



CALVERT CITY PLANT
INTEROFFICE MEMORANDUM

To: B. D. Helms

Date: 18 January 1980

From: R. W. McGinnis

Copies: A. F. Cantor
R. C. Lietzau

Re: PVC Procedures - Hygiene

Recently prepared Safe Work Practices (SWPs) for PVC and their Emergency Procedures were examined for adequacy on meeting VCM hygiene requirements. A number of deficiencies were observed and are noted on the marked up attached sheets. I have not tried to reconcile the discrepancies, and my comments should be taken only as an indication that the area needs to be examined, as a number of my comments were made in early stages of familiarization before the mosaic had crystallized into a definitive form.

R. W. McGinnis

AP00031883

MAJOR VINYL CHLORIDE RELEASE

Should a major VCl leak occur, i.e., flange, broken line or sight glass, blown manway gasket, etc., every attempt to stop the leak should be made as soon as possible. Follow the emergency procedure given below:

1. Sound the VCM spill alarm. Switches to activate this alarm will be plainly marked in the various areas.
2. Notify the foreman and all personnel in the area that there is a bad VCM leak. Air masks will be put on by all personnel in the area.
3. The following items should be done simultaneously:
 - a. All persons not required for the emergency should go to a safe area. This includes maintenance, construction, engineering, vendors, etc. All non-process equipment (welding machines, cars, trucks, etc.) will be shut down. The decision to leave the building will be made by the supervisor, or in his absence, the senior floor operator.
 - b. Advise the boiler operator, at Escambia or the Safety Officer at Calvert City, who will notify personnel in the other operating areas.
 - c. Barricade all the roads around the PVC Plant.
 - d. Turn on the light at PVOH and Emulsions to notify them of a VCM spill.
 - e. Call the boiler at 274-275 for emergency whistle.
4. Every attempt should be made to stop the leak as soon as possible. Proper respiratory (Appendix A) and protective equipment (Appendix B) should be worn. Refer to these sections for detailed instructions. *what is VCM release code?*
5. Do not enter a fogged area where visibility is limited or where the concentration of VCM is unknown unless it is for the purpose of saving a life.
6. Do not connect or disconnect extension cords, or drop tools or metal objects that could cause a spark.
7. When a deluge system is not present or working, hose down the spill with large amounts of water. Isolate the spill such that waste treatment will not be slugged with a large quantity of VCM.

8. All ventilating fans should be running. Turn off all lights in vicinity of leak, if possible, to minimize chance of ignition.
9. After the leak has been secured, the area should be "sniffed" with the portable hydrocarbon detector (HNU meter) to determine if there is any VCM still in the area.
10. After the area is clear, the VCM spill alarm should be shut off. PVCH and Emulsions should be notified that the emergency is over. Also, the Safety Officer should be notified that the emergency is over.
11. Everyone exposed to VCM concentrations greater than 5 PPM should be taken to First Aid for a blood test.
12. The PVC Plant General Foreman and the Assistant Plant Superintendent should be notified about the spill.
13. The spill should be investigated. The following two forms must be filled out:
 - a. Environmental Control Report (Relief Valve, Rupture Disc, Manual Vent)
 - b. Unusual Occurrence Report.

EXPOSURE TO VINYL CHLORIDE

To minimize the risks of vinyl chloride exposure, the following steps are to be adhered to in compliance with the OSHA ruling of 4 October 1974:

1. Section I and II are regulated areas. Insert
2. Fresh air and canister masks are provided for all personnel entering a regulated area. See the plant diagrams for location of the fresh air connections. Each connection has a T capable of handling up to 4 masks simultaneously. A separate air breathing system is provided for this purpose. All personnel may be required to carry a mask with them at all times in this area. See Attachment A for use of respirator protection.
3. The plant is equipped with chromatograph sensors and red light alarms that indicate 1 PPM VCM or greater. When these lights are on, it is mandatory that all personnel in the area wear their masks. See plant diagrams under FIRES for location of red light alarms. Below 1 PPM the wearing of masks is not required.
4. All utility men entering vessels are required to wear fresh air masks.
5. The proper protective clothing is necessary when there is a possibility of contacting liquid VCM, strong VCM vapors, or when the job requires. See Attachment B on Protective Clothing.
6. There are ^{FOUR} ~~six~~ gas chromatographs, ^{FOR VCM EMISSIONS} each detecting the VCM concentration at various points throughout the regulated area. The location and VCM concentration is displayed continually on the panel board in the appropriate Control Room.
7. Obey all standard work procedures and obtain specific instructions from supervisor for any non-routine job.
8. All equipment is to be properly assembled and pressure tested before put into use.
9. All operations are to be monitored for correct temperatures, pressures, recipes, etc.
10. All equipment is to be purged to the recovery system or by the fugitive emission system before opening and/or entering.

SAFE WORK PRACTICE

PVC
Plant

No. _____

Page 1 of 2JOB Changing Filter Cartridge Elements in VCM and Recovered VCMPrepared by R. L. Hall

Reviewed by

PR
ForemanW
ForemanD.C
ForemanFore

Orig. Date

Revision

of Issue: Sept 79

Date: _____

APPROVED BY: _____

Safety Engineer

APPROVED BY: AF Cantor Oct '79

Dept. Head

APPROVED BY: _____

Plant Manager

REQ'D PROTECTIVE EQUIPMENT:

AIRLINE RESPIRATORRUBBERSafety Glasses, GlovesHard Hat

JOB STEPS IN SEQUENCE	POTENTIAL HAZARDS	RECOMMENDED SAFE PROCEDURE
1. Turn on ventilation blower & check to see that air flow thru hose is adequate.		
2. Valve off filter to isolate	Make sure alternate filter is valved into service & checked for leaks.	Check all valving on both filters proceeding.
3. Attach hose to drain valve and to gasholder line.	Bad gasket in coupling may cause leak.	Check gaskets and tight fit of hose fittings.
4. Let down pressure to the gasholder.		Open valve slowly and bleed off p: slowly.
The following steps require	a fresh air mask, to be worn	<u>RAINCOAT, RUBBER CLOTH</u>
5. Valve off hose, disconnect from gas-holder line & connect to Fugitive Emissions line.	VCM may be evolved.	<u>TO BE WORN</u> Put on fresh air mask.
6. Valve in and pull into a vacuum.		Make sure Fugitive Emissions is i service.
7. Valve off hose and disconnect both ends.	Oxygen may enter gasholder or recovery.	Make sure valves are securely clo
8. Position exhaust hose near top of pot & break the vacuum thru the valve.		

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SAFE WORK PRACTICE

PVC

No. _____

Plant _____

Page 2 of 2JOB Changing Filter Cartridge Elements in VCM and Recovered VCMPrepared by R. L. HallReviewed by [Signature]

Foreman

Foreman

Foreman

Fore

Orig. Date _____

Revision _____

of Issue: _____

Date: _____

APPROVED BY: _____

Safety Engineer

APPROVED BY: _____

Dept. Head

APPROVED BY: _____

Plant Manager

REQ'D PROTECTIVE EQUIPMENT: Fresh Air Mask, Safety Glasses, Gloves

JOB STEPS IN SEQUENCE	POTENTIAL HAZARDS	RECOMMENDED SAFE PROCEDURE
9. PROPER VENTILATION 10. Put on gloves & carefully open the pot.	Some monomer may be trapped in pockets of polymer and may be released as the skins are fractured.	TURN WALL EXHAUST FAN ON If monomer is evolved, back off and the vent fan carry it away.
11. Remove dirty cartridges from the pot and immediately remove from the building.	Monomer evaporating from pockets in the filter cartridges can raise level within confined space.	CHECK WITH HNU METER. IF READING IS 1 PPM OR BE. Dispose of cartridges in open dump sediment ponds. DO NOT PUT INTO C DUMPSTER.
12. Wash residue from the pot and if atmosphere in the room is o.k. air mask may be removed to complete the job.	Residual vapor within the room.	POT ONLINE RESPIRATOR ON. Check with HNU meter. If reading ppm or below, the mask may be removed after washing is complete.
13. Install new filter cartridges, "O" ring and close up the pot.	Mashing fingers with heavy lid.	Do not expose fingers to possible points.
14. Put a manilla tag on the pot with time and date filters were changed. Mark "check for leaks" when put in to service.		

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Washing Strips Column

JOB STEPS IN SEQUENCE	POTENTIAL HAZARDS	RECOMMENDED SAFE PROCEDURE
3-	3-C. VCM escape. <i>AIRLINE RESPIRATOR</i>	3-C. The purpose for filling with water is to displace the VCM gas in the column. Make sure that nothing on the column or reflux drum is open until both are liquid full. Then and only then, open to the atmosphere after the gas line has been closed.
4. After the column is full of water, turn on the steam for 1-2 min. Set steam valve at 5-10% open.	4. Too much steam may damage column internals or burn resin in the column.	4. Stand by at the manual valve in the field to close the valve if the automatic valve fails.
5. Shut off the steam	5. Same as #4	5. Same as #4.
6. Drain the column to the pad. Run the bottoms pump in order to clear the slurry from the column bottom.	6. Burn hazard. <i>FOOT WATER</i>	6. Stay clear of the pump discharge.
7. Repeat until the water leaving the column is clear.		
8. Open and flush the reflux drum.	8. The drum may contain VCM vapors. <i>AIRLINE RESPIRATOR</i>	8. Isolate the tank properly and check internal atmosphere with HNU meter after opening. <i>WHAT IS THE FIELD POSITION OF ALL NORMAL OPEN VALVES?</i>
9. Close reflux drum and the column is ready for purging and start-up.	9. Valves are closed that are normally open.	9. Check field position of all normal open valves. <i>6/5 NOT M.T.P.</i>

AP00031889

AIR PRODUCTS AND CHEMICALS, INC.
Chemicals Group
Calvert City, Kentucky

SAFE WORK PRACTICE _____ PVC _____ No. _____
Plant _____
Page 1 of 2

JOB Sampling VCM Containing Streams

Prepared by R. L. Hall *RLH* Reviewed by _____
Foreman Foreman Foreman Foreman

Orig. Date _____ Revision _____
Date of Issue: 1 Oct. 1979 Date: _____ APPROVED BY: _____
Safety Engineer

APPROVED BY: A. F. Carter APPROVED BY: _____
Dept. Head Plant Manager

REQ'D PROTECTIVE EQUIPMENT: Gloves, Fresh Air Mask or Scott Air Pak

JOB STEPS IN SEQUENCE	POTENTIAL HAZARDS	RECOMMENDED SAFE PROCEDURE
I. EPA requires that all streams greater than 10% VCM must be sampled in a closed system. The following will apply to these points:		
1) Prepare a sample bomb.	1) VCM exposure	1) If the bomb contains material from the previous sample, connect to the fugitive emissions and vent down.
2) Connect the bomb to the line or vessel to be sampled with $\frac{1}{4}$ " tubing, then connect to the proper vent valve which may be a pump suction or the Fugitive Emissions Reader.	2) Leaks, emitting VCM	2) Make all connections very carefully. Make all joints tight with two wrenches to avoid twisting off a fitting.
3) Purge the sample thru the bomb.	3) Leaks, check joints	3) Open first the vent valve on the bomb then slowly open the supply valve, let the sample sweep thru the bomb.
4) Make sure the bomb has a vapor space.	4) Hydrostat and burst the bomb.	4) If the bomb is liquid full, a very small change in temperature generate a very high pressure.
<i>How?</i> 5) Disconnect: close all valves then put on gloves & fresh air mask or Scott air pak.	5) VCM emission <i>AND OIL EXPOSURE</i>	5) Break unions with wrenches. A small amount of liquid will escape. Back off and allow pressure to bleed off then finish removal.
		<i>THIS PROTECTIVE EQUIPMENT DOES NOT TIE WITH IMER. PROC. ALSO CROSS REFERENCE</i>

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FOR STEPS IN SEQUENCE	POTENTIAL HAZARDS	RECOMMENDED SAFE PROCEDURE
II. Streams Containing less than 10% VCM. 1) Prepare a sample container by rinsing or if it has been used previously, wash out all residue. 2) Put on Scott air pak or Fresh air mask & gloves. <i>MAKE EQUIP</i> 3) Collect sample. NOTE: Samples from displacement water tk. or Nash seal water or other similar streams will be treated the same as unstripped slurry but will not be hot. 4) Put warning on label: <u>"This sample contains VCM:"</u> 5) Hose down area. 6) Deliver sample to the lab. <i>AND ONLY IN DESIGNATED HOOD FOR VCM MATERIALS</i>	1) Hot water burns. 2) VCM exposure and burns. 3) VCM exposure and burns. 4) VCM exposure 5) Housekeeping 6) Routine	1) Wash and rinse thoroughly in fresh or DM water. If DM water is used, wear gloves to protect hands because it is hot. 2) Most samples of this order will be slurry and will be <u>hot</u>. 3) Open valves slowly and stand behind the valve to avoid a hot spray from contacting clothing or skin. Do not breathe vapors emitted. 4) To alert lab person that this sample requires special handling. 5) Wash any spill or residue to the sewer immediately. 6) Verbally notify the lab person that the sample may contain VCM.

AP00031891

4. Training of the wearers of respirators.
5. Use of respiratory protection equipment.

Required apparatus when VCM concentration is:

- | | | |
|------------------------|---|--|
| <u>Over 5 PPM</u> | - | Air supplied respirator. |
| <u>Over 1,000 PPM</u> | - | Self-contained breathing apparatus. |
| <u>Over 3,600 PPM</u> | - | Self-contained breathing apparatus.
Entry into area may be made only for
purpose of life rescue, fire fighting,
or securing equipment to prevent a
greater hazard from release of VCM. |
| <u>Over 36,000 PPM</u> | - | Self-contained breathing apparatus.
Entry into area may be made only for
purposes of life rescue. |

C. Limitations of respiratory protection.

1. Workers with chronic respiratory deficiencies cannot wear respirators.
2. Workers with a cold, bronchial congestion, hay fever, or any irritation that causes repeated sneezing, coughing, or runny nose, and conditions which require a person to frequently expectorate, etc. cannot wear respirators for any extended period.
3. Communication is poor in respirators.
4. Airlines are cumbersome and create a tripping hazard.

APPENDIX B

PROTECTIVE CLOTHING - PVC PLANT

A. Purpose

The purpose of this section is to outline the jobs or areas where special protective clothing is required and the type of clothing to be used.

B. Where Protective Clothing is Required

No special uniform or protective clothing is required for normal day-to-day operations in the PVC Resin Plant.

Special protective clothing is required for the following jobs or operation:

1. Reactor entry and/or cleaning
2. Cleaning of any vessel that contains polyvinyl chloride residue
3. During the opening of any line, vessel or other piece of equipment that has at any time contained vinyl chloride or polyvinyl chloride regardless of whether the line or piece of equipment has been purged.

C. Protective Clothing to be Worn

The following protective clothing is to be worn for jobs B-1 and B-2 listed above.

1. ^{AIRLINE} Respirator
2. Rain suit comprising of pants and coat
3. Rubber gloves
4. Cloth cap
5. Rubber boots
6. Eye protection

The following protective clothing is to be worn for job B-3 listed above.

1. ^{AIRLINE} Respirator
2. Rain coat