluntary in the remainder of the "hazardous" areas. Consult PVC supervision to procure necessary air respirator equipment and instruction.

- 4) Do not break open any VCM or PVC containing equipment without first consulting PVC supervision for instructions. This type of work may require respiratory equipment.
- 5) Consult PVC supervision before moving any of the rope barriers surrounding this "regulated area".



*
AREA SIGN-IN POINT

FIG 1
GROUND FLOOR 84 BLDG.

-  HAZARDOUS AREA - RESPIRATOR EQUIPMENT VOLUNTARY
-  HAZARDOUS AREA - RESPIRATOR EQUIPMENT REQUIRED

82 BLDG
VCm
PUMPHOUSE

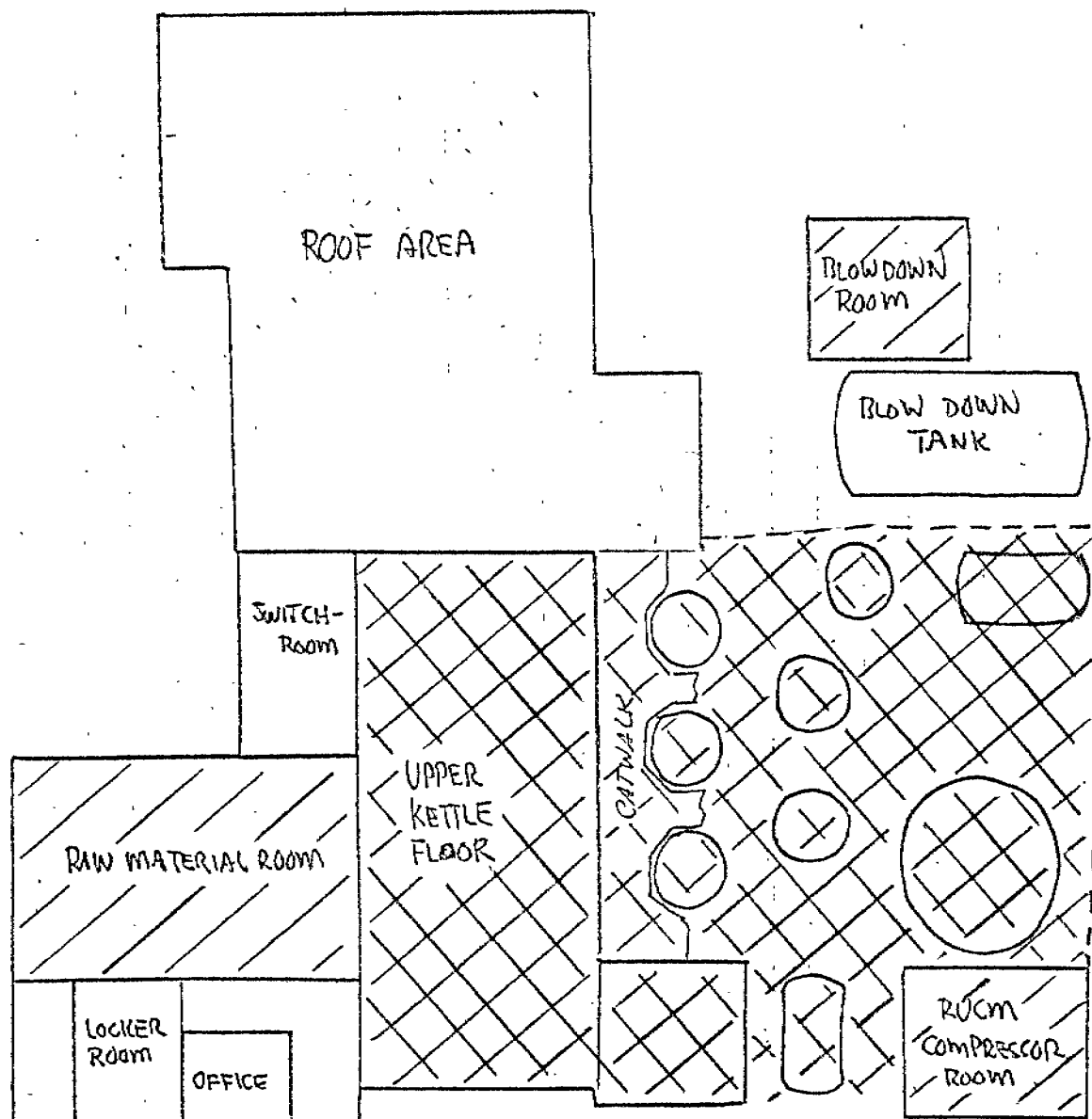


FIG. 2
SECOND FLOOR 84 BLDG.

-  HAZARDOUS AREA-RESPIRATOR EQUIPMENT VOLUNTARY
-  HAZARDOUS AREA-RESPIRATOR EQUIPMENT REQUIRED

PVC REGULATED AREA

SIGN-IN LOG

[illegible]

D-12
R. W. Buckner ✓

1/14/75

RECOVERED VCM IS TO BORDEN LAMINSTER

We have now received clearance that all MCPX 33000 SERIES VCM tank cars may be loaded so that gross wgt does not exceed 315M pounds.

This means you may load gross 215-220M lbs per car shipping.

This has been authorized by Erie Cars.

On MCPX-39000 Series Tank Car
You must restrict maximum gross wgt to 263M lbs per car or 165M lbs of VCM as these cars have 100 ton trucks.

JH [Signature]

Consalto

D-12

4 C. D. Riggs
DATE January 8, 1975
SUBJECT RVCM Storage, Loading, & Shipping
REFERENCE Memo 12/19/74
TO ~~R. W. Bueker~~
J. A. Tierney

cc: R. L. Bourget
D. L. Gendron
D. E. Philpott

This is to summarize action to date and to submit plans for the handling of RVCM per our discussion on 1/8/75.

Since the meeting with Bueker, Philpott, Tierney, and Riggs on 12/17/74 the following action has taken place:
(Reference memo 12/19/74)

* Approximately 10,000 gal. of RVCM has been pumped to #2 RVCM tank in K-1 tank farm. This is a lower fillage rate than anticipated. A revised estimate is that a quantity of 165,000 pounds will be accumulated and ready to ship week of 1/27/75.

* Samples have been taken from #2 tank and results are as follows:

12/20/74 - 28 ppm phenol in RVCM
1/3/75 - 26 ppm phenol in RVCM
1/3/75 - 0% peroxide in RVCM
1/3/75 - one sample taken and stored for visual evidence of polymer formation. No evidence of cloudiness as of 1/7/75.

* A temporary procedure has been written and used to transfer RVCM to #2 tank.

* 84 Bldg. phenol injection system was checked, and cleaned to insure operability.

* Reviewed need for check valve in line to tank #2 (Riggs, P. Tardif, D. Philpott) and considered fact that RVCM transfer pump pressure could in fact lift #2 tank relief valves. Existing system is considered adequate.

* Reviewed details of RVCM with Borden Co. 1/7/74 (Riggs/Joe Dagenfelder-Plant Manager). Borden has evidence that 10-20 ppm phenol concentration is adequate for shipment. They want RVCM with a 10-20 ppm phenol concentration but will use up to 24 ppm. A. P. Torrenzano recommended 40-50 ppm to start system out. Borden confirmed they do not use N₂ for rail car unloading.

Recommendations for future plans--

* It is recommended that the first rail car be shipped to Borden with 20-25 ppm phenol with the following sample plan:

---Until rail car is loaded, sample tank #2 every 2 weeks and confirm

phenol	20-25 ppm
peroxide	0%

---Sample #2 tank just prior to loading and test for phenol and peroxide and check visual sample taken 1/3/75 for polymer formation.

---Sample rail car after loading and test for phenol and peroxide.

---Sample rail car, obtain results after weighed in West Springfield and before leaving for Leominster.

---If rail car does not get to Borden, Leominster within 5 days of leaving West Springfield (normal trip 4 days) then sample car in route and test for phenol and peroxide.

Borden plans to sample car upon receipt in Leominster.

Phenol concentration can be increased in #2 tank by increasing phenol system charge and phenol could be blown into a rail car if required.

Responsibility - PVC Mfg./T&M

- * Additional testing after the 1st rail car should include peroxide and phenol every 2 weeks and 1 stored visual sample (stored for 40 days).

Responsibility - PVC Mfg.

- * After accumulation of monomer data if results show sustained phenol levels and no peroxide and polymer then ship subsequent rail cars at 15-25 ppm, testing each car after loading for phenol and peroxide.

Responsibility - PVC Mfg.

- * Repair seal and refill oil reservoir in tank farm pump to be used for loading.

Responsibility - PVC Mfg.

- * Confirm that 30,000 lb. VCM cars can be safely and legally shipped with a 22,000 lb. load to Leominster.

Responsibility - T & M Supv.

- * A rough draft of the procedure for tank car loading operation has been prepared by J. Tierney. Procedure should be completed and approved. It was originally suggested that remaining vapor in the VCM car to be loaded with RVCN should not be pumped out because of the chance of introducing O₂. However, upon review, pressure in the empty car is not reduced to below 5 psig and the compressor system will not see RVCN. Therefore, the VCM cars will be pumped of vapors

as is the current procedure. The plan calls for loading empty VCM cars, shipping RVCN to Leominster and then returning empty RVCN cars to Dow for virgin VCM service.

- * Operation of tank farm pump and seal should be reviewed and included in tank farm pumping procedure.

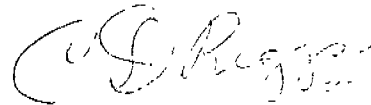
Responsibility - PVC & T&M

- * Start stop switch and alarm for tank farm pump will be disconnected on 88 Bldg. kettle floor.

Responsibility - PVC

- * The need for a logging of #2 tank fillage was discussed. The 84 Bldg. lead operator log will be revised to include a record of 84 RVCN tank pumping and #2 tank fillage. ✓ *James R. Riggs*

Responsibility - PVC/~~T&M~~



C. D. Riggs

/m

Loading RUCM

①
D-12

(RUCM)

Recovered vinyl chloride monomer from 8V Bldg. is stored in #2 RUCM tank. When filled to 22000g (165000 lbs.) a tank car can be loaded for shipment out of the plant. Phenol inhibitor level is maintained ~~at~~ ~~by~~ by production personnel.

I Special Safety Instructions

A. Do not inhale any VCM vapors. If any indication of VCM vapor in area wear a Scott Air-pak.

B. Do not bleed VCM vapors or liquid to the atmosphere. It is highly flammable. No Fire permits allowed in area when Tank car is being loaded.

C. Car must be grounded. Static sparks can ignite VCM vapors.

II General

RUCM is loaded from #2 tank using the 8V Bldg charge pump thru the recirculating line to the VCM liquid line; to dock 2 Track 5; to the liquid line yoke; to the liquid lines of the tank car. VCM vapors are vented from the tank car thru the vapor lines on dock 2 to the vapor

(2)

manifold to #2 tank.

The dip rod is used as a gauging device on the tank car and is set @ (from ^{chart} in. = 22000 g or 165000 lb.

The volume gauge on #2 RVCN tank is used to measure the amount gRVCN purged to the tank car. This can be checked using the dip rod. A sample of the tank car is taken before sealing the car for shipment. Car ^{should} be weighed at West Springfield.

III Detailed Loading Instructions

1. Attach 2 ground lines to car, chock car wheels. Flag the tracks. Position derailler.

2. Remove all plugs - 2 liquid line and 1 - Vapor line.

3. Connect liquid line yoke and vapor line pipes to car.

4. Open liquid valves + vapor valve on car.

5. Open liquid + vapor valve on dock.

6. Open liquid line valves from #2 tank to 88 Bldg pump thru manifold and discharge valves from pump. Be sure valve to 88 Bldg is closed, blanked + tagged. Be sure cross-over valve to 84 pump is closed and tagged.

7. Open recirculation valves + liquid valves to tank car liquid line. Be sure valves on liquid manifold to 1 + 6 tanks

are closed and tagged.

8. Check level in #2 RUCM tank and calculate level when 22000 g are pumped to tank car. ^{Be sure seal coolant pump is on}

9. Start pumps - Check flow by change in level in #2 tank.

10. Stop pumps when #2 tank at required level. - Check level in car with dip rod.

11. Take (4) samples in glass bombs. Label tags + deliver to refrigerator in #10 Lab.

12. Close all tank car valves

13. Vent lines to stack

14. Disconnect yoke + lines from car.

15. Install plugs in all valves. Close dome cover + seal.

16. Apply dangerous placards.

18. Remove ground cables, derail, flag and checks.

JAF:rnay
11/7/74

FROM C. D. Riggs
DATE December 19, 1974
SUBJECT RVCM Storage, Loading & Shipping

cc: R. L. Bourget
D. L. Gendron
A. P. Torrenzano

REFERENCE

TO ✓ R. W. Bueker
D. E. Philpott
J. R. Tierney

This is to summarize our discussions of 12/17/74 and report new information relative to RVCM storage, loading and shipment to Borden Co. As discussed, the following action will be taken prior to RVCM loading:

- Review need for check valve in line from 84 tank to #2 tank in K-1 tank farm. *Philpott + Tordiff* - C. Riggs *Not necessary*
- Confirm that 84 RVCM pump incapable of over pressuring #2 tank. *is capable but safety valves will relieve* - C. Riggs
Non condensables to stack
- Write procedure for transfer of RVCM to #2 tank (prevent over fillage, etc.). *Riggs to do* - C. Riggs
- Insure that 84 Bldg. phenol system is operational and test RVCM in #2 tank to insure minimum 50 ppm phenol inhibitor. *28226* - C. Riggs/
J. Tierney
- Confirm details from Borden, i.e.-will they take RVCM, where will it go, do they introduce N₂ when unloading. *No N₂* - C. Riggs
- Put positive lock on valve to 84 pump in tank farm to preclude charging RVCM to 84 Bldg. *Not Done* - C. Riggs
- Develop procedure for tank car loading (if possible, obtain reference procedure from Dow, may necessitate testing car for O₂ content). - R. Bueker/
J. Tierney
- Have MT rail car available for loading when required. - R. Bueker/
J. Tierney

I have confirmed from discussions with R. Bourget that Borden will indeed be buying RVCM and that RVCM cars will be shipped to Borden Co., Leominster, Mass. We believe, but will confirm, that Borden does not introduce N₂ in unloading procedures. At least the first shipment will be tested for phenol inhibitor to insure 50 ppm phenol.

Per R. Bourget, rail cars loaded with RVCM and emptied by Borden could be sent back to Dow for VCM loading; and providing there was no

significant heel after unloading, these would be adequate for 84 Bldg. VCM. Using an emptied VCM (instead of RVCM) car in this way to load RVCM may have a safety advantage in that the same car(s) would not be used exclusively for RVCM, a situation which would improve conditions for peroxide formation and O₂ buildup.

Timing for the loading operations estimated as follows:

#2 tank effective capacity (90%) = 31,000 gal.

84 Bldg. RVCM generation = 1,070 gal./day

Tank car capacity 165,000# = 22,000 gal.
(max. wt. limited by railroad requirements Spfld. to Leominster)

#2 tank fillage on 12/18/≈18% = 6,200 gal.
Void space left ≈ 24,000 gal.

Time at which 1st car must be loaded: no later than 22 days,
i.e. Jan. 10, 1975

Maximum frequency of loadings =, with 22,000 gal. car 20 days.

In addition to the above actions, I will review technical aspects of the plan with A. P. Torrenzano to confirm safety, Borden's RVCM processing plans, etc. Additional work may be required, i.e. filtering, routine impurity testing, etc.


C. D. Riggs

/m

WPA/VBL/os
9-3-59

MATERIALS HANDLING
PROCEDURE FOR LOADING VINYL CHLORIDE

INDEX

- I. Special Safety Instructions
- II. General
- III. Detailed Loading Instructions

Copies of this procedure were distributed to:

W. T. Anderson

C. Berg

R. H. DuVon

V. E. Logan

W. F. Seelbach

VCM Rack

Extra (5)

LOADING VINYL CHLORIDE MONOMERI. Special Safety Instructions

- A. Do not inhale excessive amounts of vapor. VCM is an anesthetic and, because it excludes oxygen, is also an asphyxiant. In addition, it accumulates in the body. It is not easily thrown off.
- B. Do not unnecessarily let large amounts of VCM to atmosphere. It is highly flammable.
- C. If any welding or cutting is being done in the area, have the work stopped until through depressuring cars. This will be corrected by addition of a line to the flare at a later date.

II. General

Vinyl chloride monomer (VCM) is loaded into pressure-type tank cars from storage tanks 22T9-1 and 2. The loading rack has 12 loading spots located on two tracks.

The cars are loaded through lines from 22P25-1 and 2 pumps, which take suction from the storage tanks. Vapor from the vapor lines of the tank car returns to the storage tanks.

III. Detailed Loading Instructions

- 1. Attach ground cable to tank car.
- 2. Remove all pipe plugs from valves.
- 3. Connect gas hose to the car.
- 4. Pressure-up cars to storage tank pressure.
- 5. Plug dome holes and fill dome with water.
- 6. Check for all leaks and put information on card to be tied to cars.
- 7. After all leaks have been repaired, connect liquid hose to tank car valves.
- 8. Line up valves from storage tank through pumps to tank car.
- 9. Open liquid and gas valves on car.
- 10. Start pumps.

LOADING VINYL CHLORIDE MONOMERIII. Detailed Loading Instructions (Cont'd.)

11. Set gauge rods on 18" outage and open valves.
12. When VCM starts blowing at 18", raise gauge rod to 10".
13. When VCM blows at 10", shut off gas and liquid valves on car.
14. After the last car is filled, shut off pumps and block in lines.
15. Take temperature and pressure of the car and record on loading report.
16. Two liquid samples are taken. One in bomb and one in thermos bottle.
17. Install plugs in all valves and apply seals.
18. Close dome and seal.
19. Apply dangerous placards.
20. Remove ground cable.
21. Complete loading report and check list.
22. Take samples to lab.

Special for Phenol-Added Cars

1. After leaks have been repaired and rechecked, depressure car.
2. Pour required phenol in the liquid line.
3. Connect car and proceed as above.

J. S. Darden - G4NL

October 22, 1974

Magnetic Gage Installation for
VCM Tank Cars
EFC:DVB

~~D. V. Herbert - 1870~~
F. S. Bonham

A. J. Frankel - G4NG
R. G. Wessels

E. F. Celette - E3SG

The estimated cost to install a magnetic level gage in one
of our VCM tank cars - MCPX 33000 series - is as follows:

Cleaning car (vent, steam and dry)	\$210
Cost of magnetic level gage (3 month delivery)	\$335
Installation cost	\$220
Nitrogen purge to 200 ppm (Dow at Freeport has done this work in the past)	<u>\$100</u>
Total Estimated Cost	\$865 per car

The time schedule to complete this work would be as
follows:

Estimated delivery of 20-30 magnetic gages	3 months
Estimated time required per car at shop for installation	2-4 weeks*
Estimated total time	3½-4 months (after authorization)

* This installation time would be based on giving the shop
a minimum of 3 months advance notice and maintaining approximately
5 cars at the shop as a backlog.

Once work begins, the repair shop should complete a minimum of
one car per week.

Joe Darden

jb

Monsanto

FROM (NAME & LOCATION)

E. F. Celette - E3SG

6 ~~711~~ f71
~~6 JHK~~ 24K
③ DV3

DATE: October 10, 1974

SUBJECT: VCM TANK CARS

REFERENCE:

TO: Messrs. -
✓ D. V. Bierwert - 1870
F. S. Bonham - G4NL
J. S. Darden - G4NL
A. J. Frankel - G4NE
G. M. Simmons - E3NF
R. G. Wessels - G4NK

This is to summarize the VCM car situation concerning needs, and the magnetic gauging requirement by Dow following conversations I had with Borden and Ethyl. I have also taken the liberty of proposing the steps we should take to respond. Please let me know if anyone has some better ideas.

Borden: Dennis Zahn, Manager Distribution Services
614/225-4636

Ethyl: Bill Brydon, Marketing Manager for Chlorine
Related Products, Industrial Products Division
504/387-0131.

1. We want to continue the Ethyl exchange through the end of the Ethyl contract with Great American (April 30, 1975) for two reasons:
 - a) Maximum volumes for Monsanto Annual Volume Tariff
 - b) Defers having to use Monsanto cars for the Monsanto half of the GA contract until after said cars are freed up by cessation of PVC homopolymer production at Springfield February 1, 1975.
2. Ethyl is willing to continue the exchange through April 30, 1975. ✓
3. To make it possible for the Ethyl exchange to continue through April 30, 1975, Dow will have to agree to load the cars Ethyl is sending to Dow Freeport for loading the Monsanto payback end of the exchange.

*Borden?
Cars?*

RSV0024431

October 10, 1974

4. The cars being used in the Monsanto payback leg to Ethyl are Borden cars, since the payback is going to Borden. ✓
5. The Borden cars presently in use do not have magnetic gauging devices, but in February, 1975 Borden is scheduled to receive 40 new VCM cars from Union Tank which will have magnetic gauging devices on them. Borden has agreed that they will put these cars into the Dow pickup starting in February (assuming their car delivery stays on schedule).
6. Alan Frankel: Please inform Dow of item 5 and try to get confirmation that it will be satisfactory to Dow to continue to load the payback material in Borden cars without magnetic gauging devices until the new Borden cars come on the scene; now expected to be in February, 1975.
7. If this is successful, George Simmons should go back to Ethyl to formalize extension of the Monsanto/Ethyl exchange through April 30, 1975.
8. Joe Darden should obtain very soon the best schedule possible for installation of magnetic gauging devices on 20 Monsanto cars. He should transmit this to Alan Frankel. 34 J. Darden
9. Alan Frankel should inform Dow of this schedule, try to get confirmation from Dow that this is satisfactory. He should also try to get Dow agreement that the 14 cars which we will have in supply of the Monsanto/Great American volumes between April 30, 1975 when the new Borden cars are withdrawn because of termination of the Ethyl exchange and the termination of our Great American contract December 31, 1975 can continue to be loaded at Dow without magnetic gauging devices.
10. If Dow refuses to let the 14 Monsanto cars in Great American service be used between April 30 and December 31 without magnetic gauging devices, Borden has said they might consider swapping cars with Monsanto for that period so we could use the new Borden cars for our move to Great American through the end of 1975.

11. A bit of intelligence I got from Borden:

- a) They talked with Bill Duncan, the Dow contact man specified for information on the gauging devices. Duncan was a little vague on timing required, but Borden was given to understand that Dow would not be adverse to a time schedule for completion by end 1975.
- b) Dow is using Lithcoat for installation of gauges on their cars.

12. Intelligence from Ethyl: At present Ethyl is not planning to put magnetic gauging devices on their own cars, and instead is working on an alternative way of meeting OSHA standards by modification of loading equipment and procedures. Ethyl was not willing to tell us exactly how since internal security clearance to do so had not been obtained (or requested). However, Ethyl did say it was a containment and recycle system with a flare for contaminated material. We are free to tell Dow about this, and if Dow is interested they should contact Bill Brydon at Ethyl directly.


E. F. Celette

ak

Monsanto

XC: CHE
→ RWB *usher*

E. F. Celette - E3SG

DATE October 16, 1974

G. M. Ellsworth - 1870

G. L. Smith - E3SH

SUBJECT VCM REGULATIONS
DISTRIBUTION INVOLVEMENT

TO ✓ D. V. Bierwert - 1870
F. S. Bonham - G4NL
R. L. Bourget - 1870
R. H. Dunlop - G4NA
W. L. Friehs - G4NK

W. R. Schaefer - C3SH
G. R. Side - G4EC
T. C. Stewart - G4NA
R. G. Wessels - G4NK

This is to summarize discussions at a meeting October 11 with Corporate Distribution and by phone with Bob Bourget.

The new OSHA regulations on VCM were reviewed, and a plan of action proposed for those items of the regulation involving distribution activities.

Routine Operations

PVC

1. Package warning labels: Basically Borden's responsibility to specify and provide bags. Bourget to contact Borden for instructions. Twining available to assist as appropriate.
2. Bulk truck warning signs: same as for package warning labels. Plant Traffic responsible for implementation.

VCM

1. Loading at Dow Freeport: Dow's responsibility.
2. Modification of tank cars to meet Dow's responsibility during loading. Rail Section of Corporate Distribution is coordinating.
3. Tank car warning signs:
 - a) Determine whether DOT will specify. CDD responsibility.
 - b) Determine how rest of industry will implement
 1. Bonham to review w/MCA Transportation Committee meeting in Washington 10/19-22.

D. V. Bierwert et al
VCM REGULATIONS
DISTRIBUTION INVOLVEMENT

-2-

October 16, 1974

2. T. Stewart to review with groups with which he is associated.
3. Celette to review with VCM sub-committee of SPI Distribution Committee at New Orleans meeting October 22-24.
- c. Gear up to implement prior to December 1 (be ready to not implement if a stay is obtained)
4. Tank car unloading: Will be handled as part of the Springfield plant's program to conform to regulations. Bourget/Bierwert responsibility includes equipment, training, monitoring, emergency procedures, etc.

Out-of-Plant Emergencies

1. Find out if Monsanto has any responsibilities to RR employees and public other than proper labeling and informing RR of nature of material. Ty Stewart to request legal opinion from P. S. Park.
2. Revise CHEMTREC data sheet. CDD responsibility to work out with MCA CHEMTREC Committee (R. Sido checking)
3. Since VCM incidents will take on a different character with the heavy focus on VCM, we should review and formalize the procedure for Monsanto reaction to - and help in - transportation incidents. Celette will investigate.


E. F. Celette

ak

TO

Mr. J. Dintine, Plant Engr.
Monsanto Company
Plastics Div.
12 Monsanto Ave.
Springfield, Mass. 01051

FROM

P. A. Nichols
American Air Compressor Corp.

SUBJECT

9 X 9 Pennsylvania, oil-free compressor

DATE

10/30/72

MESSAGE

Dear Mr. Dintine:

Attached is a quotation sheet covering a 9 X 9 Penn. compressor that is still in operation and in good running condition.

It can be seen in operation and be pulled out of service at once.

Location is in the Conn. Area.

This might be the fastest way to solve your 7 X 6 Penn. compressor problem.

SIGNED

Respectfully,

Pate

SIGNED

DATE

FORM 58-132 TRIP.
A BOEING & PEASE PRODUCT

THIS COPY FOR PERSON ADDRESSED

DSV0004426

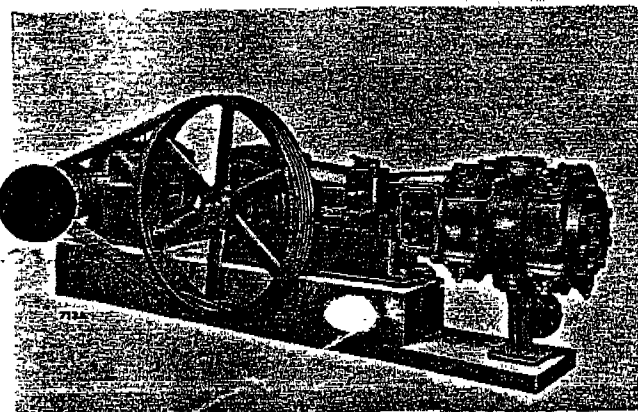
AMERICAN Air Compressor CORPORATION

(A COMPRESSOR MANUFACTURER SINCE 1902)

48TH STREET AND DELL AVENUE
NORTH BERGEN, NEW JERSEY 07047

New York Telephone
212 - 244-7665

New Jersey Telephone
201 - 865-4848



PENNS IVANIA

CLASS 3-AT C



JUST REMOVED FROM SERVICE

REBUILT AND
FROM THE ORIGINAL

NON-LUBRICATED

234 CFM Displacement 110# 360 RPM 40 HP Motor Required

9 x 9 Pennsylvania 3-ATC roller bearing, straight line, single stage, water cooled double acting Air Compressor, equipped with:

Oilless cylinder construction

Free air unloading

Air inlet filter

Multi-V-belt drive including compressor and motor sheave & necessary belts

40 HP motor, 3/60/220 or 440-volt with top motor mount

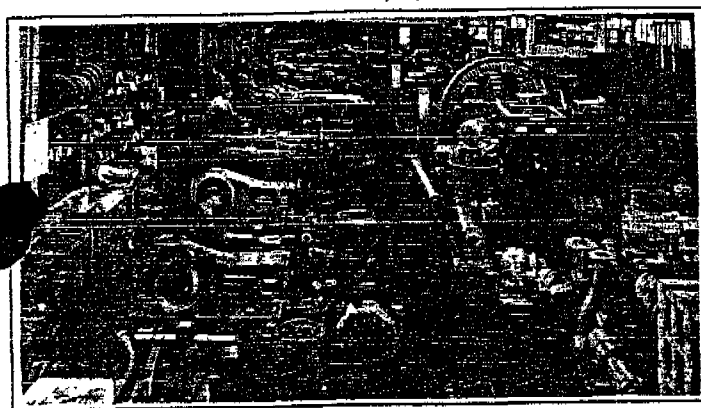
Pipeline aftercooler equipped with moisture separator

Total price, \$2,475.00

Subject to inspection

Price: F.O.B. shipping point.
Terms: 25% deposit with order.

Quotation Sheet
3 V 210 SPOR



To Our Compressor Friends:

We rebuild all make compressors and are in no way connected with the original manufacturer, except where our own originals are rebuilt. The plant as shown is our own of which we are duly proud. We invite our customers to see our plant and see how well equipped we are to build and rebuild compressors.

With over sixty years of compressor building and rebuilding our name and the integrity back of it is our guarantee.

AMERICAN AIR COMPRESSOR CORP.

THE PLANT BEHIND THE PRODUCT

Pres.

HAVE YOUR COMPRESSOR RE-BUILT BY COMPRESSORMEN — ALL QUOTATIONS SUBJECT TO PRIOR SALE

RSV0024437

Monsanto

D-12

FROM Springfield, Massachusetts

cc. R.L. Bourget
C.D. Riggs

DATE June 11, 1974

SUBJECT VINYL CHLORIDE MONOMER UNLOADING

REFERENCE

TO Al Shadensack

Attached is a diagrammatic sketch of the vinyl monomer unloading at the Springfield plant which I described to you yesterday. As you know, the unloading takes place in two stages - the liquid transfer and the removal of the residual vapor.

I have also included the specifications of the two unloading compressors and a drawing of "knock-out" tank used in the system.

If you have any questions I will be happy to answer.

R.W. Bueker
Supt. Transportation & Materials

:mp

Genl. Service by J. Bonquet
[Redacted]

cc: T. McDonald T.C.
RWF Int - T.C.
- S. Gormally - Spw
EF Celeste
J. Savage



DOW CHEMICAL U.S.A.

May 15, 1974

D-1 ✓

800 PIERRE LACLEDE CENTER
7733 FORSYTH BOULEVARD
ST. LOUIS, MISSOURI 63105
314-726-5000

Mr. A. J. Frankel
Manager, Raw Materials Purchases
Monsanto Company
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166

Dear Alan:

UNLOADING VINYL CHLORIDE MONOMER TANK CARS

For many years Vinyl Chloride Monomer tank cars have been unloaded by utilizing either an inert gas or Vinyl Chloride gas as a pressurizing medium to empty the car.

We now find it necessary to request that our customers use only Vinyl Chloride gas for this purpose.

This action is necessary to prevent contamination of the "heel" which often makes purging a necessity before again loading the car at our facility.

We are all facing more stringent regulations governing the air quality, water quality and worker environment. This change will be of great benefit in helping meet our mutual obligations and in addition will have a beneficial effect on Vinyl Chloride Monomer quality.

We appreciate your cooperation and ask that this change be made by July 15, 1974.

If we can help you in any way, let us know.

Very truly yours,

[Signature]
Lloyd R. Knaup
Office Sales Supervisor

sl

Monsanto

D-12

FROM

Springfield, Massachusetts

cc: Mr.G.M.Ellsworth
Mr.F.J.D'Amario
Shift Supers

DATE

April 29, 1974

SUBJECT

REFERENCE

TO

~~Mr. G. M. Ellsworth~~

This is for your information. At the recent Vinyl Chloride Safety Association meeting, the derailment of a Tenneco VCM railroad car was discussed.

Later, when talking with the Tenneco safety manager, he told me that they used the services of Arthur L. Proefrock, Hulcher Road, P.O. Box 191, Virdin, Illinois, telephone: 217-965-3361. He is a specialist in railroad accidents involving hazardous cargoes, and operates on a nation-wide basis.


G.W. Fletcher

s

Monsanto

FROM (NAME & LOCATION)

J. S. Darden - G4NL

DATE

March 5, 1974

cc MESSRS:

H. T. HALE

F. S. BONHAM

1870 - J. H. KNAPP

SUBJECT

PURGING VINYL CHLORIDE CARS

REFERENCE

TO

1870 -

MR. R. W. BUEKER

JH

This memo will confirm our conversation of March 5, 1974.

Tank cars in VCM service that were shopped recently for repairs were released from the shop without a "nitrogen pad." Several of these cars have been loaded at Dow in Freeport, Texas and are enroute to the Springfield plant. These car numbers are:

MCPX 33006

MCPX 33033

MCPX 33030

MCPX 39000

Before these cars were loaded at Dow they were purged with nitrogen to 4,000 PPM of oxygen. There are an additional seven cars which have left repair shops without a "nitrogen pad." When these cars arrive at Dow they will be purged with nitrogen to reduce the oxygen content to 4,000 PPM. Dow will charge approximately \$50 per car for this purging.

All of these cars have been steam cleaned at the repair shop and dried with rags. I would expect that these cars will have a small amount of rust. The rust in these cars will not create any significant problems.

As most tank car repair shops are not equipped for purging, we will continue to handle shopped tank cars in this manner. Dow will perform the purging operation prior to loading.

J S Darden

J. S. Darden

/mw

Monsanto

JA Tiernay
Cars to be split & dated.

M Springfield, Massachusetts

cc: R. L. Bourget
 E. F. Celette - SE
 G. M. Ellsworth
 H. I. Kotowski
 J. A. Mackie
 D. E. Warner

DATE February 28, 1974

SUBJECT Supplemental VCM

REFERENCE

TO Messrs.: → R. W. Bueker
 A. G. Eisold
 J. H. Knapp
 C. F. Smith

The projection of 2-26-74 indicated that immediate steps be taken to supplement our supply from the known BFG inventory that was offered to us.

On 2-27-74 I contacted Jim Wolff and made following arrangements:

1. 5 cars will be diverted and reconsigned to Monsanto Indian Orchard.
2. Monsanto will pay the freight collect and diversion-reconsignment charges.
3. Monsanto will pay \$0.06/pound for the VCM.
4. The tank cars are to be emptied as soon as possible and returned to BFG at Calvert City, Kentucky.
5. We requested Ill. Central - Chicago - Penn Central routing.
6. Car identification, location intransit and routing will be phoned to Springfield Friday 3/1/74.
7. Monsanto will ship 5 cars of VCM from Dow at the rate of one per week starting week of April 21 to BFG Calvert City plant.
8. Monsanto will bill BFG at the \$0.06/pound price.
9. Tank car shipments will be collect to BFG.
10. Monsanto purchase order T-66364 was assigned to the purchase from BFG.
11. The cars we receive are expected to contain about 180M pounds each and may be Dow material from Plaquemine.

This is essentially a pound for pound swap of material. Every effort will be made to balance out.

-cont'd.-

Supplemental VCM

Page 2.
February 28, 1974

Contacts

Marketing - Jim Wolff

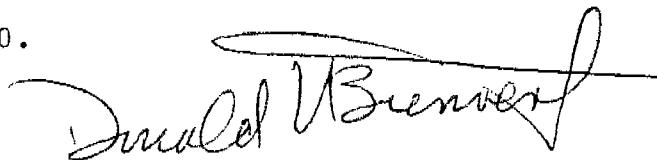
Traffic - Mike Winter

B. F. Goodrich Chemical Co.

6100 Oak Tree Road

Independence, Ohio 44131

Phone 216-524-0200.

A handwritten signature in cursive script, reading "Donald V. Bierwert". The signature is written in dark ink and is positioned above the printed name.

Donald V. Bierwert

DVB/jhb

Monsanto

D-12

F J. J. Uihlein--Springfield

cc: R. L. Bourget

DATE October 2, 1973

~~R. W. Bueker~~

K. W. Howes

SUBJECT Removal of #3, 4 & 5 Tanks
from VCM Service

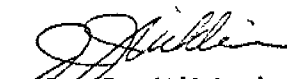
M. A. Kulig

W. A. Sitnik

REFERENCE

TO D. L. Gendron
C. D. Riggs
R. F. Sackett
P. A. Tardif
J. A. Tierney

CED has requested that we remove #3, 4 & 5 tanks from VCM service by the end of October so that they may begin dismantling. Since this requires the cooperation of all of you, I have tried to identify the steps required and assigned target dates in order to meet the October 31st deadline (attached). Item #1 has already been discussed and hopefully activity is scheduled for this week. Since each step requires that the preceding step be completed, it is essential that we all know of any delays. Please review what is required and let me know of any problems.


J. J. Uihlein

/pld

attachment

Objectives

1. By 10/31, remove tanks 3, 4 & 5 from VCM service.
2. Avoid any disruptions to PVC operations due to above.

Action Plan

1. Manifold #2 tank into #1 & #6 tank overflow.

Responsibility: Russ Sackett
Timing: 10/8/73

2. Notify 88 & 84 Building personnel that tanks 3, 4 & 5 are being removed from service. Review new method of operation (per AVL memo of 8/27/73 to DLG) with all concerned.

Responsibility: Cary Riggs/Dave Gendron
Timing: 10/12/73

3. Remove 3, 4 & 5 from service and fill with water.

Responsibility: Joe Tierney
Timing: 10/19/73

4. Isolate tanks 3, 4 & 5 by breaking inlet and outlet piping at tanks and at connections to VCM headers. Blank VCM headers as close as possible to VCM isolation valves.

Responsibility: Paul Tardif
Timing: 10/31/73

J. J. Uihlein
10/2/73

A. V. Laakso

R. L. Bourget

~~J. J. Uihlein~~

August 27, 1973

VCM Storage Tanks

D. L. Gendron

C. D. Riggs

When the L600 project takes over three of the VCM tanks in Tank Farm for AN service, we will be left with tanks 1, 2, and 6 for VCM usage.

The attached schematic shows the proposed usage procedure when the switch is made. On some weekends, both pumps will have to draw from VCM tank No. 1. This should be no problem based on the tests I ran in early August using one tank to feed both pumps.

This practice will represent no change for the 84 Bldg. lead operator. However, it will be something new for the 88 Bldg. CKO. At the time of implementation you should both plan to orient your LO's and CKO's about the change. Gary, you will need to spend more time training your CKO's as required.

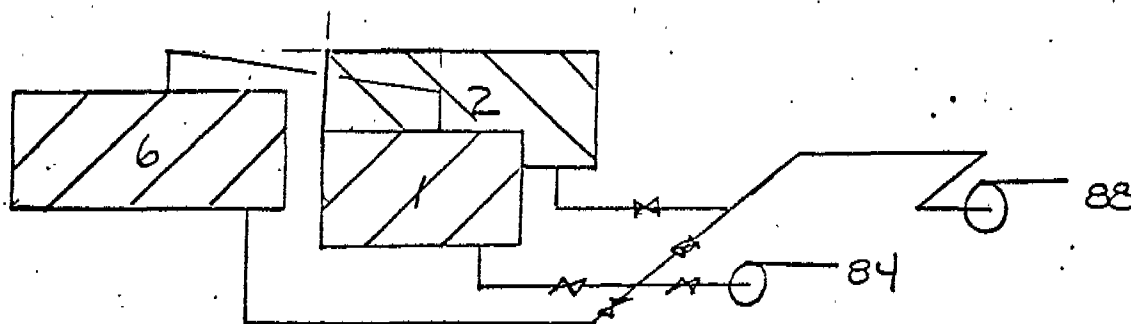
A. V. Laakso

/m

Attachment

VCM Supply

	capacity	eff.
#1	22,000	20,000
#2	34,500	31,000
#6	30,000	27,000



Daily use

88 $10 \times 11,000 \div 7.48 = 14,700$ gal. per day

84 $8 \times 13,500 \div 7.48 = 14,400$ gal. per day

Revisions

- 1) Tie in common over flow between #2 & #1/#6

Operating Practice

During week - 84 draw from #6 & 88 draw from #2. Normally a 48hr. supply.

- Top off both tanks on Fri nite.
- Open valve to #1 (LO or CKO) when your tank goes MT.

Monsanto

F J. J. Uihlein--Springfield cc: R. L. Bourget
R. W. Bueker
DATE November 26, 1973 R. E. Cummings
K. W. Howes
SUBJECT Removal of #3, 4, & 5 Tanks M. A. Kulig
from VCM Service
REFERENCE
TO D. L. Gendron
C. D. Riggs
R. F. Sackett
P. A. Tardif
J. A. Tierney

D-12

The above tanks have been removed from VCM service and #2 tank has been tied into the #1 - #6 tank overflow header. From here on, you will be operating according to the plan outlined by Al Laakso on 8/27.

Many thanks to each of you who helped make this change-over go so smoothly.

J. Uihlein
J. J. Uihlein

/pld

Attachment

A. V. Laakso

R. L. Bourget

— J. J. Uihlein

August 27, 1973

VCM Storage Tanks

D. L. Gendron

C. D. Riggs

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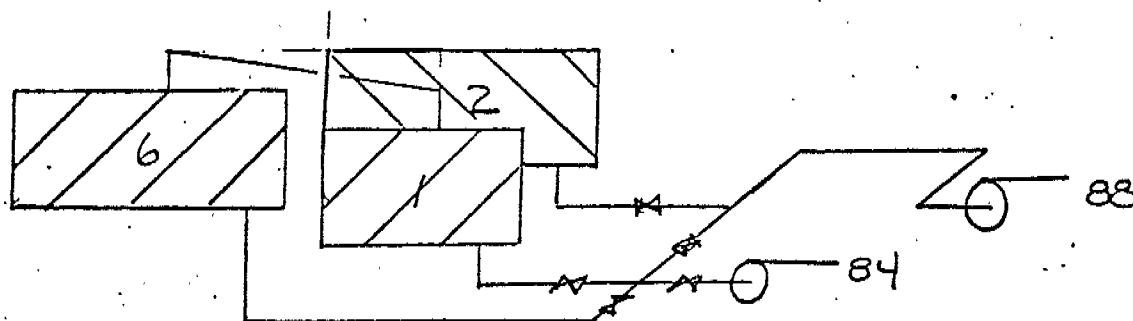
A. V. Laakso

/m

Attachment

VLM Supply

	capacity	eff.
#1	22,000	20,000
#2	34,500	31,000
#6	30,000	27,000



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- Top off both tanks on Fri nite.
- Open valve to #1 (Lo or CKO) when your tank goes MT.



DOW CHEMICAL U.S.A.

1330 BOYLSTON STREET
CHESTNUT HILL, MASSACHUSETTS 02167
617-734-7820

October 3, 1973

Monsanto Company
Springfield Plant
Mr. Charles F. Smith
730 Worcester Road
Indian Orchard, Mass. 01051

Dick Bucher
F W I W !
Chad

Dear Charlie:

We have heard from the loading supervisor at our Oyster Creek division concerning the two leaking VCM tank cars, MCPX-33018 and MCPX-33010.

Neither car appeared to be leaking when they left the plant and presumably it started during the trip due to content pressure.

On future Monsanto shipments, our loading crews will leak test all fittings and check liquid level gauges before releasing the tank cars.

We sincerely are sorry for the inconvenience we have caused and will do all we can in the future to prevent a recurrence.

Sincerely,

Bob Gorski

Robert C. Gorski
District Sales Manager
Inorganic Chemicals Department
Boston Sales Office

bc

① JH
② JH
③ JH
D-12

Monsanto

CC: D. V. Bierwert
→ R. W. Bueker
P. V. Kokoszyna

MONSANTO POLYMERS & PETROCHEMICALS CO.
730 Worcester Street
Indian Orchard, Massachusetts 01051
Phone: (413) 788-6911

September 21, 1973

Mr. William Auvenshine
Dow Chemical Company
Oyster Creek Division
P. O. Box BB
Freeport, Texas 77541

Reference: VCM Tank Car Shipments

Dear Mr. Auvenshine:

Monsanto tank car MCPX 33018 was shipped from Dow Chemical Company, Freeport, Texas August 17, 1973 loaded with VCM. This car was consigned to Monsanto Company, Indian Orchard, Massachusetts.

On August 24th the car arrived at the Penn Central Railroad Yard in West Springfield, Mass. and VCM was found to be leaking from the dome cover by railroad personnel.

Monsanto was contacted by the railroad and personnel from the plant broke the dome cover seal to determine the cause of the leak. A 1/4 inch test valve pipe was found to be cracked. This pipe was then broken off at the crack and a wooden peg was inserted into the remaining section of the 1/4 inch pipe to prevent further leakage. The car was then switched to the plant for emergency unloading.

It was estimated that approximately 400 gallons of VCM had been spilled while car was in transit.

It appears that the crack in the 1/4 inch valve pipe occurred during the loading operation at Dow Freeport, Texas.

This car has been shopped for the necessary repairs.

The purpose of this letter is to once again stress the importance of careful inspection of each empty VCM car prior to loading with product.

Corrective action must be taken to prevent reoccurrence of incidents similar to this one.

As we all know, shipments and handling of hazardous commodities are under close scrutiny these days by the regulatory agencies involved and any negligence or carelessness by parties involved

-cont'd.-

a unit of Monsanto Company

RSV0024457

Mr. William Auvenshine
Dow Chemical Company

Page 2.
September 21, 1973

can result in penalties and adverse publicity.

Your efforts to tighten up on VCM car inspection procedures
will be appreciated.

Very truly yours,



J. H. Knapp
Traffic Manager

JHK/jhb

ASSOCIATION OF

AMERICAN RAILROADS

OPERATIONS AND MAINTENANCE DEPARTMENT • BUREAU OF EXPLOSIVES
AMERICAN RAILROADS BUILDING • WASHINGTON, D.C. 20036 • 202/293-4048

R. R. MANION
Vice-President

R. M. GRAZIANO
Director and Chief Inspector

T. J. Bauer, Inspector
29 Golfview Dr. Apt. A-3
Newark, Delaware 19711
302/731-9613

D-12

Mr. J. H. Knapp, Traffic Manager
Monsanto Company
Indian Orchard, Massachusetts

025-T-1- PC

September 7, 1973

Dear Mr. Knapp:

This refers to MCPX 33018 tank car loaded with vinyl chloride observed leaking while being held in Penn Central yard, W. Springfield, Mass. August 24, 1973.

It is my understanding a representative from your plant answered the call for assistance, and it was reported "sampling valve broken off at base and unable to replace".

At your convenience, will you kindly advise whether valve was broken off in an attempt to make repairs at the scene by your representative or was it found in that condition upon his inspection? A detail description of conditions found would be appreciated.

Very truly yours

T. J. Bauer

Inspector

ans Reg
9/12/73

cc:

C.A. Garland, Jr., Ass't. Director-Field Operations-B.E.

File.

Houston Train Derailment and the Subsequent Hearing

TERRY C. HAYES
NFPA Fire Service Specialist

Mr. Hayes's article consists of a report of a derailment and fire and summary of the testimony at the hearing. The January 1972 issue of Fire Command! contains a similar report of the accident and, in addition, a detailed discussion of its lessons for fire departments.

ON October 19, 1971, officers and men of the Houston, Texas, Fire Department were stunned and injured by a violent blast from a fire-involved railroad car containing vinyl chloride. The fire companies had responded to a train wreck and were attempting to direct cooling streams on the critical part of the fire. When the explosion occurred four chief officers in command at the scene and 21 company officers and fire fighters were knocked out of action. One training officer was killed, 14 fire fighters and five news men were injured, and a Fire Department pumper was destroyed.

Like previous fire tragedies, this incident brought a number of lessons to the fire service, the most important of which is this: *When hazardous chemicals are involved or exposed to fire, treat them with maximum respect!* In this incident many other persons might have died except for miraculous quirks of good fortune.

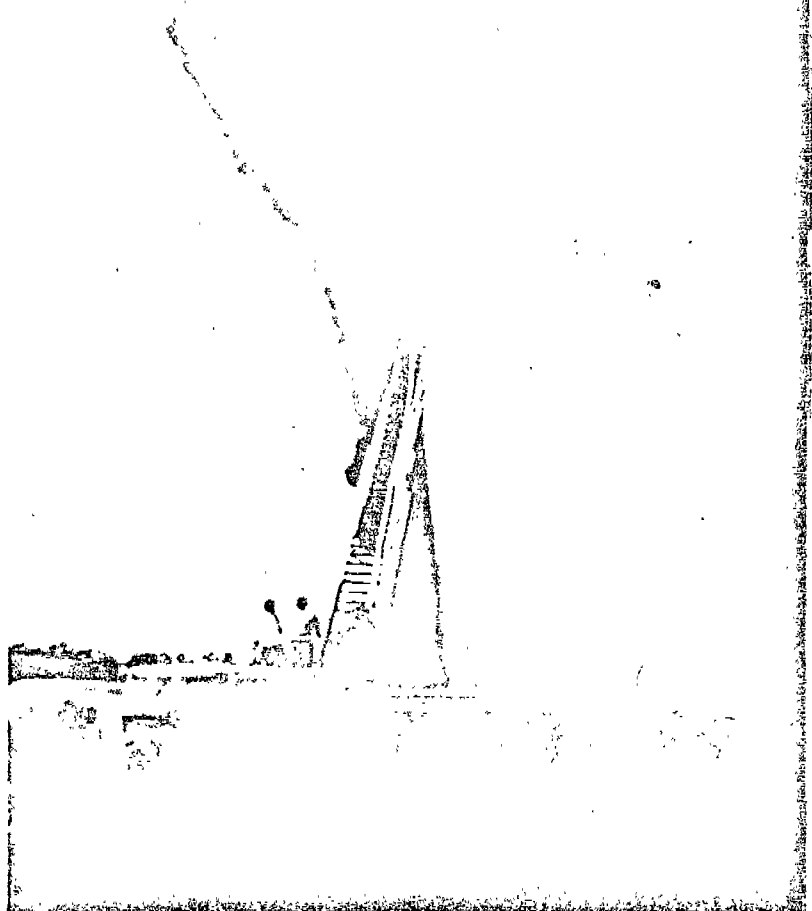
At approximately 1:40 pm Missouri Pacific Freight Train 94 entered the city limits of Houston, Texas, moving 82 cars of freight from the coastal region, the heart of the area's petrochemical complex.

At 1:46 pm the Houston Fire Department alarm office was flooded with telephone calls reporting a fire and explosion in the vicinity of Almeda Genoa Road and Mykawa Road at the railroad tracks.

At 1:47 pm the first Fire Department units dispatched acknowledged that they were responding. They arrived at the scene and at 1:51 pm reported a train derailment and several railroad cars on fire. The first-arriving chief officer asked for two additional pump companies.

Fire fighters prepared to direct hose streams on the exposed tank cars to keep them cool and, it was hoped,

All the photos in this article are used by courtesy of the Houston Fire Department.

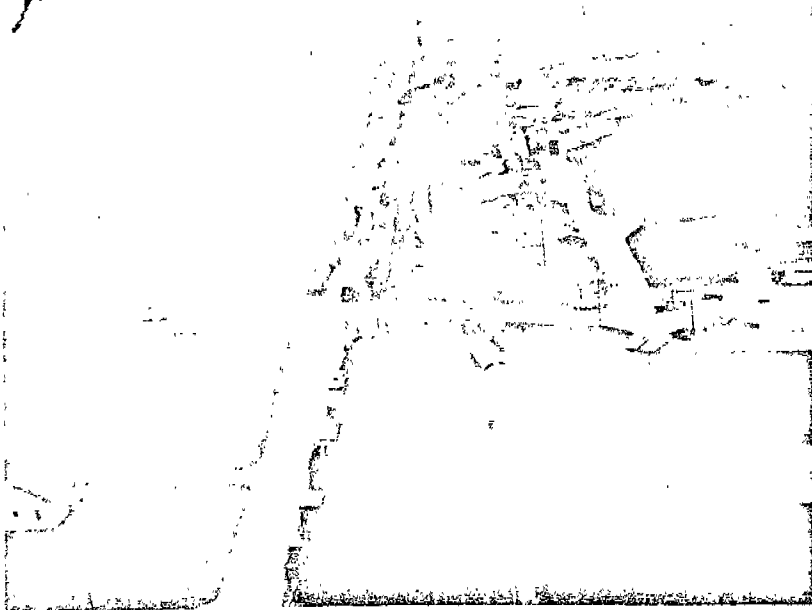


Operations just before violent rupture of vinyl chloride tank. The resulting fireball caused burns and other injuries to approximately 8 fire fighters and newsmen. One fire fighter suffered fatal injuries.

prevent further pressure buildup and fire involvement. Getting water on the tanks was not easy; the nearest fire hydrant was over six-tenths of a mile away. To complete the relay the district chief called for a second-alarm response.

The area was sparsely settled, with about 13 inhabited dwellings and small businesses located over half a square mile. Those persons were evacuated by police, but the black smoke that could be seen for miles brought spectators flocking to the scene, adding to the problems of the emergency forces.

An aerial ladder was raised and a ladder pipe, which was fed by two 2½-inch hose lines, was placed in service to cool the exposed tanks. The pipe was set up to be operated manually or remotely from the aerial. Meanwhile, an attempt was being made to bring water in from the next hydrant, over a mile away.

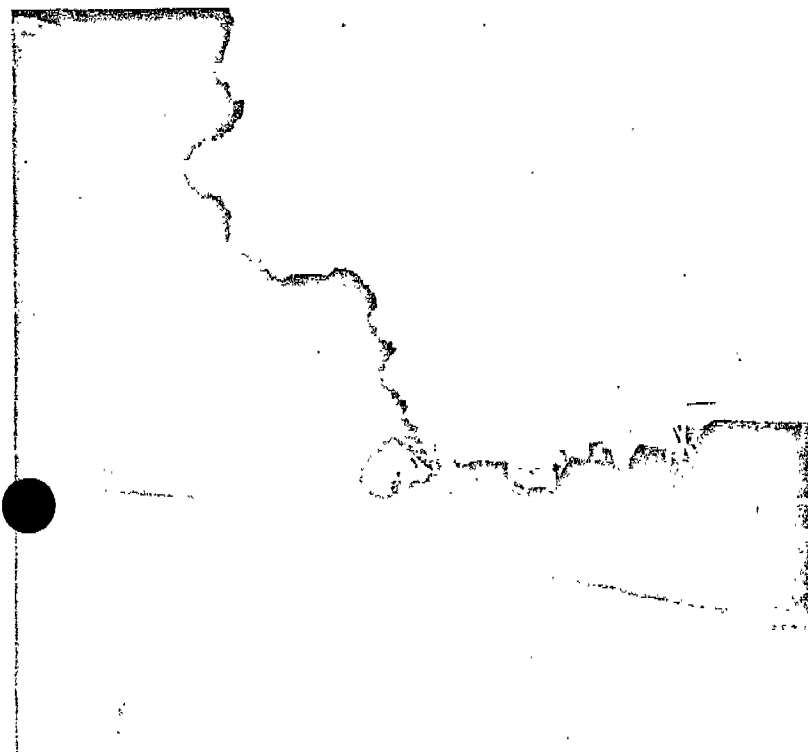


Junction of Mykawa Road (parallel to tracks) and Alameda Genoa Road. Although this was a sparsely populated area, the dense smoke attracted spectators from miles away.

At 2:08 pm the chief officer at the scene requested three additional pumpers, and at 2:20 an additional pumper was dispatched, making a total of 15 pumpers and men, plus support units to combat the fire, which was becoming more intense by the minute.

At 2:28 (approximately one minute before the explosion) Fire Chief C. W. Cook, en route to the scene, radioed the officer in charge and asked if he knew the contents of the involved tank cars. The response was:

View of Mykawa Road before blast. The white tank near speed limit sign received a massive puncture during the derailment and lost most of its contents of 48,000 gallons of vinyl chloride. This tank was moved 200 feet end over end when another vinyl chloride tank car ruptured violently, 43 minutes after the Fire Department received its alarm. The latter tank is obscured by smoke.



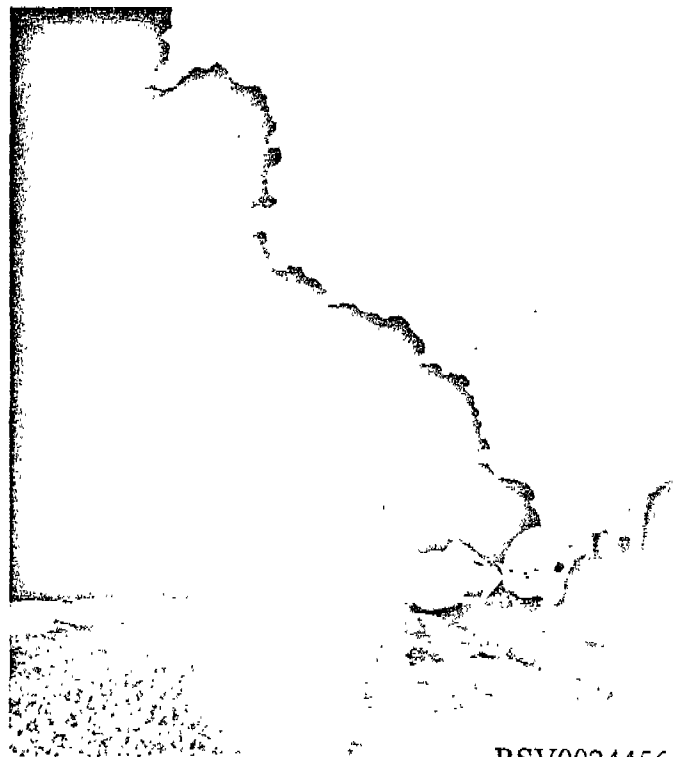
"We've had two reports, one of ethyl chloride, the other methyl chloride. We do not know for sure. There is also caustic soda involved."

At 2:29 pm, 43 minutes after the first report to the alarm headquarters and 38 minutes after the arrival of the first-in fire companies, one of the tank cars — later identified as a 48,000-gallon tank car of vinyl chloride — ruptured violently, creating a huge fireball. The surrounding area was showered with parts of tank cars, rocks, crossties, and flying debris caught up with the massive release of energy.

Accelerated fire buildup seconds before the rupture gave most of the fire fighters just enough time to turn and run. As a result, most of their burns were received on backsides and hands. However, Andy Nelson, who had helped set up the ladder pipe, had climbed back to the nozzle before the rupture and was caught on top of the ladder to suffer the full force of the fireball and blast. Half on his own power and half falling, he made it down the ladder and was helped to an ambulance by fellow fire fighters. His bunker coat was in shreds, his hip boots showed signs of melted rubber, his helmet was badly charred, and he was in critical condition; but he was alive. T. J. Hathaway, recently assigned to the Fire Department Training Division, was killed.

All available ambulances were rushed to the scene. The fire chief arrived to find his assistant, a deputy and two district chiefs, three captains, four chauffeurs, ten pipe-and-ladder men, the chief mechanic, the chief of special services, one investigator, and one fire inspector.

View of Mykawa Road before blast. The crew at left has monitor nozzle in position and is waiting for water. The low frost line faintly visible on the tank indicates that the tank had lost most of its contents in the derailment.





The tank car that ruptured violently came to rest approximately 400 feet away.



The tank shown in the two photos at the bottom of the opposite page after it had been moved 200 feet.

out of action and on their way to the hospital.

There was still a major fire to be fought, and Chief Cook regrouped his men and sent for additional help and equipment. At 6:57 pm the fire was out.

A survey of the scene revealed one fire fighter dead, another taken to hospitals, along with five injured newsmen, 14 injured but remaining at the scene; one Fire Department pumper, a two-ton truck, and a station wagon destroyed; 16 rail cars either destroyed or heavily damaged, with their cargoes of butadiene, vinyl chloride, acetone, fuel oil, styrene, and caustic soda. The property damage has been estimated at more than \$375,000, excluding the damage to the track and road bed.

THE NATIONAL TRANSPORTATION SAFETY BOARD CONDUCTED AN INVESTIGATION AND HEARING to try to determine the cause of the derailment and the reason for the loss of life and injuries. The hearing lasted four days, with 25 witnesses called before the Board of Inquiry. Seven of the witnesses were employees of the Santa Fe Railroad, eight were from the Missouri Pacific, four were from the Houston Fire Department, three were eyewitnesses, one was from the Railway Products Institute of the Association of American Railroads, one was from Union Carbide Corporation, and one was from the NFPA.

There were eight parties to the hearing, so designated by the NTSB as persons, agencies, companies, and associations deemed necessary in the public interest whose special knowledge or participation in the investigation would contribute to the emergence of pertinent evidence in the case. The parties were: the Mis-

souri Pacific Railroad Company, the Atchison Topeka and Santa Fe Railway Company, the City of Houston, the Congress of Railway Unions, the Brotherhood of Locomotive Engineers, the International Association of Fire Fighters, the Federal Railroad Administration, and the Dow Chemical Company.

The Chairman of the Board of Inquiry was the Honorable Isabel A. Burgess.

After being placed under oath, each witness was questioned by a member of the Technical Panel of the NTSB, then by a member of the Railroad Commission of Texas. Then representatives of the eight parties to the hearing were permitted to question the witness.

There were two theories advanced by witnesses as to the cause of the derailment — either track failure or impact action of the train creating heavy pushing forces that resulted in derailment. At the time of this writing the NTSB, which has the task of determining the cause of the derailment, had not made public its report.

Since space will not permit a detailed account of the testimony given during the four days, the following is an attempt to condense the more pertinent facts into a meaningful account of the proceedings.

THERE WERE 16 railroad cars in the main derailment area, among them six tank cars of vinyl chloride, three of fuel oil, and one each of acetone, butadiene, and formaldehyde. One tank car containing 48,000 gallons of vinyl chloride received a massive puncture during the derailment, causing it to lose most of its contents. The spilled vinyl chloride caught fire immediately. Another car containing vinyl chloride received

(Continued on page 17)

D. L. Gendron

A. V. Laakso

R. W. Bueker

April 16, 1973

Pumping VCM into #1 and #6 Tanks

D-12

J. A. Tierney

As a result of a recommendation made during the investigation of Near-Miss #13-71, (liquid VCM in the burning stack), an overflow line was installed connecting #1 and #6 VCM tanks. Since that time, whenever VCM vapors from either of these tanks are used in pumping out a VCM car, the pressure is lowered in both tanks simultaneously. This lower pressure often causes the 84 Bldg. VCM charge pump to cavitate, and our ability to charge VCM is lost, with potentially serious quality and safety consequences. Lowering pressure in the other four tanks supplying 88 and 92 Bldgs. does not have this critical feature, since the kettles are not charged directly from the tank farm pump as is the case in 84 Bldg. Consequently, it seems that this situation can be resolved simply by not using #1 or #6 tanks as sources of VCM vapor. Please take the necessary steps to insure that this is accomplished. Thank you.

D. L. Gendron

/m

Monsanto

D-12

F. Springfield, Massachusetts

cc. G.W. Fletcher
D.H. Howe

DATE July 29, 1974

SUBJECT

REFERENCE

TO J.A. Tierney

Recent tests of VCM concentration levels taken at the VCM pump house, building 82, indicate that concentrations of VCM are below 50PPM which the exhaust fans are running and the floor exhaust is operating.

Therefore, it will not be necessary to wear the Scott Air Pac in the pump house while the above conditions exist.

R.W. Bueker