VCM UNLOADING OPERATING MANUAL

ABERDEEN CHEMICAL PLANT

ABERDEEN, MISSISSIPPI

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I. INTRODUCTION

A. Operator Responsibilities

The purpose of the VCM Tank Farm is to safely unload and store Vinyl Chloride 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, on-the-job experience, and passing written and field examinations. The operator fulfills his responsibilities by:

1. Demonstrating understanding of how his equipment functions.
2. Being able to explain what role each piece of equipment plays in the process.
3. Keeping a close and regular check on equipment.
4. Being able to demonstrate troubleshooting and corrective measures.
5. Keeping his area of responsibility safe and clean.
6. Keeping complete and accurate records.
7. Reporting equipment problems promptly and writing maintenance work orders as needed.
8. Operating the equipment in an environmentally sound manner and promptly taking corrective measures should process leaks occur.
9. Wearing the proper respiratory protection.

I. INTRODUCTION (Cont.)

A. Operator Responsibilites (Cont.)

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

The goal for VCM overexposure to employees is "ZERO". This is accomplished by operating the equipment as designed, prompt attention given to leaks per continuous monitor sensors and follow up work orders for maintenance. As we meet our goals for overexposure, all governmental guidelines will also be kept.

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 is "Our work is never so urgent or important that we cannot take time to do it safely". Safety on the job must be our first and most important consideration. When we do a good job of planning our work with safety in mind, we are less likely to suffer injury or cause an accident. This allows us to meet our plant goal of employees going home unhurt.

I. INTRODUCTION (Cont.)

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, Uniroyal in Geismar, Louisiana, or from Shell Norce Georgia Pacific, Plaquemine. A VCM Tankcar typically holds 175,000 pounds of VCM (about 23,000 gallons of liquid). If for some reason an inbound VCM car's gross weight is less than 255,000 pounds, the car must be reweighed and spotted on the west track until billing weights are verified. This insures we receive what has been billed to the Aberdeen Plant. The cars are shipped to Aberdeen and stored on the Monroe lead until they are brought into the plant. Only the Monroe lead or new VCM spur can be used to store VCM railcars. This is a safety precaution 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 eight transfer (unloading) spots. The platform is located between two sets of railroad tracks such that there are four transfer spots on each side. These are referred to by name as Spot No. 1, Spot No. 2, Spot No. 3, and Spot No. 4, from south to north (east side); and Spot No. 6, Spot No. 7, Spot No. 8, and Spot No. 9, from south to north (west side). Spot No. 5 (east side of platform) and Spot No. 10 (west side of platform) are the two north locations for "spotting" tankcars, but there are no unloading facilities at these two spots. Once the railcars have been "spotted", it is the yard department's responsibility to unload the VCM

I. INTRODUCTION (Cont.)

B. General Process Description (Cont.)

into T-601 which is commonly called the "sphere". This is done using the five Corken compressors at the tank farm. They are commonly referred to as Compressor No. 1, Compressor No. 2, Compressor No.3, Compressor No. 4, and Compressor No. 5, from north to south, respectively. Compressors No. 3 and No. 5 combined have about the same capacity as either Compressor No. 1, No. 2, or No. 4. The tankcars are connected to the compressor piping and 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. Refer to the photograph in the Appendix. 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 type 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 all 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

I. INTRODUCTION (Cont.)

B. General Process Description (Cont.)

are evacuated. This must be done because of EPA (Environmental Protection Agency) regulations concerning the release of VCM vapor to the atmosphere. Then the transfer line can be unhooked and the cars are sent back to the respective VCM plant for reloading.

All outbound VCM cars are to be weighed. Cars containing a heel greater than 600 pounds should be set aside for additional unloading. The plant can lose considerable amounts of VCM on heavy outbound cars, which can drastically impact on our plant's cost effectiveness.

There is a big difference in winter and summer operation of the tank farm. The primary reason is probably 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, eight tankcars can be hooked up at one time and unloaded with four or five 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 $40^{o}F$ or less), it is harder to start the VCM liquid unloading and only four tankcars can be unloaded at a time, with four or five 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

I. INTRODUCTION (Cont.)

B. General Process Description (Cont.)

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 recovered vinyl receivers if the incinerator should be down for an extended period of time.

The transfer pumps on the bullets (Conoco Nos. 72-211 & 72-218) and the sphere (Conoco Nos. 72-217 & 72-270) are the responsibility of the vinyl department. The sphere transfer pumps send liquid VCM 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

I. INTRODUCTION (Cont.)

B. General Process Description (Cont.)

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 rotameter on each compressor into the pot. The valve above the rotameter should always be open when the compressor is running. The knockout pot must always have a slightly positive 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

I. INTRODUCTION (Cont.)

B. General Process Description (Cont.)

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.

g. Compressor No. 1 Liquid Line Relief Valve Discharge- This relief valve is piped up to the compressor relief valve header through a locked open valve.

h. Vapor Line Knockout Pot Relief Valve Discharge- This knockout pot is equipped with a relief valve whose discharge is piped through a locked open valve into the compressor relief valve header. The compressor relief valve header is connected to the emission recovery system knockout pot.

i. VCM Recycle Pump Relief Valve Discharge- The VCM recycle pump located below the liquid line knockout pot is equipped with a relief valve which is piped up to the compressor relief valve header.

A second knockout pot, called the vapor line knockout pot, is located just north of the emission recovery system knockout pot. The purpose of the vapor line knockout pot is to collect liquid VCM that may have collected in the main vapor line and prevent this liquid from slugging the compressors. A VCM recycle pump is located below this knockout pot and is used to pump the contents of the pot to the sphere. The pump is started and stopped by two level switches in the pot.

A

I. INTRODUCTION (Cont.)

B. General Process Description (Cont.)

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 the accounting group 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. Copies are to be kept on file by the yard supervisor. A copy of the checklist is included in the Appendix. Also included is a copy of the empty outbound VCM tank car inspection report.

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. Copies of this checklist are to be kept on file by the yard supervisor. This testing must be coordinated with the vinyl panel operators so that the valves are not closed during VCM transfer to the reactor units. This should be coordinated by using the radios.

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, while opening or closing the railcar dome, 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. O-rings for Weco fittings (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. Do Not Use Defective "O" Rings.

II. OPERATING PROCEDURES (Cont.)

A. Railcar Hookup (Cont.)

Procedure (Cont.)

2. Raise the blue metal flag located on the railroad track south of the roadway. This flag states "Stop! Tankcar Connected." This procedure is necessary to isolate the eight unloading stations and notify railroad personnel that VCM unloading is taking place.
3. Engage the derailer located near the blue flag. This will prevent railcars from entering the tank farm area when unloading is taking place.
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. If the tape does not bounce, notify the yard supervisor. The maximum allowable sphere level is 38 feet. To unload 4 tankcars the level must be below 32 feet - 3 inches (27 feet - 0 inches for 8 tankcars).
6. 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.

   Inspect the grounding cables to ensure that they are intact and in good working condition. Bond each car to the ground rod by attaching the grounding clamp to the north side of the vertical siderail of the ladder. This prevents static accumulation during unloading

II. OPERATING PROCEDURES (Cont.)

A. Railcar Hookup (Cont.)

Procedure (Cont.)

6. (Continued)

and eliminates dangerous sparking which could ignite any VCM leaks. It also prevents loss of the ground clamp if it is left connected during switching.

Should one of the grounding clamps or cables be damaged, use the backup cable located on the south liquid boom arms at each spot except Spots No. 4 and No. 9 which have no backup cables.

7. Drain the water from the breathing air filter if necessary. (The filter is located between the rail tracks).

8. Climb the stairs to the unloading platform. If the stairs are wet or icy, be especially careful. Always be sure to use the handrail.

9. 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.

10. 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).

11. Remove the nipples from the holders and peel off the old Teflon tape. Inspect the threads and retape them with new tape up to 2" from the end of the threads. If the threads are worn, write a work order to replace the old nipples with new ones.

II. OPERATING PROCEDURES (Cont.)

A. Railcar Hookup (Cont.)

Procedure (Cont.)

12. 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.

13. 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. If it leaks, adjust the straps or facepiece. Make sure you have a good face seal.

14. Purge the air line of any water that may be in the line. Connect the fresh air mask to the fresh air hose that is on the transfer line booms.

15. 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 it cannot close. Be careful to use proper lifting procedures when raising the lid.

16. Visually check inside the dome area for leaks. Leaks will be indicated by condensation or icing around the valves and fittings. Check the plugs and caps and attached chains - if any are missing, note on the checklist.

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

18. Select the correct size wrench to fit the railcar valve plugs and remove the plugs. Be alert to the fact that the wrench could 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.

II. OPERATING PROCEDURES (Cont.)

A. Railcar Hookup (Cont.)

Procedure (Cont.)

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

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

21. Unhook the flexlines and or Weco fittings from the holders on the booms. Be careful to minimize bending and twisting the flexlines during hookup. Excessive bending of the flexlines causes early failure of the lines. Visually inspect the flexlines for small holes or extremely worn areas of the armored weave. If a flexline is punctured, badly twisted or damaged, or in your judgment has a likely potential for failure during operation, contact maintenance and have the hose replaced.

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

23. Press the Weco union attached to the flex hose against the nipple inserted in the railcar. Check the alignment of the "O" rings to make sure there is a good seal. "O" rings that are pinched or crooked will cause leaks. Completely tighten the Weco hammerlock to prevent leakage.

II. OPERATING PROCEDURES (Cont.)

A. Railcar Hookup (Cont.)

Procedure (Cont.)

24. 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 up to open it. Opening the valves too fast can cause an undesirable surge of pressure. Check for leaks around each coupling and vacuum breaking valve as the railcar valves are opened.

25. 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.

26. Recheck the valves on each transfer line to make sure they are open.

    The railcar dome valve and both tranfer line valves must be open. The vacuum breaking valve must be closed. Initial the checklist to show that the valves are open.

27. 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 24 - "Unhooking Railcars").

28. 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.

29. 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 compressors in a dead-headed condition will raise the compressors' relief valves and force VCM into the emission recovery knockout pot T-201. A pressure switch on T-201 will shut down all compressors if the pressure in the pot reaches 70 psig.

Equipment Required

1. Fresh Air Mask.

Procedure

1. After hooking up the cars, carefully come down the stairs from the unloading platform, using the handrails. Check the valves that are between the railroad tracks going to each unloading station, which is to be used for unloading cars. 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 put on the fresh air mask, check for face seal, and connect it to the fresh air hose.

II. OPERATING PROCEDURES (Cont.)

B. Unloading Railcars (Cont.)

Procedure (Cont.)

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.

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 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. Open the vapor line knockout pot inlet and outlet valves to allow vapor to flow through the knockout pot. These valves are located near the main vapor valve. Close the vapor header block valve located between the knockout pot inlet and outlet valves.

7. 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.

II. OPERATING PROCEDURES (Cont.)

B. Unloading Railcars (Cont.)

Procedure (Cont.)

Initial the checklist after checking the vapor valve for each compressor.

8. Check the level of the VCM in the vapor line knockout pot by observing the sight glass located on the east side of the pot. The level should be below the pot's high level switch before unloading is started. The level in the pot is automatically controlled by high and low level switches. Should the instruments malfunction and the level be above the high level switch, notify the yard supervisor and proceed to drain the pot manually. Do this by placing the VCM recycle pump switch in the "hand" position. This switch is located on a panel on the south side of the knockout pot. The recycle pump will pump the contents of the pot to the sphere. When the level in the pot has lowered to the low level switch, place the pump switch back in the "auto" position.

9. 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 must be checked before signing off the work order.)

10. 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

II. OPERATING PROCEDURES (Cont.)

B. Unloading Railcars (Con.t)

Procedure (Cont.)

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). When this occurs, close the Jamesbury valve.

11. 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, Compressors No. 3 and No. 5 should discharge to the No. 3 transfer station, Compressor No. 2 should discharge to No. 2 transfer station, Compressor No. 4 should discharge to the No. 4 transfer station, and Compressor No. 1 should discharge to the No. 1 transfer station. When one or more compressors are not to be run, or if fewer than four railcars are to be unloaded, it is best to setup the compressors on common discharge by opening the four valves on the No. 5 compressor header. This allows all the compressors to be set up on one common header. Check the valves on the line from the No. 5 compressor to made sure they are set up correctly and be sure to check the jumper lines that connect the lines going to the four spots. Finally, check the four vapor valves near the ground going to the four transfer stations. 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.
12. When all the lines have been traced for each compressor, push the start buttons for the compressors to be run.
13. Check the oil pressure on each compressor. It must read between 10-20 psig.

II. OPERATING PROCEDURES (Cont.)

B. Unloading Railcars (Cont.)

Procedure (Cont.)

14. 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.
15. 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.
16. Check to see that the Jamesbury valves on the compressor suction liquid traps are closed.
17. Take off the fresh air mask, disconnect it, and roll up the hose.
18. Record the identification numbers of the railcars being unloaded and log into log book.

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 6-8 psig. If they are recovered to less than 6 psig it causes problems at the VCM plants, because the car may be below atmospheric pressure and pull air into the car. If the cars are not recovered to less than 8 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 four valves from the No. 5 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 be checked to see if they have blown out. Use the following procedure: (Assume that railcar A and railcar B are hooked up

II. OPERATING PROCEDURES (Cont.)

C. Recovering Vapor From Railcars (Cont.)

Procedure (Cont.)

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.

C. When the sight glass shows that railcar B has blown out, go back to the platform and open the liquid and vapor 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.

F. When the sight glass shows that railcar A has blown out, re-open the liquid and vapor 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.

2. Put on the fresh air mask, check for face seal, and connect it to the fresh air hose.

II. OPERATING PROCEDURES (Cont.)

C. Recovering Vapor from Railcars (Cont.)

Procedure (Cont.)

3. Open the four valves on the No. 5 compressor header so that all the compressors are on one comon header.
4. Reverse all the 4-way valves so that the handles are in the horizontal position.
5. Close all liquid line valves located beneath the sight glasses at the ground level.
6. Check the compressor discharge pressures to make sure the compressors are not dead headed (pressure should be 70-100 psig).
7. Take off the fresh air mask, disconnect it and roll up the hose.
8. 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 compressors will be automatically shut off by the low pressure switches. 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^{o} 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 and 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.)

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 hand-rail.
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 6-8 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). Go to the compressor shed and put on the fresh air mask, check for face seal, and then connect it to the fresh air hose.
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 system. (Gauge is at the southwest corner of compressor shed.) It must read at least 10" Hg vacuum. Open the four 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 (Con.t)

Procedure (Cont.)

7. Immediately after opening the four manual evacuation valves, carefully climb the stairs to the unloading platform, hook up and put on the fresh air mask, check for face seal, and connect it to the fresh air hose. 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. The pressure gauges should be maintained in good working condition or be replaced. The stainless steel flex hose is now valved off at 10" Hg vacuum or less, which complies with EPA regulations.
10. Open the ½" vacuum breaking valve at the end of the transfer line boom.
11. Disconnect the Weco hammerlock coupling.
12. Inspect the "O" ring on the Weco coupling nipple. Discard it if it has any nicks or cracks on it. Close the vacuum breaking valve.
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 pipe-wrench. Remove them from the dome and cover the portholes.

II. OPERATING PROCEDURES (Cont.)

D. Unhooking Railcars (Cont.)

Procedure (Cont.)

Be careful not to let the pipewrench slip and trap your hands or fingers against the railcar.

15. Select the correct size wrench 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. All the plugs must be in place tight and have chain attached.

16. Put the nipples, pipewrench and wrench on the transfer station walk ramp and close the railcar dome lid. Be careful not to let the lid trap your hands or fingers. Slide the latching bar shut to hold the lid closed. Seal lid and record the lid seal number on the checklist.

17. Unhook the fresh air mask and take the pipewrench, nipples, and wrench 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 flex-lines excessively. This can cause early failure of the flexlines.

20. Loosen the locks on the walk ramp 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.

II. OPERATING PROCEDURES (Cont.)

D. Unhooking Railcars (Cont.)

Procedure (Cont.)

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.
24. Turn the placards on the railcar over so that they read "Empty." These placards must be present on both sides and both ends of each car. The placards must be right side up and all must be in place before car leaves the plant. A sample of the railcar placards is attached in this manual.
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). Also close the 2" emission recovery valve located overhead at the southwest corner of the compressor shed. These must be manually blocked in to prevent air or VCM leaks into the emission recovery system and to prevent VCM leakage through the automatic valves during railcar unloading.
26. Lower the blue flag to show that tank cars are no longer connected.
27. Disengage the derailer located south of the roadway.
28. 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. High Pressure on the Sphere or Bullets (or Evacuation)

Occasionally, the pressure on the bullets or 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 five 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.

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.

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

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

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:

Considerable planning and preparation must be done prior to attempting this procedure. However, the following concept should be utilized.

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.

3. 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 using the emission recovery system. When using the emission recovery system,

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

3. Evacuating a Compressor for Maintenance (Cont.)

Compressor No. 5 must be evacuated by a different procedure than the other compressors.

a. Using the emission recovery system:

NOTE: Not for Compressor No. 5.

(1) Close the 3" valve coming off 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 Compressor No. 5 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.

(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).

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedres (Con.t)

3. Evacuating a Compressor for Maintenance (Cont.)

(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. (Make sure maintnenace blinds all the lines when working on a compressor).

b. Using the emission recovery system for Compressor No. 5:

NOTE: One of the other compressors must also be evacuated because the emission recovery system valves tie in only to the four transfer lines dwonstream of the Compressor No. 5 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 Compressor No. 5. Leave the Compressor No. 5 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.

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

II. OPERATING PROCEDURES (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

3. Evacuating a Compressor for Maintenance (Cont.)

(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 Compressor No. 5, block off the Compressor No. 5 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). Compressor No. 5 should now be ready for maintenance.

4. 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 compressor, 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.

II. OPERATING PROCEDURES (CONT.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

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

b. After making sure that all valves are open and pressures are normal, open the valves on the No. 5 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.

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 No. 5 compressor header.

5. 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

II. OPERATING PROCEDURE (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

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

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. If this reseats valve, reopen all partically closed valves.

b. Turn off the compressor and let the car unload itself for a period, then reopen all valves partially closed and restart the compressors. This can usually be done only in 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, the liquid lines should always be hooked up to each car.

6. Evacuating The VCM Vapor Line Knockout Pot and Recycle Pump For Maintenance

Before taking the knockout pot and recyclye pump down for maintenance; the pot, pump, and related piping must be isolated and the VCM vapors removed (down to below 0 psig). This will be done by using the emission recovery system.

a. Close the 4" inlet and outlet valves to the knockout pot. Tag these valves with "Do Not Operate" tags.

b. Close and tag the recycle pumps's 1½" discharge and recirculation valves.

II. OPERATING PROCEDURE (Cont.)

E. Troubleshooting and Miscellaneous Operating Procedures (Cont.)

6. Evacuating the VCM Vapor Line Knockout Pot and Recycle Pump For Maintenance (Cont.)

c. Open the 2" manual valve that will evacuate the knockout pot and pump to the emission recovery system.

d. When the pressure in the knockout pot and on the pump reaches less than 0 psig, close the 2" valve to the emission recovery system. The knockout pot and pump should now be ready for maintenance.

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 (Compressors No. 1, No. 2, and No. 4)

Purpose : Unloading and evacuation of VCM tankcars.

Description : Corken model 690, 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 (Compressors No. 3 and No. 5)

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, Duriron 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 (T-201) - 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.

III. EQUIPMENT INDEX (Cont.)

H. VCM Knockout Pot (T-202) - Conoco No. 45-061

Purpose	:	To remove liquid VCM from the vapor line and prevent liquid slugging of the compressors.
Description	:	Vertically mounted on supports 6 feet above grade, 5-foot straight wall height, 2.5-foot diameter, with capacity of 150 gallons.
Normal Operating Conditions	:	70°F and 40 psig.
Design Conditions:		150 psig @ 200°F.
Relief Valve Setting	:	150 psi.

I. VCM Recycle Pump (P-250)

Purpose	:	Removal of knockout pot contents to sphere.
Description	:	CMP model #3 x 1½ x 5, canned centrifugal pump, 3 HP driver.
Normal Operating Conditions	:	10 GPM @ 58 feet of differential head.
Relief Valve Setting	:	170 psi.

J. Compressor Low Pressure Switches

Purpose	:	To shut off compressors at the end of vapor recovery from railcars.
Description	:	Static-O-Ring diaphragm type.
Set Point	:	6 psig decreasing.

K. Vapor Line Knockout Pot Level Switches - High and Low

Purpose	:	To start and stop VCM recycle pump as liquid VCM collects in the knockout pot.
Description	:	Robertshaw switches.

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 indivi-ual 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 regu-lator, 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. Opening railcar dome lids, 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 con-centration 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 conditions:

1. Working in a contaminated area of less than 10 ppm VCM for up to 10 hours. NOTE: If the HNU monitor reads greater than 10 ppm VCM, a fresh air mask must be used.
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 six diesel operated fire pumps from the firepond and Number 5 waste water 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

IV. SAFETY EQUIPMENT AND SYSTEMS (Cont.)

D. Fire Systems (Cont.)

1. Fire Monitors (Cont.)

be sent to these monitors by opening the tank farm monitor switch on the module charge panel in the vinly control room. Opening this switch operates a 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. (A manual bottle back up system can also be used to open this fire monitor supply valve.)

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. (A manual bottle backup system can also be used to open this weir supply valve.)

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.

IV. SAFETY EQUIPMENT AND SYSTEMS (Cont.)

D. Firewater System (Cont.)

3. Deluge System (Cont.)

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. 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 vessesl. 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 valves are to be checked daily. The person draining the dike should stay in the area and close the valve when draining is completed. The four actuated valves on the sphere inside the dike can be closed from the old module charge panel in the vinyl control room or from 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 CLOSED FOR UNLOADING:

_____1. 4 - 1" manual valves on evacuations lines, east side of the compressor shed.

_____2. Main 2" overhead manual valves on evacuation line, southwest corner of compressor shed.

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).

_____10. Vapor line knockout pot inlet and outlet valves on west side of compressor shed.

VALVES THAT MUST BE OPENED FOR RECOVERING VAPOR FROM RAILCAR:

_____11. Same as above except 4-way valves on compressor being used in horizontal position (handle).

WHAT TO CHECK FOR UNLOADING:

1. Pressure gauages 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.

5. Liquid VCM avove the low level switch in the vapor line knockout pot.

CAR NUMBERS BEING UNLOADED:

_____ _____ _____ _____

_____ _____ _____ _____

B. CHECKLIST FOR TESTING AUTO-VALVE UNDER SPHERE

MAIN LIQUID VALVE INTO SPHERE:

	(Test)	
Open	Closed	Open

MAIN VAPOR VALVE INTO SPHERE:

	(Test)	
Open	Closed	Open

LIQUID VALVE TO TRANSFER PUMPS:

	(Test)	
Open	Closed	Open

RECIRCULATION LINE VALVE:

	(Test)	
Open	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 located on north side of switchgear module at south end of VC tank farm. Tests are to be performed every Wednesday.

OPERATOR: _____

DATE: _____

C. EMPTY OUTBOUND VCM TANK CAR

INSPECTION REPORT

Note: This inspection report is to be completed by the yard operator responsible for unhooking car.

Operator's Name: _____

Time: _____

Date: _____

Car No.	Seal No.(1)	Due Date

	YES	NO
1. All unloading fittings removed		
2. All product openings capped or plugged tightly		
3. All plugs and fittings equipped with chains		
4. Placards reversed and upright (4)		
5. Chocks removed		
6. Blue flag put down		
7. Derailer removed		
8. Visual evidence of any car defects		

NOTIFY SUPERVISOR OF ANY ACTUAL OR SUSPECTED DEFECTS.
DEFECTIVE CARS ARE NOT TO LEAVE THE PLANT.

(1) Note: All dome lids are to be sealed shut and corresponding seal numbers recorded.

The above cars have been inspected and prepared for shipment. To the best of my knowledge these cars have no defects.

_____
Operator's Signature

Conoco Chemicals Company
Conoco Inc.
P. O. Box 91, New Highway 25
Aberdeen, Mississippi 39730
(601) 369-8111

PVC PLANT SAFETY AND HEALTH MANUAL
ABERDEEN, MS

SUBJECT: Fire Prevention Plan

EFFECTIVE DATE: March 18, 1983

PREPARED BY: A. H. Scothern — Safety Director

APPROVED BY: John Trimble — Manager

References: CFR 1910, Subpart L-Fire Protection, 1910.134

Purpose: The potential for personal injury and property damage in operating plants that handle flammable and toxic materials can be serious if the hazards are not properly controlled. Conscientious operation of our plant and adherence to sound operating practices are the only consistent methods that can be used to control these hazards. This plan is therefore being issued to:

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

2. 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 industries like ours are particularly severe. Due to the nature of the materials which are routinely handled in our plant (primarily VCM, natural gas, propane, and other hydrocarbon raw materials and fuels), operating personnel must exercise preventive control of hazards which can lead to fires.

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
	Diesel Fuel
	2-Ethyl Hexaldehyde (CTA)
	Glycerine
	Methocel
	Paper Bags
	Hydroquinone

COMPOUND DEPARTMENT

Flammable

Gasoline

Combustible

Antimony Trioxide	"Mark" Compounds
4310 R-1 Violet	Mineral Oil
Expoxidized Soybean Oil	Bisphenol A
Oncor 75RA	Cardboard Boxes
Paper Bags	Color Concentrates (Vinyl Base)
Cyasorb UV-531	Lead Stabilizers
Diabasic Lead Stearate	R-4067 (Interstab)
Ferro ThermOCheck 1827	Hal-Lub-D
Synpron 1438	Hystrene 5016
Hostalube XL 165	
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, 175
Wax Lubricants
(polyethylene, petroleum)

PLASTICIZER DEPARTMENT

Flammable

Gasoline

Combustible

Alcohols
Phthalic Anhydride
"Darco" Carbon Black

Cardboard Boxes
Diesel Fuel
Bisphenol A
Paper Bags
Sulfonic Acid Catalyst
(liquid)
(Scott Air Pak and turnout gear required for fire fighting)

MAINTENANCE DEPARTMENT

Flammable

Acetylene
Amercor Mark III
Anhydrous Ammonia
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)
BETZ KI-2
Cardboard Boxes
Conoco lube oils and greases
Diesel Fuel
Mitee Thread Cutting Oil
Neutrameen NA-7
Polysperse Plus
Slimicide C-31
Slimicide C-68
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. We must always remember that elevated processing temperatures can cause a material that is classified as a combustible at normal storage temperatures to be reclassified as a flammable material. 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. Hot work in the vinyl and propane processing area should be allowed only when there is no other reasonable method.

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 Electrical and Instrument Personnel to insure that it operates properly when needed. The Safety Director is responsible to see that 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 identified 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 used in the event of a fire related emergency.

TABLE II

FIRE FIGHTING EQUIPMENT

Equipment	Areas Of Coverage
Diesel Driven Fire Pumps For Water Supply (4-2000 GPM, 100 psig units - north pump house) (2-2000 GPM, 130 psig units - south pump house)	Areas processing vinyl chloride monomer and propane fuel.
Process Water System	Plasticizer, compound, and warehouse buildings sprinkler systems
Deluge Spray Systems	Vinyl reactors and tank farm.
Fire Monitors (Fixed)	Vinyl reactor, VCM and propane tank farm, VCM incinerators.

TABLE II (Continued)

Equipment	Areas Of Coverage
Fire Monitors (portable)	Emergency equipment station, initiator storage freezers.
Dry Chemical Wheeled Fire Extinguishers	New reactor module, old reactor module, south compound cooling tower.
Dry Chemical Hand Portable Fire Extinguishers	Various locations plant-wide.
Hose Houses and Fire Hydrants	Various locations plant-wide.
Fire Turnout Clothing (hats, coats, boots & gloves)	Available for use plant-wide, stored in the Emergency Equipment Station.
Extra Handline Fire Hoses, Nozzles, and gated wyes	Selected hose houses in vinyl areas.
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.
Halon 1211 Fire Extinguishers	Behind vinyl control panel and in telephone switching room.

HOUSEKEEPING

Along with the 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:

HOUSEKEEPING - (Continued)

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 and Process Engineering.

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 east of the API Separator. Empty fiber drums should be placed in the large open top trash containers located south of the plasticizer building.

4. Cleanup and disposal of dust type materials which have been contaminated with substances 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 requirements 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) All engines start on pressure drop and sequence. 2) Battery and charger condition. 3) Engine operating temperature. 4) Engine oil pressure. 5) Engine hours. 6) Fuel levels. 7) Flowing and static pressure. 8) Engine RPM
	Semi Annual	1) Flow studies. 2) Verify engine RPM with tachometer. 3) Cooling system flush and charge with fresh coolant (annual). 4) Verify 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.
	Monthly	1) Systems drain freely. 2) No breaks in deluge piping systems.
	Quarterly	1) Check flowing pressure on each system.
VCM Storage Sphere	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 antifreeze solution if wet.
Post Indicator Block Valves and Other Fire System Valves In Each Unit	Weekly	1) Check to insure that firewater supply valves to unit deluge valves are open and locked. 2) Verify all thermostatic release air line valves are open and locked.

TABLE III

FIRE PROTECTION SYSTEM
AND
EQUIPMENT MAINTENANCE

System/Equipment	Frequency	Checkout Requirements
Post Indicator Block Valves and Other Fire System Valves In Each Unit	Quarterly	1) Check to insure that all underground supply line block valves are open and locked.
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, pre-connected to hydrant or supply valve.
Fire Extinguishers (Hydrostatic)	Five or Twelve Years	1) Done under contract with licensed cylinder hydrostatic test contractor.
Emergency Alarm	Weekly	1) Test alarm tones (vapor, fire, evacuation, weather) one per week on rotating sixteen week cycle. 2) Test all clear tone after each test.
Smoke Detection System	Semi Annual	1) Check voltages, detectors and alarm signal devices for proper operation. 2) Check supervisory circuitry.
CO_2 Fire Extinguishing 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.

Conoco Chemicals Company
Conoco Inc.
P. O. Box 91, New Highway 25
Aberdeen, Mississippi 39730
(601) 369-8111

PVC PLANT SAFETY AND HEALTH MANUAL
ABERDEEN, MS

SUBJECT: Emergency Plan-Immediate Actions

EFFECTIVE DATE: March 18, 1983

PREPARED BY: A. H. Sather Safety Director

APPROVED BY: John Tuer Manager

References: CRF 1910, Subpart L-Fire Protection, 1910.1017 Vinyl Chloride

Purpose: The Aberdeen Plant Emergency Plan is broken into two separate and supporting parts. This section, entitled Emergency Plan-Immediate Actions, contains the essential steps necessary to control an emergency condition in the plant. The primary objectives of this section are to:

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

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

3. 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.

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.

Significant vapor release conditions can cause human overexposures and/or fire. The conditions that warrant vapor or any alarm are described in Attachment A. Follow-up announcements must be made as noted to prevent exposure and maintain a clear area.

Immediate Actions To Be Taken In Event Of A Plant Emergency

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

Immediate Actions To Be Taken In Event Of A Plant Emergency (Continued)

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:

I. 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. The message shall also be given three (3) times over the Gaitronics paging system as noted above.

Plant Emergency Alarm Codes

The plant emergency alarm tones are generated electronically from a tone generator that is a part of the Gaitronics paging system. As is noted above, the generator is controlled by the Vinyl Operators in the Vinyl Control Room. This alarm system has been designed such that anytime the Gaitronics alarm is activated by an operator in the control room, a relay closes causing the Gaitronics and public address systems to be interconnected. This allows the signal tones to be broadcast plantwide by all the Gaitronics and public address speakers.

The alarm tones and their corresponding meaning are shown below:

Alarm Tone	Meaning
Siren	Fire
Pulse	Vapor
Warble	Evacuation
Yelp	Severe Weather/Tornado
Steady	All Clear

II. Use The Proper Emergency Equipment

Protective equipment needs are dictated by the emergency conditions. Personnel responding to an emergency must evaluate the risks before they attempt to correct problems. For emergencies involving VCM or propane vapor releases, the minimum requirements for personnel protective equipment would be a Scott Air Pak. For more serious releases where flammable vapors have been released into an area where an ignition could occur, protective equipment needs could reasonably include full fire turnout equipment, Scott air packs and water sprays from deluge systems, fire hose handline or all again depending upon the needs.

III. Evacuate Non-Essential Personnel From Danger Areas

Always evacuate non-essential personnel and all personnel not properly equipped with personnel protective equipment which is appropriate for the hazards present. Emergency crews are to report to the emergency location as directed in the Emergency Crew utilization section below. Evacuated 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 located 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 - RUNNING SHOULD BE AVOIDED!

Supervisors must designate non-emergency personnel to act in their place for head count purposes (noted below) if the emergency condition requires the activation of the Emergency Crews or Emergency Organization.

Wind direction at the time of fire 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 502 to determine the wind direction.

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, Receiving Warehouse/Stores, Yard - Main Shop

Off Shift (Evenings Nights, and Weekends) Stores/Warehouse - Guard House

PRIMARY EVACUATION AREAS (Continued)

Transportation - Warehouse at northwest corner of the staging area but east of the lab and compound/plasticizer group.

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

Office Personnel - Lobby in each office area.

Contractors - North of main gate.

IV. Account For All Personnel

When personnel have assembled in the primary evacuation areas, head counts must be made as noted in the Evacuate Non-Essential Personnel From Danger Areas section above. 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 to conduct search and rescue operations. NOTE: Where 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.

Each department shall develop a plan to account for their personnel. Personnel in that department shall be trained in the prompt and proper execution of their plan when it is approved by the manager. Each department will report the status of their personnel to the guard. Any missing personnel will then be reported to the Emergency Officer by the guard.

V. Rescue Trapped Personnel

Search and rescue operations in the immediate area of 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, or exposure to extreme heat.

In the event that rescue operations are required during serious plant emergencies, the Emergency Officer (Emergency Crew 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. These requirements are outlined in "Use The Proper Emergency Equipment" section above.

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.

VI. STOP ALL HOT WORK! - Motor vehicles, portable transfer systems, the incinerator, welding machines and other sources 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.

VII. Stop flow of:

A. Flammable materials feeding fires or potential fires, including dryer and incinerator gas burners.

B. Boilerhouse operation is to be shutdown 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 Crew Chief, the Emergency Officer, or the Safety Director.

VIII. Fire Control

This section is divided into two interrelated parts - Activation Of Fire Protection Systems And Emergency Organization Utilization. Although they are treated separately in this plan, actual emergency conditions in the plant will dictate a coordinated effort using every safe and reasonable control method at our disposal.

Activation of Fire Protection Systems

The fire protection system available in the plant should be used to control ignition sources in event of vapor release or to remove heat in event of fire. Whenever a vapor release occurs, deluge systems or fire monitors should be put into operation immediately to disperse vapors and reduce ignition sources, depending upon the conditions. In the reactor modules, vapor sensors detect the presence of flammable gases and at preset concentrations, these sensor units will "trip" or activate the unit deluge valves automatically. Other methods of fire water activation for the deluge systems include:

A. Operation from the control room panel;

B. Manual release at the deluge valves; and

C. Thermostatic release sensors. (High heat or rapid rate of temperature rise such as fire or direct steam impigement will cause a trip condition.)

(The above tripping methods simply release control air from the top chamber of the deluge valves. Loss of control air causes the valve to open and allows fire water to flow through the deluge valve into field piping.

The conditions that would reasonably dictate the need to use either the deluge system or fire monitor nozzles and other equipment are:

Deluge System

- 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 or storage vessel areas at the VCM tank farm.

  (NOTE: Cold Water On A Hot Corken Compressor Could Cause A Rupture Of The Compressor. Use Caution And Sound Judgment In This Area.)

- Fires resulting from any of the above.

Fires 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 if both reactor area systems are 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 in that area 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.

* Phase IV of the Fire Protection Improvement Project will provide a hose house at the initiator storage freezer.

Other Equipment - In the event that stationary fire fighting equipment is inadequate to control or reduce the impact of an emergency condition, additional fire fighting equipment is available in the Emergency Equipment Station. The equipment available includes fire turnout gear, portable fire monitor, firehose nozzles and water wall nozzles (used to protect adjacent exposures from fire damage or to provide a vapor shield barrier - water is supplied with 2½ or 3 inch fire hose).

Emergency Crew Utilization

Recently, many of the fire hose stations in the Vinyl operating areas were put on the new fire water system. This resulted in higher operating pressures available to fight fires at these stations. Increased supply pressure causes increased nozzle reaction forces (more effort is required to control the hose when water is flowing). The operating pressures from the north (#1) and south (#2) fire pump houses are 140 and 155 psig respectively at design flow rates. This high pressure requires additional manpower for hose handling. Previously, a five man hose crew was planned. A seven man hose crew should be used now to handle the hand lines and nozzles (three (3) men for each of two (2) hoses and a Crew Chief). No changes have been made in the basic structure of the Emergency Crews since no additional staffing is available for this work. The Emergency Organization is shown in Attachment C.

The utilization of the Emergency Crews must be directed to controlling fires and vapor releases as follows.

A. In the event of any serious emergency, the Emergency Crew Chief is to activate the Emergency Organization.

Activation Of Emergency Organization - Whenever the acting Emergency Officer (Operations Superintendent of affected area - alternate - on duty supervisor) determines that the Emergency Organization must be activated, it shall be done in the following manner.

1. Weekdays - Announce "ACTIVATE EMERGENCY ORGANIZATION" three (3) times over the paging systems (P. A. and Gaitronics).

2. Off Hours - Instruct the plant guard to initiate call out of the Emergency Organization using the current Emergency Organization Call List (Attachment B.)

The on-duty Supervisor can instruct a lead operator to initiate either action.

In the event of a fire alarm, Emergency Crews are to assemble upwind of the fire and await further instructions. In the event of a vapor release alarm, Emergency Crews will assemble only if requested by general plant announcement. An assembly point must also be announced as directed by the Emergency Officer.

B. Use stationary fire protection systems to our greatest advantage. Use deluge systems and fire monitors to remove heat from a fire, reduce ignition sources, disperse flammable vapors, and protect nearby equipment and structures. Supplement stationary equipment with portable fire protection equipment such as monitors, fire hose and nozzles using a ground loop as necessary to protect personnel or equipment.

C. Obtain fire turnout equipment (helmets, coats, boots, and cotton gloves from the Emergency Equipment Station as needed to protect personnel from potentially hazardous exposures in vapor releases and fires. Scott air packs must also be used to protect personnel from toxic or otherwise harmful vapors and smoke.

D. Emergency Crew personnel should provide help to operating unit supervisors and unit personnel to block in fuel sources away from the fire or vapor release as directed by the Emergency Officer. Personnel performing this work should put on fire turnout gear and Scott Air Packs before attempting to enter an area near a fire or serious vapor release.

E. The Emergency Crew Chief shall guide fire fighting personnel into fire areas to block in fuel sources only after all other reasonable methods of fire control have been tried and found unsuccessful. The hose crew size is seven personnel (Chief and two-three man hose crews for handlines). All personnel must understand that each move must be controlled by the Crew Chief and is commanded verbally by him.

F. If a man is down near a fire or serious vapor release, the Emergency Officer must quickly assess the risks his crew must face to rescue the downed person. He must take into account such things as the injured person's location, the location of the fire or vapor release, climbing requirements, obstructions, available manpower, hose availability, and other similar considerations. The specific question that must be answered by this analysis is: Can the injured person be removed under the conditions at the time without seriously endangering the lives or safety of the rescuers? Extra personnel will be required to attend the needs of the injured in this case.

IX. 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

In the event that an emergency condition necessitates the assistance of the Aberdeen Fire Department, the following guidelines must be understood.

1. The Aberdeen Fire Department has agreed to provide assistance in the areas of manpower and fire water pressure boosting for handlines.

2. The Emergency Officer is responsible to determine if Fire Department assistance is necessary to control a fire. If he determines that they are needed, he must initiate the call by notifying the guard to make the call. (This can be done by radio to the control room and a lead calls the guard.) He must also assign someone to meet the fire trunk at the guard-house. The guard should be informed as to who has been assigned to meet the fire truck so he can tell the fire truck driver who to follow. The guard will hold the fire truck until the escort arrives. Specific instructions should be given to the employee assigned to meet the fire truck so the route of travel and destination are understood.

3. The Emergency Officer shall retain control of all fire fighting operations.

4. Additional manpower from the fire department may arrive at the plant in personal vehicles. They should be allowed to pass through any roadblock. They are to park in the employee parking lot. Any fire department personnel who do not have protective equipment should be stopped at the gate. Fire department personnel are to assemble at the gate and will be escorted to the fire location by a CONOCO employee, designated by the Emergency Officer. Aberdeen Fire Department personnel must be equipped with fire turnout equipment that covers all body parts to fight fires of a serious nature in the vinyl or propane areas. For fires in other areas, full fire turnout equipment may not be required. The Emergency Officer must judge the needs and send firemen back if the turnout equipment is inadequate. Outside fire fighting personnel must be escorted at all times by CONOCO escorts.

Have local police warn adjacent plant 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 section in Safety And Health Manual Section 1.232 Emergency Plan-Reporting Requirements and Emergency Organization Duties.)

X. Locate the boundaries of contaminated areas during vapor releases. This will normally be done by the Safety Supervisor during weekdays. The Vinyl Shift Supervisor will perform this duty during off-shift hours only after he has successfully contained the emergency condition and completed the work assignments necessary to clear the emergency.

Readers of the plan must understand that the items discussed in this plan have not been placed in any priority. In fact, most of the items will have to occur at the same time.

Responsible personnel must exercise sound judgment in their decision making and obtain help whenever they think they may need it. It is far better to call out the Emergency Organization in a time of potential need and the help arrive only to find out that the problem has been taken care of, than to find out after people have been hurt that help was needed.

ATTACHMENT A
PLANT ALARM SYSTEM
TRIGGER LEVELS

CONDITION	RESPONSE
Three (3) consecutive readings on the Honeywell at or above 5 ppm - VCM at any point (EPA leak).	1. Notify unit or Chief Operator to clear personnel from affected area and keep them clear. 2. Find and properly report leak.
Known release, three (3) consecutive readings on the Honeywell's 10 ppm-VCM or greater, or a major vapor release in any VCM or propane handling area.	1. Sound VAPOR RELEASE ALARM. 2. Announce which unit is affected and should be cleared on the Gaitronics and public address systems. (Announce 3 times - each system.) 3. Dispatch Supervisor, Chief or unit operator to find leak, check size of leak, clear personnel, and report conditions to control room personnel. THIS MUST BE DONE ON A TOP PRIORITY BASIS.
Fire	1. Sound Fire Alarm. 2. Announce location of fire on Gaitronics and public address systems (3 times each system). 3. Announce Emergency Crew assembly point as specified by Supervisor. 4. Activate Emergency Organization as directed by Supervisor/ Emergency Officer.
Evacuation	1. Sound Evacuation Alarm. 2. Announce Plant Evacuation over Gaitronics and Public Address systems (as noted above).
Severe Weather/Tornado	1. Sound Severe Weather Alarm as specified by Supervisor or guard (if tornado is seen). 2. Initiate steps to control reactors or rapidly shut down equipment. 3. Seek shelter in protected area.

ATTACHMENT B

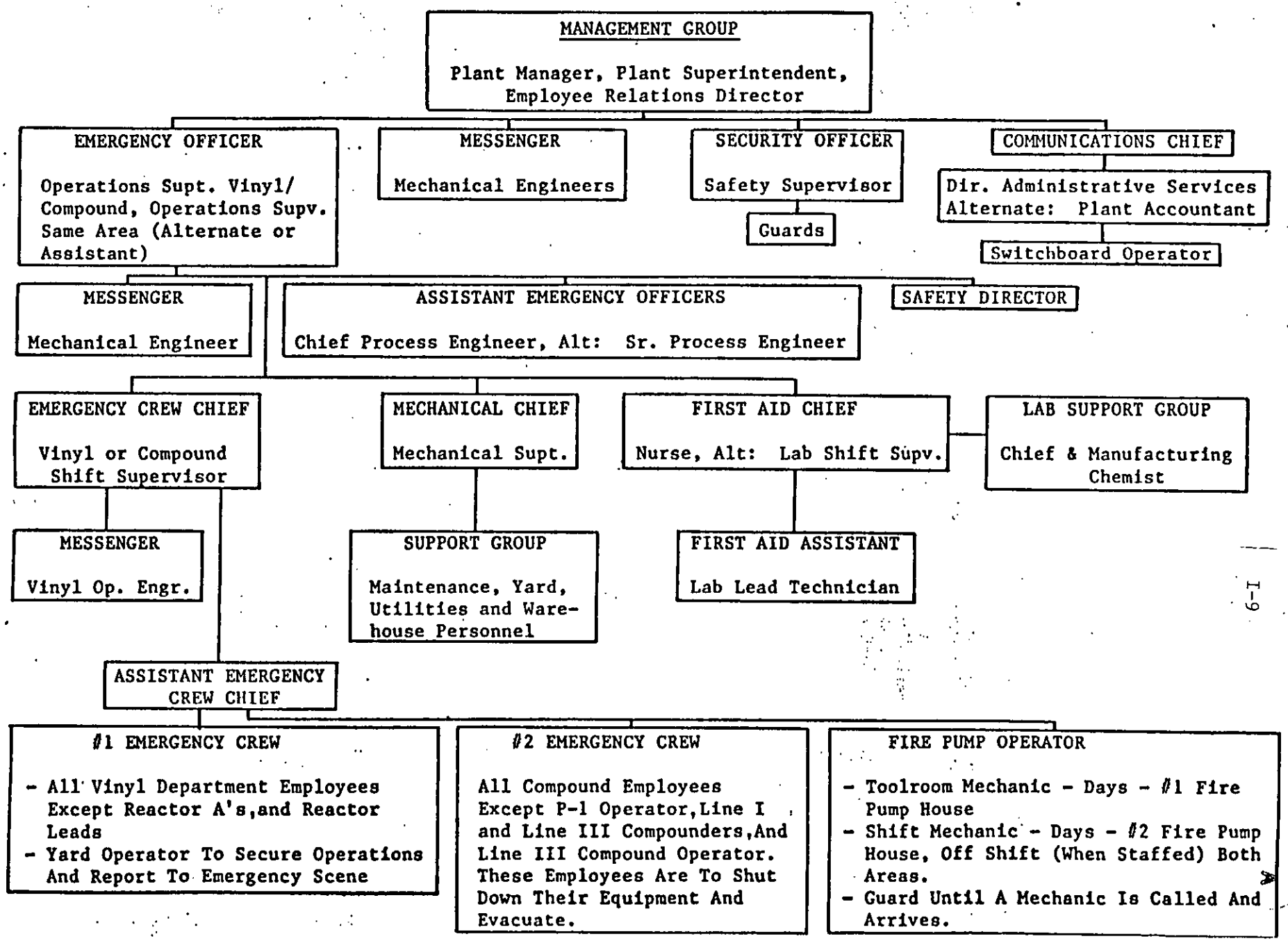
EMERGENCY ORGANIZATION CALL LIST

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

Vinyl	Compound	Utilities
1. D. J. Miller 369-9234	1. R. G. Gilreath 369-7745	1. J. L. Horstman 369-6005
2. P. E. Markey 369-6019	2. P. J. Kober 369-7096	2. F. W. Frantz 369-8508
3. L. D. Honeycutt 343-5595	3. L. D. Honeycutt 343-5595	3. C. E. Davis 369-8780
4. C. R. Miller 369-9100	4. C. R. Miller 369-9100	4. C. R. Snowden 1-327-7382
5. A. H. Sather 369-9271	5. A. H. Sather 369-9271	5. C. R. Miller 369-9100
6. V. A. Belk 369-4416	6. V. A. Belk 369-4416	6. A. H. Sather 369-9271
7. J. Friend 369-7377	7. J. Friend 369-7377	7. V. A. Belk 369-4416
		8. J. Friend 369-7377
(1) J. Frossard 369-6990	(2) L. Michels 369-6743	(3) J. Pope Unlisted (Call So. Central Bell Operator)
8. J. L. Horstman 369-6005	8. J. L. Horstman 369-6005	9. L. D. Honeycutt 369-5595
9. C. E. Davis 369-8780	9. C. E. Davis 369-8780	10. P. E. Markey 369-6019
10. C. R. Snowden 1-327-7382	10. C. R. Snowden 1-327-7382	11. D. J. Miller 369-9234
11. F. W. Frantz 369-8508	11. F. W. Frantz 369-8508	12. P. J. Kober 369-7096
12. P. J. Kober 369-7096	12. P. E. Markey 369-6019	13. R. G. Gilreath 369-7745
13. R. G. Gilreath 369-7745	13. D. J. Miller 369-9234	14. J. G. Roberts 369-8059
14. J. G. Roberts 369-8059	14. J. G. Roberts 369-8059	15. J. V. Uptain 369-8109
15. J. V. Uptain 369-8109	15. J. V. Uptain 369-8709	16. M. H. Williams 1-963-2796
16. M. H. Williams 1-963-2796	16. M. H. Williams 1-963-2796	
17. G. A. Morgan 369-6522	22. J. C. Green 369-9288	27. R. W. Rye 369-4730
18. R. A. Miller 1-327-0951	23. W. W. Robinson 369-8606	28. D. D. Knight 1-205-698-9545
19. R. A. Frohreich 1-328-3628	24. W. F. Higginbotham 1-327-0827	29. R. D. Jackson 369-2405
20. V. L. Thornhill 369-8952	25. J. A. Dixon 369-8372	30. V. E. Messick 1-327-0741
21. S. C. Hillman 369-7892	26. J. L. White 369-2991	31. D. S. Cox 369-8752

ATTACHMENT C

EMERGENCY ORGANIZATION



ATTACHEMENT D I-9

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

_____

_____

_____

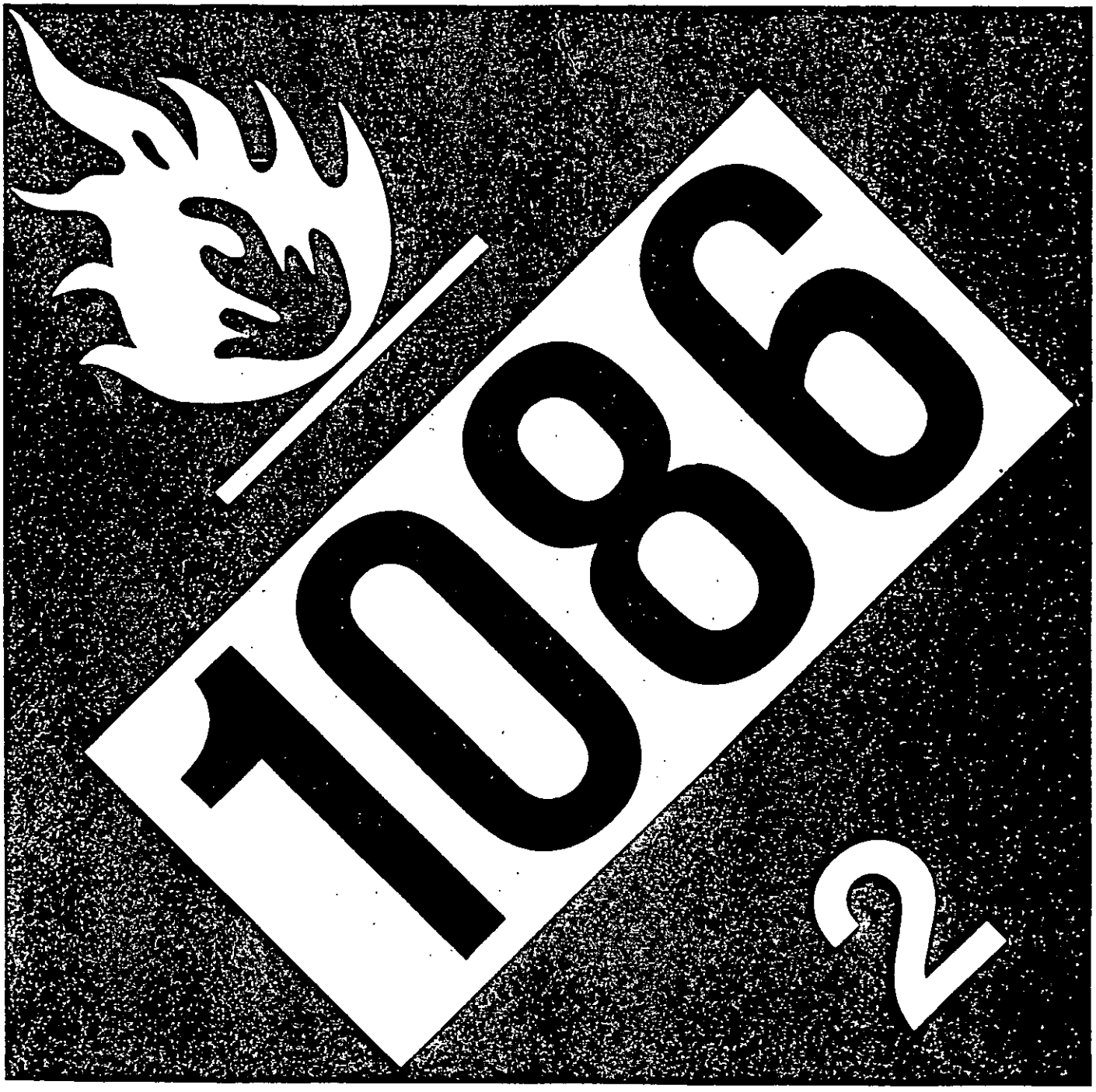
_____

_____

_____

Alarm Activated By: _____

E. SAMPLE RAILCAR PLACARD




EMPTY
1086

F. PHOTOGRAPHS

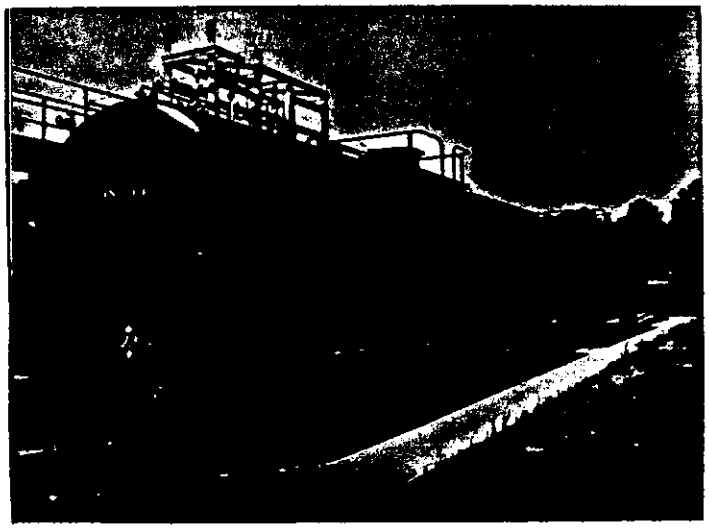


FIG. 1 - VCM TANK CARS "SPOTTED" FOR UNLOADING AT EAST SIDE OF TRANSFER STATION NO. 1.

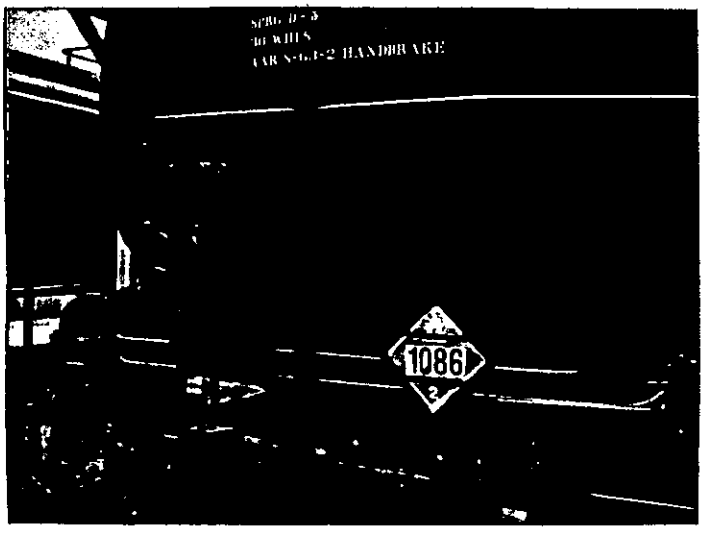


FIG. 2 - VIEW OF HANDBRAKE LOCATED AT THE END OF TANKCAR

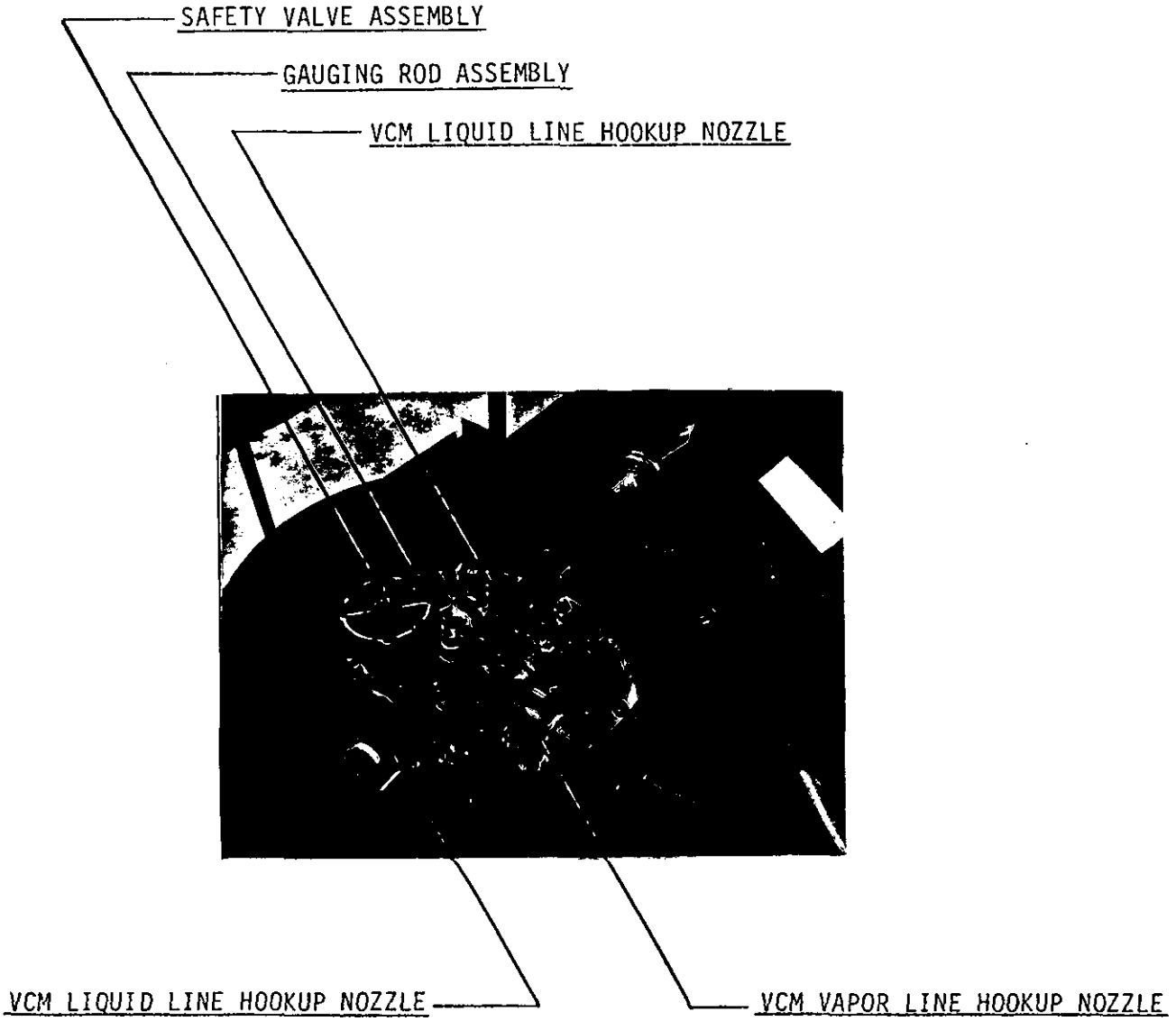


FIG. 3 - UNLOADING ARRANGEMENT FOR VCM TANKCARS

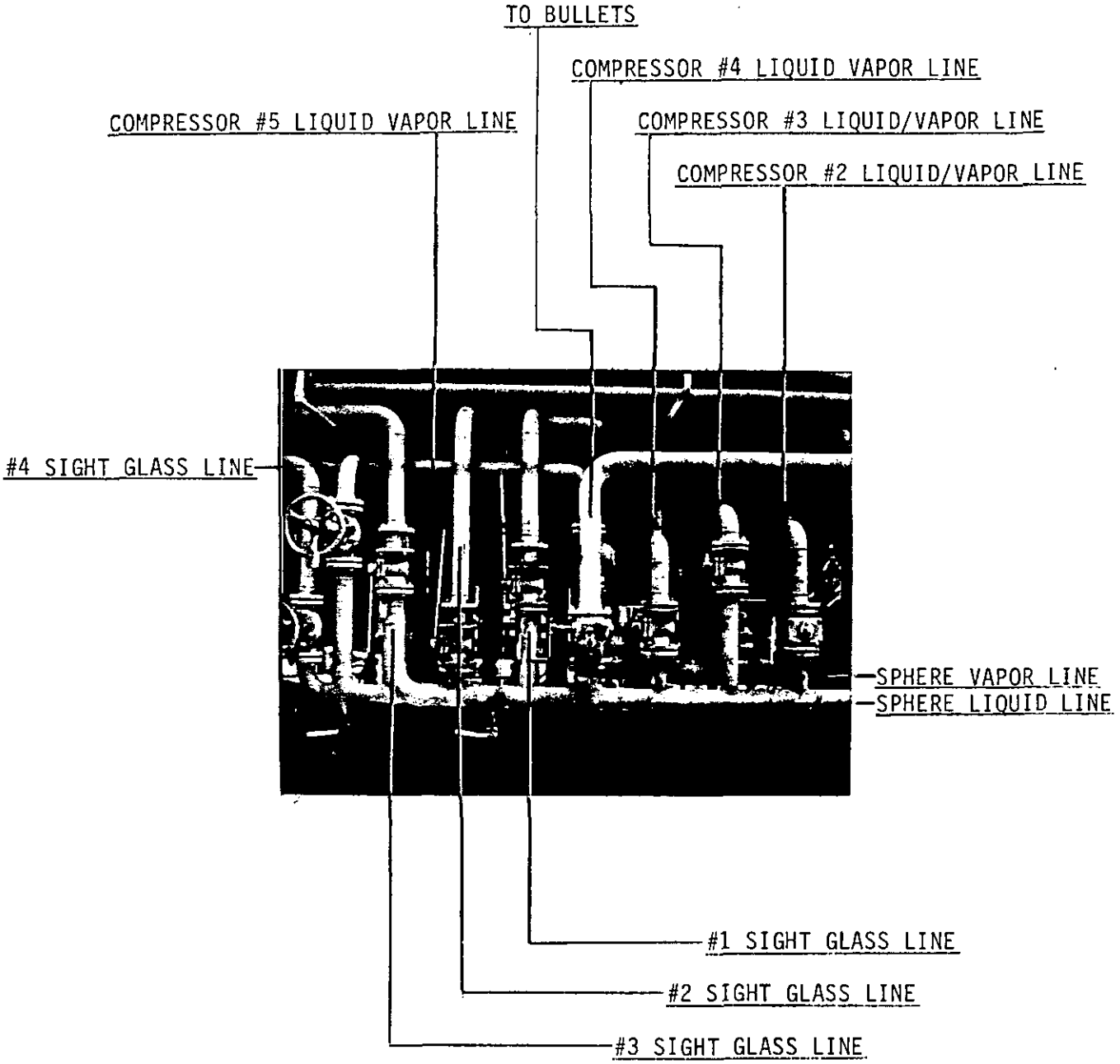


FIG. 4 - PIPING AND VALVES ON WEST SIDE OF THE COMPRESSOR SHED

FIG. 5 - SIGHT GLASSES FOR CHECKING VCM LIQUID UNLOADING, LOCATED ON EAST SIDE OF COMPRESSOR SHED

FIG. 6 - ANOTHER VIEW OF SIGHT GLASSES AS SEEN LOOKING NORTHWARD

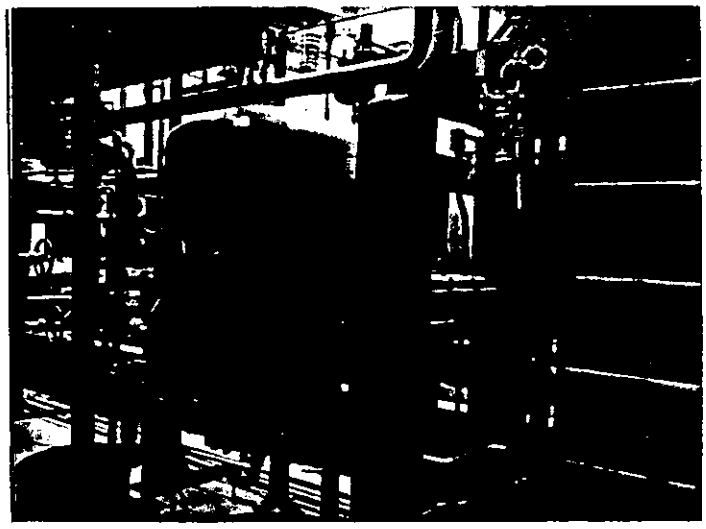


FIG. 7 - T (201) EMISSION RECOVERY SYSTEM KNOCKOUT POT-NORTHWEST CORNER OF COMPRESSOR SHED

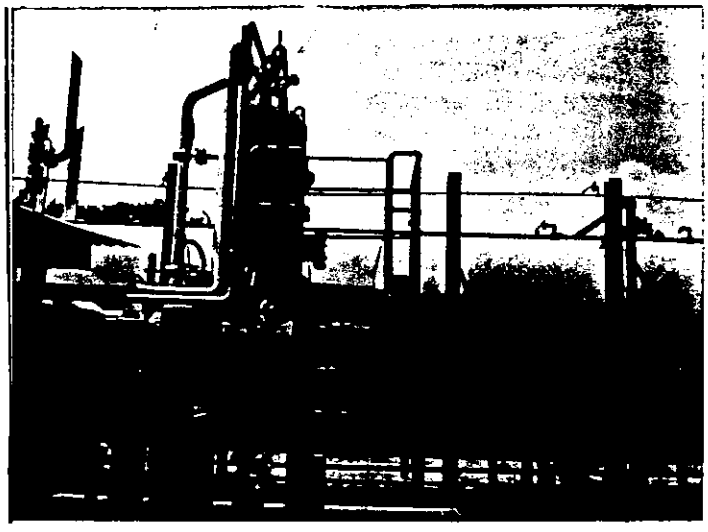


FIG. 8 - T (202) VCM KNOCKOUT POT - NORTHWEST CORNER OF COMPRESSOR SHED

CONOCO

Interoffice Communication

To : Distribution

From : M. L. Nathan

Date : March 21, 1983

Subject : INITIATOR INJECTION POT REPLACEMENT - OPERATING PROCEDURES

Attached are the operating procedures for initiator injection systems installed per the Initiator Injection Pot Replacement Design. New initiator injection systems were installed for all V-11 and CRD reactors. Systems on D-700 and 745 are being modified to be similar to the new systems. The operating procedures include a description/discussion of all equipment and instrumentation installed to prevent the initiator addition ram valve from remaining open for an excessive length of time. Leaving the ram valve open would allow the reactor to hydraulically fill with the end result being blown rupture discs and subsequent relief valve discharge.

Michael L. Nathan

Michael L. Nathan
Process Engineer

bls

Attachments

c: JF, CRM, PEM, DJM (5), RAF, VEM, VLT, AHS, GAM

INITIATOR INJECTION POT REPLACEMENT

ABERDEEN CHEMICAL PLANT

I. OPERATING PROCEDURES

A. Old Reactor Module

The operating procedures for use of the initiator injection systems in the old reactor module are essentially the same. Differences in the procedures for D-700 will be noted in parentheses. Refer to the P & I diagram for the D-300 Initiator Injection System when reviewing the operating procedures.

a. Initiator Injection

1. Close the valve on the drain line from the initiator injection pot, FA-300. This valve should have been left open from the previous charge.

2. Check the vent valve (on top of FA-300 by PG-300) to make sure it is open. This valve should have been left open from the previous charge. Check the pressure gauge valve on the vent line to be sure that it is open. This valve should be open at all times.

3. Open funnel valve and pour initiator into FA-300.

4. Close funnel valve and vent valve.

5. Check valve in reactor sampling line to make sure it is closed. Valve in initiator injection line just upstream of sampling tie-in should be open. (D-700 has a separate reactor sampling system so this step is omitted when using D-700 initiator injection system.)

6. Partially open valve in high pressure service water (HPSW) line and pressure up FA-300. When initiator pot is pressured up, as indicated by no flow on the flow indicator, FI-300, completely open valve. The bomb should now be pressured up in excess of 200 psig as indicated on PG-300. If the pressure on the bomb is less than 200 psig, a potential for backing vinyl chloride into the initiator system exists and the initiator system should not be used at that point. If PG-300 indicates a pressure of less than 200 psig, check the valve on the pressure gauge line to be sure that it is open and the true process pressure is being read. If the valve is open and the pressure gauge reads less than 200 psig, replace the pressure gauge to be sure that a true pressure indication is being given. If the new pressure gauge also reads less than 200 psig, check all valves to be sure they are in the proper position and then immediately contact the Shift Supervisor. Do not try injecting initiator.

INITIATOR INJECTION POT REPLACEMENT

ABERDEEN CHEMICAL PLANT

7. Open the reactor ram valve, CV-300, using the local switch, HS-300. A local position switch with indicating lights shows whether the ram valve is open or closed. This position switch is also tied into indicating lights on the control panel and indicate the position of the ram valve.

8. When 50 gallons of HPSW have been flushed into the reactor, as indicated by the totalized flow on FI-300, close the ram valve, CV-300, using the local switch, HS-300. Check the indicating lights and valve position to make sure the valve is closed.

9. Close the valve on the HPSW line.

10. Open the drain valve on FA-300.

11. Open the vent valve located on top of FA-300.

The initiator injection system is now ready for re-use.

b. Reactor Kill

The procedure described above for the initiator injection is also used for reactor kill.

c. Initiator Injection System Instrumentation/Equipment

As seen from the P & I diagram, each initiator injection system is equipped with instrumentation and equipment installed to prevent the ram valve from remaining open for an excessive length of time. Leaving this valve open with the HPSW line open to the reactor would cause the reactor to hydraulically fill with the end result being blown reactor rupture discs and subsequent relief valve discharge. Listed below is a brief description and discussion of the various instrumentation for D-300 reactor.

1. Initiator Pot Pressure Switch (PS-300)

The pressure switch is activated when the pressure in the bomb reaches 150 psig. This occurs while the bomb is being pressured up prior to reactor injection. At 150 psig, the switch resets a timer which will activate the high pressure alarm (PAH-300 located on the vinyl control panel) if the pressure in the initiator pot remains above 150 psig for five minutes. Under normal operating conditions, the whole injection process requires only a couple of minutes to complete so the pot will be depressurized in less than

INITIATOR INJECTION POT REPLACEMENT

ABERDEEN CHEMICAL PLANT

5 minutes and the alarm will not sound. If the bomb is still pressured up after five minutes and the alarm sounds, one of the following conditions exist on the initiator injection system in use: (1) a problem with the water injection is causing slow addition to the reactor, (2) the ram valve has been left open with or without the HPSW line open to the reactor, or (3) the ram valve is closed but the initiator pot is still pressurized because the pot has not been properly drained as described in the operating procedures. Upon hearing the initiator pot high pressure alarm, the lead operator should immediately respond by taking the following steps:

(1) Check the indicating lights on the control panel for the initiator system in use. This will be the system on a reactor that is or has just been charged or killed.

(2) Contact the "A" operator.

a. Ram Valve Open Light - As mentioned above, the ram valve will be open after the alarm sounds only because of slow HPSW addition to the reactor or if the valve was inadvertently left open. Find out from the "A" operator why the ram valve is still open. If the HPSW addition is slow, instruct the "A" operator to contact you when the addition is complete and watch the panel light for a closed valve indication. Inform the Shift Supervisor of the problem with the injection system. If the ram valve was left open inadvertently, instruct the "A" operator to immediately close the valve. If the "A" operator is not in the immediate area of the reactor, close the ram valve from the panel using the "Emergency Close" switch. Watch the panel for a valve close indication. Inform the "A" operator that the valve is closed and that the switch in the field needs to be moved to the closed position. When this has been done, push the "Reset" switch on the panel to transfer control of the ram valve back to the local switch in the field. If the alarm sounds with the ram valve open and the "A" operator cannot be immediately contacted, the ram valve is to be closed from the panel. In the case that the ram valve on an initiator system that is not being used has an open light on the panel, immediately close this valve from the panel. The "A" operator should then check why this valve is open.

INITIATOR INJECTION POT REPLACEMENT

ABERDEEN CHEMICAL PLANT

b. Ram Valve Close Light - The alarm will sound after the ram valve has been closed if the bomb is still pressured up and has not been properly drained. After checking the indicating lights on the panel and seeing that all the initiator injection ram valves are closed, the lead operator should have the "A" operator check the initiator system recently used to see if the bomb has been drained.

2. Initiator System High Pressure Alarm (PAH-300)

As mentioned above, the high pressure alarm will sound if an initiator injection pot is pressured up for more than five minutes. All the pressure switches in the old module are tied into one high pressure alarm.

3. Emergency Close/Reset Switch

This switch is located on the vinyl control panel and should be used to close the ram valve on an initiator injection system in any one of the circumstances discussed earlier. Once the "Emergency Close" switch has been activated, control of the ram valve has been transferred to the control panel. The "Reset" switch must be pressed in order to transfer control of the ram valve back to the local switch in the field. Once the "Reset" switch is activated the ram valve will return to the position indicated by the local field switch.

4. Air Drum (AD/300)/Low Pressure Switch (PSL-300)

The air drum (AD-300) and the low pressure switch (PSL-300) are installed to close the ram valve upon loss of instrument air pressure due to one reason or another. When the pressure of the instrument air supply to the ram valve actuator drops below 45 psig, the low pressure switch will automatically close the ram valve. The air drum supplies the air capacity needed to operate the valve. Once the ram valve is closed due to low air pressure, the valve cannot be opened until the air pressure rises above 45 psig and the pressure switch is reset. It is important to remember that once the air pressure has risen, the "A" operator must reset the pressure switch by pressing the "Reset" button located next to the local on-off switch at the reactor.

INITIATOR INJECTION POT REPLACEMENT

ABERDEEN CHEMICAL PLANT

B. New Module

The operating procedures for use of the initiator injection systems in the new reactor module are essentially the same. Differences in the procedures for 745 will be noted in parentheses. Refer to the P & I diagram for the 741 Initiator Injection System when reviewing the operating procedures.

a. Initiator Injection

1. Close the valve on the drain line from the initiator injection pot, FA-741. This valve should have been left open from the previous charge.

2. Check the vent valve (on top of FA-741 by PG-741) to make sure it is open. This valve should have been left open from the previous charge. Check the other valve on the vent line to be sure that it is open. This valve should be open at all times.

3. Open funnel valve and pour initiator into FA-300.

4. Close funnel valve and vent valve.

5. Check valves on reactor sampling line and CTA addition line to be sure both are closed. (745 has a separate reactor sampling and CTA addition line so this step is omitted when using 745 initiator injection system).

6. Partially open valve in high pressure service water (HPSW) line and pressure up FA-741. When initiator pot is pressured up, as indicated by no flow on the flow indicator, completely open valve. The bomb should now be pressured up in excess of 200 psig as indicated on PG-741. If the pressure on the bomb is less than 200 psig, a potential for backing vinyl chloride into the initiator system exists and the initiator system should not be used at that point. If PG-741 indicates a pressure of less than 200 psig, check the valve on the pressure gauge line to be sure that it is open and the true process pressure is being read. If the valve is open and the pressure gauge reads less than 200 psig, replace the pressure gauge to be sure that a true pressure indication is being given. If the new pressure gauge also reads less than 200 psig, check all valves to be sure they are in the proper position and then immediately contact the Shift Supervisor. Do not try injecting initiator.

INITIATOR INJECTION POT REPLACEMENT

ABERDEEN CHEMICAL PLANT

7. Open the reactor ram valve, CV-741, using the local switch, HS-741. A local position switch with indicating lights shows whether the ram valve is open or closed. This position switch is also tied into indicating lights on the control panel and indicate the position of the ram valve.

8. When 50 gallons of HPSW have been flushed into the reactor, as indicated by the totalized flow on the flow indicator, close the ram valve, CV-741, using the local switch, HS-741. Check the indicating lights and valve position to make sure the valve is closed.

9. Close the valve on the HPSW line.

10. Open the drain valve on FA-741.

11. Open the vent valve located on top of FA-741.

The initiator system is now ready for re-use.

b. Reactor Kill

The procedure described above for the initiator injection is also used for reactor kill.

c. Initiator Injection System Instrumentation/Equipment

As seen from the P & I diagram, each initiator injection system is equipped with instrumentation and equipment installed to prevent the ram valve from remaining open for an excessive length of time. Leaving this valve open with the HPSW line open to the reactor would cause the reactor to hydraulically fill with the end result being blown reactor rupture discs. Listed below is a brief description and discussion of the various instrumentation for 741 reactor.

INITIATOR INJECTION POT REPLACEMENT

ABERDEEN CHEMICAL PLANT

1. Initiator Pot Pressure Switch (PS-741)

The pressure switch is activated when the pressure in the bomb reaches 150 psig. This occurs while the bomb is being pressured up prior to reactor injection. At 150 psig, the switch resets a timer which will activate the high pressure alarm (PAH-741 located on the vinyl control panel) if the pressure in the initiator pot remains above 150 psig for five minutes. Under normal operating conditions, the whole injection process requires only a couple of minutes to complete so that the pot will be depressurized in less than five minutes and the alarm will not sound. If the bomb is still pressured up after five minutes and the alarm sounds, one of the following conditions exist on the initiator injection system in use: (1) a problem with the water injection is causing slow addition to the reactor, (2) the ram valve has been left open with or without the HPSW line open to the reactor, or (3) the ram valve is closed but the initiator pot is still pressurized because the pot has not been properly drained as described in the operating procedures. Upon hearing the initiator pot high pressure alarm, the lead operator should immediately respond by taking the following steps:

1. Check the indicating lights on the control panel for the initiator system in use. This will be the system on a reactor that is or has just been charged or killed.

2. Contact the "A" operator

   a. Ram Valve Open Light - As mentioned above, the ram valve will be open after the alarm sounds only because of the slow HPSW addition to the reactor or if the valve was inadvertently left open. Find out from the "A" operator why the ram valve is still open. If the HPSW addition is slow, instruct the "A" operator to contact you when the addition is complete and watch the panel light for a closed valve indication. Inform the Shift Supervisor of the problem with the injection system. If the

INITIATOR INJECTION POT REPLACEMENT

ABERDEEN CHEMICAL PLANT

ram valve was left open inadvertently, instruct the "A" operator to immediately close the valve. If the "A" operator is not in the immediate area, close the ram valve from the panel using the "Emergency Close" switch. Watch the panel for a valve close indication. Inform the "A" operator that the valve is closed and that the switch in the field needs to be moved to the closed position. When this has been done, push the "Reset" switch on the panel to transfer control of the ram valve back to the local switch in the field. If the alarm sounds with the ram valve open and the "A" operator cannot be immediately contacted, the ram valve is to be closed from the panel. In the case that the ram valve on an initiator system that should not be in use has an open light, immediately close this valve from the panel. The "A" operator should then check why this valve is open.

b. Ram Valve Close Light - The alarm will sound after the ram valve has been closed if the bomb is still pressured up and has not been properly drained. After checking the indicating lights on the panel and seeing that all the initiator injection ram valves are closed, the lead operator should have the "A" operator check the initiator system recently used to see if the bomb has been drained.

2. Initiator System High Pressure Alarm (PAH-741)

As mentioned above, the high pressure alarm will sound if an initiator pot is pressured up for more than five minutes. All the pressure switches in the new module are tied into one high pressure alarm.

3. Emergency Close/Reset Switch

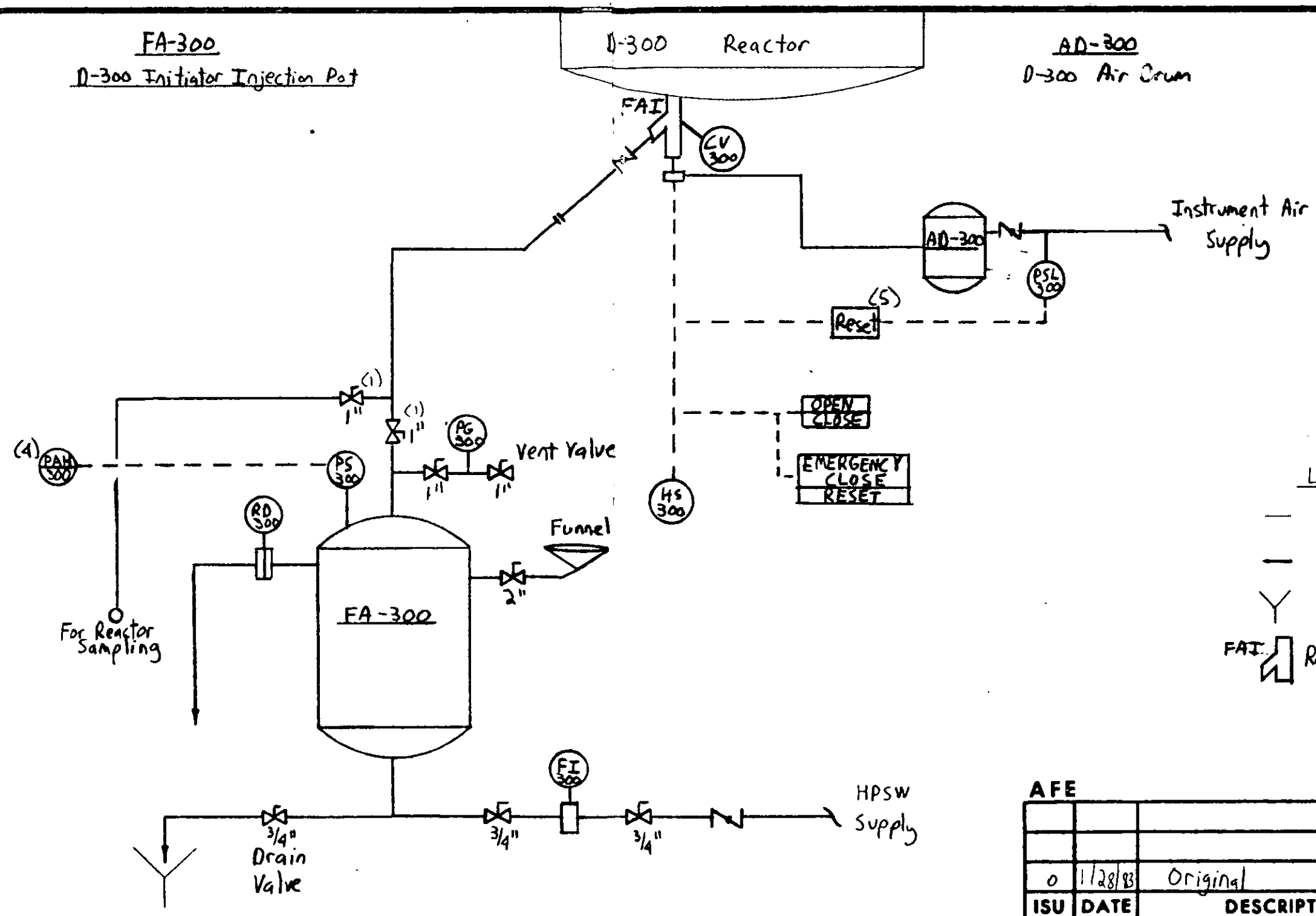
This switch is located on the vinyl control panel and should be used to close the ram valve on an initiator system in any one of the circumstances discussed earlier. Once the "Emergency Close" switch has been activated, control of the ram valve has been transferred to the control panel. The "Reset" switch must be pressed in order to transfer control of the ram valve back to the local switch in the field. Once the "Reset" switch is activated, the ram valve will return to the position indicated by the local field switch.

INITIATOR INJECTION POT REPLACEMENT

ABERDEEN CHEMICAL PLANT

4. Air Drum (AD-741)/Low Pressure Switch (PSL-741)

The air drum (AD-741) and the low pressure switch (PSL-741) are installed to close the ram valve upon loss of instrument air pressure due to one reason or another. When the pressure of the instrument air supply to the ram valve actuator drops below 45 psig, the low pressure switch will automatically close the ram valve. The air drum supplies the air capacity needed to operate the valve. Once the ram valve is closed due to low air pressure, the valve cannot be opened until the air pressure rises above 45 psig and the pressure switch is reset. It is important to remember that once the air pressure has risen, the "A" operator must reset the pressure switch by pressing the "Reset" button located next to the local on-off switch at the reactor.



Legend

— Existing

— New

Y Sewer

FAI Ram Valve, Fail-As-Is

Notes:

(1.) Valve and line will be installed to allow sampling of V-11 reactors with the reactor sampling cart.

(2.) Initiator injection system for D-300 is same as systems for D-400, D-500 and D-600.

(3) Initiator injection system for D-700 will be modified to be like D-300 system.

(4) Old reactor module has one high pressure alarm. The pressure switch on each injection pot is tied into the same alarm.

(5) Reset switch to be located adjacent to field handswitch.

AFE

ISU	DATE	DESCRIPTION	BY	CKD	APD
0	1/28/83	Original	MLN	VLT	VLT

CONOCO CHEMICALS
ABERDEEN MISSISSIPPI

—P & I Diagram— Figure 1

Initiator Injection Pot Replacement
D-300 Reactor

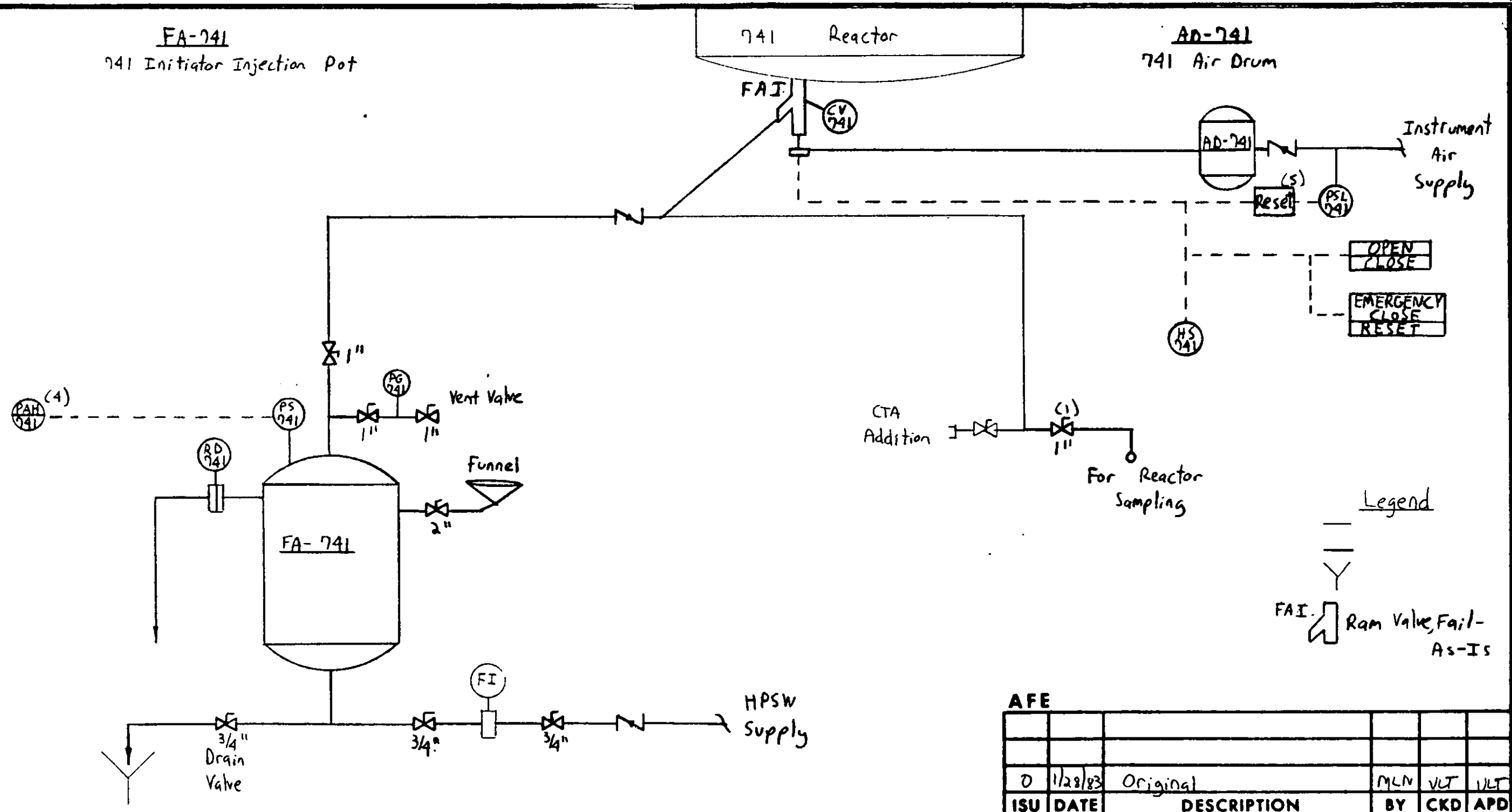
SCALE: NTS

APPD: V. L. Thornhill
DATE: 3-28-83

No.

BRUNING 40-534 50237

ABD00281121



Notes:

(1) Valve and line will be installed to allow sampling of the CRD reactors with the reactor sampling cart.

(2) Initiator injection system for 741 is same as systems for 742, 743, and 744.

(3) Initiator injection system for 745 will be modified to be like 741 system.

(4) New reactor module has one high pressure alarm. The pressure switch on each injection pot is tied into same alarm.

(5) Reset switch to be located adjacent to field handswitch.

AFE

ISU	DATE	DESCRIPTION	BY	CKD	APD
0	1/28/83	Original	MLN	VLT	VLT

CONOCO CHEMICALS
ABERDEEN MISSISSIPPI

—P&I Diagram— Figure 2

Iniator Injection Pot Replacement
741 Reactor

SCALE: NTS

APPD: W.R. Thornhill
DATE: 3-28-83

No.

BRUNING 40-534 50237

ABD00281122