

Vista Chemical Company
Olefins & Vinyl Division

Highway 25
Post Office Box 91

Aberdeen, Mississippi 39730-0091
Phone (601) 369-8111

**ABERDEEN CHEMICAL PLANT SAFETY AND HEALTH MANUAL
ABERDEEN, MISSISSIPPI**

SUBJECT: VCM EXPOSURE MINIMIZATION PROGRAM

EFFECTIVE DATE: December 1, 1993

REVIEWED BY: *Ch. M. Pearson* **SAFETY DIRECTOR**

APPROVED BY: *Pat Seymour* **PLANT MANAGER**

VISTA

A. REFERENCE

CFR 1910.1017 - Vinyl Chloride

B. PURPOSE

Establish and administer a program for minimizing employee exposure to vinyl chloride monomer.

C. PROGRAM ELEMENTS

1. Personnel Monitoring

Conduct a personnel monitoring program that will provide VCM exposure data for individuals and/or job positions. Maintain records of the program. Report exposures exceeding the permissible exposure limit to affected employees in writing.

2. Maintain a fixed point, continuous monitoring system in areas of the plant where VCM concentrations may occasionally exceed the permissible exposure limit.

3. Regulated Areas

Establish regulated areas where vinyl chloride monomer concentrations exceed the permissible exposure limit and restrict access to those areas to people having a need to go there because of their work.

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Page=1

C. PROGRAM ELEMENTS - continued**4. Engineering and Work Practice Controls**

Control employee exposure to vinyl chloride monomer at or below the permissible exposure limit with engineering, work practices, and personal protective equipment controls.

5. Respiratory Protection

Provide respiratory protective equipment, and training in the use of such equipment, to employees who might be required to work in areas where vinyl chloride monomer concentrations exceed the permissible exposure limit.

6. Emergency Procedures

Establish and maintain a set of emergency procedures that detail the steps to be taken by employees to control and/or correct emergency situations involving vinyl chloride monomer and how and when to evacuate the endangered area(s) when they are not equipped, trained, or otherwise unprepared to safely handle such occurrences.

7. Training

Provide training for each employee relating to the hazards of vinyl chloride monomer and the precautions to be taken for its safe handling, storage, and use.

8. Medical Surveillance

Provide a medical surveillance program to all plant employees and maintain records of the program.

9. Warning Signs and Labels

Provide warning signs and labels for areas in which employees or other personnel may encounter exposures to vinyl chloride monomer above the permissible exposure limit.

D. PERSONNEL MONITORING PROGRAM

The plant conducts an ongoing personnel monitoring program for all employees whose work has the potential for exposure to vinyl chloride monomer in excess of the permissible exposure limit. In general, all job classifications within the Maintenance and Vinyl Departments are monitored once each month, and in most cases, involves most of the people in each such classification. Other jobs are monitored less frequently and as need arises.

The monitoring system equipment consists of a "Minimonitor", a diffusion membrane-type, passive monitor marketed by REAL, Inc. Samples are collected in the breathing zone for the duration of the worker's actual work period. Subsequent analysis of each sample is performed with a "headspace analyzer" in the plant laboratory.

Monitoring records are maintained according to the requirements of CFR 1910.1017 (m).

E. CONTINUOUS, FIXED POINT, AREA MONITORING

The fixed point monitoring system consists of four gas chromatograph analyzers and 40 remote sensor collecting heads. The electronic signals from three of the analyzers are sent to the Vinyl Department's "Distributed Control System" where they are interpreted by a MOD 300 computer. Levels above safe limits cause alarms to sound in the control room. When this occurs, operators in the control room instruct people in the endangered area(s) to leave the area, using radios and public address systems.

All data collected by the Distributed Control System is temporarily stored on a hard disk drive. When allocated storage space has been filled, the system automatically transfers the data to archival tapes.

Signals from the fourth chromatograph are interpreted and recorded on a stripchart recorder located in the Q.C. Laboratory. These strip charts are retained for archival purposes, along with a logsheet of data which the Q.C. Technicians are required to record each hour.

The locations of all of the forty sampling locations noted above appear in Appendix I.

F. REGULATED AREAS

Since no area of the plant has vinyl chloride monomer concentrations above the permissible exposure limit, there are no longer any regulated areas, as defined by CFR 1910.1017 (e), identified and recognized as such in the plant. However, several of the areas of the plant formerly so designated continue to be regarded as controlled access areas. In addition, employees may be required to wear respiratory protection while performing certain tasks in these areas.

G. ENGINEERING AND WORK PRACTICE CONTROLS

A written plan to reduce vinyl chloride monomer exposures to at or below the permissible exposure limit, or to the greatest extent feasible, solely by means of engineering and work practice controls has been prepared and is updated every six months. A copy of the last such update is attached (see Appendix II).

H. RESPIRATORY PROTECTION

Respiratory protective equipment is provided to employees who may be required to perform work in concentrations of one part per million of vinyl chloride monomer or more. Such employees are also provided annual training in the proper selection, maintenance, and use of the equipment. The plant maintains a written respiratory protection program which is a part of the Safety and Health Manual. This program requires, in part, that workers must wear appropriate respiratory protective equipment while opening equipment that contains, or has contained, VCM until monitoring of the area shows that VCM concentrations are below the permissible exposure limit.

I. EMERGENCY PROCEDURES

The plant maintains a written emergency plan which includes procedures for handling VCM emergencies. The plan is reviewed and updated, as needed. Employees receive annual training on the contents of the plan, which is routinely tested via monthly drills conducted by a team established for the purpose.

J. TRAINING

All employees are provided training relating to the hazards of vinyl chloride monomer and its safe storage, handling, and use, as required by the training provisions of the OSHA vinyl chloride monomer regulation, CFR 1910.1017(j). Employees receive this training during their initial plant orientation and annually thereafter.

K. MEDICAL SURVEILLANCE

A comprehensive medical surveillance and health screening program is provided to all employees. The program meets, and in some cases exceeds, the minimum requirements of CFR 1910.1017 (k).

Examinations are provided every six months to employees who have been employed in vinyl chloride or polyvinyl chloride manufacturing for ten years or more and annually for all other employees.

Each employee exposed to VCM during an emergency release of VCM is offered appropriate medical surveillance at the time of occurrence.

Medical records associated with this surveillance program are maintained by the Vista Medical Department in accordance with the provisions of CFR 1910.1017 (m).

L. WARNING SIGNS AND LABELS

1. Regulated Areas

Since the plant has no regulated areas, as strictly defined by CFR 1910.1017, posting per that regulation is not required. However, warning signs are maintained in most of the areas formerly classified as regulated areas as a matter of good practice.

2. PVC Containers, including PVC Wastes

Since the amount of residual VCM in PVC made at the plant is typically below the action level of 0.5 parts per million of vinyl chloride, containers of PVC are not labeled with the hazard warning prescribed in CFR 191.1017.

L. WARNING SIGNS AND LABELS - continued

3. VCM Containers

VCM containers, including gas cylinders and railcars, are labeled in accordance with the provisions of the OSHA vinyl chloride regulation, CFR 1910.1017 (1) (5). Processing and storage vessels are labeled in accordance with the OSHA hazard communication regulation, CFR 1910.1200.

A P P E N D I X I

ABERDEEN PLANT HONEYWELL CONTINUOUS MONITOR SAMPLING POINTS

VCM TANK FARM CHROMATOGRAPH

1. VCM railcar unloading compressor shed
2. N VCM railcar unloading station
3. N Mid VCM railcar unloading station
4. S Mid VCM railcar unloading station
5. S VCM railcar unloading station
6. VCM storage sphere
7. Emission recovery system, upstairs
8. Emission recovery system, downstairs
9. No. 6 dryer blend tanks
10. Vinyl control room

OLD MODULE CHROMATOGRAPH

1. FVCM receiver
2. North RVCN receiver
3. Large recovery system, downstairs
4. Large recovery system, upstairs
5. Reactor dump Sweco
6. Bottom of D300 reactor
7. Top of D400 reactor
8. Bottom of D500 reactor
9. Top of D600 reactor
10. Bottom of D700 reactor

NEW MODULE CHROMATOGRAPH

1. Bottom of 741 reactor
2. Top of 742 reactor
3. Bottom of 743 reactor
4. Top of 744 reactor
5. Bottom of 745 reactor
6. Reactor dump Sweco
7. Recovery System, downstairs
8. Middle VCM receiver
9. Blowdown tank
10. Recovery system, upstairs

LAB CHROMATOGRAPH

1. Guard House
2. Maintenance shop
3. No. 1 Dryer blend tanks
4. Q.C. Lab
5. G.C. Lab
6. South of Plasticizer building
7. Compound Line I
8. D700 dump Sweco
9. 745 dump Sweco
10. Plant breathing air

APPENDIX II

Engineering and Work Practice Control Plan
Vista Polymers
Aberdeen PVC Plant
September 1993

- A- Work Practice Controls
- B- Uncompleted or Recently Completed Engineering Controls

1. Railcar Unloading

A) Fresh air respirators are required by the plant when connecting or disconnecting railcar unloading hoses due to the potential for employee exposure. Valves have been installed on the end of the railcar unloading hoses to reduce the volume of VCM released when the unloading hoses are disconnected. The unloading compressor shed area is posted as a regulated VCM area. Fresh air respirators are required when working in the shed.

B) A project to reduce potential for emissions from VCM unloading compressor was completed in October 1993. The project includes an eductor system to minimize back pressure on the distance piece vent which will thereby reduce emissions which occur from packing leaks.

2. Polymerization Reactors

A) Steam stripping of the reactor slurry has greatly reduced emissions from this source. Tests show that the total VCM content of the reactor is less than 420 pounds of VCM per million pounds of PVC produced.

B)

3. Chem Wash Screener

A) This source was eliminated in September, 1990.

B)

4. Dump Screener

A) Improved steam stripping has greatly reduced VCM emissions from this source. Existing emissions are removed from the work area by an exhaust system. This system is not a significant source of VCM exposure.

B)

5. Blend Tanks

A) VCM emissions from this source are routed above the dryer roof structure and blend tanks resulting in an insignificant exposure potential to employees. The blend tanks are posted and employees are required to wear breathing air when working above the blend tanks. No regular job requirement places employees at this site. Exposure potential is very low.

B)

6. Dryer Operation

A) Air stripping in the blend tanks reduces the VCM content of the slurry to below 10 ppm. This action has eliminated the potential for significant exposure to employees from drying operations.

B)

7. Water Discharges

A) Vapor vents from equipment in VCM service are routed to the waste water strippers. The strippers reduce the VCM content of the water to below 10 ppm. The waste water is then sent to the blend tanks or the cooling towers to be air stripped before discharge to Pond 1. The resulting discharge does not represent a significant exposure potential.

B)

8. Incinerator Vent

A) Vapor vents from equipment in VCM service are routed to the plant's incinerator which reduces the VCM content below 10 ppm. The resulting vent does not represent a significant exposure potential.

B)

9. Rotating Pumps, Compressors, and Agitators

A) All units in VCM service are equipped with tandem mechanical seals greatly reducing the potential of VCM exposure.

B)

10. Relief Valves

A) All relief valves that have the potential of discharging VCM to the atmosphere are equipped with rupture discs to eliminate leakage through the relief valve.

B)

11. Equipment Maintenance

A) Procedures have been established to clear equipment through the recovery system to reduce VCM emissions from equipment opening. Fresh air is required to prevent exposure when equipment is first opened and until the VCM level has been determined to be below the exposure limit.

B)

12. Fugitive Emissions

A) Leaks are detected and repaired through the plant's leak detection programs. These programs consist of leak patrols and fixed point monitors. In addition, bleed valves are checked quarterly and have been either plugged or capped.

B)

13. Personnel Monitoring

A) Personnel monitoring is conducted each month. The frequency of monitoring each individual depends upon the employee's exposure history and job classification.

B)