VCM UNLOADING OPERATING MANUAL

ABERDEEN CHEMICAL PLANT

ABERDEEN, MISSISSIPPI

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ABERDEEN PVC PLANT

TABLE OF CONTENTS

Page No.

I. INTRODUCTION

A. Operator Responsibilities.....1

B. General Process Description.....3

II. OPERATING PROCEDURES

A. Railcar Hookup.....9

B. Unloading Railcars.....14

C. Recovering Vapor From Railcars.....18

D. Unhooking Railcars.....20

E. Troubleshooting and Miscellaneous Operating Procedures

1. Liquid in the Compressor Suction.....25

2. Condensed Liquid in the Sphere Vapor Line.....25

3. High Pressure on the Sphere or Bullets (or Evacuation).....26

4. Evacuating a Compressor for Maintenance.....28

5. Lack of Liquid Flow in Sight Glass.....32

6. Tank Car Excess Flow Valve Closing.....33

III. EQUIPMENT INDEX.....35

IV. SAFETY EQUIPMENT AND SYSTEMS.....37

V. EQUIPMENT ENTRY PROCEDURES.....41

VI. APPENDIX

A. Valve Setup Checklist

B. Checklist for Testing Auto Valves

C. Plant Emergency Plan

D. P & I Diagram

A

VCM UNLOADING OPERATION MANUAL

ABERDEEN PVC PLANT

I. INTRODUCTION

A. Operator Responsibilities

The purpose of the VCM Tank Farm is to safely unload and store Vinyl Chloridé Monomer (VCM). VCM is brought into the plant in tankcars. It is the main raw material used in making the plant's major product, polyvinyl chloride (PVC). VCM is a colorless sweet-smelling gas at atmospheric pressure that is stored and transferred as a liquid at moderate pressure (30-70 psig).

The yard department is responsible for the offloading of VCM tankcars and the related transfer equipment. The yard operator helps fulfill the tankfarm's purpose by making sure that the VCM is safely unloaded without endangering his fellow workers or equipment. The operator is able to attain his goals in safety, job performance and efficient operation through a training period and on-the-job experience.
The operator fulfills his responsibilities by:

1. Understanding how his equipment functions.
2. Understanding what role each piece of equipment plays in the process.
3. Keeping a close and regular check on equipment.
4. Knowing how to spot malfunctions and correct them.
5. Keeping his area of responsbility safe and clean.
6. Keeping complete and accurate records.
7. Reporting equipment problems promptly and writing maintenance work orders as needed.

This operating manual will cover the normal responsibilities and duties of the yard operator when unloading VCM railcars. Each phase of the

I. INTRODUCTION (Cont.)

A. Operator Responsibilities (Cont.)

unloading procedure will be covered. In addition to normal operating procedures it will also discuss operations under abnormal conditions. The operator must be prepared to meet these situations with temporary measures until the abnormal condition is corrected or ceases to exist.

Safety takes second place to no plant activity. The safety of the plant personnel and equipment is to be carefully considered before any job is started. The Conoco safety slogan, "Our work is never so urgent or important that we cannot take time to do it safely", is an idea that can help make the work area safer for everyone when it is put into practice.

Good housekeeping is also an important responsibility of the opeators. It requires careful attention for safety reasons and to maintain good working conditions. Cleaning up after the job is completed is the resonsibility of the person doing the job. A job should not be considered complete until all materials are picked up and properly stored.

1. INTRODUCTION

B. General Process Description

VCM tankcars are brought into the plant from various VCM plants throughout the United States. Most of the VCM that comes into this plant comes from Conoco's VCM Plant in Lake Charles, Louisiana. VCM also occasionally comes from PPG in Lake Charles, B. F. Goodrich in Calvert City, Kentucky or from Uniroyal in Geismar, Lousisiana. A VCM Tankcar typically holds 175,000 pounds of VCM (about 23,000 gallons of liquid). The cars are shipped to Aberdeen and stored on the Monroe lead until they are brought into the plant. Only the Monroe lead can be used to store VCM railcars. This is a safety precaution taken by the railroad so that all the VCM cars are kept in one general area.

The railroad crew is responsible for bringing the VCM cars into the plant and "spotting" them at the VCM transfer stations that are on the platform at the VCM tank farm. This is usually done once per day except on weekends or holidays. A maximum of ten tankcars can presently be brought into the tank farm. The tank farm has six transfer (unloading) stations. The plaform is located between two sets of railroad tracks such that there are three transfer stations on each side. These are referred to by name as the north, middle, and south "spots". A maximum of two tankcars can be hooked up at each spot.

Once the railcars have been "spotted", it is the yard department's responsibility to unload the VCM into T-601 which is commonly called the "sphere". This is done using the four Corken compressors at the tank farm. They are commonly referred to as the south little compressor, the south big compressor, the north little compressor, and the north big compressor

I. INTRODUCTION (Cont.)

B. General Porcess Description (Cont.)

(in order from south to north). The two little compressors combined have about the same capacity as the one big one. The tankcars are connected to the compressor piping and the the sphere piping with flexible hoses. The compressors pull vapor from the top of the sphere and compress it into the tankcars, forcing liquid out of the cars through a stand pipe, into the bottom of the sphere.

Each tankcar has three valved connections in the dome of the car (two liquid lines and one vapor line). The liquid lines are 2" lines and point toward each end of the tankcar. The vapor line is a 1½" line and points toward the side of the car. Only one liquid line is usually hooked up on a car because the car does not unload significantly faster with two lines and it takes longer to hook up the car. Both liquid lines have to be hooked up on some types of cars (ACFX and PPGX cars) because the excess flow valves are set to close at lower rates than our normal unloading rate of 65-95 gpm.

The operator can tell when the liquid has been unloaded from a car by watching the sight glass in the liquid transfer line. When the tankcar has been emptied, the 4-way valves on the compressor are reversed such that the compressor evacuates vapor from the car and discharges it into the top of the sphere. When the specified amount of vapor is removed from the tankcar, the compressors are shut down and the transfer lines are evacuated. This must be done because of EPA (Environmental Protection Agency) regulations concerning the release of VCM vapor to the atmosphere. Then the trasfer line can be unhooked and the cars are sent back to the respective VCM plant for reloading.

I. INTRODUCTION (Cont.)

B. General Process Description (Cont.)

There is a big difference in winter and summer operation of the tank farm. The primary reason is problably because the vessels are uninsulated and the transfer lines are lengthy and are exposed to ambient temperatures along their entire run. The vapor pressure drops in the vessels and the tankcars as the temperature drops, making it harder to unload in cold weather because there is less VCM pressure to move the liquid through the pipes. Thus, unloading conditions can also vary from day to night and when rapid changes in weather occur.

During the summer, six tankcars can be hooked up at one time and unloaded with three or four compressors. Also, the tankcars will usually start unloading as soon as the valves on the liquid lines are opened. During winter conditions (ambient temperature approximately 40° F or less), it is harder to start the VCM liquid unloading and only three tankcars can be unloaded at a time, with three or four compressors. If the weather gets extremely cold, it may take four compressors to unload only two or even one car, but this has not happened since the system has been revised and vapor from the sphere is used. The volume of VCM kept in the sphere is usually large enough that sufficient vapor is available for the compressors. When the bullets were used, there was not enough vapor available and the tankcars unloaded very, very slowly, if at all.

Other equipment at the tank farm includes the bullets, T-201 (west) and T-202 (east). These are not used for unloading VCM, even though each one presently contains a small amount of liquid VCM. They are piped up to take inerts from the vinyl recovered receivers if the incinerator should be down for an extended period of time.

I. INTRODUCTION (Cont.)

B. General Process Description (Cont.)

The transfer pumps on the bullets and the sphere are the responsibility of the vinyl department. The sphere transfer pumps send VCM liquid through a 4" line to the old and new reactor modules where it is charged into reactors and made into PVC. The bullet transfer pumps are not used at the present time.

The emission recovery system knockout pot is also located at the tank farm, northwest of the compressor shed. The emission recovery system is located in the vinyl department old reactor module and is designed to collect and contain miscellaneous VCM emissions. It runs continuously. The knockout pot is connected to it via a 2" line that runs to the tank farm. A 15" Hg. vacuum should be maintained on this line at all times. This line is used to evacuate the VCM vapors from the transfer lines prior to unhooking cars. The knockout pot is the responsibility of the vinyl department, but the yard operator should be familiar with the purpose of it.

The knockout pot collects VCM vents from the following:

a. Double Mechanical Seals on the sphere and bullets transfer pumps - Used by vinyl to bleed VCM from the seals when maintenance is required on the pumps.

b. Corken Compressor Packings - The pot recovers vapor that leaks through the compressor packing into the distance piece. The vapor goes through a rotometer on each compressor into the pot. The valve above the rotometer should always be open when the compressor is running. The knockout pot must always have a slightly positive

I. INTRODUCTION (Cont.)

B. General Process Description (Cont.)

pressure on it or oil can be sucked out of the bottom of the compressors through the packing around the piston rods. This is the reason for the back pressure control valve on the knockout pot.

c. Corken Compressor Relief Valve Discharges - The relief valve discharges are piped to the knockout pot through a locked open valve.

d. Corken Compressor Liquid Traps - Liquid caught in the traps is drained to the knockout pot through the 1" Jamesbury valves on the traps. Opening the 1" valve should let the liquid flow into the knockout pot and then it is recovered to the emission recovery system.

e. VCM Sphere and Bullet Recovery - The vessels can be recovered through the knockout pot. A procedure will be given for this in the operating procedures section.

f. Sphere Liquid Lines Relief Valve Discharges - The three liquid lines under the sphere have relief valves that discharge into a 1" line that goes to the knockout pot. The 1" valve on the line south of the compressor shed is locked open. The line runs into the header at the west side of the knockout pot, where the main 2" valve is also locked open.

Complete and accurate records must be kept on VCM unloading. These are necessary for accounting purposes and for communication between shifts. A VCM Unloading Card must be filled out and turned in to accounting for each car unloaded. Records are also kept in the yard scale-house on which cars were unloaded, when they started, when they were put on vapor, and when they were unhooked. A valve setup checklist also must be filled out by the yard operator when hooking up cars and starting unloading. A copy is included in the Appendix.

I. INTRODUCTION (Cont.)

B. General Process Description (Cont.)

The automatic valves under the sphere are tested every Wednesday morning. The checklist used to record the results of this testing is shown in the Appendix. This testing must be coordinated with the vinyl panel operators so that the valves are not closed during VCM transfer to the reactor units.

II. OPERATING PROCEDURES

A. Railcar Hookup

After VCM cars are brought into the plant, the yard operator "hooks up" each car by connecting transfer hoses to it. Vapor can then be transported into the car and the liquid VCM can be sent into the sphere. In the summer, two cars can be hooked up at each transfer station for unloading. During winter operation or when a rapid change in the weather is anticipated during unloading, only one car can be unloaded from each transfer station. Fresh air masks must be worn under the compressor shed or while connecting and disconnecting the transfer hoses. Gloves must be worn while handling the nipples and the transfer hoses. VCM cars are not to be hooked up during an electrical storm.

Equipment Required

1. Fresh Air Mask
2. 1 1/2" Teflon Tape
3. Flange O-rings (if needed)
4. Gloves

Procedure

1. Get a fresh air mask and a roll of 1 1/2" Teflon tape, from the yard scale house. Also get "O" rings that are needed to replace the ones at the tank farm. Inspect the "O" rings individually for cracks and nicks.
2. Check the railcar chocks and handbrake and ground the railcar. Make sure that the chocks are in good condition and are against the railcar wheels. Manually check the handbrake to make sure it is tight. Ground each car to its unloading station with the cable provided. This prevents static accumulation during unloading.

II. OPERATING PROCEDURES (Cont.)

A. Railcar Hookup (Cont.)

Procedure (Cont.)

3. Drain the water from the breathing air filter if necessary. (The filter is located between the rail tracks). Connect the fresh air mask to the hose at the compressor shed, then put on the mask.
4. Visually check the valves under the sphere to make sure they are set up for unloading. The 4" valve on the vapor line and the 6" valve under the sphere on the liquid line to the sphere must be open (both valves are actuated valves).
5. Record the sphere level on the checklist (see checklist in Appendix). Turn the handle on the gauge to move the tape, then take the reading. The maximum allowable sphere level is 38 feet. To unload 3 tankcars the level must be below 33 feet - 6 inches (29 feet - 6 inches for 6 tankcars).
6. Climb the stairs to the unloading platform. If the stairs are wet or icy, be especially careful and be sure to use the handrail.
7. Go to the station you want to unload from, loosen the locks on the walkramp, and use your foot to push the ramp onto the car dome. The ramp will not operate if it is not in the middle of the platform opening. Adjust the height and length of the ramp and lock the ramp into place. Watch for pinch points when positioning the ramp and do not put any unnecessary strain on your back.
8. Unlatch the vapor and liquid line(s) and swing each line over the railcar dome area. Be careful not to let the lines swing back and catch your arm or hands. (The vapor line is the 1½ line).
9. Remove the nipples from the holders and peel off the old Teflon tape.

II. OPERATING PROCEDURES (Cont.)

A. Railcar Hookup (Cont.)

Procedure (Cont.)

9. (Cont.)

Inspect the threads and retape them with new tape up to 2" from the end of the threads.

10. Remove the pipewrench from the holder and fasten it on one nipple. Then carry the pipewrench and nipples to the dome area of the car. Be careful not to drop the nipple and damage the threads.

11. Put on the fresh air mask and tighten it. Test the face seal by blocking the hose with one hand while trying to breathe in.

12. Connect the fresh air mask to the fresh air hose that is on the transfer line booms.

13. Break the domelid seal with the pipewrench and slide the latching bar so that the lid can be raised. Open the domelid and push it all the way back so that is cannot close. Be careful to use proper lifting procedures when raising the lid.

14. Visually check inside the dome area for leaks. Leaks will be indicated by icing around the valves and fittings.

15. Test the valves to make sure they are closed by pushing the valve handles against the closed stop.

16. Adjust the pipewrench to fit the railcar valve plugs and remove the plugs. Do Not let the wrench slip and trap your hand or fingers against the dome. Also do not stand in the direction of the valve opening in case a valve is leaking and VCM spews out.

17. Push the port hole covers aside and screw the nipples into the valve openings until they are hand tight. Then tighten the nipples with

II. OPERATING PROCEDURES (Cont.)

A. Railcar Hookup (Cont.)

Procedure (Cont.)

17. (Cont.)

the pipewrench. Be careful not to let the wrench slip. The nipples must be very tight or they will leak. Double check them after installing.

18. Close the bleed off valves on the end of the transfer line booms. Make sure they are fully closed so that VCM will not leak to the atmosphere.

19. Unhook the flexlines and camlock couplings from the holders on the booms. Be careful to minimize bending and twisting the flexlines during hookup. It has been determined that excessive bending of the flexlines causes early failure of the lines.

20. Inspect the "O" rings individually and install them in the coupling slots. The "O" ring must be evenly seated to prevent leaks. "O" rings with cuts or nicks should be discarded.

21. Press the coupling against the nipple flange and tighten the bolts hand tight. Check the alignment of the "O" ring against the flange and the coupling to make sure there is a good seal. "O" rings that are pinched or crooked will cause leaks. When the "O" ring is seated properly, evenly tighten the blots with the pipewrench. (Note: Do not beat on the flanges with the pipewrench.)

22. Check to make sure that the valve on the transfer line closest to the railcar dome is closed (it should be closed from the previous unhooking). Slowly pull the handle of each railcar valve down to

II. OPERATING PROCEDURES (Cont.)

A. Railcar Hookup (Cont.)

Procedure (Cont.)

22. (Cont.)

open it. Opening the valves too fast can cause an undesirable surge of pressure. Check for leaks around each coupling or bleed off valve as the railcar valves are opened.

23. Slowly open the liquid valve(s) on the end of the booms. Then open the vapor valve at the end of the boom. Make sure that the valves are fully opened or flow will be restricted.

24. Recheck the valves on each transfer line to make sure they are open. The railcar dome valve and both transfer line valves must be open. The bleed valve must be closed. Initial the checklist to show that the valves are open.

25. Inspect the flex hose for leaks. Contact maintenance to replace any leaking flex hoses. (Note: The line must be disconnected using proper procedures prior to replacing. The procedure is on page 20 - "Unhooking Railcars").

26. Disconnect the fresh air mask and check the pressure gauges at the platform on the vapor and liquid lines and make sure that they are showing pressure. Lack of pressure may indicate a leak, a plug or a closed valve.

27. Hookup additional railcars using steps 9-27.

II. OPERATING PROCEDURES (Cont.)

B. Unloading Railcars

After the VCM cars at the tank farm are hooked up, the cars are unloaded using the Corken compressors. The compressors take vapor from the top of the sphere and compress it into the tank cars, forcing the liquid in the cars to flow into the bottom of the sphere. It usually takes 4-6 hours to unload the liquid VCM from a tankcar.

It is very important for the valves on the compressors to be set up correctly or the compressor will dead-head. Running the compressor in a dead-headed condition will make it overheat and tear up.

Equipment Required

1. Fresh Air Mask.

Procedure

1. After hooking up the cars, carefully come down the stairs from the unloading platform. Check the valves that are between the railroad tracks going to each unloading station. All the valves should normally be open. Initial the checklist if the valves are open. If any of the valves are closed, do not startup any compressors going to that unloading station.
2. Go to the compressor shed and connect the fresh air mask to the fresh air hose. Put on the mask.
3. Open the main liquid valve on the west side of the compressor shed on the sphere liquid line (it should have been closed prior to unhooking previous cars). Initial the checklist appropriately after opening the valve.

II. OPERATING PROCEDURES (Cont.)

B. Unloading Railcars (Cont.)

Procedure (Cont.)

4. Visually inspect each liquid unloading line from where they come out of the ground on the east side of the compressor shed through the valves near the ground, through the sight glasses, across the compressor shed, and through the valves above the liquid header on the west side of the shed. All valves must be open from each spot being unloaded from. During summer operations, flow may be observed in the sight glass after opening the main liquid valve. This is due to the vapor pressure in the car forcing liquid to go ahead and start unloading. Initial the checklist after making sure that the valves are open (Checklist Item: Valves Under Sight Glasses, etc.).

5. Open the main vapor valve at the west side of the compressor shed on the sphere vapor line (it should have been closed prior to unhooking previous cars). Initial the checklist appropriately after opening the valve.

6. Visually trace the vapor lines going from the sphere vapor line, through the manual valves to the 4-way valve on each compressor. The manual valve must be open for each compressor that will be run. Initial the checklist after checking the vapor valve for each compressor.

7. Turn the handle of each 4-way valve so that the handle is in the vertical position. This sets up the compressor to pull from the sphere and discharge into the tank cars. (NOTE: The handles can be installed in the opposite direction. If maintenance works on a 4-way valve, check the arrows on the valve and make sure the flow is from the sphere to the tankcars when the valve handle is vertical. This should be checked before signing off the work order.)

II. OPERATING PROCEDURES (Cont.)

B. Unloading Railcars (Cont.)

Procedure (Cont.)

8. Check the suction pressure of each compressor. It should read the same as the sphere pressure. If the pressure is 0 psig, the liquid trap may be full of liquid which closes the high level shutoff valve in the trap and will not allow any flow to the compressor. The trap can be drained by opening the Jamesbury valve that goes to the emission recovery knockout pot by the compressor shed. When the liquid is drained off, the pressure will rise on the suction (as the shutoff valve opens).

9. When the suction of each compressor is set up correctly, visually trace the vapor discharge lines for each compressor. When all of the compressors are to be run, the north and south little compressors should discharge to the middle railcar transfer station, the big north compressor should discharge to the north transfer station and the big south compressor should discharge to the south transfer station. When one or more compressors are not to be run, or if fewer than three railcars are to be unloaded, it is best to setup the compressors on common discharge by opening the three valves on the south little compressor header. This allows all the compressors to be set up on one common header. Check the valves on the line from the south little compressor to make sure they are set up correctly and be sure to check the jumper lines that connect the lines going to the three spots. Finally, check the three vapor valves near the ground going to the three transfer station. The valve to each transfer station that is to be unloaded from must be open. Initial the checklist after making sure the appropriate valves are open.

II. OPERATING PROCEDURES (Cont.)

B. Unloading Railcars (Cont.)

Procedure (Cont.)

10. When all the lines have been traced for each compressor, push the start buttons for the compressors to be run.
11. Check the oil pressure on each compressor. It must read between 10-20 psig.
12. Check the discharge pressure on each compressor. If it is under 100 psig, go to the sight glasses and watch for liquid flow. If the discharge pressure is above 110 psig, one of the valves between the compressor and the tank car is closed. Shut off the compressor and retrace the piping until the valve is opened.
13. Check for liquid flow to the sphere in all the sight glasses. Lack of flow may indicate a closed valve between the tank car and the sphere.
14. Check to see that the Jamesbury valves on the compressor suction liquid traps are closed.
15. Take off the fresh air mask, disconnect it, and roll up the hose.
16. Record the number of the railcars being unloaded and log into log books.

II. OPERATING PROCEDURES (Cont.)

C. Recovering Vapor from Railcars (Cont.)

Procedure

1. (Cont.)

to see if they have blown out. Use the following procedure: (Assume that railcar A and railcar B are hooked up on the same transfer station and that the sight glass for that transfer station shows vapor flow).

A. Go to the dome of railcar A and close the liquid valve(s). This allows you to check the sight glass and see if the liquid has blown out of railcar B.

B. Go to the sight glass and check for liquid blowing through the line. If liquid flow shows in the sight glass, railcar B has not blown out. Finish unloading it by closing the vapor valve on railcar A and setting up the compressors on a common header as mentioned in the first part of this procedure.

C. When the sight glass shows that railcar B has blown out, go back to the platform and open the liquid valve(s) on railcar A.

D. Next, close the liquid valve(s) on railcar B to make sure that railcar A has blown out.

E. Check the sight glass as in step B (Above). If liquid flow shows in the sight glass, railcar A was not blown out and must be unloaded. Close the vapor valve on railcar B and set up the compressors on a common header to unload railcar A.

F. When the sight glass shows that railcar A has blown out, re-open the liquid valve(s) on railcar B.

G. After all the cars have blown out, reopen any valve that you closed to check or unload the railcars.

II. OPERATING PROCEDURES (Cont.)

C. Recovering Vapor from Railcars (Cont.)

Procedure

2. Put on the fresh air mask and connect it to the fresh air hose.

3. Open the three valves on the south little compressor header so that all the compressors are on one common header.

4. Reverse all the 4-Way valves so that the handles are in the horizontal position.

5. Check the compressor discharge pressures to make sure the compressors are not dead headed (pressure should be 70-100 psig).

6. Take off the fresh air mask, disconnect it and roll up the hose.

7. Record in the logbook the time that the cars were put on vapor.

D. Unhooking Railcars

When the VCM railcars at the tank farm have been unloaded and evacuated to the specified pressure, the railcars must be unhooked. Before the cars can be unhooked, the amount of VCM vapor in the transfer hose must be reduced to 0.13 cubic feet of VCM vapor (at 20° C and 29.92 in. Hg) to comply with EPA regulations. To meet this requirement, the lines must be evacuated to a 10" Hg vacuum. Then the lines can be unhooked and the cars can be sent out of the plant.

Fresh air masks must be worn under the compressor shed or while connecting the transfer hoses. Gloves must be worn while handling the nipples and the transfer hoses. VCM cars are not to be unhooked during an electrical storm.

Equipment Required

1. Fresh Air Mask

2. Gloves

II. OPERATING PROCEDURES (Cont.)

C. Recovering Vapor from Railcars

When the liquid VCM has been unloaded from the VCM tank cars, the Corken compressors are used to remove most of the remaining VCM vapor from the car. The compressor is set up to take vapor from the tank car and send it back to the sphere. The railcars are pulled down to about 6-10 psig. If they are recoverd to less than 6 psig it causes problems at the VCM plants. If the cars are not recovered to less than 10 psig, we are charged for some of the VCM which is left in the car. It normally takes 1-2 hours to recover vapor from the railcars.

Equipment Required

1. Fresh Air Mask.

Procedure

1. Go to the tank farm and check the sight glasses to make sure the liquid has blown out of the railcars. NOTE: If one of the cars blows out before the others, hook up and put on the fresh air mask and open the three valves from the south little compressor header (this sets up all the compressors on one common header). Then close the valve near the ground on the vapor transfer line at the east side of the compressor shed for the transfer station which has blown out. This will cause the cars that have not blown out to empty faster. After the cars have blown out, be sure to reopen any valves on the vapor transfer lines that were closed. If there are 2 cars hooked up on any of the transfer stations, both cars will have to checked

II. OPERATING PROCEDURES (Cont.)

D. Unhooking Railcars(Cont.)

Procedure

1. Go to the tank farm and climb the platform stairs. Be especially careful if the stairs are wet or icy and be sure to use the handrail.
2. Check the pressure on each transfer station according to the gauges on the platform. Make sure that the car(s) at each transfer station have been pulled down to 8-10 psig.

   NOTE: If one of the transfer stations has reached the proper evacuation pressure before the others, close the valves at the platform for that transfer station. Since the compressors are on one common header, this will allow the other transfer station(s) to evacuate faster. When all the transfer stations have been properly evacuated, reopen the valves on the transfer lines which you closed.
3. Climb down from the platform (carefully), hook up the air mask to the hose at the compressor shed, and put on the mask.
4. Turn off the compressors.
5. Close the 4" main vapor valve from the sphere and the 6" main liquid valve to the sphere that are on the west side of the compressor shed.
6. Check the pressure gauge on the line to the emission recovery stystem. (Gauge is at the southwest corner of compressor shed.) It must read at least 10" Hg vacuum. Open the three manual valves that evacuate the transfer lines to the emission recovery system. NOTE: If there is not at least 10" Hg vacuum on the line, notify the vinyl control room. It is the vinyl department's responsibility to maintain at least 10" Hg vacuum on the line.

II. OPERATING PROCEDURES (Cont.)

D. Unhooking Railcars (Cont.)

Procedure (Cont.)

7. Immediately after opening the three manual evacuation valves, carefully climb the stairs to the unloading platform, hook up and put on the fresh air mask, and close the valves in the railcar dome on each car that was unloaded (you will have to unhook and reconnect the fresh air mask at each station).
8. Open the actuated valves that evacuate the transfer lines to the emission recovery system by opening the switch at each transfer station (Write work orders for any valves that do not open or close correctly.)
9. When the pressure gauge at the transfer station reads 10" Hg vacuum or less, put on the fresh air mask and close the valve on the transfer line that is closest to the railcar dome. This valves off the stainless steel flex hose at 10" Hg vacuum or less, which complies with EPA regulations.
10. Open the 1/2" vacuum breaker bleed valve at the end of the transfer line boom.
11. Loosen the bolts on the coupling with the pipe wrench and disconnect the coupling.
12. Take the "O" ring out of the coupling and inspect it. Discard it if it has any nicks or cracks on it. Close the vacuum breaker bleed valve and hang the "O" ring around it.
13. Connect the transfer line to the boom and swing it out of the way.
14. Unscrew the nipples from the railcar valve opening with the pipewrench. Remove them from the dome and cover the portholes. Be careful not to let the pipewrench slip and trap your hands or fingers against the railcar.

II. OPERATING PROCEDURES (Cont.)

D. Unhooking Railcars (Cont.)

Procedure (Cont.)

15. Adjust the pipewrench to fit the railcar valve plugs and screw them tightly into the valve opening. Once again, do not let the wrench slip while tightening the plugs.
16. Put the nipples and pipewrench on the transfer station walkramp and close the railcar domelid. Be careful not to let the lid trap your hands or fingers. Slide the latching bar shut to hold the lid closed.
17. Unhook the fresh air mask and take the pipewrench and nipples back to the main platform. Place them in the racks provided for them. Be careful not to drop the nipples or damage the threads.
18. Turn off the switch to close the actuated valves that evacuate the transfer lines to the emission recovery system.
19. Latch the transfer line booms to the platform. Be careful not to let them pinch your arms or hands. Do not bend or twist the flexlines excessively. This can cause early failure of the flexlines.
20. Loosen the locks on the walkramp and pull it away from the tank car. Lock it after raising it into the vertical position.
21. Repeat steps 9-20 to unhook the other railcars.
22. After unhooking all the railcars, climb down the steps from the platform. Do Not leave the fresh air mask on the platform. Take it back to the yard scale house with you and place it in the proper receptacle for cleaning at the end of your shift.
23. Unhook the ground cable from the unloading station.

II. OPERATING PROCEDURES (Cont.)

D. Unhooking Railcars (Cont.)

Procedures (Cont.)

24. Turn the placards on the railcar over so that they read "Empty-Flammable Gas." These placards must be present on both sides and both ends of each car.

25. Close the manual valves on the 1" lines from the VCM transfer lines to the emission recovery header (under northeast corner of compressor shed). These must be manually blocked in to prevent air leaks into the system and to prevent VCM leakage through the automatic valves during railcar unloading.

26. Go to the sphere and record the level. Record this level and other information about unhooking the car in the logbooks in the yard scalehouse.

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures

This section describes various problems that occasionally occur in connection with the Corken compressors and unloading the VCM tank cars. The standard operating procedure for solving each problem is given after the problem description. Normal rules concerning the use of safety equipment apply in all of these situations. Fresh air masks must be worn under the compressor shed.

1. Liquid in the Compressor Suction

   The symptoms of this problem and the solution are given in the operating procedures on unloading railcars, step No. 8.

2. Condensed Liquid in the Sphere Vapor Line

   After a sudden change in weather or an extended period of no unloading, the vapor in the sphere vapor line will sometimes condense. If this liquid is not trapped by the liquid trap on the compressor suction, it will tear up the compressor because of various reasons including that valve clearnances are not large enough to allow liquid to flow through them. When this problem is anticipated or when it has been occurring frequently (like during winter conditions), it is best to start up the compressors from the railcars and blow the liquid that is condensed in the sphere vapor line back into the sphere. The valves should already be set up to do this after evacuating vapor from the last set of railcars that were unloaded. Use the following operating procedures:

   a. Follow the normal operating procedure for unloading railcars down to step No. 7.

   b. Leave the 4-Way valves in the horizontal position to pull vapor from the tank cars and send it to the sphere.

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

2. Condensed Liquid in the Sphere Vapor Line (Cont.)

c. Check the pressure on the suction of the compressor per step No. 8 of the unloading railcars procedure.

d. When the suction of the compressor is set up, visually trace the suction lines of each compressor from the east side of the compressor shed into the compressor 4-way valve. The three valves on the south little compressor header should be open so that all compressors are on one common header.

e. When all the lines have been traced for each compressor, push the start buttons for the compressors to run.

f. Let the compressors run for 1-2 minutes. This should give the liquid in the sphere vapor line time to blow out.

g. Shut the compressors off and go back to step No. 7 in the unloading railcars operating procedures.

3. High Pressure on the Sphere or Bullets (or Evacuation)

Occasionally, the pressure on the bullets on the sphere needs to be reduced. This can be done by opening the appropriate valves and letting the emission recovery system pull on the vessel(s).

A. To pull vapor from the sphere:

a. Close the four valves on the west side of the compressor shed that are on the sphere vapor line.

b. Open the main 4" valve on the sphere vapor line.

c. Open the valve on the bullets vapor line that connects to the sphere vapor line.

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

3. High Pressure on the Sphere or Bullets (or Evacuation) (Cont.)

d. Open the 2" valve on the line that connects the bullets vapor line to the emission recovery knockout pot at the northwest corner of the compressor shed. This is the same line that the compressor relief valves discharge into. The knockout pot is set up to relieve any pressure over 3 psig to the emission recovery system.

B. To pull vapor from the bullets:

a. Open the valves at the bullets on the line that goes to the sphere vapor line from the bullets.

b. Follow step (d) in the procedure for pulling vapor from the sphere.

C. To evacuate the sphere or bullets:

a. Follow the above procedure for pulling vapor from the appropriate vessel.

b. Close the manual 2" valve on the line from the Corken compressor distance pieces to the emission recovery knockout pot. This will prevent the oil from being pulled out of the compressors when the knockout pot is pulled to below atmospheric pressure.

c. Open the bypass valve for the pressure control valve that is south of the knockout pot. This will allow the vessel being evacuated to be pulled below 3 psig using the existing piping.

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

4. Evacuating a Compressor for Maintenance

Before taking a compressor down for maintenance, the lines to and from the compressor must be isolated and the VCM vapors removed (down to below 0 psig). This can be done by either using the emission recovery system or by using another compressor. The preferred way is to use the emission recovery system because there is less chance of opening or closing a wrong valve and tearing up another compressor. When using the emission recovery system, the south little compressor must be evacuated by a different procedure than the other compressors.

a. Using the emission recovery system:

NOTE: Not for south little compressor.

(1) Close the 3" valve coming off of the sphere vapor line for the compressor to be evacuated. Tag the valve with a "Do Not Operate" tag.

(2) Close and tag the 3" valves on the east side of the compressor. shed that are on the transfer lines coming from the compressor that is to be evacuated. The valves on the transfer line and the valve from the south little compressor must be closed and tagged.

(3) Close and tag the valve on the compressor liquid trap and the valve above the rotameter.

(4) Open the 1" manual valve that will evacuate the blocked off lines to the emission recovery system.

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

4. Evacuating a Compressor for Maintenance (Cont.)

(5) Open the actuated valve that evacuates the line to the emission recovery system. On some of the valves this can be done by overriding the valve and blocking off the air. On the ones without overrides, block the air off on the valve to the liquid line (to keep it closed) and open the vapor valve by using the switch at the transfer stations (on the platform).

(6) When the pressure reaches less than 0 psig on the compressor, close the actuated and manual 1" valves on the line that goes to the emission recovery system . Be sure to open the air valve for the actuated valve on the liquid line if it was closed in step (5).

(7) Close the air to the actuated valve on the vapor line and tag it. The compressor should now be ready for maintenance.

b. Using the emission recovery system for the south little compressor:

NOTE: One of the other compressors must also be evacuated because the emission recovery system valves tie in only to the three transfer lines downstream of the little compressor block valve.

(1) Same as step (1) in (a.) above.

(2) Close one of the 3" valves on the vapor station transfer lines at the east side of the compressor shed. Open the valve on that line from the south little compressor. Leave the south little compressor block valve open. Close the 3" valve that comes off of the sphere vapor line on the west side of the compressor shed that will isolate the compressor that discharges to the transfer line which was blocked off.

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

4. Evacuating a Compressor for Maintenance (Cont.)

(3) Same as step (3) in (a.) above.

(4) Same as step (4) in (a.) above.

(5) Same as step (5) in (a.) above.

(6) When the pressure reaches less than 0 psig on the south little compressor, block off the south little compressor block valve on the east side of the compressor shed and tag it.

(7) Close the actuated valve that was opened in step (5) and reopen any air that was blocked off.

(8) Open the blocked in 3" valves on the east and west side of the compressor shed that were closed in step (2). The south little compressor should now be ready for maintenance.

c. Using one compressor to evacuate other compressors:

(1) Set up the compressor you are going to run as if you were going to evacuate vapor from a railcar and send it to the sphere. This includes visually tracing out the line from the ground on the east side of the compressor shed to the compressor, and to the sphere. Be sure to check the 4" vapor valve at the sphere and make sure it is open.

(2) Close the 3" valve on the vapor transfer line on the east side of the compressor shed that goes to the compressor you plan to run.

(3) Close and tag the 3" valve coming off of the sphere vapor line for the compressor that is to be evacuated.

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

4. Evacuating a Compressor for Maintenance (Cont.)

(4) Close and tag the valve on the compressor liquid trap and the valve above the rotometer for the compressor that is to be evacuated.

(5) Close and tag the 3" valve on the vapor transfer line at the east side of the compressor shed that isolates the compressor that is to be evacuated. NOTE: If the south little compressor is to be evacuated, omit this step.

(6) Open the valves on the south little compressor header that will allow flow from the compressor to be evacuated to the compressor that you intend to run. Two of the valves on the south little compressor header will be open and two will be closed when evacuating one compressor.

(7) Make sure the 4-way valve is in the horizontal position on the compressor you plan to run and check the suction pressure per normal operating procedures (to make sure the liquid trap is not full).

(8) Start the compressor that you are using to evacuate with.

(9) Check the discharge and suction pressure per normal unloading procedures to make sure that all valves are open and that the compressor is running correctly.

(10) When the compressor to be evacuated has been pulled to below 0 psig, tag the valve on the south little compressor header that will isolate the compressor and close it.

(11) Immediately shut down the compressor being used to evacuate with.

A

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

4. Evacuating a Compressor for Maintenance (Cont.)

(12) Reopen the 3" valve on the vapor transfer line for the compressor that you were using to evacuate with.

The compressor you were isolating should now be ready for maintenance.

5. Lack of Liquid Flow in Sight Glass

Occasionally, there will be little or no liquid flow in one or more of the liquid sight glasses after starting up the compressors, even though all the valves are open. This may be caused by a lower pressure on one of the railcars, more pressure drop in one of the lines due to length of pipe, or other reasons. This problem only occurs occasionally and it usually happens in only one of the transfer lines. If there is not a closed or partially closed valve in the line, the problem usually corrects itself after 5-10 minutes. To speed up this process, use the following operating procedure.

a. First, trace all the lines and check the valves going to and from the transfer station that is giving the problem. Make sure that all the valves are fully open and that the compressor discharge pressure is normal.

b. After making sure that all valves are open and pressures are normal, open the valves on the south little compressor header to put all compressors on a common header (if these were not already open).

c. Close the vapor transfer valve on the lines of one or more of the cars which are flowing normally. This will put more flow to the transfer station that is having trouble.

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

5. Lack of Liquid Flow in Sight Glass (Cont.)

d. After establishing normal flow in the sight glass that was giving problems (this usually takes only a minute or two), reopen the vapor transfer valves to the other transfer stations. Normal flow will usually be reestablished in the other transfer lines when the valves are reopened.

e. Close any valves that you opened on the south little compressor header.

6. Tank Car Excess Flow Valve Closing

Occasionally, the excess flow valve on a tank car will close. This is caused when the flow in the line exceeds a set flow rate. This condition can be detected either when the liquid valves are opened and a pinging noise is heard at the dome of the car or when the compressors are started and there is no liquid flow in the sight glass and all valves are open. Usually there will be a pinging sound in the car dome when an excess flow valve shuts off. This situation can be overcome by hooking up the other liquid line at the transfer station. If it is already hooked up, use one or a combination of the following procedures:

a. Partially close the liquid valves on the dome of the car. This will slow down the flow and should reseat the valve.

b. Turn off the compressor and let the car unload itself for a period, then restart the compressors. This can usually be done only in

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

6. Tank Car Excess Flow Valve Closing (Cont.)

b. (Cont.)

summer conditions. NOTE: If the excess flow valves shut in a car that has both liquid lines hooked up, this indicates that the valve is probably faulty. The car number should be noted so that it can be shopped after unloading. On ACFX and PPGX cars, the excess flow rates are set at a lower flow rate than on most UTLX, RTMX, and NATX cars. For the ACFX and PPGX cars, two liquid lines should always be hooked up to each car.

III. EQUIPMENT INDEX

A. T-601 (Sphere) - Conoco No. 93-001

Purpose : VCM storage tank which holds fresh VCM taken from railcars for use in the reactor units.

Description : Spherical tank, mounted on 9 columns, 54'-9" diameter, 57' overall height, with capacity of 640,594 gallons, carbon steel construction, built in 1975.

Normal Operating Conditions : Ambient Temperature and 10-60 psig.

Design Conditions : 125°F and full vacuum to 100 psig.

Relief Settings : Rupture discs (2) = 100 psi @72°F.
Safety valves (2) = 100 psi.

B. Bullets: T-201 (West) and T-202 (East) - Conoco Nos. 89-201 & 89-202

Purpose : Spare VCM storage tanks to hold fresh VCM from railcars for the reactor units or to store inerts from RVCM receivers if incinerator goes down.

Description : Horizontal-mounted, 80' straight wall length, 10'-10¼" diameter, with approximate capacity of 61,450 gallons, carbon steel construction, built in 1962.

Normal Operating Conditions : Presently kept at ambient temperature and approximately 0-20 psig.

Design Conditions : 250 psig maximum allowable working pressure.

Relief Settings : Rupture discs (2 per vessel) = 136 psi @ 72°F.
Safety valves (2 per vessel) = 150 psi.

C. Big Corken Compressors (North and South)

Purpose : Unloading and evacuation of VCM tankcars.

Description : Corken model D680, 2-cylinder, 825 RPM vapor compressor.

Normal Operating Conditions : Rated for 60 ICFM at 825 RPM, 295 psig maximum discharge pressure.

Relief Settings : North - Cannot read tag, 250 psi when purchased.
South - 225 psi.

III. EQUIPMENT INDEX(Cont.)

D. Little Corken Compressors (North and South)

Purpose : Unloading and evacuation of VCM tankcars.

Description : Corken Model D490, 2-cylinder, 825 RPM vapor compressor.

Normal Operating Conditions : Rated for 35.5 ICFM at 825 RPM, 295 maximum discharge pressure.

Relief Settings : North - No tag, 250 psi when purchased.
South - 250 psi.

E. Sphere Transfer Pumps (North and South)

Purpose : To transfer VCM liquid from the sphere to the old or new unit fresh VCM receiver.

Description : Centrifugal type, Durion A50, 3 x 1½ - 10, 3500 RPM.

Normal Operating Conditions : Rated for 150 GPM at 252" of differential head.

F. Bullets Transfer Pumps (East and West)

Purpose : To transfer VCM liquid. Presently not in use.

Description : Centrifugal type, Duriron A50, 3 x 1½ - 10, 3500 RPM.

Normal Operating Conditions : Rated for 150 GPM at 252" of differential head.

G. Emission Recovery System Knockout Pot - Conoco No. 45-305

Purpose : To collect miscellaneous VCM emissions.

Description : Vertical-mounted, four-foot straight wall height, eight-foot overall height, four-foot diameter with an approximate capacity of 470 gallons.

Normal Operating Conditions : Ambient temperature and 3 psig.

Design Conditions : 150 psi at 366° F.

Relief Settings : Rupture disc = 150 psi @ 72°F.
Safety valve = 150 psi.

IV. SAFETY EQUIPMENT AND SYSTEMS

A. Continuous Flow Fresh Air System

In order to provide personnel protection, a continuous flow fresh air system has been installed. This system consists of personnel fresh air masks and a constant flow breathing air supply. The supply lines are piped to various locations around the VCM tank farm. The individual hookup stations consist of quick connect/disconnect-type fittings.

The individual line to the area is designed to allow a minimum flow of 6 SCFM to each mask at approximately 10-15 psig. An air pressure regulator, shutoff valve, and an air filter are provided at the piping header to the area.

Fresh Air masks are required to be worn during the following tasks:

1. Hooking up or disconnecting VCM tankcars.
2. Any time you enter the tank farm compressor shed, whether the compressors are running or not.
3. Whenever performing leak detection operations where the VCM concentration is expected to exceed 10 ppm.
4. Entering any vessel that normally contains VCM.
5. Blanking or line breaking of any line or vessel which has contained VCM.

Clean fresh air masks are stored in the yard scalehouse. After using the mask, it should be properly disposed of by placing it in the used fresh air mask receptacle inside the yard scalehouse. Fresh air masks are not to be left on the transfer station platform at the tank farm.

IV. SAFETY EQUIPMENT AND SYSTEMS (Cont.)

B. VCM Canister Masks

VCM Canister Masks may be used under the following conitions:

1. Working in a contaminated area of less than 10 ppm VCM for up to 10 hours.

2. Performing leak detection operations when Honeywell units are indicating between 1 and 10 ppm VCM.

3. Escape from an area of high concentration of VCM to obtain a Scott Air Pack.

C. Scott Air Packs

Scott Air Packs are self-contained breathing equipment and must be worn when entering concentrations of VCM which are above 1000 ppm or in unknown concentrations. Scott air packs are located south of the sphere near the electrical breaker switches and north of the compressor shed.

D. Firewater System

The firewater system consists of a deluge system on the bullets and compressor shed, a 6" weir to the top of the sphere, and fire monitors. All firewater to the tank farm deluge systems and monitors is supplied by the diesel fire pumps from the fire pond. Process water can be used in fire fighting by hooking hoses to the fire hydrant south of the tankfarm in the MCC area.

1. Fire Monitors

There are four fire monitors located around the diked area at the VCM tank farm, Three of these are kept pointed toward the bottom of the sphere with the manual valve to them open. Water can be sent to these monitors by opening the tank farm monitor switch on the old module charge panel in the vinyl control room. Opening this switch operates a

IV. SAFETY EQUIPMENT AND SYSTEMS(Cont.)

D. Firewater System (Cont.)

1. Fire Monitors (Cont.)

pressure switch that automatically turns on the fire pumps. A manual backup switch is located south of the sphere at the tank farm. The monitors should be used to lower VCM concentrations in the area in the event of a VCM leak or to help put out fires.

2. 6" Weir To Top of Sphere

Water can be sent to the top of the sphere by activating a switch on the old module charge panel in the vinyl control room. A manual backup switch is located south of the sphere at the tank farm. Thermal sensors under the sphere can also activate the system and send water through the weir. Water through the weir is rated at 3000 gpm. The primary purpose of the weir is to supply water for cooling the sphere in the event of a fire in the area.

3. Deluge System

The deluge system supplies water through sprinklers to cover the bullets and the compressor shed. This system can be set off with a switch on the old module charge panel in the vinyl control room. The valve must be manually reset at the concrete basin north of the bullets. A manually activated trip is located at the basin. Thermal sensors under the compressor shed or on the bullets can also set off the deluge system. The deluge system is designed to lower VCM concentrations in the bullets and compressor shed area, to cool the bullets in the event of fire in the area, and help put out fires.

IV. SAFETY EQUIPMENT AND SYSTEMS (Cont.)

D. Firewater System

Because of the dikes around the sphere and bullets, firewater should be used judiciously in the area. The dikes are designed to contain any VCM spill from the vessels. The VCM will float on water, and if the dikes are overfilled liquid VCM will be allowed to escape from the area, enlarging the hazard. The dikes can be drained with post-indicator valves on the west side of the dikes. If a dike is drained, make sure that the drain is closed after draining. The person draining the dike should stay in the area and close the valve when draining is completed. The four activated valves on the sphere inside the dike can be closed from the old module charge panel in the vinyl control room or from the switches outside of the dike, south of the sphere. (These are the valves that are tested every Wednesday - See Appendix B for checklist).

E. Fixed Point VCM Monitor

A fixed point VCM monitor is used to detect VCM and record the VCM concentration at various locations at the VCM tank farm. The recorder and alarm annunciator are located in the vinyl control room. The vinyl panel operators will inform the yard operator of any high readings at the VCM tank farm.

V. EQUIPMENT ENTRY PROCEDURE

EPA standards for VCM emissions and OSHA regulations on personnel exposure to VCM require that certain operating procedures be followed when there is the possibility of VCM emission to the atmosphere or personnel exposure to VCM. For this reason and to ensure safe working conditions at all times, the "Engineering and Work Practice Control Program for the Reduction of Employee Exposure to Vinyl Chloride" manual should be consulted whenever equipment in the VCM tank farm is opened for any reason. This manual contains a list of detailed procedures as well as safety precautions for equipment opening.

VI. APPENDIX

A. VALVE SETUP CHECKLIST FOR UNLOADING VCM

VALVES THAT MUST BE OPENED FOR UNLOADING:

_____ 1. Main liquid valve to sphere } (located under sphere)

_____ 2. Main vapor valve from sphere }

_____ 3. Check sphere level _____ Feet _____ Inches

_____ 4. Both valves on liquid and vapor lines hooked to car

_____ 5. Valves inside car dome for vapor and liquid.

_____ 6. Vapor and liquid going to stations between railroad track

_____ 7. Vapor and liquid valves under sight glasses on each station being unloaded from

_____ 8. Sphere liquid and vapor valve on main headers on west side of compressor shed

_____ 9. 4-way valves on each compressor being used must be in vertical position (handle)

VALVES THAT MUST BE OPENED FOR RECOVERING VAPOR FROM RAILCAR:

_____ 10. Same as above except 4-way valves on compressor being used in horizontal position (handle)

WHAT TO CHECK FOR UNLOADING:

1. Pressure gauges on compressors:

   a. Inlet Side - 20 to 50 pounds. If 0, compressor is full of liquid.

   b. Outlet Side - 60 to 110 pounds. If over 120, compressor is dead headed.

2. Sight glasses on liquid lines (flow of liquid).

3. Jamesbury valves on knockout pots closed to evacuation system.

4. No valve mentioned above partially closed.

CAR NUMBERS BEING UNLOADED:

_____ _____ _____ _____

_____ _____ _____ _____

A

B. CHECKLIST FOR TESTING AUTO-VALVE UNDER SPHERE

MAIN LIQUID VALVE INTO SPHERE:

Open	(Test) Closed	Open
_____	_____	_____

MAIN VAPOR VALVE INTO SPHERE:

Open	(Test) Closed	Open
_____	_____	_____

LIQUID VALVE TO TRANSFER PUMPS:

Open	(Test) Closed	Open
_____	_____	_____

RECIRCULATION LINE VALVE:

Open	(Test) Closed	Open
_____	_____	_____

Test must be done while no unloading of railcars is taking place and there is no transferring to reactor buildings. Switches for test are locted on north side of switchgear module at south end of VC tank farm. Tests are to performed very Wednesday.

OPERATOR: _____

DATE: _____

C. FIRE PROTECTION AND EMERGENCY PLAN

SUBJECT: FIRE PREVENTION AND EMERGENCY PLAN

EFFECTIVE DATE: February 17, 1981

APPROVED BY: C L Miller

TITLE: Manager

References: C FR 1910, Subpart L - Fire Protection, 1910.35, 1910.37, 1910.38

PURPOSE: Due to the nature of the chemical process industry and specifically, the Aberdeen Chemical Plant, the potential for a vapor release and/or fire can only be minimized by conscientious operation of the plant. Emergency conditions caused by human error or equipment failure can ultimately lead to serious personal injury, loss of life, or severe damage to plant equipment. This plan is therefore being issued to:

1. Minimize the potential for fires and related emergencies through positive housekeeping and control of flammable materails and ignition sources.

2. Insure the safety and welfare of employees and the general public in the event of a plant emergency;

3. Minimize property damage and provide for the resumption of normal operations following a plant emergency;

4. Satisfy the legitimate concern of employees, their families, and the general public by providing prompt, accurate information concerning the extent and effects of plant emergencies; and,

5. Insure that all fire protection systems operate properly by routine testing and maintenance of critical systems.

FIRE PREVENTION PLAN

Fire related losses which can occur in the chemical industry are particularly severe. Due to the nature of the materials which are routinely handled in the Aberdeen Plant (primarily VCM, natural gas, propane, and other hydrocarbon fuels), operating personnel must exercize preventive control of hazards which can lead to fires. The Fire Prevention Plan is therefore being incorporated into the body of the Emergency Plan and its specific provisions will be reviewed on a routine basis by operating departments.

FIRE PREVENTION PLAN - (continued)

Many of the materials used to make PVC and its compounds are flammable or combustible. Table I, below, is a list of commonly used materials which are flammable or combustible and can be fire hazards if not properly controlled. The majority of these materials are supplied as finely divided dusts and in some cases are capable of causing an explosion if dust accumulations are allowed to form an ignitable cloud.

TABLE I

VINYL DEPARTMENT

Flammable	Combustible
PVC Initiators (Oxidizer)	Alpha Methyl Styrene (AMS)
Gasoline	Odorless Mineral Spirits (OMS)
Natural Gas/Propane	Bubble Breaker
Vinyl Chloride Monomer	Cardboard Boxes
	Diesel Fuel
	2-Ethyl Hexaldehyde
	Glycerine
	Methocel
	Paper Bags
	PC-555
	Shell Sol 71 Code 83195
	Hydroquinone

COMPOUND DEPARTMENT

Flammable

Gasoline

Combustible

Anitimony Trioxide	"Mark" Compounds
4310 R-1 Violet	Mineral Oil
Epoxidized Soybean Oil	Molydenum Trioxide
Bisphenol A	Oncor 75 RA
Cardboard Boxes	Paper Bags
Color Concentrates (Vinyl Base)	Plastiflow POP
Cyasorb UV-531	"Plastolein" Products
Lead Stabilizers	PX-316
Dibasic Lead Stearate	R-4067 (Interstab)
Ferro ThermOChek 1827	Santicizer 429
Hal-Lub-D	Synpron 1438
Hostalube XL 165	"Vinyzene" Products
Hystrene 5016	Wax Lubricants (polyethylene, Petroleum)

DRY BLEND DEPARTMENT

Flammable

Gasoline

Combustible

"Acryloid" Products
Acrawax
"Advastab" Products
Advawax
Calcium Stearate
Cardboard Boxes
Diesel Fuel
"Mark" Products
Paper Bags
Thermolite 101
Wax Lubricants (polyethylene, petroleum)

PLASTICIZER DEPARTMENT

Flammable

Gasoline

Combustible

Alcohols
Phthalic Anhydride
"Darco" Carbon Black
Cardboard Boxes
Diesel Fuel
Bisphenol A
Paper Bags
Paratoluene Sulfonic Acid (PTSA)
(Scott Air Pak and turnout gear required for fire fighting)

MAINTENANCE DEPARTMENT

Flammable

Acetylene
Amercor Mark III
Gasoline
Hydrogen Gas
Natural Gas
Propane
Paints and Thinners
Sulfuric Acid (generates hydrogen gas)

Combustible

Agitene (Regular, Super)
Amerzene 35
Ammonium Nitrate (Highly Dangerous if Mixed with Oils)
Biocide 285
Biosperse 201
Cardboard Boxes
Conoco Lube Oils and Greases
Drewplex 505
Drewsperse 738
Mitee Thread Cutting Oil
UCON Lubricants and Heat Transfer fluids.

LABORATORY DEPARTMENT

Numerous flammable and combustible liquids and solids are stored and used in small quantities in this department.

Many of the above noted chemicals classified as combustible are used routinely and are not commonly thought to be fire hazards due to the very high temperatures required to ignite them. Special precautions are outlined in the Safety Control Permit System Procedure which will govern all hot work operations in areas where flammable or combustible materials are used or stored.

Fire protection and control systems used in the plant range from simple hand held fire extinguishers to sophisticated water spray deluge systems. This equipment is routinely checked by Safety and/or Instrument Personnel to insure that it operates properly when needed. The Safety Director is responsible to see that all fire protection systems are maintained in an operational condition.

Supervisory personnel plant wide are responsible for controlling fuel source hazards through conscientious operation and the Safety Control Permit System. Smoking will be permitted only in areas of the plant specifically specified for that purpose. Fire protection rules in the Safety Rule Book will be strictly adhered to.

Table II, below, is a listing of fire protection equipment which is available for use in the event of a fire related emergency.

TABLE II

FIRE FIGHTING EQUIPMENT

Equipment	Area(s) of Coverage
Diesel Driven Fire Pumps for Water Supply (4-2000 GPM, 100 psig Units)	Areas processing vinyl chloride monomer (propane area upon completion of phase III fire protection improvements).
Process Water System	Propane area fire protection equipment, warehouse area sprinkler systems.
Deluge Spray Systems	Vinyl reactors and tank farm.
Fire Monitors (Fixed)	Vinyl reactor, VCM and propane tank farm, VCM incinerators.
Fire Monitors (Portable)	Emergency equipment station, initator storage freezers.
Dry Chemical Wheeled Fire Extinguishers	Vinyl reactor areas (one each)
Dry Chemical Hand Portable Fire Extinguishers	Various locations plant wide.
Hose Houses and Fire Hydrants	Various locations plant wide.

Equipment	Area(s) of Coverage
1½ Inch Fire Hose and Nozzles	Warehouse areas and vinyl reactor and propane tank farm areas.
Fire Turnout Clothing (Hats, Coats, Boots and Gloves)	Available for use plant wide, stored in the Emergency Equipment Station.
Extra Fire Hose (3 inch hose with 2½ inch couplings)	Hose reel cart in Emergency Equipment Station.
Scott Air Paks	Various locations plant wide.
Additional Firefighting Nozzles and Related Equipment	Available for use plant wide, stored in the Emergency Equipment Station.
CO_2 (Carbon Dioxide) Fire Extinguishers	Laboratory and Motor Control Centers.

HOUSEKEEPING - Along with proper control of flammable and combustible materials, maintenance of high housekeeping standards is critically important. The proper disposal of trash from the various plant operations will minimize the accumulation of combustible materials and thereby reduce the potential for fire. The following is a list of basic housekeeping requirements for fire prevention purposes.

1. Ordinary hazard materials such as floor sweepings, paper bags, used filters, rags, and other miscellaneous discarded items shall be placed in dumpsters which are routinely dumped into the central trash compactor.

2. Initiator bottle disposal shall be done in accordance with current Vinyl Department procedures. Disposal of initiators which cannot be used in our operations shall be done under supervision of the Safety Department.

3. Inventories of empty drums in the various operating areas shall be kept to a minimum. All empty steel drums shall be taken to the drum storage area south of the plasticizer building. Empty fiber drums should be placed in the large open top trash containers located south of the plasticizer building.

4. Clean-up and disposal of dust type materials which have been contaminated with a substance hazardous to health, such as lead, shall be done with vacuum cleaning methods.

5. Housekeeping requirements for operations which involve hot work are specified in the Safety Control Permit System Procedure.

6. Motor control center areas (breaker rooms) shall be maintained free and clear of discarded materials and shall not be used as storage areas. Whenever breaker panels are located in storage areas, a clear access lane of at least 36 inches from the front of the breaker panel shall be maintained.

7. Containers of laboratory solvents and reagents, once empty, shall be disposed of as ordinary hazards (see paragraph 1). Waste chemicals shall be disposed of in accordance with approved waste disposal procedures.

FIRE PROTECTION SYSTEM MAINTENANCE - The fire protection systems and equipment used in the plant undergo routine testing and maintenance. The Safety Director is responsible to see that all systems are operational and that routine testing is accomplished. Also, he is responsible to see that repair work on systems and equipment is accomplished on a timely basis whenever problems are discovered. Table III below specifies testing requiremetns and frequencies for the various systems and equipment.

TABLE III

FIRE PROTECTION SYSTEM AND EQUIPMENT MAINTENANCE

System/Equipment	Frequency	Checkout Requirements
Fire Pumps	Weekly	1) Start on pressure drop and sequence 2) Battery condition 3) Engine Temperature 4) Engine oil pressure 5) Fuel level
	Annual	1) Flow/pressure measurements 2) Engine RPM 3) Cooling system flush and charge with fresh coolant 4) Check thermostat operation
Deluge Systems (Reactors & Tank Farm)	Weekly	1) Flow gas over gas detector field sensors on gas detection system - check for system release. 2) Proper operation of deluge valves - trip and reset. 3) Systems drain freely. 4) No breaks in deluge piping systems.
VCM Storage Sphere Fire Monitor Nozzles	Weekly	1) Remote and local control operation of actuated valve (pit). 2) Nozzle orientation directed at bottom half of sphere.
Stationary Fire Monitor Nozzles	Semi-Annual	1) Free operation of valve. 2) Flush until water is clear. 3) Nozzle free of debris.
Sprinkler Systems	Annual	1) Flow test at inspector check point. 2) All systems protected by anti-freeze solution if wet.

System/Equipment	Frequency	Checkout Requirements
Fire Hose	Annual	1) Hydrostatic pressure test of at least 200 psig maintained for at least 15 seconds. 2) Hose shall not leak or jacket threads break. 3) Dried and reinstalled in hose house, or rack, preconnected to hydrant or supply valve.
Fire Extinguishers	Monthly	1) Fluff dry chemical powder. 2) Charged to specified pressure or CO_2 cartridge seal in-tact. Release mechanism sealed. 3) Cylinder hanger, handle, and hose undamaged. 4) Wheeled units - hose properly coiled, valve in OFF position.
Fire Extinguishers	Annual	1) Extinguisher contents emptied, screened or replaced and extinguisher recharged with agent. 2) CO_2 cylinders (CO_2 and dry chemical) weighed. Reject underweight units for refill. 3) Inspect internals of cylinder, hose, and nozzle for deterioration or damage. Repair or replace as needed. 4) Provide replacement extinguisher while inspecting extinguisher from permanent location.
Fire Extinguishers 'Hydrostatic)	Five or Twelve Years	1) Done under contract with licensed cylinder hydrostatic test contractor.
Emergency Alarm	Monthly	1) Test alarm modes (vapor, fire, evacuation) one per month on rotating cycle. 2) Test public address system alarm and all clear.
Smoke Detection System	Semi-Annual	1) Check voltages, detectors and alarm signal devices for proper operation. 2) Check supervisory circuitry..
CO_2 Fire Extinghishing System - Lab Chemical Storage Room	Semi-Annual	1) Weigh CO_2 supply bottles, refill as needed. 2) Check actuating mechanism for proper operation. 3) Check pre-alarm for operation and audibility. 4. Assure that all piping connections are secure and that there are no system leaks.

EMERGENCY PLAN

Definition of Plant Emergencies

A plant emergency is any unexpected event or condition which requires immediate action to prevent injury to personnel and/or damage to equipment. Plant emergencies include, but are not limited to: fires, explosions, release of toxic, flammable, or corrosive materials, or an injury which requires removal of an employee from an elevated location.

EMERGENCY PLAN - (continued)

Definition of Plant Emergenices - (continued)

A "Vinyl Chloride Emergency" is any massive release of vinyl chloride. This does not include minor leaks of temporary concentrations above permissible exposure limits.

Immediate Actions to be Taken in Event of a Plant Emergency

Immediate actions are the direct responsibility of the Emergency Officer. In his absence, they are the responsibility of the Emergency Brigade Chief (Shift Supervisor).

The extent and severity of a plant emergency shall dictate the extent to which the Emergency Plan is utilized. The initial determination of required action shall be made by the Shift Supervisor in charge of the affected area(s). The action taken may range from handling the emergency with personnel present at the time to full alert of the emergency organization. In general, the following actions, as applicable, are required during an emergency:

1. Activate the Emergency Alarm System

   Anyone who detects an emergency situation shall communicate it to the Vinyl Control Room by the radio, the Gaitronics System, or by dialing 2200 on the plant telephone system. In each case, the caller shall clearly communicate the location and nature of the problem to control room personnel (this information must be recorded on the forms provided). The Operator who takes the message shall then activate the appropriate alarm by depressing that button on the emergency alarm system control panel. Once the alarm system has been activated and the alarm is no longer operating, the operator shall dial 641 on the plant telephone system and give the nature and location of the emergency in a clear, calm, and distinct manner. This message must be given a minimum of three (3) times in order that plant personnel understand the nature and location of the problem.

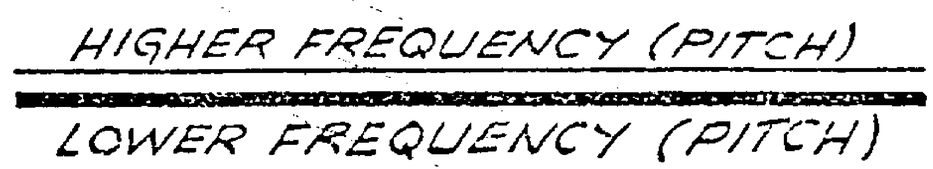
   Plant Emergency Alarm Codes

   The plant emergency alarm siren is a dual tone type which produces a high and low pitch simultaneously during normal operation. Signal coding is achieved by alternately turning the siren motor on and off, and by opening and closing the air supply tubes feeding the rotating (sound producing) elements of the siren. On the following page is a graphical illustration of the alarm codes used in the Aberdeen Plant.

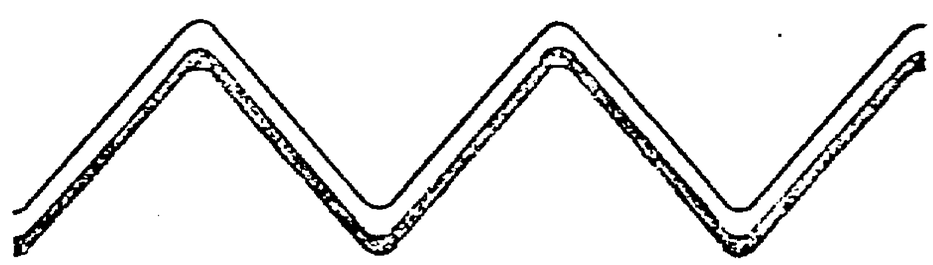
   Whenever a plant emergency occurs, the nature of the problem will be communicated to the plant via the siren and the plant P.A. system as noted above. If the conditions require a general plant evacuation, the evacuation signal should be given only after the fire or vapor alarm. This allows the evacuation signal to act as a tornado warning when used by itself as noted in the storm warning section below.

PLANT EMERGENCY ALARM CODES

Vapor
(Steady Signal)



Fire
(Wailing Signal)



Evacuation
(Undulating Pulsed/
Dual Tone Signal)

All Clear
Dial 63 (Steady Signal
On Plant P.A. System)

EMERGENCY PLAN - (continued)

Immediate Actions to be Taken in Event of a Plant Emergency

2. Use the Proper Emergency Equipment

All employees directly engaged in correcting emergencies involving VCM liquid/or vapor concentrations in excess of permissible exposure limits (1 ppm averaged over an 8-hour period with excursions to 5 ppm averaged over a 15 minute period) shall be equipped with personnel protective equipment which is appropriate for the hazards involved. In the case of VCM emergencies, the location of the spill must be evaluated prior to action on the part of any employee. If the discharge is ocurring from a reactor relief line, Scott Air Paks may be the only personnel protective equipment required. In the case of major discharges which occur in and around electrically driven process equipment, the Supervisor in charge may require his personnel to also wear full fire turnout gear to maintain safety in the particular emergency operation. Whenever emergency situations occur where liquid (VCM or propane) is involved, personnel must wear special heat and liquid resistant gloves to protect from freeze burns and potential flash fires.

3. Evacuate Non-Essential Personnel from Danger Areas

Always evacuate non-essential and all personnel not properly equipped with personnel protective equipment which is appropriate for the hazards present. Such personnel shall not be allowed to return until the emergency situation has been corrected. In all cases, evacuated personnel shall immediately proceed to primary evacuation areas as noted below. If the wind directs hazardous vapors into the primary evacuation areas, evacuated personnel shall proceed to the secondary evacuation area at the guardhouse and assemble in departmental groupings as noted on the fence location east of the parking lot and south of the guardhouse. If that area is noted as being contaminated by VCM vapor, evacuated personnel will be moved to a safe location along the property line north of the plant. ALL EVACUATIONS MUST BE PROMPT AND ORDERLY!

PRIMARY EVACUATION AREAS

Vinyl Area - At pad north of the control room.

Lab & Compound/Plasticizer - Warehouse at northwest corner of the staging area directly south of the plant auditorium.

Maintenance (including Warehouse, Yard and Safety) - Main shop.

Transportation - East of Lab and Compound/Plasticizer as noted above.

Off-Shift Yard and Mechanics - At pad north of vinyl control room.

Office Personnel - Lobby in each office area.

Contractors - North of main gate. (east of contractor gate during plant expansion work.)

4. Account for all Personnel

When personnel have asembled in the primary evacuation areas, head counts must be made as noted in EVACUATION OF WORK AREAS below. Personnel not accounted for at this time must be regarded as trapped and/or injured and rescue efforts initiated. It is extremely important for all personnel to understand the location of their primary evacuation areas and to get to them as quickly as possible; otherwise, other personnel may have to jeopardize their personal safety during search and rescue operations. NOTE: Where ever Supervisors have been pre-assigned duties under this plan, other arrangements must be made by the various departments to insure that personnel are accounted for on a timely basis (see evacuation of work ares for more information).

5. Rescue Trapped Personnel

Search and rescue operations during VCM and propane vapor releases and fires must be attempted only with fire turnout gear due to the likelihood of vapor ignition causing a flash fire or explosion.

In the event that rescue operations are required during serious plant emergencies, the Emergency Officer (Emergency Brigade Chief on off shifts) will utilize personnel who are not assigned specific emergency duties to conduct search and rescue operations. In all cases, the buddy system is required to perform these duties and the Emergency Officer must take that into account as he assigns the duties. Personnel protective equipment requirements must be defined by the Emergency Officer. This can vary from nothing to the use of fire turnout equipment and Scott Air Paks depending upon the circumstances.

EMERGENCY PLAN - (continued)

5. Rescue Trapped Personnel - (continued)

Rescue operations may become necessary due to serious personal injury in elevated plant locations. In this event, the rescue equipment kept in first aid and the Emergency Equipment Station must be assembled and utilized by plant personnel under the joint direction of the Emergency Officer and either the plant nurse or ambulance attendant.

6. Activate Fire Protection Systems

Activate and utilize Emergency Brigades, support personnel present (under the direction of the Mechanical Superintendent as noted in the EMERGENCY ORGANIZATION SPECIFIC DUTIES section below) and the Emergency Organization as necessary to prevent or extinguish fires, explosions, or chemical exposures. Activate the deluge system and/or fire monitors as follows:

Deluge System - These systems should be activated whenever emergencies which require deluge system operation include but are not limited to the following:

- Serious leaks from rotating equipment seals.
- Abnormal discharges of flammable material from process piping, valves, and relief systems.
- Serious leaks in the VCM compressor shed at the tank farm. (CAUTION: Water can damage the Corken compressors if they are hot. The system should be used only during fire conditions or when serious VCM leaks may cause a fire. In all cases, the appropriate piping should also be blocked in to prevent the release of large amounts of VCM).
- Fires resulting from any of the above.

Fire Monitors - Permanently installed fire monitors in the various areas provide supplemental fire water to locations which may need additional water for equipment protection due to direct flame inpingement, high concentrations of VCM vapor, or during periods when the deluge system is out of service. During VCM vapor releases which involve the reactor relief systems, the Supervisor may decide to utilize only the fire monitors since the point of discharge is above all other operating equipment. Due to high volume demand of the deluge systems, fire streams from monitor nozzles may not reach the top of the relief lines with both systems in operation.) If supplemental fire water is needed or in cases where there is no permanently installed fire protection system (i.e., the initiator freezers), the Supervisor should utilize the portable fire monitor and hose reel stored in the Emergency Equipment Station. Lead Operators should make sure the fire pumps are operating when major leaks occur in the reactor areas and only the fire monitors are in use. If the pumps are not operating and there is flow through the monitors from the process water system, the pumps can be started by briefly opening and closing the deluge water valve to the sphere from the old module control panel. (NOTE: For additional information regarding the operation of fire protection equipment in the VCM tank farm area, consult the VCM Tank Farm Operating Manual.)

EMERGENCY PLAN - (continued)

6. Fire Monitors - (continued)

   Whenever the fire alarm is activated, all hose crews shall report to a location upwind of the fire, and assemble by hose crew grouping. The Chief and Assistant Chief shall survey the problem and direct their personnel accordingly. In all cases where significant size fires are noted, fire fighting personnel must be properly outfitted with fire turnout gear.

7. STOP ALL HOT WORK! - Motor vehicles, portable transfer systems, the incinerator, welding machines and any other source of ignition must be positively shutdown immediately whenever the plant emergency alarm is activated! Shut down and secure operations as required to prevent further injury to personnel or damage to equipment.

8. Stop flow of:
   A. Flammable materials feeding fires or potential fires, including dryer and incinerator gas burners.
   B. Boilerhouse operation is to be shut down only in cases where unfavorable wind conditions and flammable material release is great enough to present a hazard. Boilerhouse shutdown can occur only on direct orders from the Emergency Brigade Chief, the Emergency Officer, or the Safety Director.

9. Utilize outside assistance and notify the community as required.

   A. Aberdeen Fire Department.....369-9551

   B. Ambulance.....369-2455

   C. Hospital Emergency Room.....369-2455

   D. Dr. R. E. Coghlan (office).....369-2411
      (home).....369-4418

   E. Dr. J. N. Turnage (office).....369-2413
      (home).....369-6311

   F. Aberdeen Police Department.....369-6454

   Have local police warn adjacent plants and residential areas if they are threatened by fire, flammable material releases or toxic gases (chlorine or hydrogen chloride (HCl) as a result of a VCM fire). Plant Manager approval is required prior to contacting the police department unless the delay increases the danger to the community (see PUBLIC ALERT below).

12. Locate the boundaries of contaminated areas during vapor releases. This will be done by the Safety Supervisor during weekdays and by the Vinyl Shift Supervisor at all other times.

RESPIRATORY PROTECTION REQUIREMENTS

Plant emergencies involving VCM and Chlorine shall require the use of Scott Air Paks. Emergencies involving propane and other materials require the use of Scott Air Paks only if concentrations of vapor might decrease the oxygen content of the leak area to levels which will not support life.

EMERGENCY ORGANIZATION

Please refer to the attached EMERGENCY ORGANIZATION chart for the following discussion. When activated, this organization shall be directed by the Management Group, which bears overall responsibility for meeting the objectives of the plan.

Activation - Whenever a emergency occurs in the plant, the Shift Supervisor responsible for the affected area(s) will be in charge of all immediate actions, including activation of the Emergency Organization if and as required. During normal office hours, the organization shall be activated by the Shift Supervisor by announcing "ACTIVATE EMERGENCY ORGANIZATION" three (3) times over the P.A. system. During off-hours and weekends, the Shift Supervisor shall instruct the Plant Guard to "call-out" the Emergency Organization. The Guard shall then call all personnel listed on the Emergency Organization Call List in rank order. If an individual cannot be reached, the Guard should then call the next person listed on the list. Once contacted, these personnel are to immediately come to the plant and assume their emergency duties.

Specific Duties - The following is a discussion of specific duties assigned to each position in the Plant Emergency Organization.

1. Management Group

   The Management Group will consist of the Plant Manager, the Plant Superintendent and the Industrial Relations Manager. The duties of the Management Group are:

   A. Provide leadership for the disaster group and coordinate all activities connected with control of the situation.

   B. Promptly release factual information to the news media, preventing erroneous reports and creating the best possible public image for the company.

   C. Notify Corporate Management and keep them up to date on the situation.

   D. Notify next of kin in cases of serious or fatal injuries.

   E. Maintain close communication with the Emergency Officer.

EMERGENCY ORGANIZATION - (continued)

2. Emergency Officer

The Operations Superintendent of the area affected will serve as the Emergency Officer. He will report directly to the Management Group and will be in overall charge of emergency control activities. He will be assisted in this duty by the Safety Director and the Chief Process Engineer. The alternate to the Operations Superintendent is the Operations Supervisor of the area involved. The duties of the Emergency Officer are:

A. Work closely with the Emergency Brigade Chief in determining the most effective manner of establishing control of the situation.

B. Keep the Management Group informed of the situation and the action being taken to bring it under control.

C. Rely on the advice and help of the Assistant Emergency Officer and the Safety Director.

D. Issue instructions for the "Call Out" of off-duty employees and advise the Security Officer of who is authorized to enter the plant.

3. Assistant Emergency Officer

The Chief Process Engineer will serve as the Assistant Emergency Officer. He will assist the Emergency Officer in the evaluation of the situation and the planning of action necessary to establish control of the emergency. He will also provide any technical information regarding the equipment or process that might be necessary. He will keep the Emergency Officer informed of his whereabouts at all times. The alternate to the Chief Process Engineer is the Senior Process Engineer.

4. Security Officer

The Security Officer position will be filled by the Safety Supervisor and he will report directly to the Management Group. His specific duties are:

A. Provide security protection for all plant property and material. This will include procurement and assignment of Guards, if needed.

B. Dispatch personnel to the road blocks so that authorized personnel may be identified and allowed into the area. The unauthorized personnel must be turned back in a firm, tactful manner.

C. Provide emergency supplies that might be needed during the emergency.

D. Monitor VCM concentrations in the area of the secondary evacuation area southwest of the guardhouse.

EMERGENCY ORGANIZATION - (continued)

6. Emergency Chief - (continued)

The Emergency Chief will usually be the first individual in authority to recognize the existance of an emergency situation. He must make the immediate decisions regarding the emergency action and continue in this capacity until the Emergency Organization can assemble, if it is required. The Vinyl Shift Supervisor, acting as the Emergency Chief, will initiate the necessary action to put this plan into effect.

The specific duties of the Emergency Chief in time of emergency are listed under "IMMEDIATE ACTIONS..." section above.

Once the Emergency Officer arrives, the Emergency Chief will report to him.

7. Assistant Emergency Chief

The Compound Shift Supervisor will serve as the Assistant Emergency Chief during emergencies in all areas of the plant, except Compound, Plasticizer, Laboratory and Warehouse. In those areas, the Vinyl Shift Supervisor will act as Assistant Emergency Chief. The Assistant Chief's duties will be as follows:

A. Make sure that all of the Fire Brigade members in his area leave for the scene of the emergency.

B. Report to the Emergency Chief for instructions.

8. Mechanical Chief

The Mechanical Superintendent will act as the Mechanical Chief during the time of the emergency. The alternate is the Maintenance Superintendent. In this capacity, the Mechanical Chief will report to the Emergency Officer. He will carry out the following duties:

A. Organize and direct damage control work as directed.

B. He will be in charge of all personnel reporting to the Shop Area.

C. Assist the Emergency Officer in any way necessary to bring the situation under control.

D. Establish relations with outside utility companies and work closely with them, maintaining or restoring service as soon as possible.

E. Notify the Security Officer of the names of those people in the plant under his direction and of any who have been called out.

F. Keep the Emergency Officer informed of his whereabouts at all times.

G. Organize and direct clean-up and repair crews for the purpose of getting the plant back into operation as soon as possible.

EMERGENCY ORGANIZATION - (continued)

5. Safety Director

The Safety Director will assist the Emergency Officer in any way necessary in bringing the situation under control. His primary responsibility is in helping with fire fighting and rescue efforts. He will work closely with the Fire Chief.

Following an emergency, the Safety Director will assist Department Heads in restoring safe conditions throughout the plant. He will also see that emergency equipment is serviced and placed in the proper locations. He will act as a team leader to make a detailed study of the causes of the emergency, action taken, and any recommendations made to prevent similar emergencies.

The Safety Director will also be responsible for the following areas of emergency readiness:

A. Assist Department Heads in training personnel in the functioning and employee acceptance of the plan.

B. Organize and regularly train the Emergency Brigades in fire control methods and emergency actions.

C. Organize refresher courses for the First Aid Personnel.

D. Make sure that all plant personnel are exposed to basic fire fighting techniques pertaining to the use of portable extinguishers, emergency alarm systems, and evacuation procedures. This will normally occur on a every other year basis for all maintenance, operations, and laboratory personnel, and quarterly for Emergency Brigades. All new hires will receive basic fire fighting training within 120 days of employment.

E. Insure that fire fighting and emergency equipment is maintained in operable condition at all times.

F. Conduct Emergency Plan review and drills at least annually.

6. Emergency Chief

The Vinyl Shift Supervisor will fill the position of the Emergency Chief during emergencies in the Vinyl Reactor, Vinyl Dryer, Boilerhouse, Waste Treatment and VCM Tank Farm areas. The Compound Shift Supervisor will act as Fire Chief in the Compound, Plasticizer, Laboratory, and Warehouse areas. The Chief will direct the Fire Brigade and others involved in fire control or other emergency action. He will work closely with the Safety Director in the effective uses of manpower and equipment necessary to bring the situation under control.

EMERGENCY ORGANIZATION - (continued)

9. First Aid Chief and Assistants

The Nurse will act as the First Aid Chief and will report to the Emergency Officer. The Laboratory Lead Technician will act as an Assistant. The alternate for the Nurse will be the Laboratory Shift Supervisor.

A. The First Aid Chief and Assistants will go immediately to the emergency scene whenever the Emergency Organization is activated or there is a call for First Aid help.

B. Give First Aid to the injured.

C. Advise the Communications Chief if ambulances are needed.

D. Keep the Management Group and the Security Officer informed of injuries, including the names and estimates of severity.

E. Transport injured personnel to ambulance.

10. Messengers

The Messengers will report to the Emergency Organization member to whom they are assigned.

11. Fire Pump Supervisor

During the first shift on weekdays, the Safety Inspector will act as the Fire Pump Supervisor. When alerted by emergency signals, he will report to the Fire Pump House. He will keep all four (4) pumps running until the "ALL CLEAR" is sounded. He will be assisted by the Tool Room Man. In the Tool Room Man's absence, the Day Shift Mechanic will assist the Safety Inspector. At all other times, the position of Fire Pump Supervisor will be filled by the on-duty Shift Mechanic. Whenever there is no coverage by any of the above, the Plant Guard shall insure that all fire pumps are operating. The Vinyl Shift Supervisor shall be responsible for the shutdown of the fire pumps when the emergency condition has been corrected.

12. Emergency Brigades

There are two hose crews. The objectives of these crews are to insure that, through quick action, we will be able to protect employees and minimize any damage due to fire. Both crews are to report to the scene immediately when summoned by alarms, the Shift Supervisor, or when the Emergency Organization is activated. The crews will consist of the following:

EMERGENCY ORGANIZATION - (continued)

12. Emergency Brigades - (continued)

#1 Emergency Brigade

Emergency Brigade Chief - Vinyl Shift Supervisor
Chief Operator
Dryer "A" Operators (2)
Dryer Utility

#2 Emergency Brigade

Assistant Emergency Brigade Chief - Compound Shift Supervisor
Automatic Bag Operator
Line I Bagging Utility
Line III Mill Utility
Dry Blend Utility - if available -
Line I Compounder

Emergency Brigade Duties - The prompt and proper response of Emergency Brigade members is essential to the protection of lives and property. The following are the duties to be performed in the event of a serious plant emergency:

A. Obtain fire fighting protective clothing from the Emergency Equipment Station (next to yard scale house) and Scott Air Paks for personnel protection.

B. Make sure that fixed fire protection systems (deluge systems and fire monitors) are being used to the greatest advantage.

C. Provide help to block-in fuel sources by closing valves as specified by the Emergency Brigade Chief.

D. Perform manual fire fighting operations under the direction of the Emergency Brigade Chief.

13. Support Group

The Support Group will consist of all Maintenance, Warehouse and Yard Personnel (Supervisors and Hourly). They will report to the Maintenance Shop and be under the orders of the Mechanical Chief. The Maintenance Mechanical Superintendent will stay in the shop with the personnel. The Mechanical Chief will contact him for assistance.

EMERGENCY ORGANIZATION - (continued)

14. Guards

A. Direct ambulance and other vehicles to the emergency scene.

B. Stop all other vehicle traffic into the plant and have it park without blocking the gate. Do not permit any unauthorized personnel to enter the plant.

C. Phone the Emergency Organization when instructed to do so by the Vinyl Shift Supervisor, the Compound Supervisor, or their designees.

D. Monitor fire pump operation as noted in 11. above.

E. Record wind direction and speed, barometric pressure, time and outside temperature at time of release if a gas release or fire has occurred.

F. Announce the wind speed and direction i.e., from _____, to _____) over the plant public address system if a gas release or fire has occurred.

15. Communications Chief

A. The Director of Administrative Services will act as the Communications Chief.

B. Establish the gatehouse switchboard as a emergency and communications headquarters. The Communications Chief shall also prearrange for a Secretary to act as the Switchboard Operator. Several alternates should be planned. The Switchboard Operator should be contacted immediately following receipt of the call to activate the Emergency Organization.

C. Handle all incoming and outgoing calls.

EVACUATION OF WORK AREAS

As noted in the IMMEDIATE ACTIONS... section of the plan, all personnel being evacuated from their work area due to fire or large uncontrolled vapor release shall shut down the equipment for which they are responsible and proceed to the PRIMARY EVACUATION AREAS for a head count. (To expedite the head count, each department shall maintain a current list of personnel by shift grouping on a clipboard in the Supervisor's office. A listing of office personnel shall also be maintained in or near the lobby of each office area.) If conditions warrant further action to avoid danger, evacuated personnel shall proceed to the SECONDARY EVACUATION AREA, southwest of the plant guardhouse. In all cases, evacuated personnel must assemble by departmental grouping for a head count. In the event that this area is unsafe, all personnel must assemble at a safe location south of Highway 25 along the north plant property line. Supervisors must designate

EVACUATION OF WORK AREAS - (continued)

non-emergency personnel to act in their place for head count purposes if the emergency condition requires the activation of the Emergency Brigades or Emergency Organization.

Wind direction at the time of a gas or vapor emergency will play an important role in the choice of escape routes. Evacuation routes should always be at right angles to the wind (cross-wind). Use the wind socks located on silos 415 and 281 or slurry blend tank (407) to determine the wind direction.

PUBLIC ALERT

During an emergency, the Plant Manager (or in his absence, the Plant Superintendent) will determine if and when action is required to protect the public, including requests for law enforcement assistance.

REENTRY TO WORK AREAS

Personnel, except those required to deal with the emergency condition, shall not be allowed to reenter endangered areas until the emergency condition has been corrected and verified.

Upon establishment of control over VCM releases, the Shift Supervisor, equipped with Scott Air Pak and HNU Photoionizer shall verify that all areas have returned to safe levels. Whenever an employee reenters a work area in which a VCM release has occurred, for the purpose of verifying safe levels, there shall be at least two other persons equipped with Scott Air Paks observing from a safe distance. In some cases, this may be done by Honeywell readings.

During normal office work hours, the Safety Supervisor shall monitor public and total plant area safety with portable monitoring instruments and Scott Air Pak, if necessary. During his absence, this task shall be performed by the Vinyl Shift Supervisor. Again, this may be checked by Honeywell readings.

MEDICAL TREATMENT AND SURVEILLANCE

Anyone who is injured during any emergency is to be immediately treated as appropriate to circumstances.

Anyone who looses consciousness because of inhalation of any substance is to be taken to the Aberdeen-Monroe County Emergency Room as soon as possible.

Medical treatment of any employees injured by any substances will be that determined most appropriate by the Corporate Medical Division or its designee.

REPORTING

All emergencies will be reported by the Plant Manager to the Vice President of Manufacturing within 24 hours. In addition, VCM emergencies will be reported as follows:

1. The Operations Superintendent will issue a written report on each VCM emergency as soon as possible, not to exceed 24 hours.

2. The Plant Safety Director will report the emergency and the facts obtainable to the OSHA Area Director as required by OSHA Regulations.

3. The Chief Process Engineer will report the emergency and the facts obtainable to the Mississippi Bureau of Pollution Control and to the Regional Administrator of the Environmental Protection Agency as required by NESHAP and State regulations.

EMERGENCY TELEPHONE NUMBERS

1. Medical

Ambulance, Monroe County Hospital.....369-2455
Dr. Coghlan, Office.....369-2411
Home.....369-4418
Dr. Turnage, Office.....369-2413
Home.....369-6311

2. Police

Aberdeen Police Department.....369-6454
Sheriff's Office.....369-2468
Mississippi State Police.....(Contact Police Dept.)

3. Fire Department

Aberdeen Fire Department.....369-9551

4. Light and Water Department

Aberdeen Light & Water Department.....369-4731
or.....369-2159

5. Headquarters Personnel

R. D. Gamblin Office.....(713) 965-2100
Home.....(713) 531-7242

M. S. Reynolds, Office.....(713) 965-2806
Home.....(713) 445-9187

EMERGENCY TELEPHONE NUMBERS - (continued)

6. Public Relations Personnel

Houston	John Gehbauer	(office)	(713) 965-3115
		(home)	(713) 376-9279
	Al Amsden	(office	(713) 965-1037
		(home)	(713) 667-8747
Lake Charles	Carlton Adams	(office)	(303) 575-6132
		(home)	(303) 674-2019

7. CHEMTREC Emergency Numbers

See CHEMTREC Call Manual

STORM WARNING

These procedures are established to give personnel early tornado warning. When atmospheric conditions indicate that a tornado is possible:

1. The Guard will continuously monitor National Weather Service broadcasts for weather reports.

2. If the Weather Service announces a tornado watch for the area, the Guard will:

   A. On days - contact all Department Heads.

   B. During off-shifts and weekends - contact the Vinyl, Lab and Compound Supervisors.

   C. Be watchful for an approaching tornado cloud.

3. If the Guard spots an approaching tornado cloud, he will call the Vinyl Control Room and ask that the tornado alert alarm, on the plant siren be sounded, and announce it over the plant P.A. system.

4. Whenever an approaching tornado cloud is announced, all personnel will take whatever action and cover that is established by departmental procedures.

EMERGENCY ORGANIZATION CALL LIST

When advised by the Shift Supervisor, or his designee, the guard will start calling the names listed below in numerical sequence (rank order) from the appropriate list.

VINYL

1. J. E. Barton 369-4755
2. P. E. Markey 369-6019
3. C. R. Miller 369-9100
4. A. H. Sather 369-9271
5. V. A. Belk 369-4416
6. C. L. Miller 369-7041
7. R. G. Gilreath Unlisted
8. J. R. McCrimon 369-9213
9. J. L. Horstman 369-6005
10. S. J. Vincent 369-9298
11. F. W. Frantz 369-8508

COMPOUND

1. R. G. Gilreath Unlisted
2. J. R. McCrimon 369-9213
3. C. R. Miller 369-9100
4. A. H. Sather 369-4416
5. V. A. Belk 369-4416
6. C. L. Miller 369-7041
7. J. E. Barton 369-4755
8. P. E. Markey 369-6019
9. J. L. Horstman 369-6005
10. S. J. Vincent 369-9298
11. F. W. Frantz 369-8508

UTILITIES

1. J. L. Horstman 369-6005
2. F. W. Frantz 369-8508
3. S. J. Vincent 369-9298
4. C. R. Miller 369-9100
5. A. H. Sather 369-9271
6. V. A. Belk 369-4416
7. C. L. Miller 369-7041
8. J. E. Barton 369-4755
9. P. E. Markey 369-6019
10. R. G. Gilreath Unlisted
11. J. R. McCrimon 369-9213

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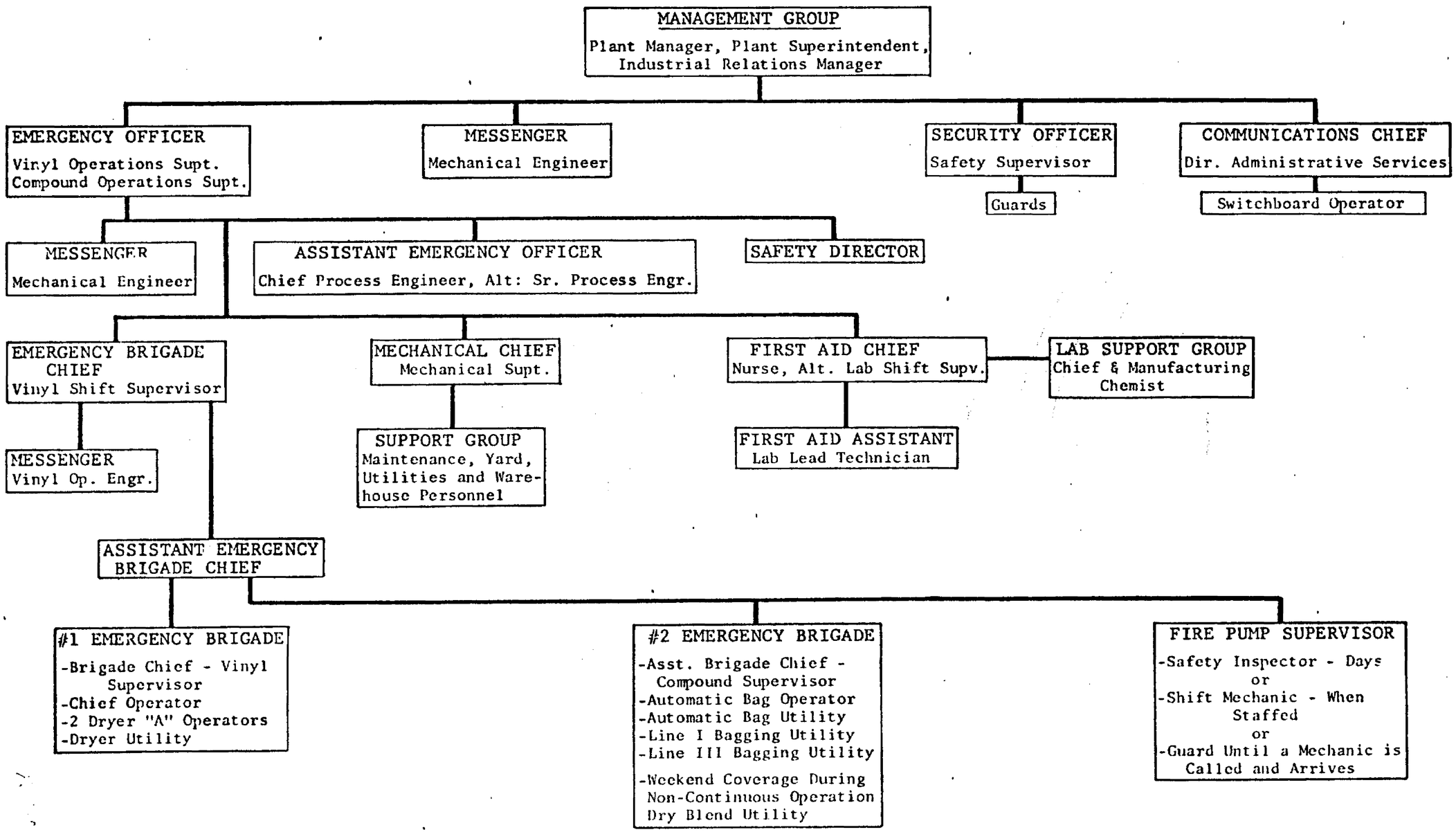
12. J. G. Roberts 369-8059
13. J. V. Uptain 369-8109
14. T. B. Davis 1-327-0183
15. C. E. Davis 369-8780
16. R. W. Rye 369-4730
17. J. A. Dixon 369-8372
18. G. A. Morgan 369-6522
19. J. L. Carter 1-327-6816
20. R. A. Frohreich 1-327-6070
21. J. L. White 369-2991
22. L. D. Honeycutt 343-5595
23. A. L. Barr 369-8232
24. R. D. Jackson 369-2405
25. J. R. Williams 256-3810
26. V. L. Thornhill 369-8952
27. J. P. McKee 256-3142
28. V. E. Messick 1-327-0741
29. D. S. Cox 369-8752

EMERGENCY ORGANIZATION



PLANT EMERGENCY

ALARM DATA SHEET

DATE: _____ TIME: _____

ALARM: Fire Vapor Evacuation* Tornado**
(Circle One)

* Evacuation alarm must follow either the fire or vapor alarm.

** The tornado alarm and the evacuation alarm are the same alarm. The difference lies in the fact that the evacuation alarm by itself means a tornado is approaching. The evacuation alarm must be proceeded by either the fire or vapor alarm.

LOCATION: _____

SPECIFIC NATURE OF PROBLEM

_____

_____

_____

_____

_____

_____

Alarm Activated by: _____