

1970 - PLANT LOSSES SUMMARY

Product VCM, EDC, and HCl (to Ancon)	89.0%	+ 1.4%
Light Ends Hauled Away	1.1%	
Tars Hauled Away	2.7%	
H ions Removed in Oxy as H ₂ O	1.4%	
Water Effluent Losses	2.7%	
C-500 Vent Gas Losses	2.5%	
Unknown Losses	<u>0.5%</u>	
Total Losses and Production		100 %
as a % of Cl ₂ and C ₂ H ₄ Feedstock		

CCR 000007567

- 1.a direct chlorinate (PED)
- (1) oxy vent (must be dry)
 - (2) increase R-304 feed temp
150 to 75 psi steam letdown
 - (3) study R-304 to improve
operation (PED - DEM)
have MED check raising temperature
also raise pressure on drum
 - (4) Add R-305 !!!
 - (5) R-303 catalyst wash good at
last change — R-301 had
popcorn coke.
 - (6)

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 Steam or N_2 diluent to R-301
or recycle R-304 effluent
 ▶ corrosion & explosive range
 - (7) Convert R-304 to oxy reactor
 - (8) Run R-301-3 with C_2H_4
 - (9) Adsorb & recovery C_2H_4 (PED)
 - (10) Raise R-101 temp & Cl_2 conc.

2.5 ft. x 13 ft. x 24 ft. and
 water is 100 ft. deep
 for 40 hours per day

During outage to Day 7 Wed

With source 180 gpm

R-101 intake 200

Other intake 115

495 gpm

$$\text{Total} = 495 \times 40 \times 60 = 1,188,000$$

$$\text{Leakage} = \frac{1,188,000}{13 \times 24 \times 60} = 38 \text{ gpm}$$

$$\begin{aligned} \text{Total water leaking} &= 495 + 38 \\ &= 533 \text{ gpm} \end{aligned}$$

Day 530 gpm

Design = 372 gpm

$$\text{Factor} = 1.4784 = 1.5$$

Overhead flow = 545000
 Reflux = 540000

$$1.2 \times 62.4 = 75 \quad P_1 = 0.75 \text{ Gt/ft}^2$$

$$P_1/P_2 - P_2 = .010101 = .100505$$

Liquid rate = 547.72 gpm
 Vapor rate = 200 LFL

$$SFC \times H/P_1 = 11.4114$$

$$18'' \text{ TS} \Rightarrow 23.9$$

$$1068.7 \text{ gpm}$$

Use 11' DF tower with Koch
 Floxtrays. Standard 11' x 11'
 trays around 11' dia.

$$H \text{ E Column} \quad h_{\text{ave}} = 6.8125 \text{ FT}^2$$

$$P_1 = 1.12 \times 62.4 = 70$$

$$\text{Reflux} = 345000$$

$$P_2 = 1.12 \times 62.4 = 70 \quad P_2 = 0.23$$

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$$P_1/P_2 - P_2 = .003296 = .057415$$

12-19-67
jwc

$$\begin{array}{lcl} \text{GPM} & = & 614.5 \\ V_{\text{Load}} & & 55.3 \end{array} \quad \begin{array}{l} = \\ = \end{array} \quad \begin{array}{l} 73.2 \\ 55.3 \end{array}$$

Use 15' D-

Run tower @ 30 gpm 116°C
213
53

$$\begin{array}{l} P_v = 0.4572 \\ P_L = 7.2 \\ \sqrt{P_v / (P_L - P_v)} = \sqrt{0.06578} = .08111 \end{array}$$

$$\begin{array}{lcl} \text{GPM} & = & 614.5 \\ V_{\text{LOAD}} & & 39.2 \end{array} \quad \begin{array}{l} \longrightarrow \\ \longrightarrow \end{array} \quad \begin{array}{l} 73.2 \\ 39.2 \end{array}$$

13' D F

Run tower @ 30 gpm 128°C
265°F
77.5°F

$$\begin{array}{l} P_v = 0.57 \quad P_L = 66.8 \\ \sqrt{P_v / (P_L - P_v)} = \sqrt{0.08610} = .092799 \end{array}$$

CCR 00007571

$$\begin{array}{lcl} \text{GPM} & = & 645 \\ V_{\text{LOAD}} & = & 327 \text{ cfm} \end{array} \quad \begin{array}{l} \longrightarrow \\ \longrightarrow \end{array} \quad \begin{array}{l} 77.0 \\ 36.1 \end{array}$$

12' 3" D F

What about 45 p.s.i.g. $\rightarrow 293^{\circ}\text{F}$

$$F_v = 0.7315 \quad F_L = 1.057 \times 62.4 = 65.92$$

$$F_v / (F_L - F_v) = .011276 \quad J = .10614$$

$$\text{GPM} = 660 \quad \rightarrow 785$$

$$V_{\text{grad}} = 35.2$$

12' DF.

CLT or called design 2 p.s.i.g. $\rightarrow 90^{\circ}\text{C}$
 194°F
 654

$$F_v = .2355 \quad F_L = 1.13 \times 62.4 = 70.512$$

$$F_v / (F_L - F_v) = .003351 \quad J = .05754$$

$$V = 450000 \quad \rightarrow 36.6$$

$$L = 229000 \quad \rightarrow 405 \rightarrow 482$$

12' SF.

2-17-67
JWC

INCOME

VCM 21 M # 2,580

EDC 246 M # 1,380

HCC 67 M # 340

4,150 4150

1,380 140

2770 450

1246 → 1315 750%

1315 700

1315 100

2765 210

1.50 → 100%

195 GPM x 4,000,000 = 780,000,000 OK

CCR 000007573

8-29-69
RWC

VINYL CAPACITY

HQ USA	Oxy	547,000,000
	ANCON	67,000,000
		<u>464,000,000</u>

$$VCM = 464 \bar{M} \times \frac{68.5}{36.5} \times .75 = 765,000,000$$

EDC REQUIRED - 1,193,000,000

Oxy = 477,000,000

DIRECT = 716,000,000

SALES = 180,000,000

TOTAL DIRECT REQUIREMENT 896,000,000

PURIFICATION REQUIREMENT 2,510,000,000

LE FEED 340 DAYS 513 GPM.

5-11-69
RWC

PLANT CAPACITY

CASE I

FURNACE LIMITING AT	175 GPM - 50% CON	
FURNACE RATE =	1,680 M	EDC
CRACKED	840 M	"
Oxy PRODUCTION	410 M	"
DIRECT PRODUCTION	622 M	"
TO SALES	192 M	"
VCM SALES	526 M	VCM

CASE II

Oxy LIMITING AT 90%

Oxy PRODUCTION	428 M	EDC
DIRECT PRODUCTION	²² 685 M	"
TO PURIFICATION	⁵⁰ 1083 M	"
PURE EDC	¹⁸³⁰ 1029 M	"
TO VCM	⁸⁵⁴ 854 M	"
TO SALES	¹⁹⁶ 175 M	"
VCM SALES	540 M	VCM

CASE III

FURNACE 176.25 GPM - 51.26%

RATE	1692
CRACKED	867
Oxy	423
DIRECT	622
SALES	183
VCM SALES	

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OXYCHLORINATION

$$\Delta P \propto W^2$$

$$45 = K (1213.6)^2$$

$$K = 30.5536 \times 10^{-6}$$

$$95 = 30.5536 \times 10^{-6} W^2$$

$$W^2 = 3.1092 \times 10^6$$

$$W = 1,761 \text{ mol/hr HCl}$$

$$= 64,276.5 \text{ \#/hr}$$

$$\text{HCl to ANCON} = 8,333.3$$

$$72,610 \text{ \#/hr}$$

$$\text{VCM} = 1,989.3 \text{ mol/hr}$$

$$= 995,000,000 \text{ \#/yr}$$

$$\text{EDC By oxy} = 748,000,000 \text{ LB/yr}$$

$$\text{EDC BY DIRECT} = 622,000,000 \text{ LB/yr}$$

$$\text{EDC PRODUCTION} = 1,370,000,000 \text{ LB/yr}$$

$$\text{EDC TO VCM} = 1,574,000,000 \text{ LB/yr}^{\leftarrow}$$