



Interoffice Communication

To Environmental Leak Detection File

From M. W. Cheesman

Date September 23, 1983

Subject DETERMINATION OF SOURCE OF LEAK
INTO C-500 VENT SYSTEM

Following the startup of the O₂-based Oxychlorination Reactor System, samples of the C-500 vent that are collected as a provision of the VCM Plant's NESHAP Leak Detection Plan indicated higher than expected concentrations of ethyl chloride (EtCl), VCM, EDC, and several other hydrocarbons. Following an extensive investigation the source was found to be a corroded and leaking blind between the Wet Vent Header (normally feeds to the Incinerator) and the Relief Vent Header (flows to the atmosphere through C-500) located near the VCM Tar Stills. The emissions that occurred due to the leak (See Table I) are permitted under our most recent EIQ. The hourly rates did not exceed the limits set by State of Louisiana Air Quality Regulations Section 17.11 and are thus non-reportable.

The high concentration of EtCl indicated that the wet vent header was somehow leaking into the C-500 vent system. The three known connections between the wet vent header and C-500 system (direct connection on east side of C-500 which was blocked by a valve, the incinerator bypass control valve, and the bypass's control valve manifold) were checked and were not leaking. The two vent headers feeding into C-500, the Oxy Vent and Relief Vent (RV), were then sampled at C-500. The sampling indicated that the source of the chlorinated hydrocarbons in the C-500 vent was the RV header. None of the plant's piping schematics showed a connection between the Relief Vent and Wet Vent Headers. Therefore a direct inspection of the RV header from the pipe rack was conducted in conjunction with sampling of the RV header at several points throughout the plant. The connection was eventually found on July 19, 1983 and was located above the Quench Column Blowdown Drum, S-218 (east of the VCM Tar Stills). The blowdown drum had a vent line that was connected to both the wet vent header and a RV header feed line leading from the VCM Tar Stills. The blind that was between the two headers had holes and pits due to corrosion. The headers and the blind were isolated from each other and the blind replaced. Replacement of the blind has also reduced the failure rate of the rupture discs on the VCM Tar Stills by eliminating the source of acidic water that was condensing and collecting over the discs.

It should be noted for possible future reference a connection from the Dry Vent Header to the RV header was found below the relief valve on top of HCl Column Bottoms Accumulator, T-202. The headers are isolated by a blind and a closed block valve on the line. Due to the dry nature of the vent, corrosion should not be a problem as was the case with the wet vent header.

The investigation of potential future problems of this nature could be simplified if all process designs that contain tie-ins into any of the vent headers contain a specific notice of such for the environmental files. If there are any questions or comments please contact me.

Mark W. Cheesman

Mark W. Cheesman
Process Engineer

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cc: RAC-JWW-RB-MLA-PLF-DLD-MCM-SJR-MGH

CCR 000046099

TABLE I
C-500 Emissions Due to Leak into Relief
Vent Header

<u>Component</u>	<u>Concentration, ppm (1)</u>			<u>Emissions Lbs./Day</u>			<u>Emissions Lbs./Hr.</u>		
	<u>High</u>	<u>Low</u>	<u>Average</u>	<u>High</u>	<u>Low</u>	<u>Average</u>	<u>High</u>	<u>Low</u>	<u>Average</u>
VCM (2)	7212	457	4230	250	14	144	10.4	0.6	6.0
EDC (3)	11449	1838	5317	521	95	286	21.7	4.0	11.9
EtCl (4)	55920	147	27534	1968	4	950	82.0	0.2	39.6

Notes

- 1) ppm by volume which is assumed to be equal to molar concentration
- 2) Section 17.11 limit of 100 lbs./hr.
- 3) Section 17.11 limit of 100 lbs./hr.
- 4) Section 17.11 limit of 1000 lbs./hr.

117 SCFM
/379

E+CI

	<u>High</u>	<u>ppm</u>
5/17	28866.7	
5/16	23410	
6/6	23790	
6/11	27050	
6/3	31710	
6/8	55920	

	<u>Low</u>
5/16	558
5/11	341
5/9	147.3

Aug = 27534.3 ppm

Mu = 63.5

	Concentration ppm by volume			lbs/day		
	High	Low	Average	High	Low	Aug
E+CI	55920	147.3	27534.3	1968.2	4.3	949.8
EOC	11449	1838	5317.3	520.5	95.4	286.0
VCM	7212	457	4229.6	250.2	13.8	143.6

Hydro

[unclear]

	High	Low	Aug
5/17	2234	5/10 457	
6/6	3153		
6/11	6642		
6/18	6865		
7/1	7212		
		7/6 3870	
		7/8 2680	

5/9 Through 7/19 Lx Aug 4229.6 ppm

N₂

	High	Low
5/16	88.69	5/17 23.75
5/10	92.24	6/8 80.2
5/11	97.51	6/15 76.9
5/9	96.8	7/1 50.09
Aug	81.83	
		6/1 85.94 7/15 84.5
		6/13 82.7
		7/13 80.9

EDC

	High ppm	Low ppm
5/17	5985.3	5/10 5418
5/16	7194	6/1 4696
5/9	11449	6/8 4505
Aug = 5317.3 ppm		6/13 3051
		7/13 2321
		7/15 1838

117 SCFM
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E+CI

	<u>High</u>	<u>ppm</u>		<u>Low</u>
5/17	23235.7		5/10	558
5/16	23410		5/11	341
6/6	23790		5/9	147.3
6/1	27090			
6/3	31710			
6/8	55920			

Aug = 27534.3 ppm

Mu = 63.5

	Concentration ppm by volume			lbs/day		
	High	Low	Average	High	Low	Aug
E+CI	55920	147.3	27534.3	1968.2	4.3	949.8
EDC	11449	1838	5317.3	520.5	95.4	286.0
UCM	7212	457	4229.6	250.2	13.8	143.6

CCR 000046103