CHEMICALS

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TO See Distribution Below

DATE May 31, 1977

FROM VDCM Containment Task Force

SUBJECT VDCM Containment

Reference: VDC Emission Control
Project P-749

This report concludes the original phase of the VDCM study performed by the VDCM containment task force group. The attached VDC Emissions list outlines the areas of concern; and, where possible, we have proposed a suitable solution. Our guideline was a memo from I. C. Klimas to J. R. Farst written on March 25, 1977. Since some of the items in the proposed guildline needed clarification, a conversation was held between John Clapperton, Zeb Bell, Phil Snyder and Bob Lynch. As a result of this conversation, Zeb was to institute some modifications to the proposed guidelines. This report completes the work of the committee with the exception of a couple of items where further definition of actions is required to complete ideas proposed. T. Miller and D. Savoy are giving some time to these items.

Checking has shown that the exposure level above water containing VDC is very low; so water streams were routed to the Plant "B" steam stripper rather than develop other steam strippers in the areas. (Rerouting has already been done by sewer segregation.)

The MC section has been included in the scope of work as it may run up to one year after the startup of Tri-Ethane. If the section is shut down, this work can be deleted.

The major problem encountered is an effective system to remove the VDC. Because of polymerization and peroxide formation, a line to the incinerator is impractical. A system to absorb or remove VDC must be designed for continuous or normal vents. Purging of equipment for maintenance may be done by using large amounts of nitrogen and thoroughly sweeping the lines to an incinerator.

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SL 084860

VDC EMISSIONS

P-746

SL 084861

VDC EMISSIONS

I. MC-VDCM PLANT

A. LEAK DETECTION SYSTEM

This system will use gas chromatography to analyze air samples and send a related signal to a mini-computer which will interpret this signal to a corresponding 'ppm'. This computer will also tabulate the data in the necessary forms required to better control leaks and emissions. An exact number of points and gas chromatographs have not been determined at this time. Areas where this system will be implemented are:

1. VDC
2. VDCM
3. MCA
4. MC
5. P/T Acid Pit
6. Storage and Loading Facilities

B. PUMP SEAL REPLACEMENT

The following pumps have either packing or a single mechanical seal which will be replaced with double seals. They will either be pressurized with water or a low pressure barrier fluid will be used between the seals. When the low pressure barrier fluid is used, the vent will be routed to the vent control system.

1. VDC Plant
    a. VDC Still Bottoms Pumps (2)
    b. VDC Reflux Pumps (2)
    c. VDC Product Pumps (2)
    d. VDC Vaporizer Feed Pumps (2)
    e. VDC DH Still Reflux Pumps (2)

2. MC Plant

   a. VDC Vaporizer Recirculation Pump (1)

   b. MC Reactor Recirculation Pumps (3)

   c. Stripper Feed Pumps (2)

3. MCA Plant

   a. DH Vent Recovery Transfer Pumps (2)

4. VDCM Plant

   a. VDCM Still Reboiler Pump (1)

   b. VDCM Still Reflux Pump (1)

   c. VDCM Product Transfer Pumps (2)

   d. VDCM Loading Pump (1)

   e. VDCM Reactor Feed Pump (1) - Feeds Still

C. VALVE REPLACEMENT

There are some valves and control valves which will need replacing, but at this time they have not been identified. A complete study of the plant valves will be made in the near future.

D. VENT CONTROL SYSTEM

There are several vent streams which make up the Tri-Ethane plant vent which must be routed to a VDC recovery or destruction system. This system has not been defined at this time but is currently being investigated. The vents which will be included are:

1. VDC Plant

   a. VDC Secondary Condenser/VDC Phase Separator

   b. VDC Storage Tanks (2)

   c. HQMME Storage Tank

2. VDCM Plant

   a. VDCM Still Condenser/Reflux Tank

   b. VDCM Day Tanks (2)

3. MCA Plant

   a. MCA Reactor Condenser

4. MC Plant

   a. Vent Condenser

      (1) MC Reactor

      (2) Flasher Condenser

      (3) Flasher Accumulator

E. WASTE WATER CONTROL

Listed below are the VDC bearing waste streams. Most of these are being routed to the Area "B" stripper. There are no plans for waste water treatment within the VDC-MC plant.

1. VDC Plant

   a. VDC Reactor Bottoms to Sewer or Steam Stripper

   b. VDC Still Bottoms to P/T Acid Pit

   c. VDC Phase Separator to Steam Stripper

   d. DH Still Phase Separator to Steam Stripper

   e. Vent Scrubber Bottoms to Steam Stripper

   f. VDC Process Area Sump to Steam Stripper

2. VDCM Plant

   a. Dryer Purge to Sewer

3. MCA Plant

   a. MCA Phase Separator to Steam Stripper

4. MC Plant

   None

F. SHIPPING FACILITIES

VDC is presently being drummed at the Natrium Plant, but with the VDC regulation, these facilities should be located in Lake Charles. At this time, a decision has not been made to consider these facilities as part of the VDC emissions program. Lake Charles has tentatively investigated these facilities and determined that a new building or a separate enclosure inside the existing building would be required to handle this Class 1A flammable liquid. Major modifications would be required in the existing building such as heaters, lighting, transformers and conduit. New items required would be a closed system for drumming, a sprinkler system and adequate ventilation.

The existing areas which will require major modifications are:

1. Tank Truck Loading

2. Tank Car Loading

3. Loading and Purging Vents

G. RUPTURE DISCS AND SRV's

Some of the vessels in these plants have only a rupture disc or only a safety relief valve. They will be modified to contain a rupture disc, a spool piece with a gauge and bleed and an SRV.

1. VDC Plant

   a. DH Phase Separator

   b. VDC Reactor

   c. VDC Still

   d. VDC Phase Separator

e. DH Still

f. Product Storage Tanks (2)

g. HQMME Storage Tanks (2)

2. VDCM Plant

a. VDCM Still

b. VDCM Reflux Tank

c. VDCM Dryers

d. Day Tanks (2)

e. Shipping Tanks (3)

3. MCA Plant

a. MCA Reactor

b. Phase Separator

c. Day Tanks

d. Reactor Dump Tank

4. MC Plant

a. VDC Vaporizer

b. MC Reactor

c. Flasher

d. Flasher Accumulator

e. Stripper

f. Stripper Feed Dryers

H. BREATHING AIR SYSTEM

Breathing air outlets will be piped throughout the VDC, VDCM, MCA and MC plants, which will be supplied by compressed air bottles. Auxiliary equipment required will be full face breathing air masks, hoses and storage cabinets in the control room for the above.

I. HQMME ADDITION FACILITIES

The present system is a mixture of VDC and HQMME, which is an open system batch process. A new HQMME addition system will be devised and implemented.

J. VESSEL AND EQUIPMENT PURGING

Some vessels and equipment are not designed for purging to a closed system. They must be modified to purge into a new header which will be routed to the incinerators. The following must be modified:

1. VDC Plant
    a. VDC Retention Tank
    b. DH Still Reboilers
    c. Pumps
2. VDCM Plant
    a. VDCM Still Reboilers
    b. VDCM Dryers
    c. Shipping Tank Filters
    d. Pumps
3. MCA Plant
    a. Pumps
4. MC Plant
    a. VDC Vaporizer Feed Filters

b. VDC Vaporizer

c. Stripper Feed Dryers

d. Stripper Feed Filters

e. Pumps

K. DRYER REGENERATION

The VDC dryers are designed to purge to the VDC still primary condenser. The line is usually plugged, and regeneration steam now goes to the sewer and atmosphere. The regeneration process of these dryers must be investigated and a revised or new procedure developed.

L. MISCELLANEOUS AUXILIARY EQUIPMENT

1. Sight Glasses

2. Float Chambers

3. Rotometers

These must be cleared occasionally due to polymerization.

4. Agitator Packing - Fugitive Emission

a. Dopp Kettles

b. Flasher

M. SAMPLING SYSTEM

Samples are presently being caught in open bottles. A closed sampling system will be investigated, and if satisfactory, it will be implemented.

II. PER-TRI PLANT

A. DH CONDENSATE TO TETRA

1. Pumps

a. Provide provisions to purge and clear.

2. Valves

a. Replace necessary valves.

B. DH VENT

1. This presently goes to the incinerators.

C. ACID PIT

This is a potential area for personnel over exposures. Recent area monitoring around the acid pit has shown VDC concentrations <1 ppm.

D. TRI AND TOPPING STILL CONDENSER VENT

These presently go to three small open scrubbers, but a work order has been written to route these streams to the heavies still scrubber. This is a large open scrubber; therefore, will require more analysis.

E. TRI STILL REFLUX DRYER AND DH CONDENSATE DRYERS

These dryers have shown high as well as low personnel exposures. They must be investigated for both purging and clearing procedures prior to opening to the atmosphere. Personnel monitoring will continue to be performed.

III. OHC/TETRA

A. DH VENT

This presently goes to the incinerator.

B. DRYERS

Provisions for purging and clearing will be required.