

Subject: VCM OSHA Compliance
Texas City Status Report for 1/14/75 VCM Steering
Committee Meeting

From: Texas City VCM Ad Hoc Committee, R. W. Sesler, Chairman

I. Work Place Concentrations 1/75

A. Solvent Resin Department

1. Area ranges - 0 - 5.8 ppm
2. Employee exposure ranges - 0.5 - 2.5 ppm
3. Mask time - 2 hrs./shift - 1 operating position

See Attachment I for area range and employee exposure details

4. VCM area levels and employee exposure have been reduced during 1974 as a result of completing the projects listed on Attachment II. Carbon tube 8 hr. TWA data indicates a downward trend for most areas.

B. Suspension/Non-Solvent Resin Department

1. Area ranges - 0.5 - 10.0 ppm
2. Employee exposure ranges 2.0 - 6.0 ppm
3. Mask time - 0.8 hours/shift 2 - operating positions

See Attachment III for area range and employee exposure details.

4. VCM area levels and employee exposure have been reduced substantially during 1974 as a result of completing the projects listed on Attachment IV. 8 hr. TWA data indicates a downward trend for most areas.

Area data from the VFA will be more meaningful when it is processed by the micro computer. The computer is due late 1st quarter 1975.

II. State of preparedness to cope with other requirements

- A. Record keeping - Employee Records and Payroll Departments will review proposal developed by South Charleston - no progress to date. M. E. Eisenhower has been assigned follow up and coordinating responsibility for this item.

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- B. Health surveillance - Dr. Glenn is now performing medical screening per the proposed new standard. He has not initiated the form to notify employees of their suitability to continue employment in VCM area and use of protective equipment and respirators. Form will be available when needed per Dr. Glenn.
- C. Regulated area - Have everything ready to identify area as marked on map. Roadways have been excluded at this time. Possible problem with action level of 0.5 ppm and wind direction. Materials on hand. Project on hold for future implementation pending court actions on standard.
- D. Cartridge type respirators - Problem area - none on order at this time.
- E. Training - Training Department will have draft of proposal ready for critique 1/30/75.

III. Problem areas related to compliance with the permanent standard

- A. Limited sensitivity of sequential vinyl chloride VFA analyzer below 1 ppm.
- B. Identification and control of regulated area.
- C. Procurement of NIOSH approved respirators.
- D. Roster of authorized persons entering regulated areas - (record keeping).
- E. Identification of unknown sources of VCM emissions.
- F. Preparation of VCl tank cars for maintenance.
- G. Unclear meaning of vinyl chloride standard.
- H. Detection system to alert workers in excessive vinyl chloride concentrations.
- I. Employee health limitation which prohibit prolonged use of respiratory protection, especially maintenance personnel.
- J. Manpower requirements to fulfill gas masks maintenance requirements in VCl standard.

IV. Present programs underway to reduce area levels and employee exposure.

A. Solvent Resin Department

1. Expense items 1975 \$100M
2. Working Budget 543M (Present estimate)

Original estimate for Texas City was \$280M (Approved 1974)
See Attachment V and V(a) for project list and priorities.

B. Suspension/Non-Solvent Resin Department

1. Expense items 1975 \$100M
2. Working Budget 439M

See Attachment VI for detail.

V. Future programs to reduce area levels and employee exposure.

- A. Solvent Resin Department - revise remaining stripping stills \$150M.
No additional programs are recommended at this time. The present programs need to be completed and evaluated in order to provide a sound basis for any future expenditures.
- B. Suspension/Non-Solvent Resin Department -
No additional programs are recommended until we get an OSHA standard that is reasonable and it appears there will be no regulatory problem with continued operation.

If we get a reasonable standard the Suspension Unit will want to install a gas holder to provide improved VCM recovery and a place to vent low pressure streams - probable cost is \$1.5MM.

ATTACHMENT I

EMPLOYEE VCM EXPOSURE DATASOLVENT VINYL RESINS - TEXAS CITY

<u>Job</u>	<u>Area</u>	<u>8-Hr. Job TWA</u>	<u>Avg. Area Exposure</u>
114		0.1	
	Control Room		0
	Outside		0.2
115		1.0 (18.5% in Respirator)	
	Control Room		1.0
	Third Level		5.8
	First Level		1.4
117		1.8	
	Control Room		1.5
	Outside		1.5
	Tank Area 1		3.3
	Compressors		4.3
121 East		2.3	
	Control Room		0.7
	Outside		4.2
121 West		1.2	
	Control Room		0.7
	Outside		1.3
122		0.6	
	Clarification		0.8
	DI Water System		0

NOTE: 115, 117 data from chromatograph; 114, 121, 122 from carbon tube.

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ATTACHMENT II

COMPLETED VCM EXPOSURE REDUCTION PROJECTS

SOLVENT VINYL RESINS - TEXAS CITY

Improved Maintenance Program for autoclave agitator packing.

Enclosed VCI compressors' shaft packing glands, venting outside building.

Rerouted blowdown lines from compressor intercoolers to outside building.

Improved Monitoring Program for compressors.

Substituted sample bombs for open cold falsks for feed samples.

Respirators used for autoclave sampling and analyses.

115 lab isolated from control room.

Dynatrols in service on B-2 and B-9.

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ATTACHMENT III

TEXAS CITY SUSPENSION/NON-SOLVENT UNITCALCULATION 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 & VCI 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.

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January 10, 1975

ATTACHMENT IV

ACTION TAKEN IN 1974 TO REDUCE VINYL CHLORIDE

EXPOSURES IN THE SUSPENSION/NON-SOLVENT/

VINYL REFRIGERATION UNIT

1. Discontinued standard operating procedure of water rinsing D-autoclaves to pad between batches.
2. Installed 20 point VFA/VCl analyzer (\$20M) in Bldg. 174 control room to analyze and record VCl concentrations at sample heads located throughout the unit.
3. Issued instructions to operating personnel to log, locate, and stop sources of vinyl chloride emission whenever the VFA/VCl high exposure alarm sounds.
4. Relocated dumping of Nos. 3 and 4 stripping tanks from highly traveled area to remote location.
5. Purchased portable vinyl chloride analyzer (MSA) for testing vessels (which previously contained vinyl chloride) for vinyl chloride content to minimize personnel exposure upon vessel entry.
6. Conducted in-depth stripping study to determine relative importance of operating parameters in reducing residual monomer content.
7. Replaced styrene with more efficient sodium nitrite terminator for "killing" runaway reactions.
8. Revised procedure to use resin analysis as a guide instead of "boil-off" sampling of recovered monomer.
9. Developed method for heating suspension autoclaves to reaction temperature using direct steam injection.
10. Replace PVP suspending agent with HEMC to provide more stable VAc/VCl copolymer reactions.
11. Installed Off-Gas Recovery system to recover vinyl chloride flashed from resin in vacuum strippers.

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Action Taken in 1974 To Reduce Vinyl Chloride
Exposures in the Suspension/Non-Solvent/Vinyl
Refrigeration Unit

2.

12. Issued SOP to vent autoclaves with high reaction pressure to Off-Gas Recovery system vacuum header instead of the atmosphere.
13. Used 50 M gallon suspension surge tank in Non-Solvent service to provide additional surge capacity between Non-Solvent autoclaves and dryers to prevent overflow of resin slurry.
14. Reduced premature D-autoclaves rupture disc failures by changing from type PLDV to type RB-90 for more accurate bursting pressures.
15. Modified No. 1 VCl recovery system to allow recovery of contained vinyl chloride in the high pressure vent by scrubbing in Solvent Vinyls acetone stripping system.
16. Modified No. 2 VCl recovery system to send high pressure vent stream to the No. 1 Powerhouse for burning in boilers as fuel.
17. Revised Off-Gas Recovery System to send high pressure vent to the No. 1 Powerhouse for incineration as boiler fuel.
18. Enclosed the atmospheric packing areas of Nos. 1 and 2 compressors for venting outside the compressor room.
19. Designed and installed exposure-proof slurry samplers for D-autoclaves.
20. Added an additional operating position to allow closer monitoring of vinyl chloride recovery facilities.
21. Barricaded compressor room doors with chains and hung signs on each doorway which read, "Entry Without Fresh Air Protection Requires Chief Operator Approval".
22. Changed packing on Nash compressor to improve reliability and lessen vinyl chloride emissions to the atmosphere.
23. Revised procedurs for flushing skin-pots to minimize operator exposures to vinyl chloride.
24. Relocated maintenance eating facilities outside the manufacturing area to reduce potential exposures.

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Action Taken in 1974 To Reduce Vinyl Chloride
Exposures in the Suspension/Non-Solvent/Vinyl
Refrigeration Unit

3.

25. Revised piping to allow decanting of recovered monomer tanks to a closed vessel instead of the sewer.
26. Removed walls from Bldg. 127 (upstairs) to improve ventilation and lessen operator exposure.
27. Increased technical staff (67%) to devote more time to minimize vinyl chloride monomer losses.
28. Installed DMV in No. 1 Blowdown tank feed header to avoid autoclave blowdowns during vacuum stripping which result in blown rupture discs.
29. Revised piping to vent VCl filters to an enclosed vessel rather than the atmosphere prior to opening for maintenance.
30. Install piping on all VCl pumps to allow priming to an enclosed vessel instead of the atmosphere.
31. Purchased portable Century OVA/VCl analyzer for use as a tool for locating emission sources of vinyl chloride.
32. Revised piping to recover vinyl chloride and vinyl acetate in seal water in the No. 3 vacuum stripper.
33. Modified pilot plant operating procedures to recover most vinyl chloride emissions in the No. 2 VCl recovery system.

Otis A. Shelton
January 13, 1975

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ATTACHMENT V

CURRENT APPROVED 930 PROJECTS

SOLVENT VINYL RESINS - TEXAS CITY

<u>Project</u>	<u>Original Issue, M\$</u>	<u>Present Estimate, M\$</u>
VFA Monitor No. 1	30	30
Dynatrols	148	148
Autoclave Mechanical Seals	80	250
Control Room Pressurization	22	25
VFA Monitor No. 2	-	40
Stripping Still Revisions (one)	-	50
TOTAL	280	543

FUTURE 930 PROJECTS

Revise Remaining Stripping Stills	100
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VCM PROJECT PRIORITIES -

SOLVENT VINYL RESINS

Priority I

1. Mechanical seals for autoclaves.
2. Installation of Dynatrols and relocation of 115 lab.
3. Modifications to stripping stills to reduce VCM in varnish.
4. Pressurization of 117 control room and relocation of lab.
5. Tank Area 1 valves and pumps maintenance.
6. 117 compressors maintenance.
7. Establish regulated areas.
8. Purchase required respiratory equipment.

Priority II

1. Bldgs. 115, 117 valves and pumps maintenance.
2. VCM monitors.
3. 72T pump mechanical seals.
4. VCl pumps acetone wash system.
5. VCl isolation motor valves (as operations permit).

Priority III

1. 115 sample point hoods (now have masks; Dynatrols may greatly reduce or eliminate sampling; if not, re-rate as II-1a).
2. Fresh air stations (25 ppm ceiling lessens immediate need; some already installed; if I and II completed successfully, may alter needs).

Priority IV

1. 115 process leads in control room (need 2 transmitters).
2. Tank Area 1 filters out of service.
3. Miscellaneous VCM containing vents to scrubber or flare.

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INTERNAL CORRESPONDENCE

CHEMICALS AND PLASTICS

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

TO (NAME) Mr. R. W. Sesler
COMPANY
LOCATION Texas City Plant

DATE January 13, 1975

COPY TO Mr. M. E. Eisenhour

SUBJECT

Expenditures to Reduce VCM Exposures at Suspension/Non-Solvent Vinyls
Resins Unit

CurrentCapital Working Budget

1. Install scrubbing system utilizing MEK to recover VCM from high pressure vents.
\$300,000 - Completion Third Quarter 1975
2. Spare Off-Gas Recoery Vacuum pump.
\$100,000 - Completion Third Quarter 1975
3. Second multi-point VFA analyzers.
\$39,000 - Completion Second Quarter 1975

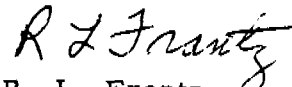
Expense

Numerous "09" revisions totaling about \$100,000 in 1975.

Future

If a reasonable regulation (at least 5 or 10 ppm TWA) is finally issued by the government, which will allow the Suspension/Non-Solvent Unit to remain in operation, a gas holder costing an estimated \$1.5 MM will be requested.

Very truly yours,


R. L. FrantzUCC
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