

ETHYL CORPORATION

INTER-OFFICE

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Info only
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To Mr. H. B. Beeson *File - John* ADDRESS One American Place
(VCL Emissions - EPA)

FROM R. M. Carlson ADDRESS One American Place

SUBJECT Effect of the April 4, 1978 EPA Rejection of Flare DATE April 21, 1978
Stacks - VCL Emissions Reduction Program

SUMMARY

The Ethyl VCL Emissions Reduction Program was predicated on the use of an instrument monitored flare stack for back-up to the primary incinerators for VCL emissions reduction. The April 4, EPA rejection of flare stacks tends to indicate that additional incinerators are the EPA acceptable back-up approach.

Compliance with the October, 1978 EPA deadline is in jeopardy. A duplicate (back-up) PVC plant incinerator would cost approximate \$400M installed and has an equipment delivery of approximately 10 months. Use of the proposed H-C plant emissions reduction incinerator would require a similar time schedule.

If the EPA denies an operations variance which allows sufficient time for installation of new incinerators, the PVC plant will be forced to operate in a manner which is predicated upon the existing PVC incinerator capacity and service factor.

DISCUSSION

The attached memo from D. V. Melville gives the background and history of the VCL Emissions Reduction Program, and defines several alternative approaches to VCL emissions reduction. You may wish to have some of these, or other alternatives, developed in more detail.

R. M. Carlson
R. M. Carlson

/ssd
Attachment
cc: D. V. Melville

ETHYL CORPORATION

INTER-OFFICE

To Mr. R. M. Carlson ADDRESS One American Place

FROM D. V. Melville ADDRESS One American Place

SUBJECT Alternatives for VCL Vent Disposal System for the H-C Plant and a Back-Up to the present VCL Vent System in PVC DATE April 20, 1978

OBJECTIVE:

1. Primary Objective - Bring operation of the VCL and PVC plants into compliance with EPA regulations for VCL Emissions (compliance deadline is October, 1978).
2. Secondary Objective - Identify schemes to be considered for a compliance plan.
 - a) Identify the need for a back-up to the vent systems.
 - b) Identify possible back-ups to the vents.
 - c) Propose equipment locations and approximate sizes.

NEED:

EPA regulations for VCL require that emission concentrations are not to exceed 10 ppm at any time. This regulation implies that a service factor of 100% is required for any VCL vent stream disposal facility, such as our VCL incinerator in the PVC plant.

On April 4, 1978 EPA denied Ethyl's request to use a flare as a back-up for the VCL incinerator for the PVC plant's VCL recovery area. Ethyl could not show consistent compliance with the 10 ppm VCL standard.

HISTORY AND FUNCTION OF PRESENT VENT FACILITIES:

PVC

Installation of a VCL incinerator for the PVC plant was completed in mid- 1975. The facilities were installed as part of the H-C Emission Control Project - Job 1087.

The unit was sized for 100% of the VCL recovery area's peak vent flow and normally operates at about 50% of full load. Normal load varies from 100 to 500 lb/hr VCL plus non-condensables. "Peak" design load is 780 lb/hr with 620 lb/hr VCL.

H-C

A vent header system circulates through the H-C VCL plant and routes vents to either the No. 1 or No. 4 flare. Normal capacity is approximately 790 lb/hr.

HISTORY OF PREVIOUSLY CONSIDERED BACK-UPS

The VCL incinerator for the PVC plant is subject to shutdowns for maintenance. A back-up to the VCL incinerator is needed to provide the required 100% service factor for the vent gas system. The following back-ups were considered for the scope of item PVC-5 - Job 20281.

- A. A back-up flare system to be located in the PVC plant (near the existing incinerator).
- B. A pipeline from the PVC plant incinerator to the H-C plant No. 4 flare.
- C. A back-up incinerator identical to the existing unit in PVC.

Based on a capital advantage of \$50M^{*} and the assumption that a flare could be proven to be an acceptable disposal means for VCL, a back-up flare to be located in the PVC plant was initially chosen for the scope of item PVC 5. However, EPA gave indications that they may not accept a flare as a satisfactory back-up at a later date. Considering this possibility, a pipeline to the No. 4 flare was substituted, based on the following logic:

- 1. If EPA requires incineration at a later date then a pipeline from PVC and H-C would be unacceptable.
- 2. If flares are allowed at a later date then a pipeline from PVC to the No. 4 flare would result in approximately \$50M more capital for installation (\$190M - \$140M). * And, operating cost for a pipeline would be much less than for an additional flare. (An additional flare would require a minimum of a new operator and a supply of natural gas to the pilot light.)

ALTERNATIVES:

Alternatives for back-ups to the present VCL incinerator in PVC and a future vent disposal system in the H-C plant are based on the assumption that VCL production in the H-C plant will continue at its present rate. These alternatives are:

- 1. Connect a new incinerator for the H-C plant with the existing incinerator in PVC with a new pipeline as provided by item PVC 5. Also, include surge capacity to allow each incinerator to spare the other during periods of downtime of either unit.
- 2. Install two new incinerators in the H-C plant with a pipeline connection from PVC.
- 3. Replace the existing PVC incinerator with a larger unit in addition to the installation of a new incinerator in the H-C plant. Also connect the two with a pipeline as provided by item PVC 5.
- 4. Install a new incinerator in the H-C plant. Also, install the pipeline provided by item PVC 5. Use the existing flares as a back-up.

In the event that continued production of VCL in the HC plant is not realistic, then the alternative for a back-up for the PVC plant incineration becomes:

- 5. Use an existing Hortonsphere North of the PVC plant for vent gas storage during incinerator shutdowns.
- 6. Install an identical spare incinerator near the present VCL incinerators for PVC.

DISCUSSION OF ALTERNATIVES:

Alternate No. 1

Location and capacity of a new incinerator for the H-C plant:

The incinerator should be located in a general purpose area near existing vent piping to minimize the tie-in expense. Accessibility for maintenance and remoteness from

*The preliminary estimate of \$190M for the pipeline was upgraded to \$167M.

Alternate No. 1 (cont'd)

the operating area should also be criteria for selection of a site. The area just south of the No. 4 flare meets all these conditions.

The capacity of the unit should be such, that the sum of the peak capacity from the H-C plant and the normal capacity from the VCL incinerator for PVC can be handled. Only the normal capacity of the PVC incinerator would be required in addition to the H-C capacity because peak surges from PVC vents would be stored in one of the EtCl Hortospheres located just north of PVC (additional piping would be required to connect the Hortosphere with the VCL incinerator for PVC supply piping). During shutdowns of the new H-C incinerator, the normal flow of vent gasses would be piped to the Hortosphere for storage before being fed to the VCL incinerator for PVC.

Vent gas from the PVC plant is introduced to the system at 50 - 55 PSIG from the VCL recovery compressors. This pressure is reduced to $\frac{1}{2}$ PSIG for feed into the VCL incinerator for PVC. This vent gas could be routed from the VCL recovery area to the surge tank at 50 - 55 PSIG by by-passing the pressure reducing valve in the transfer line.

Vent gasses from the H-C plant are released by a number of storage tanks containing several chemicals (VCL, EtCl, MeCl, etc.). These are released at their respective vapor pressures to a vent header that operates at flare pressure. A component to make up the pressure differential between the 50 - 55 PSIG of gasses entering the surge tank from the PVC vents and the "total pressure" of the gasses from the H-C vents would be required. This component would be a compressor sized to handle the normal flow of the mixture of gasses in the vent header.

This system would be controlled by the economics for an estimated 48 hours of total storage time available in the Hortosphere.

Alternate No. 2

In the event that surge capacity cannot be established (which is essential for Alternate No. 1), then Alternate No. 2 would be required to provide a back-up for both the VCL incinerator for PVC and the primary H-C incinerator. The piping connection from the VCL incinerator for PVC to the incinerator to be located south of the No. 4 flare would be required for this alternate. Location of this second H-C incinerator should be adjacent to the No. 1 flare per the same logic used to locate the primary H-C incinerator.

Alternate No. 3

Replace the existing VCL incinerator for PVC with a unit sized to handle loads from PVC and the H-C plant in the event the H-C incinerator (Alt. No. 1) shuts down. A single new H-C incinerator would be installed and connected to the PVC unit by the PVC 5 pipeline. No compressor or surge capacity would be required because

Alternate No. 3 (cont'd)

vent gasses from the H-C plant could be reduced to incinerator pressure from the H-C vent's total pressure.

This alternate would be essentially the same as Alternate No. 2, with some cost advantage due to the existing reusable facilities at the VCL incinerator for PVC.

Alternate No. 4

Install a single vent gas incinerator in the H-C plant and connecting pipeline as in Alternate No. 1, but without storage capacity. Back-up to the system would be provided by the existing H-C plant flares.

To justify this work, Ethyl would first have to demonstrate that the H-C plant flares consistently reduce the concentration of VCL in the flare exhaust to less than 10 ppm to the satisfaction of EPA. The EPA would then have to reverse their denial of Ethyl's equivalency request for use of the flares.

Selection of this alternative involves a risk in that EPA may still deny our future requests to use the flares.

Alternate No. 5

Install a pipeline linking the VCL incinerator for PVC to the Hortonsphere mentioned in Alternate No. 1. During a shutdown of the VCL incinerator for PVC vent gasses would be routed to the Hortonsphere for storage. A knockout drum, pump, and liquid return line would be required in the line leading to the Hortonsphere to collect condensed VCL and return it to storage. Upon completion of repairs to the incinerator, the stored vent gasses would be metered into the incinerator supply line along with the normal vent flow.

Alternate No. 6

The backup VCL incinerator for PVC should be identical to the existing incinerator and should be located adjacent to it.

Timing:

Obtaining compliance with the EPA regulations by October 21, 1978 by any of the alternatives discussed is impossible. A letter outlining our plan to achieve compliance will have to state that our failure to achieve compliance by October 21, 1978 was caused by EPA's delay in answering our equivalency request. In the meantime, Ethyl will have to ask for, and obtain, immunity from legal action to allow operation of our vent disposal system until facilities provided by our compliance program are in effect.

D. V. Melville

/ssd

TITLE

PROGRAM NO.

hydrocarbon

Incineration Hydrocarbon Vents

PROJECT NO.

R-3323

1. DESCRIPTION OF PROPOSED WORK AND 2. REASON FOR EXPENDITURE

1. The Louisiana Air Control Commission has announced plans to issue revised rules on the discharge of carbons and halogenated hydrocarbons in late-1977. The preliminary draft of these proposed regulations indicates that it will probably be necessary to incinerate and scrub most of the material presently flared or discharged to the atmosphere. We anticipate being granted an exemption on the No. 2 EDC Oxygenation Reactor vent. The project will provide facilities to collect, incinerate, and scrub gaseous and liquid waste streams from the Hydrocarbon Area. Appropriations for this project will be required by 1978 if the present LACC Timetable is followed.

2. Justification is pollution abatement.

Budget estimate is based on very preliminary scope and assumptions. A carbon steel piping system would collect six vent gas sources (residue gas tower, MeCl process vent, VCI tank car loading, No. 1 EDC vent backup, No. 2 EDC vent back-up, and vent back-up to the existing VCI incinerator), and discharge to a vent incinerator located adjacent Polymer Hydrolysis Unit (Bldg. 1907). The H/C incinerator is tentatively sized at 3285 lbs/hr vent gas, and was assumed to be similar to the existing 780 lbs/hr VCI incinerator (w/ Hastelloy shell), water scrubber and caustic scrubber installed in 1975.

Justification Code: 8Product Code: D, E, F, G, J, L

(If additional space required, attach plain 8 1/2 x 11" sheets)

PROPOSED BY (SIGNATURE NOT REQUIRED)

D. E. Park

AREA ENGR.

R. G. Stirling/T. J. Callender

DATE

4/18

	SA. HI-SPOT ESTIMATE	3 I.R. ESTIMATE		7 I.R. APPROVAL	DATE
		ESTIMATED	ACTUAL		
INVEST	\$ 1,100,000	\$	\$		DATE
OPERS	-0-				DATE
TOTAL	\$ 1,100,000	\$	\$		DATE
GROSS WRITE OFF	\$ -0-	\$	\$		
NET WRITE OFF	\$ -0-	\$	\$		
EST. BY	EST. BY				
E.G. Wilbourn	R.S. Robison		5/18/77		

4. BUDGET STATEMENT

PROJ. COORD

DATE

5. ECONOMIC ANALYSIS

☐

NOT REQUIRED

☐

PREPARED AND ATTACHED

AREA ENGR. OR HEAD ECON. EVAL.

DATE

6. APPROVAL REQUESTED

SUPT.

DATE

DEFINITIVE ENGINEERING RECOMMENDED

S.E. MGR.

DATE

7B. DEFINITIVE ENGINEERING

☐

APPROVED

☐

DISAPPROVED

REMARKS

COPY FOR

PLT. MGR. (FOR PROJ. COMM.)

DATE