Revised: 12/15/82

General Foreman
Production Superintender
Operations Superintender
Plant Manager
Environmental Control

# ENVIRONMENTAL UPSET REPORT

SUBJECT: LEAK AT OHC II CATALYST CATCH POT

FROM: DON PEARSON

Please complete the following questionnaire and forward as soon as possible. [This report must be received by the Environmental Control Department within five (5) calendar days of the incident.]

1. DATE OF INCIDENT: 2-25-83
2. SOURCE OF RELEASE: HOLE IN OHC CATALYST CATCH POT
3. TIME AND DURATION: 8AM — 11 AM
4. WEATHER CONDITIONS (Circle One): (Clear) Partly Cloudy Cloudy Rain
5. WIND SPEED AND DIRECTION (if a gas release): 10 mph N
6. HAZARDOUS MATERIAL RELEASED: HCL, EDC, CHLORAL, TCE
7. ESTIMATED QUANTITY RELEASED: 385 lbs
8. CAUSE OF RELEASE: HOLE IN CATALYST CATCH POT
9. IMMEDIATE ACTION TAKEN: REDUCED REACTOR RATE TO MINIMUM TO TRY TO PLUG LEAK. WHEN IT WAS DECIDED LEAK COULD NOT BE STOPPED, REACTOR WAS SHUT DOWN.
10. ACTION PLANS TO PREVENT REOCCURRENCE: WILL TAKE A CLOSE LOOK TO DETERMINE CAUSE OF FAILURE. CATCHPOT WILL BE TEMPORARILY REPLACED WITH A STEAM-TRACED APE SPOOL AS WAS DONE IN NOS. 3, 5 + 6 REACTORS.
11. NOTIFICATION MADE (Who, When): PLANT B II SHIFT ENGINEER

Environmental File #_____

SL 047767

## CALCULATION

Loss through oval hole 1/4" wide by 1/2" long
≈ .30" dia round hole

Process pressure was changing as reactor rates were reduced and reactor was shut down. Figure average pressure was 15 psig and material was lost over a period of 3 hrs. (8 AM to 11 AM)

Composition of reactor vent : (wt%)

| | |
|---|---|
| $O_2$ | 0.49 |
| $N_2$ | 0.70 |
| CO | 0.27 |
| $CO_2$ | 8.76 |
| $C_2H_4$ | 7.83 |
| HCl | 0.63 |
| VC | 0.01 |
| EC | 0.01 |
| DCE | 0.06 |
| EDC | 67.75 |
| $CCl_4$ | 0.09 |
| CHLORAL | 0.37 |
| TCE | 0.84 |
| $H_2O$ | 12.19 |

Average MW = 52.5

To calculate loss use eq. from Crane p. 3-5

$$q = .525\, d_1^2\, C \sqrt{\frac{\Delta P}{\rho}}$$

$\Delta P = 15$ psig $\quad \rho = \frac{52.5 \text{ lbs}}{\text{mole}} \times \frac{\text{mole}}{379 \text{ ft}^3} \times \frac{29.7}{14.7} \times \frac{520}{910^\circ}$

$= 0.160 \text{ lb/ft}^3$

$d_1$ = orifice diameter = 0.3 in

from pp A-20 Crane use maximum value of C for $\beta = 0$ (to be conservative)

$\Rightarrow C = 0.7$

$$q = .525\,(.3)^2\, 0.7 \sqrt{\frac{15}{.160}} = 0.320 \frac{\text{ft}^3}{\text{sec}}$$

$$0.320 \frac{\text{ft}^3}{\text{sec}} \times \frac{3600 \text{ sec}}{\text{hr}} \times \frac{0.160 \text{ lb}}{\text{ft}^3} \times 3 \text{ hrs} =$$

552 lbs lost over 3 hrs

Hazardous materials lost:

| | | |
|---|---|---|
| HCL | = | 3.5 LBS |
| VC | = | 0.06 LBS |
| EDC | = | 374 LBS |
| CHLORAL | = | 2 LBS |
| TCE | = | 5 LBS |

Non-hazardous materials lost: $N_2$, $C_2H_4$, $H_2O$ make up the balance of the 552 lbs.