

VCM GENERAL TRAINING GUIDE

WHO: All employees who work in the VCM Regulated Area

WHEN: At the employees' initial training and annually thereafter

I. Nature of Health and Safety Hazards

A. Chronic Exposure Hazard

1. B.F. Goodrich, Firestone, and Goodyear reported several deaths of VCM workers in the early 1970's from a rare liver cancer (angiosarcoma).
2. Tests with rats exposed to 250 ppm VCM chronically did develop angiosarcoma.
3. In 1975 OSHA established a permanent standard for VCM exposure of 1.0 ppm for an 8-hour time weighted average. A ceiling exposure of 5 ppm for 15 minutes was also established.

B. Acute Exposure Hazard

1. High concentrations act as an anesthetic and drowsiness and unconsciousness may occur. Remove the victim to uncontaminated atmosphere as soon as possible and obtain medical help.
2. Liquid VCM on the skin can cause freeze burns and be absorbed through the skin. Obtain medical help.

C. Safety Hazard

1. VCM is highly flammable with a flash point of -78°C . Flammability limits are between 3.6% VCM to 33% VCM in air. To fight a fire, valve off source and allow to burn out.
2. VCM will totally vaporize at ambient temperatures. It exists at high pressure in lines and vessels. Foam can be used to decrease vaporization and water spray to disperse cloud.

II. Applicable VCM Regulations

- A. OSHA 1910.1017 (Personnel protection)
- B. EPA National Emission Standard for Vinyl Chloride Subpart F 61.60 (Control emissions)
- C. Louisiana DEQ Emission Standard for Vinyl Chloride 77.0 (Control emissions)

III. Personnel Protection

- A. To target the area where VCM exposure could be most likely. A VCM regulated area was established and access limited to authorized personnel with a need to enter the area. Map is attached. Records must be kept of the time spent by each person in the regulated area. Safety Policy #25 established this area.
- B. Respiratory Protection
 - 1. To afford protection against the cancer hazard due to chronic exposure, the following limits were set:
 - (a) 0.5 ppm - action level above which engineering efforts must be made to decrease the emissions.
 - (b) 1 ppm - 8-hour time weighted average
 - (c) 5 ppm - 15 minute ceiling concentration
 - 2. The following types of respiratory protection must be used:
 - (a) 5 ppm or above - full face mask with VCM cannister
 - (b) 25 ppm or above - self contained breathing apparatus with supplied air
 - (c) Note that the Comfo II respirator is not approved for VCM exposure. See Safety Policy #16.
- C. Area and Personnel Monitoring
 - 1. To check the effectiveness of emissions control and requirements for respiratory protection periodic personnel monitoring must be done. FPC does this by placing the little VCM specific tabs on personnel for eight hours. Anyone found to be over the 1 ppm limit triggers an investigation as to the cause and a letter must be sent to the person and placed in his personnel file as to cause and correction.
 - 2. To help control emissions, there is a requirement for VCM specific area monitors. The VCM has two monitors with 10 points each. These points are located in area where VCM leaks may occur and at the perimeter of the regulated area to help locate leaks. The monitors print out in the VCM control room with alarms at 5 and 10 ppm.
- D. Medical Surveillance

To monitor the health effects of VCM exposure, there is a requirement for annual physical examination and blood test for personnel working with VCM less than 10 years and semiannual for 10 years and over. These records must be kept 20 years. Anyone found not suitable can be banned from VCM areas.

- E. Specific nature of operations that could lead to VCM exposure
 - 1. Doing maintenance on VCM containing vessel or line after the line or vessel has been vented or purged to the required 2% or less.
 - 2. Drilling reboilers from the residue left in the tubes.
 - 3. From the solids in the quench pump strainers etc.
 - 4. From leaks.
- F. Emergency Procedures (See attached sheet)

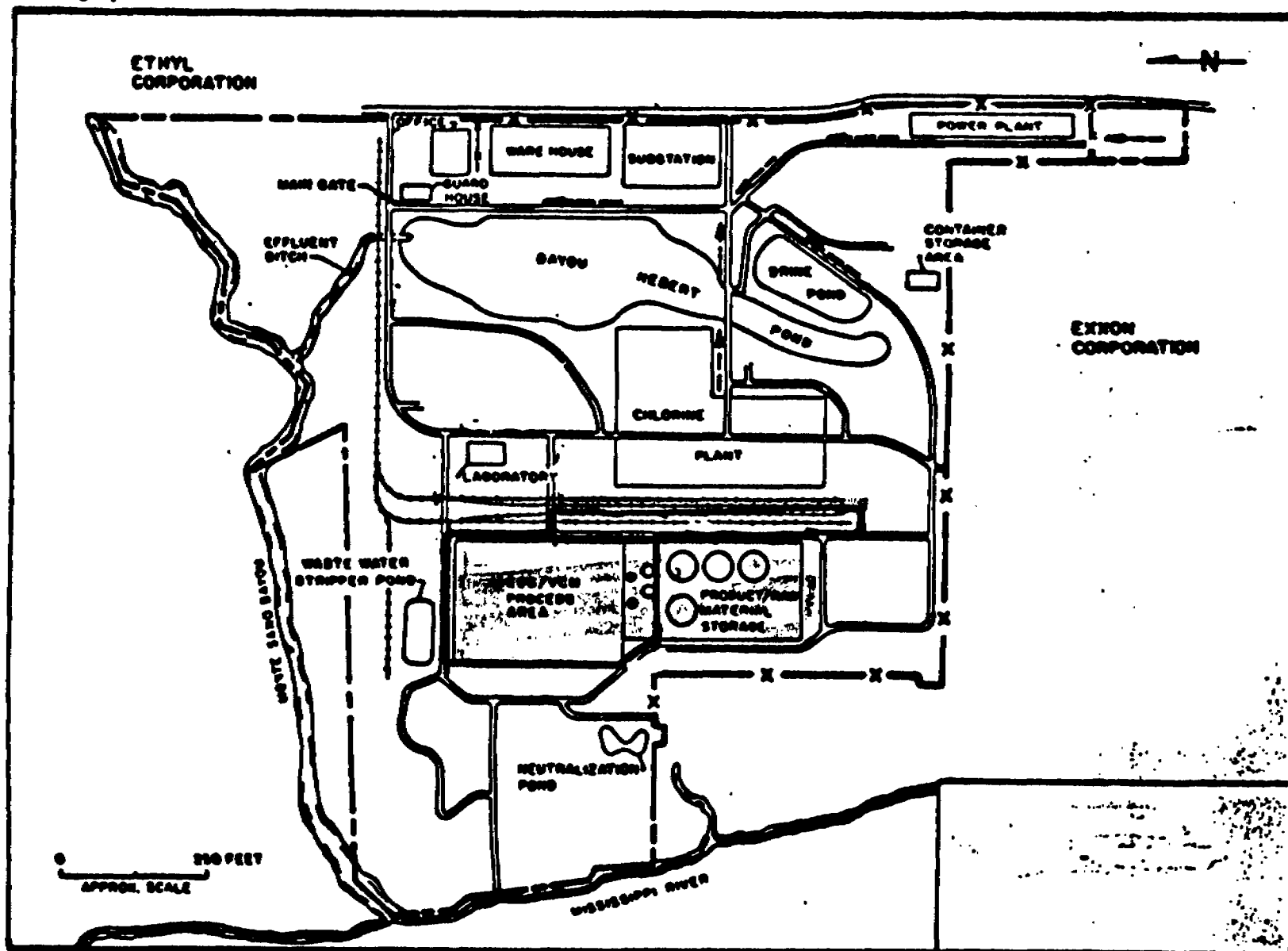
IV. Summary of VCM Emission Regulations

- A. Any vent stream containing over 10 ppm of VCM must be sent to a control device.
- B. Any vessel or line having a volume of 25 gallons or 3.34 ft³ must be vented and purged to less than 2% VCM before opening to the atmosphere for any reason.
- C. There shall be no relief valve discharge except nature diasters and other reasons that cannot be avoided by taking preventive measures (electrical outages, operator error, valves leaking through, most equipment failure, etc. are not acceptable reasons).
- D. The vent from the Oxy reactor is limited to 0.02 LB. VCM/100 LB. of EDC produced in Oxy.
- E. There shall not be any manual venting of VCM.
- F. Pumps in VCM service must be seal-less or have double mechanical seals with the space between seals conducted to a control device.
- G. A weekly leak detection survey must be made.
- H. A VCM area monitoring system must be set up and daily span and calibration done.

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EMERGENCY PROCEDURE

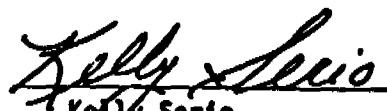
VCM RELEASE

1. Check wind direction.
2. Alert Patrol and trip warning system.
 - a. If wind from southwest, west or northwest, have Patrol advise Cell Assembly, Caustic-Chlorine and Powerhouse North to extinguish all flames and spark producing devices.
 - b. If wind is from southeast or east and VCM is drifting toward cracking furnaces or incinerator:
 - 1) Have Guard block off entry and exit roads using any material available - safety tape, empty drums, etc.
 - 2) If danger of ignition is imminent, shut down and cool furnace with steam snuff and check for other ignition sources.
 - 3) Trip incinerator line and leave blower running.
 - c. If a vapor cloud is travelling toward Kaiser and exposure to a heavy cloud concentration is imminent, have Patrol notify them of danger and advise extinguishing all ignition sources.
 - d. If wind is from north or northeast, notify Docks to eliminate all ignition sources.
3. NOTIFY ALL PERSONNEL NOT REQUIRED FOR CONTINUED PLANT OPERATION AND/OR CONTAINMENT OF LEAK TO EVACUATE AFFECTED AREA.
4. Put on respiratory protection according to following:

<u>Expected VCM Concentration</u>	<u>Required Apparatus</u>
(1) Not over 1.0 ppm	Chemical cartridge respirator with organic vapor cartridge.
(2) Not over 25 ppm	Gas mask, full face piece with acid gas, organic vapor cannister.
(3) Greater than 25 ppm	Self-contained type air pack with full face piece.
5. Put on protective clothing if danger of liquid or heavy vapor contact to skin exists.

Required Clothing:

 - (1) Full hood.
 - (2) Rubber rainsuit.
 - (3) Rubber boots and gloves.
6. Make every effort, CONSISTENT WITH SAFETY, to shut off the source of the release.
7. Use water spray to help disperse heavy vapor clouds and melt accumulations of frozen VCM and water.
8. Notify VCM Superintendent.
9. When situation is corrected, alert Patrol to give "All Clear."


Kelly Serio

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