

<u>Item</u>	<u>Type</u>	<u>Frequency</u>	<u>Number</u>
1	8-hr TWA operator position	Weekly	20
2	8-hr TWA assigned maintenance	Weekly	5
3	15-minute avg. specific tasks	Weekly	9
4	8-hr TWA perimeter (fence line)	Monthly	6
5	8-hr TWA perimeter (outside reg. area)	Monthly	12
6	8-hr TWA distribution opr.	Quarterly	3
7	8-hr TWA Bldg. 133 lab analysts	Quarterly	1

The 8-hour TWA results on personnel are communicated in writing to the individual within ten days of the test.

1.3 Specific Points

1.3.1 Area monitoring - The VFA sample points are located at spots in the regulated area where personnel are likely to be working. They are positioned at approximately head-high levels. The monitor scans the area every 40 minutes - 2 minute per point. The microcomputer can average the data in a number of ways including a simulation of 8-hr TWA's. A listing of the type of data the computer print-out will show is attached (Attachment B) with a copy of the "Data Presentation" (Attachment C). The VFA can be set to alarm at any fraction of full scale. It is currently set at 90% of 25 ppm = 22.5 ppm. The alarm is a buzzer-type and must be manually switched off in the control room.

1.3.2 Personal monitoring accuracy - The carbon tube method has recently been evaluated and found to be well within the limits required by the permanent standard:

UCC 091385

<u>OSHA Regulation</u>		<u>UCC Evaluation</u>		
<u>Range (ppm)</u>	<u>Accuracy</u>	<u>Level (ppm)</u>	<u>Accuracy</u>	<u>Precision</u>
0.25 to 0.5	+ 50%	0.5	6.7%	9.6%
over 0.5 to 1.0	+ 30%	1.0	7.1%	5.5%
over 1.0	+ 25%	5.0	1.5%	4.6%

1.3.3 Areas Not Scanned by VFA - Discuss

II. MONITORING RESULTS

2.1 VFA Area monitoring

Attached Table I shows the average number of points per day exceeding certain levels for the period since the VFA was installed in June 1974 through March 1975. Installation of the computer will allow much more extensive data averages to be obtained.

2.2 Personal

Personal monitoring results are shown in attached Table II for the period from January 3 to April 30, 1975 when the major part of the 8-hr TWA data was taken.

A calculation of 8-hr TWA exposure from VFA data was made in January for each operating position - Table III attached. The values varied from 2-6 ppm - average of 2.9 for all operators which compares with the 1.89 ppm determined for the operators by carbon tube in February-March period Table II.

III. INTERPRETATION OF RESULTS

No write-up - Discussion

UCC 091386

IV. WORK PRACTICES TO REDUCE VCM RELEASE TO ATMOSPHERE

Changes to equipment

Suspension high pressure vent	Sent to No. 1 Powerhouse
Off-gas high pressure vent	for incineration. Will be
	sent to MEK recovery system
	at future date.
Non-solvent high press. vent	Sent to Solvent Vinyls strip-
	ping system
Decanting 07,08,11 & 12 tanks	Decant to No. 3 stripping tank
	to eliminate atmospheric losses
Decant tanks C-10 & C-11	Suspension feed tank decanted
	to closed vessel to eliminate
	atmospheric losses
Boil-off sampling	Use lab resin analysis as a
	guide and eliminated need for
	operators to boil off VCl in
	feed samples
Autoclave resin sampling	Autoclave resin sampler was
	installed to minimize operator
	exposure when checking autoc.
Suspension surge tanks ⁺ dryer	No. 5 BDT has been revised
exhausts	to batch strip w/steam in-
	jection. Revisions to No. 1
	BDT in progress, to be com-
	pleted May 20. Remaining
	BDT's have been inspected and
	will be done as time allows.
	Residual monomer & VCM in
	dryer and surge tank exhausts
	have been reduced significantly
Non-Solvent surge tank and	Continuous stripping of the
dryer exhausts	non-solvent resin has reduced
	residual monomer, dryer ex-
	hausts and surge tank losses.

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Vinyl chloride filters

Piping installed to vent filters to No.3 stripping tank before opening.

Priming VCl pumps

Piping installed to allow venting of pumps to No. 3 stripping tank instead of to atmosphere.

Vinyl chloride pumps

Double mechanical seals are to be installed on all VCl pumps.

Nash Compressor

VCl packing leaks were eliminated by installing double mechanical seal on Nash compressor.

Nash Hytor seal water

Seal water sent to No. 3 stripping tank to recover VCl and vinyl acetate.

C-autoclave agitator
packing failures

Corrected quality control problem w/vendor. Also new seal arrangement designed and installed for trial run.

MEK recovery system

An MEK scrubber is to be in operation by Dec. 1975 to recover the high pressure vent streams from the area.

Reactor purge, opening, cleaning, ventilation and VCM unloading procedures to be discussed by Mr. Peterson.

UCC 091388

IV.A TRAINING

This item not on agenda but slide-tape presentation being given to personnel as training program relating to OSHA regulation may be of interest at this point since it pertains to personnel protection.

V. OPERATOR PROTECTION

Respiratory Equipment

Three types of equipment are available:

1. MSA full face canister mask - type VCM-SS for use below 25 ppm.
2. MSA full face mask plus regulator for hookup to fresh air supply (bottle) - mask No. 4522, regulator No. BM.19B-42 for use in 0-100 ppm range.
3. Fresh air pack, self contained full face mask with regulator MSA Model 401 - for use in 0-100 ppm range.

Equipment to modify (2) and (3) to pressure demand type are on order to upgrade these to the required 3600 ppm or above.

Protective Clothing

Cotton "coveralls", gloves, and face shield are required for entry into vessels containing residual PVC.

Showering, Eating Facilities, etc.

There are no requirements for showering although shower facilities are available in the plant for personnel wishing to use them. The eating facilities for the maintenance group has been moved to a location outside the regulated area. Operating personnel are allowed to eat in facilities in the control rooms. These rooms are air conditioned and pressurized to give a positive displacement of air.

UCC 091389

VI. ENVIRONMENTAL

Mr. Eisenhower will discuss.

VII. VCM IN FINISHED PRODUCT

Removal of VCM has been most effectively accomplished by batch stripping at elevated temperatures under vacuum. This technique was begun in March and only two products have been done to date:

<u>Product type</u>	<u>Continuous</u>	<u>Batch 90°C. 30 minutes</u>
QSAP	100	-
QSAN	100	-
QSAL	175	-
QSAH	800	-
QSQH	1200	120
QSQF	1200	200
VSJE	165	-
VSKK	600	-

All of the above represent levels from the dryer. All decrease as the products are transferred to storage bins and shipping containers to customers. Recent work has shown appreciable decrease with storage, particularly in paper bags. Copy available.

UCC 091390

TABLE I
VFA ANALYSIS FOR VCI
AVERAGE/DAY⁽¹⁾

	<u>Number of Points</u>		
	<u>Exceeding 50</u>	<u>Exceeding 25</u>	<u>Exceeding 10</u>
June 22 - July 21	19		
August 19 - September 5	11		
September	8		
October	5	12	
November ⁽²⁾		18	74
December		18	64
January		16	
February		12	
March		6 ⁽³⁾	

(1) Out of 720/day, until Oct. 5 when it changed to 684/day.

(2) Changed sensitivity of VFA on Nov. 4 from 100 to 25 ppm, full scale.

(3) For the period March 1 - March 23 when the unit was operating.

UCC 091391

TABLE II
PERSONAL MONITORING RESULTS
(8-HOUR TWA - PPM)

<u>Period</u>	<u>Operators</u>				<u>Maintenance</u>				<u>Combined</u>			
	<u>No.</u>	<u>High</u>	<u>Low</u>	<u>Avg.</u>	<u>No.</u>	<u>High</u>	<u>Low</u>	<u>Avg.</u>	<u>No.</u>	<u>High</u>	<u>Low</u>	<u>Avg.</u>
Jan. 3 to Feb. 19	11	8.81	0.03	0.92	0				11	8.81	0.03	0.92
Feb. 24 to Mar. 22	21	10.06	0.06	1.89	17	15.04	0.06	3.65	38	10.06	0.06	2.68
Mar. 23 to April 30*	8	0.34	0.02	0.11	28	5.31	0.01	0.49	36	5.31	0.01	0.41

* Unit was down during this period.

UCC 091392

ATTACHMENT B

COMPUTER PRINT-OUT

By Shift (8 hours)

1. Reading of each point (20) every 40 minutes.
2. 8-hour averages of each point.
3. Number of times exceeding 5 ppm (total shift).

By Day (24 hours)

1. Average of each point for day.
2. Number of times exceeding 5 ppm (each point).

By Month

1. Average of each point for month.
2. Standard deviation of average.
3. Number of times exceeding 5 ppm (each point).
4. Average number of times/day exceeding 5 ppm (each point).

REACTOR PURGE, OPENING, CLEANING, VENTILATION, AND VCM UNLOADING PROCEDURES

Vessels are opened for inspection, cleaning and maintenance work. Those vessels which have contained VCl or are suspected to have contained VCl require the following procedures:

- 1) The vessel is water washed to another vessel which will not be entered (such as washing an autoclave to a blowdown tank).
- 2) A vacuum is pulled on the vessel using a Nash Hytor vacuum pump, which discharges to the VCM recovery system.
- 3) If the vessel to be opened contains resin or chunks of resin, it is steamed for several hours to the atmosphere.
- 4) The vessel is then either completely disconnected or slipblinded and all agitators are locked out.
- 5) The vessel is then tested with our Vapor Fraction Analyzer (VFA) for the presence of VCM. If the test indicates that the level is below the TLV, further steaming and evacuation is not required. During autoclave manual cleaning, the VFA continues to monitor the vessel atmosphere.

AC is cooled & ventilated

Currently, VCM unloading is performed in the following manner:

- 1) The tank car hose and piping are stripped down to a pressure of 5 psig using the unloading compressor.
- 2) The hoses are then vented to the atmosphere and purged with nitrogen.

Hose Connecting:

- 1) All hoses and piping are purged with nitrogen to eliminate oxygen.

In both the connecting and disconnecting procedures, the operator is required to wear fresh air equipment.

Proposed unloading facilities will have a purge system will vent to the production monomer recovery system. Hopefully, this will eliminate the use of fresh air equipment.

Currently, UCC uses a solvent washing system for the autoclaves and manual cleaning of the autoclaves is not required unless an agglomerated batch or severe plugging of the autoclave dump valve occurs. Our current rate of manual cleaning is now about once every other month or six autoclaves per year. Most problems occur during the reaction of VAC copolymer resins.

TABLE III

TEXAS CITY SUSPENSION/NON-SOLVENT UNIT

CALCULATION OF 8-HR TWA VINYL CHLORIDE EXPOSURE FROM VFA DATA

<u>Operating Position</u>	<u>Area (ppm)</u>	<u>8-Hour TWA (ppm)</u>
1. Non-Solvent autoclaves		2
Bldg. 174 control room (6 hrs.)	1	
Outside (2 hrs.)	5	
2. Off-Gas Recovery		3
Bldg. 174 Control Room (6 hrs.)	1	
Outside (2 hrs.)	10	
3. Suspension Utility		6
Bldg. 174 Control Room (2 hrs.)	1	
Outside (6 hrs.)	8	
4. Suspension, North line autoclaves		2
Bldg. 174 Control Room (6 hrs.)	1	
Outside (2 hrs.)	6	
5. Suspension, South line Autoclaves		2
Bldg. 174 Control Room (6 hrs.)	1	
Outside (2 hrs.)	6	
6. Suspension, East line Autoclaves		3
Bldg. 174, Control Room (5.6 hrs.)	1	
Outside (2.4 hrs.)	7	
7. Dryer, Inside		2
Bldg. 120, Control Room (6.4 hrs.)	0.5	
Outside (1.6 hrs.)	6	
8. Dryer, Outside		4
Bldg. 120, Control Room (2.4 hrs.)	0.5	
Outside (5.6 hrs.)	6	
9. Refrigeration & VCl Unloading		2
Bldg. 113 Control Room (6.5 hrs.)	0.5	
Outside (1.5 hrs.)	7	
10. Chief Operator		3
Control Room - 174 & 120 (4.8 hrs.)	1	
Outside (3.2 hrs.)	5	

To prevent operator exposure to over 50 ppm VCM currently requires two operators to wear respiratory equipment 5% of the time. This is equivalent to one percent of the total operator time.

UCC 091395

January 10, 1975

England
London

Visit to
John W. Mays

Regulated area except control room
Storage area up to
1" in by 4" in
Scan 25000

Antenna personnel list
John W. Mays
John W. Mays - John W. Mays
John W. Mays - John W. Mays

John W. Mays - 12 at
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UNION
CARBIDE

INTERNAL CORRESPONDENCE

CHEMICALS AND PLASTICS

TO (NAME) ^② Mr. K. E. Ross ✓
COMPANY Mr. R. L. Frantz
LOCATION TEXAS CITY PLANT

DATE May 27, 1975

COPY TO Mr. R. W. Sesler, 515
Mr. J. B. Leverton, 515
Mr. G. F. Tacquard, 515
Mr. J. L. Hockersmith, 515
Mr. R. N. Wheeler, 514

SUBJECT OSHA

Nick Wheeler called to pass on that in his conversations with OSHA, it became apparent that their compliance officers will check to see that there is a respirator available for each employee in a regulated area. Their thinking is that an employee may change his mind at any time and request a respirator so it must be available to him. The respirators should be located so that they are readily accessible, and the employees should know of their whereabouts and availability.

Apparently a proposed standard for MEK and MIBK has recently published in the Federal Register. The National Cancer Institute has published an early warning (before all data is in) on trichloroethylene. John Leverton, could you please have someone check the Federal Register for the MEK and MIBK standards?



M. E. Eisenhour

MEE/ebm

For Operations - we need about 45 more than we now have. A good place to store them is hard to find, but probably 25 in 121, second floor (existing); and 35 in 115 control room or upstairs at 117. We would probably need cabinets with locks & keys to prevent pilferage. And 40 more at 157 for Maintenance.

UCC 091397

DLGK - We don't comply.

How many masks do we need, and where should they be stored?

UC 149-2

P. O. BOX 471, TEXAS CITY, TEXAS 77590



RECD. JUN 11 1975

INTERNAL CORRESPONDENCE

*Maint. Department
Log - C -*

PLANT & GRS. FILES

CHEMICALS AND PLASTICS

P. O. BOX 371, TEXAS CITY, TEXAS

NAME: Mr. E. Bell - B.B.
COMPANY: Mr. R. N. Wheeler - 514
LOCATION:

DATE: May 30, 1975

TO: Mr. A. E. Donaldson - B.B.
Mr. R. L. Frantz - 515
Dr. W. R. Manning - 511
Mr. R. W. Martin - 511
Mr. R. W. Sesler - 515
Dr. A. B. Steele - NYO, 28th Floor
Mr. K. L. Topham - 515

SUBJECT: VCM Tank Car Unloading

The attached from Keith Topham outlines a scheme that should permit the unloading and removal of VCM tank cars for maintenance without planned loss of VCM to the atmosphere. With Drs. Manning and Steele's permission we will proceed with the preparation of a work order request.

Our thanks to Keith for evolving a scheme for solving a rather difficult knotty problem.

Sincerely,

M. E. Eisenhower
M. E. Eisenhower

MEE:lw

Attachment

UCC 091398

REC'D.

W. A. H. S.

*Held for Bill Harty until
medical record sent*

VINYL CHLORIDE TANK CAR RACK

PLANT MGRS. FILES

DESIGN CHANGES TO MEET O.S.H.A. STANDARDS

EQUIPMENT AND PIPING MATERIAL LIST

Vinyl Chloride Vaporizer Installation

Vaporizer - Design pressure tube side

75 psig - steam, 608 pc, 96" long tubes

3/4" O.D. 16 BWG - 330 sq. ft.

Design pressure tube side - 100 psig

Vinyl chloride liquid and vapor

27" O.D. x 15'10" long. Overall length including steam jacket 18'

Insulated for 70 psig steam, steel shell and tubes

Piping

300' - 3" 1-B-2- design pressure 150 psig

from vaporizer to Bldg. 120

Operating pressure 70 psig - steam - insulated

5 pc. 3" 150 psig steam valves GA-5

20' 4" 1-C-1 design pressure 150 psig

from vaporizer to VCl compressors discharge

Operating pressure 70 psig VCl vapors

7 pc. 4" 150 psig VCl vapor valves GA-59

Operating pressure to 70 psig

35' 1 1/2" 1-C-1 design pressure 150 psig

Operating pressure to 150 psig VCl liquid feed piping

5 pc. 1 1/2" 150 psig VCl liquid valves

GA-1148 operating pressure to 150 psig

60' 3" VCl vapor safety valve piping

1-C-1 discharge to VCl vent and to air

2 pc. 3" 150 psig VCl vapor valves under safety valves GA-1148

4 pc. 1/2" 150 psig steam and VCl press. gauge and vent valves -
1-B-2 and 1-C-1

300 1" 1-B-2 design press. 150 psig steam condensate return

1 pc 3/4" 1-B-2 steam condensate trap with valves

Instrumentation

1 pc 3" steam motor valve with press. controller -

operating press. 0-70 psig - normal press. 40 psig 1-B-2

1 pc 0-100 psig press. gauge for steam service tube side

1 pc 1 1/2" vinyl chloride liquid feed motor valve with liquid level controller 1-C-1

UCC 091399

Instrumentation (continued)

- 1 pc 4" VC1 vapor feed motor valve with two-way cross-over to existing suspension and solvent accumulator liquid level controller
- 1 pc 0-100 psig press. gauge for VC1 shell service
- 2 pc 3" safety valves 1-C-1 VC1 vapors oper. press. 75 psig & 85 psig
- 1 pc 3" safety valves 1-B-2 steam service oper. press. 85 psig

VC1 Brine Cooler Inert Gas Vent

- 720' 1½" 1-C-1A design press. 150 psig VC1-N₂ vent from condenser shell to Bldg. 119 - oper. press. 7 psia to 70 psig
- 4 pc 1½" 150 psig VC1 and N₂ vapor vent valves GA-1148, oper. pressure 7 psia to 70 psig
- 1 pc ½" vacuum to 100 psig press. gauge

VC1 Tank Car Hose Purge Connections and Piping

- 110' 1" 1-C-1-A design 150 psig VC1 & N₂ vent piping to 1½" brine condenser vent header - oper. press. 7 psia to 90 psia
- 18 pc ½" N₂ purge valves G-1191 (ball valves)
- 12 pc ½" VC1 & N₂ vent valves G-1191 (ball valves)
- 2 pc 1" 150 psig VC1 & N₂ vent valves to 1½" VC1 & N₂ vent header Oper. press. 7 psia to 90 psig GA-1148
- 2 pc ½" vacuum to 100 psig press. gauge VC1 & N₂ service

VC1 Tank Car Maintenance Preparation

Location from old VC1 & acid tank car racks to Bldg. 119

- 900' 1½" 1-C-1-A design pressure 150 psig VC1-N₂ vent line from tank cars to Bldg. 119
- 5 pc 1½" 150 psig VC1 & N₂ vent valves oper. press 7 psia to 100 psia GA-1148
- 1 pc 12" Dia. x 4' long liquid separator pot 1-C-1-A
- 2 pc 1" 150 psig VC1 & N₂ safety valve shutoff and drain valves GA-1148
- 1 pc 1" safety valve for pot oper. press 100 psig

K. L. Topham
May 12, 1975

UCC 091400