

11/14 ABS - a lot of progress in the past year.

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TEXAS CITY SUSPENSION/NCN-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		RECEIVED
Bldg. 174 control room (6 hrs.)	1	
Outside (2 hrs.)	5	JAN 17 1975
2. Off-Gas Recovery		A. B. STEELE
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.

January 10, 1975

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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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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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INTERNAL CORRESPONDENCE

UC 139-2

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CHEMICALS AND PLASTICS

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

TO (NAME) Mr. R. L. Frantz
COMPANY
LOCATION

DATE January 9, 1975

COPY TO Mr. M. E. Eisenhour
Mr. R. W. Sesler

SUBJECT VFA Analysis for VCI at the
Suspension/Non-Solvent Unit

The VFA instrument was installed at the Suspension/Non-Solvent Unit in June to monitor for VCI. The instrument is, primarily, being used as a tool to locate VCI release problem areas.

Table I shows a summary of the number of high readings for the June-December period. The sensitivity of the instrument was changed from 100 ppm to 25 ppm full scale on November 4. Basically, the data shows that the number of high readings has been decreasing as steps have been taken to reduce leaks and releases.

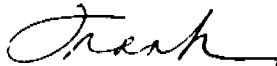
Based on observations and data taken from the monitoring of the VFA charts for December, the following statements can be made:

1. The VCI level in the control rooms (Bldgs. 174 and 120) is normally less than 1 ppm.
2. The readings in Bldg. 174 - Bldg. 119 work area indicate that the average VCM concentration is normally slightly below 5 ppm.
3. Data given in Table II show the current problem areas (based on the critical few - 40 readings exceeding 25 ppm) are:
 - a) The Off-Gas Recovery System. The system (seal water and knock-out pot) had to be released to the sewer several times during the month to overcome resin contamination problems. Steps are being taken to eliminate the need for these releases.
 - b) The Compressor Room in Bldg. 119. Although several steps have been taken to eliminate leakage, the compressors still constitute a problem. However, personnel entry into the compressor room is seldom required.

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- c) Vinyl Chloride Unloading Facilities. Because of the colder weather, nitrogen was used to unload the VCI monomer tank-cars. Subsequent venting to remove the N_2 was responsible for the number of high points. Revised procedures are planned.
- d) Downstairs, North and South Lines. These points were high, primarily, because of the releases from the Off-Gas Recovery System and wind blowing the gas across these areas.
- e) Second Level, East Line. This may have also been due to the Off-Gas Recovery System.

A printer-log has been requested from SID at the Tech Center that will give 8 and 24-hour averages of each point and other pertinent data. This addition will allow accumulation of more complete data which currently is done visually and tabulated by hand.


Frank Johnson

FLJ/sld
Attachments

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		
Aug. 19 - Sept. 5	11		
September	8		
October	5	12	
November ⁽²⁾		18	74
December		18	64

(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.

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TABLE II

DATA FROM VFA ANALYZER FOR DECEMBER

<u>Point</u>	<u>Location</u>	<u>No. of Readings Exceeding 25 ppm</u>	<u>% of Readings (Time) less than 25 ppm</u>
1	Control Room, B.174	0	100
2	Downstairs, East Line	15	99
3	Downstairs, North Line	47	96
4	Downstairs, South Line	46	96
5	Second Level, East Line	42	96
6	Second Level, North Line	23	98
7	Second Level, South Line	23	98
8	North Line, B.119, first level, West end	25	98
9	B.127, Second Level	19	98
10	B.119, North Side, Second level, center	7	99
11	B.119, North Side, third level, center	17	98
12	Off-Gas Rec. Facilities	112	90
13	B.119, Compressor Room	52	95
14	B.119, Maint. Room	23	98
15	B.119, South Side, NW of Strip Tank	16	98
16	VCI Unloading Facilities	48	96
17	Tank Area A, Gnd. Level	33	97
18	Pilot Plant Grating	2	99+
19	Control Room, B.120	0	100
TOTAL		550, or 2.6%	
Average/day		18	

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