

MONSANTO COMPANY

Location: Texas City, Texas

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To : Ray Rosenberg

Subject : VCM Plant Quarterly Manufacturing Report
2nd Quarter 1966

SUMMARY

Production rates for the second quarter in percent of rated capacity were:

VCM	99.8%
Department 23 EDC	111.3%
Oxidative Chlorination EDC	73.3%

Rates were limited by: 1) C_2H_2 distribution; 2) failure of plant water supply; 3) fouling of reboilers and a number of mechanical failures.

Quality control was generally good. Plugging of 22D14 (VCM final purification column) in June and the resin bed test during May caused most of the off-spec material. A new quality control record was set in April.

The quarterly unit manufacturing cost was 5.84 ¢/lb. VCM. This was above standard (5.321 ¢/lb. VCM) because of: 1) high variances in Department 23 due to the high price of chlorine; 2) high catalyst usage in Department 26; and 3) low volume in June.

CBY 1112518

RSV0032631

VCM Plant Quarterly Manufacturing
Report - 2nd Quarter 1966

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OPERATING DETAILS

A. Summary Table

<u>Production</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>2nd Qtr. Totals</u>	<u>Std.</u>	<u>Year to Date</u>
<u>VCM - MM Lbs.</u>						
Cracking	9.52	10.53	7.87	27.92	27.6	55.78
Reaction	<u>2.45</u>	<u>2.30</u>	<u>1.78</u>	<u>6.53</u>	<u>6.9</u>	<u>16.05</u>
Total	11.97	12.83	9.65	34.45	34.5	71.83
<u>EDC - MM Lbs.</u>						
Department 23	14.79	14.76	12.30	41.85	37.5	83.73
Department 26	<u>1.71</u>	<u>2.06</u>	<u>1.24</u>	<u>6.01</u>	<u>7.5</u>	<u>9.64</u>
Total	16.50	16.82	13.54	47.86	45.0	93.37
Acid, M Gals.	201	281	219	701		1163
Scheduled - Acid	180	180	180	540		980

On-Stream Time

Cracking	100	100	97.1	99.03	99.5
Reaction	96.6	98.4	83.4	92.80	95.6
Department 23	100	93.9	79.6	91.10	91.7
Department 26	88.1	96.6	67.2	83.90	83.6
Department 21	85.3	91.0	63.1	79.80	76.7

Yields

Department 22

EDC to VCM	93.54	96.69	91.87	95.5
C ₂ H ₂ to VCM	95.33	98.54	94.56	97

Department 23

C ₂ H ₄ to EDC	100.22	98.73	98.57	95
Cl ₂ to EDC	101.41	93.56	100.26	95

Department 26

C ₂ H ₄ to EDC	57.78	73.45	70.18	88.4
HCl to EDC	72.18	76.13	81.92	91.0

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OPERATING DETAILS (continued)

B. Operations and Maintenance

April 1966

The spare rotor was installed in the York refrigeration drive turbine, 22DT1-1 along with steam carbon rings which failed.

The 22E21 (the EDC purification column reboiler) and 22E30 (the EDC drying column reboiler) were changed out one time each.

The hydration reactor, 22R3 was recharged. Piping was installed to allow bypassing this reactor without shutting down the C_2H_2 reaction unit.

Catalyst usage in Department 26 was high. The recycle compressor was down 17 days to prevent damage to it from corrosion.

The HCl compressor 21C2-1 was overhauled.

May 1966

The HCl stripper reboiler (22E14) and the cracking feed vaporizer (22E1) were changed out one time. The VCM compressor (22C2) was overhauled to replace leaking seals. The VCM reactor (22R1-3) catalyst recharge was started.

A leak was repaired on the high pressure chlorine line feeding the crackers. External corrosion from failure of the insulation weather coating caused the leak.

The resin bed test for HCl removal in product VCM caused low dilatometer and high acetylene. Removal of HCl could not be measured because product VCM did not go off spec on HCl during the test period.

Seven leaking tubes in 21D2 were plugged.

Two nozzles in the cooler piping for the EDC reactor 23V1 were replaced because of corrosion.

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OPERATING DETAILS (continued)

B. Operations and Maintenance

Corrosion in the 26K1 caustic scrubber outlet piping resulted in a leak in the surge tank, 26T9. Raw material metering and product EDC metering problems indicated low yields and low product production. A new column was installed in the feed gas chromatograph.

Outside purchases of tank car chlorine due to start-up troubles at the Alcoa Cl_2 plant had a serious effect on VCM cost.

June 1966

The VCM purification column (22D14) was boiled out two times due to plugging. The EDC purification column reboiler (22E21) was switched twice. VCM reactor (22R1-3) catalyst change was completed. Both VCM dryers 22A1-1 and 2 were recharged.

A new HCl absorber (21D3) was installed and a new-lid was put on 21T2 (acid storage tank) in Department 21.

Repairs were made to the severely corroded shell of the EDC reactor cooler, 23E2-4. The top three rows of tubes, which were severely corroded, were plugged. The liquid chlorine barge valves on 23T1-1 and 3, Cl_2 storage tanks, were replaced along with the liquid chlorine tank car valve on 23T1-3.

To reduce pressure drop and achieve higher thruput, the 26R1 tubes were hand fluidized and each ferrule orifice cleaned. 26T9 (overhead surge pot for the 26K1 caustic scrubber) was repaired and replaced. The Fenwall suppression system was installed and on-stream testing started.

C. Personnel and Safety

April 1966

Safety meetings were held with all operators covering protective masks and the "Escape Suit".

There was one (1) minor injury to a maintenance craftsman during the month.

CBY 1112521

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OPERATING DETAILS (continued)

C. Personnel and Safety

May 1966

Safety meetings were held with all operators covering "Thermal Burns".

There were five (5) injuries; one doctor case and four minor injuries. The doctor case injury was an abdomen strain to a maintenance craftsman. The minor injuries occurred to an operator, an instrument repairman, and two maintenance craftsmen.

CBY 1112522

June 1966

Safety meetings were held with all operators covering "Flammable Liquids".

There were five (5) injuries during the month; one major, one serious, and three minor. The lost time injury involved a pipefitter who swung down from a scaffold and landed on some pipe resulting in bone fractures of both ankles. The serious injury was to an electrician who cut three fingers on a new pump base while installing new conduit. The three minor injuries were to an operator, an instrument repairman, and one maintenance craftsman.

Mr. H. W. Cutcher reported back to work as an assistant operating supervisor. He had been in Haifa, Israel, on a plant start-up.

Mr. G. A. Danner, operating supervisor in VCM, was promoted to general operating supervisor for the methanol plant.

Mr. K. F. Webb, assistant operating supervisor in VCM, was promoted to operating supervisor for the VCM plant.

	<u>Injuries</u>			
	<u>Serious</u>		<u>Minor</u>	
	<u>Operator</u>	<u>Other</u>	<u>Operator</u>	<u>Other</u>
April	0	0	0	1
May	0	1	1	3
June	0	2	1	2
2nd Qtr. Total	0	3	2	6
Total-To-Date	1	5	2	12

OPERATING DETAILS (continued)

D. Costs

	<u>Total Mfg. Cost - \$</u>		<u>Total Mfg. Unit Cost</u>	
	<u>Actual</u>	<u>Standard</u>	<u>Actual</u>	<u>Standard</u>
April	701,523	637,247	5.858	5.321
May	731,629	682,389	5.700	5.321
June	578,464	513,424	5.990	5.321
2nd Qtr. Total	2,011,616	1,834,060	5.840	5.321
Total-to-Date	4,189,827	3,903,946	5.833	

The main contributors to the above standard costs were:
1) high variances in Department 23 due to the high price of Cl_2 , 2) high catalyst usage in Department 26, and 3) low volume in June. Chlorine price was high in April and May due to operating difficulties at the Alcoa plant. Abnormally high catalyst usage continued in Department 26. Improper feed ratios caused by incorrect analyzer analysis resulted in catalyst poisoning. Until the catalyst is turned over or changed out, high usage will continue. Low volume in June was caused by two boilouts of 22D14 (final VCM purification column) and a plant wide water supply failure.

E. Quality

April 1966

Quality control continued to be excellent.

A new quality control record of 100% of gross production on-spec was made.

Product VCM was high in methyl acetylene and allene while the Hydration Reactor was being recharged.

Total gross production from 22D14: 13,981 M lbs.

Total slopped: 0

Recycle due to low 22F32 level: 1,300 M lbs.; 0.94% gross

Total on-spec production: 12,681 M lbs.; 99.06% gross
(all met Springfield spec)

CBY 1112523

OPERATING DETAILS (continued)

E. Quality

May 1966

Quality control was good during the month.

283,000 lbs. of VCM made during the resin bed test were low on dilatometer and high on C_2H_2 .

43,000 lbs. of VCM were slopped due to a rotometer failure on the styrene oxide addition system and on upset of the 22D14 purification column.

Total gross production from 22D14: 13,496 M lbs.

Total slopped: 329 M lbs.; 0.245% gross

To off-spec storage: 222 M lbs.; 55% slopped

Reason: Slop material resulting from resin bed test. Product VCM out of resin bed had low dilatometer and high C_2H_2 .

To 22T32 feed tank: 107 M lbs.; 45% slopped.

Reason: 61 - Resin bed test
26 - Styrene oxide pump failure
17 - Upset in 22D14

Recycle due to low 22T32 level: 404 M lbs.; 0.3% gross

Total on-spec production: 12,763 M lbs.; 99.455% gross
(all met Springfield specs)

June 1966

Quality control was good after the second boil-out of 22D14.

Product VCM was off-spec in EtCl for three days prior to the first boil-out of 22D14. The first VCM rundown made after the boil-out was off-spec in EDC. A second boil-out was required a week later probably due to not getting a good clean-out the first time.

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E. Quality

A CTW pressure surge from CT2 caused an upset in the 22D13-22D14 VCM purification columns. 47,000 lbs. of off-spec VCM was slopped during this period.

The 22D14 bottoms draw-off line plugged, and product VCM went off-spec in HCl. 132,000 lbs. of VCM was slopped during period.

The 22T9-1, off-spec VCM storage sphere, RV developed a leak at the flange in late May. 22T9-1 had to be pumped to 22T9-2 so 22T9-1 could be depressured for repairs. 90,000 lbs. of VCM was used to flush 22T9-2, spec VCM storage sphere, so it could be returned to spec VCM storage.

Total gross production from 22D14: 12,968 M lbs.

Total slopped: 2,040 M lbs.; 15.8% gross

To off-spec storage: 1,568 M lbs.; 76.8% slopped.

Reason: 760 - Off spec in EtCl before 22D14
 boilout.
 554 - VCM made during 22D14 boilout.
 254 - Off spec in EDC after 22D14 boilout.
 90 - Used to flush 22T9-2 for spec VCM
 storage.

To 22T32 feed tank: 472 M lbs.; 23.2% slopped.

Reason: 293 - 22D14 boilout
 132 - Off spec in HCl due to 22D14
 bottoms drawoff plugging.
 47 - Upset in 22D13-22D14 caused by CTW
 surge from CT2.

Recycle due to low 22T32 level: 190 M lbs.; 1.47% gross

Total on spec production: 10,738 M lbs., 82.73% gross.
(2 T/C's, 450 M lbs. shipped to Carbide - HCl 1.2 ppm)

K. F. Webb
K. F. Webb

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CBY 1112525

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