EQUIPMENT:

1. Chromatograph - 4 ea. ARCAS, Model No. 505 BFID and 2 Model No. 905 BFID with pre-cut and analytical columns and hydrogen flame ionization detector.

2. Programmer - 5 ea. ARCAS, Model No. 1905, Model PMC 2000.

3. Computer - Digital Equipment Co., POP 8M with LA36 printer.

Operation

1.1 The gas chromatograph and programmer portions of the Arcas Monitoring System must be in operation at all times. Repairs to these two units must be on a call-out priority 1 basis.

1.2 If the computer portion of the Arcas Monitoring System is out of service, vinyl chloride leaks, as defined by AOP-9, must be recorded manually and reported in the Shift Supervisor log.

1.3 For automatic operation, the programmer switches must be in the following positions:

Timer	RUN
Block	AUTO
Sample Inject	AUTO
Calibrate	OFF
Column Switch	AUTO
Auto Zero	AUTO
Electrometer	ELECT
Stream Selector Switches (Except Stream 16)	ON

Daily Maintenance Schedule

2.10 Calibration - Each gas chromatograph must be calibrated daily with a standard vinyl chloride gas mixture. The standard gas mixture may be different for each area chromatograph. The standard gas mixture which must be used for each chromatograph is the vinyl chloride concentration defined as a leak for each area in AOP-9, Vinyl Chloride Leak Detection and Elimination Procedure. Since the definition of a leak may also change with time, the current leak definition for each area can always be found in Appendix A of AOP-9.

The procedure for calibration is shown in Section 7.0 of this procedure.

2.20 Instrument Gas Supply - The hydrogen and helium gas cylinders must be checked daily.

Daily Maintenance Schedule (cont'd)

2.21 Record the pressures of the gas cylinders shown on the primary gauge of the regulator.

2.22 If a cylinder is empty (less than 200 psig on primary gauge) have proper gas delivered from warehouse to analyzer.

2.30 Air Supply - The air dryer at each analyzer must be checked daily for moisture contamination. Also, check the rotometer for proper air flow as indicated at each analyzer. Adjust air flow as required.

2.40 Standard Gas Mixture - The pressure on the vinyl chloride standard gas mixture must be checked daily.

2.41 Read the pressure on the primary gauge of the regulator.

2.42 If the cylinder is empty (less than 200 psig on primary gauge) have proper gas mixture for particular area delivered from warehouse.

2.43 The secondary gauge must be set no higher than 5 psig. If unusual pressure drops are noted from day to day, the gas feed lines must be checked for leaks.

2.50 Instrument Heater Air Supply - The heater air supply pressure must be checked daily and maintained at 50 psig. Reach the pressure gauge located at the diaphragm at each analyzer.

2.60 Sample Stream Bypass Flow - The vacuum gauge on the sample stream bypass header must be checked daily to assure proper bypass flow. The vacuum should be maintained between 2" and 8" of H_2O vacuum.

2.61 If vacuum is low, check for leak and proper operation of sample pump.

2.62 If vacuum is high, check for restriction in sample system.

2.70 Sample Flow - The sample flow rotometer and sample header pressure must be checked daily on each sample stream of each chromatograph. The rotometer should indicate a minimum of 17 scfh and the pressure should not exceed 5" H_2O vacuum per stream.

2.71 If the vacuum is high or flow is low, check for restriction at sample line filters, also, check for proper vacuum pump operation and proper solenoid operation.

2.80 Oven Temperature - The analyzer oven temperature must be checked daily on each chromatograph. The temperature must be within $\pm$ 3 °F of the temperature established for each instrument.

Daily Maintenance Schedule (cont'd)

2.81 If the temperature is out of the 3 °F range, check the instrument heater air flow by opening the oven and observing the air flow rate coming out of the heater air nozzle. If a low flow is observed, adjust the air supply pressure. At the same time, check for possible feed line plugagge.

2.82 If the temperature is out of the 3 °F range, and air flow is normal, try to adjust the temperature with the potentiometer on the temperature control card. If still having problems, check heater elements for continuity. If this checks out proper, replace heater control card.

Column and FID Gas Supply Flow Rate

3.10 Check column and FID gas supply flow rates as required for upset conditions. Upset conditions are indicated by base line drift, erratic base line, and auto zero drift.

3.20 If upset conditions prevail, check flow rates. Possible causes for flow changes are insufficient gas pressure at the cylinder, column aging, flow restriction in the air supply, plugged flame jet, sample slide valve not operating properly, or system fitting leaks.

Instrument Warm-Up Procedure

4.10 Analyzer Unit

4.11 Turn on heater air flow. Set the air inlet pressure to about 50 psig.

4.12 Turn on the power supply to the analyzer unit.

4.13 With the oven door open, check to see if the heater air is being heated by checking the air at the heater air nozzle.

4.14 If the heater is functioning, close the oven door and allow the oven to come to the previously established temperature.

4.15 To adjust oven temperature allow oven to heat up for 30 minutes. The light on the temperature control card should be blinking. Check temperature on thermometer on oven door. If too low, turn pot on temperature control card clockwise, wait 15 minutes, and observe temperature. Adjust as necessary. If temperature is too high, turn counter clockwise.

4.16 Turn on high voltage power supply.

Instrument Warm-Up Procedure (cont'd)

4.20 Control Unit

4.21 Turn on power supply to programmer.

4.22 Put all switches in auto and clock to stop.

4.23 Light flame in FID as instructed in maintenance manual.

4.24 After flame is lit and all flows are set, put clock to run.

Flow and Pressure Settings

5.10 Total Column Flow - Backflush and Analytical Column

5.11 Place column switch into the 2 position.

5.12 Close the midpoint pressure regulator valve.

5.13 Adjust the main column pressure regulator to have VCM elute at about 34-40 seconds after injection.

5.20 Backflush Flow - Stripper

5.21 Set backflush pressure as stated in manual.

5.22 This procedure may require being repeated several times.

5.30 FID Air Flow

5.31 Air flow is monitored by a rotometer just above the analyzer. Each analyzer is marked for the proper setting. To adjust the setting, raise or lower the pressure with the regulator just above the rotometer.

5.40 FID Hydrogen Flow

5.41 Disconnect the capillary tube from the analyzer on the left side of the oven.

5.42 Connect the bubble tube and set the proper flow with the bottle regulator located on the hydrogen cylinder. The flow should between 40-60 cc/min.

6.0 Gate Time Check - Run Mode

6.1 Turn standard gas on by turning on stream 16 on programmer. Turn all other streams off. Reset and stop the digital clock.

6.2 Turn the electrometer to manual zero and adjust the baseline to somewhere above zero on the chart.

6.3 Put column switch in the 2 position and start the clock. This will allow a one minute purge of standard before injection because it will not inject the first cycle.

6.4 Note the time on the digital clock when the VCM starts to come out and when it is finished. Set the rear digital timer to one second before and the one next to it to one second after the time recorded previously.

6.5 Put the column switch back in auto. Start decreasing the backflush timer till the VCM peak starts to become smaller. Then move the time back 3-4 seconds.

6.6 The auto zero function should be set to finish 2-3 seconds before the peak gates in. This function lasts for 4 seconds so the timer should be set 6-7 seconds earlier than the peak gate in.

6.7 Now turn the electrometer back to elec.; all switches should be in auto except the calibration and it should be off. Turn stream 16 off and turn on all other streams.

7.0 Calibration

7.1 Turn standard on and all other streams off.

7.2 Dial the correct point number into the multiplexer. This answer will read out on the LED display on the front of the multiplexer every time the standard is analyzed.

7.3 Vary digital attenuator to receive the correct standard ppm reading.

7.4 Turn the other streams back on and the standard off and continue with the field results.

7.5 During calibration monitor the recorder to make sure the analyzer is reading and gating correctly.

8.0 Backup Procedures

TENNECO POLYMERS DIVISION

AUTHORIZED OPERATING PROCEDURE

PASADENA PLANT

Procedure No.: 8
Date: 8/20/84

TITLE: HNU Photoionization Detector Operation and Maintenance

AUTHORIZED BY:

Manufacturing Manager	- C. A. Hendricks	Rev. Date 8/3/84
Mgr. Envir. Sciences	- J. W. Kachtick	Rev. Date 8/28/84
Plant Manager - PVC	- J. W. Bonnette	Rev. Date 8/28/84
Mtce. Manager	- L. Cox, Jr.	Rev. Date 8/28/84
Safety Manager	- J. L. Oliver	Rev. Date 8-22-84

PURPOSE: The purpose of this procedure is to standardize the operation and maintenance of the HNU Photoionization portable hydrocarbon detector.

EQUIPMENT:

The HNU Photoionization detector is an instrument designed to measure organic materials in air, with a sensitivity of less than 1 ppm and a range of 2,000 ppm. The detector uses the principle of photionization for detection. The sample gas stream is exposed to a sealed ultraviolet light source which ionizes the hydrocarbons to a collector electrode, where the current measured is proportional to the concentration of hydrocarbon.

The instrument has two basic parts, a hand-held probe and readout box. The probe contains the ultraviolet light source, the ionization and detection chamber, a signal preamplifier, and a pump to draw the sample into the instrument. The readout box contains the battery power detection and ionization electronics, and a visual readout meter.

PROCEDURE:

1. Startup of Instrument

1.1 Check the function switch on the control panel of the instrument and make sure that it is in the off position.

1.2 Check the probe to ensure that plastic end cap is properly secured. If not properly secured, reseat the end cap and secure into place.

1.3 Attach the probe to the readout unit via the 12 pin connector. Match the Alignment Key carefully; then twist the connector until a distinct snap and lock is felt.

1.4 Turn the function switch to the battery check position. The needle on the meter should indicate a reading within or beyond the green battery arc on the scale plate. If the indication is in the lower portion of the battery arc, the insturment should be recharged prior to making the survey.

1.0 Startup of Instrument (cont'd)

1.5 A brief description of the instrument control functions is given below:

Six Position Switch

OFF - Shuts off all power and removes DC voltages.

ON - In any other function position or measuring mode, the electronics are on.

BATTERY CHECK - Indicates the condition of the battery. If needle position is below green battery arc, the instrument should be recharged.

STANDBY - UV lamp is off but electronics are on. This position will conserve power and extend the useful operating time between recharges of the battery. The position is also utilized to adjust the electronic zero.

RANGES - 0-20, 0-200, 0-2,000 direct reading ranges available at minimum gain for benzene. More sensitivity is available by adjusting the span potentiometer.

Zero Potentiometer

A ten turn potentiometer is employed to adjust the zero electronically when the instrument is placed in the standby position with the probe attached. This eliminates the need for a hydrocarbon free zero gas.

Span Potentiometer

A ten turn counting potentiometer is utilized for upscale setting of the meter on calibration gas. Counterclockwise rotation increases the sensitivity (~10 times). This pot can increase the sensitivity to make the instrument direct reading for nearly any gas which the instrument responds to.

2.0 Zero Adjustment

2.1 To zero the instrument, turn the function switch to the standby position and rotate the zero potentiometer until the meter reads zero. Clockwise rotation of the zero potentiometer produces an upscale deflection while counterclockwise rotation yields a downscale deflection. NOTE: No zero gas is needed since this is an electronic zero adjustment.

2.2 Wait 15 or 20 seconds to ensure that the zero reading is stable. If not, readjust the zero.

2.0 Zero Adjustment (cont'd)

2.3 If the span adjustment setting is changed after the zero is set, the zero should be rechecked and adjusted, if necessary.

3.0 Calibration of Instrument

3.1 For normal operation, the span setting should be set at approximately 4.5. This will allow direct readout of vinyl chloride in ppm on all scales. If the span setting is grossly different from 4.5, the instrument should be recalibrated.

3.2 On a routine basis, the instrument should be recalibrated as follows.

3.3 Connect one side of a "T" to a pressurized container of calibration gas, another side of the "T" to a tedlar or aluminized mylar bag (0.5 or 1 liter capacity) and the third side of the "T" directly to the 8" extension to the photoionization probe.

3.4 Crack the valve of the pressurized container and fill the bag.

3.5 Close the valve and allow the instrument to sample the contents of the plastic bag.

3.6 Adjust the span pot so that the instrument is reading the exact value of the calibration gas. (If the instrument span setting is changed, the instrument should be turned back to the standby position and the electronic zero should be readjusted, if necessary).

3.7 The portable monitor should be zeroed each time it is used. Using a standard gas of 25 ppm of VCM, the portable monitor will be calibrated at least once per month.

3.8 The I & E department is responsible to maintain the portable monitor for proper calibration.

4.0 Battery Charging

To charge the battery, place mini phone plug into jack on left side of bezel prior to plugging charger into 120 VAC. When disconnecting charger, remove from 120 VAC before removing mini phone plug. The battery is completely recharged overnight (ca. 14 hours). To ensure that the charger is functioning, turn the function switch to the battery check position, place phone plug into AC outlet. The meter should go upscale if charger is working and is correctly inserted into the jack.

5.0 Troubleshooting

If problems occur while using the photoionization analyzer, it is recommended that the following troubleshooting guide be followed before consulting the factory.

Troubleshooting (cont'd)

5.1 General Aid to Fault Determination

Check battery condition. Recharge if necessary. Turn instrument on. A violet colored glow from the UV light source should be observed in all positions of the mode switch except the standby position. If unstable readings are obtained, a faulty probe cable or electrical connection could be the problem. To check, hold the probe normally and flex the cable firmly. Watch the meter for fluctuations as the cable is stressed. Individual wires in the readout can be checked in a similar way. Check the coaxial connector on the amplifier board in the probe.

In the more sensitive ranges, a fluctuation in the reading may be noted if a hand or other large object is placed in very close proximity to the probe. This is normal for the instrument and will not result in an error in the measurement as long as the probe is held stationary while the measurement is being taken.

If the probe is held close to AC power lines or power transformers, an error may be observed. If measurements are to be made in close proximity to such items, their effect on measurements can be determined by the following procedure. Zero the instrument in an electrically quiet area in the standby position; then move the instrument to the questionable area involved. If AC pickup is going to be a problem, the meter (in the standby position) will indicate the magnitude of the error.

5.2 Disassembly of Instrument

Probe - Turn the function switch to the OFF position and then remove the probe connector from the readout unit. Unsnap the connectors on the side of the probe. Remove the end cap. The ionization chamber which is housed inside the end cap can then be removed. Place a hand over the end of the probe and slightly so that light source slides out into the hand. Then place two fingers inside the probe and tug gently to remove the lamp housing assembly. The amplifier board can be removed from the lamp housing assembly by unsnapping the coaxial connection and then removing the retaining screw.

To reassemble this unit, place lamp housing assembly into probe taking care to align the fan exhaust extension with the vent hole in the probe. Slide assembly all the way in. Replace the lamp housing or the ion chamber will not go into place. (This piece will only go on one way). If there is any problem getting it on, make sure that it is correctly aligned. Place end cap on probe assembly, align and snap fasteners into place.

5.0 Troubleshooting

5.2 Disassembly of Instrument (cont'd)

Readout Unit - Turn the function switch to the OFF position and disconnect the probe from the readout unit before any disassembly is conducted. To remove the case, loosen the screw on the bottom of the case and, holding the instrument by the bezel, remove the case. The power supply board can be removed by removing two screws and two nuts. The entire panel including the function switch and zero and span pots is removed in this operation. No soldering is necessary to electrically disconnect this module since all connections are made with molex connectors.

5.3 Specific Faults

1. No meter response in any switch position (including BATT CHK)

   A. Broken meter movement

      (1) Tip instrument rapidly from side to side. Meter needle should move freely, and return to zero.

   B. Electrical connection to meter is broken

      (1) Check all wires leading to meter and clean the contacts of quick-disconnects.

   C. Battery is completely dead

      (1) Disconnect battery and check voltage with a volt-ohm meter.

   D. If none of the above solves the problem, consult the factory.

2. Meter responds in BATT CHK position, but reads zero or near zero for all others

   A. Power supply defective

      (1) Check power supply voltages per Figure 11. If any voltage is out of specification, consult the factory.

   B. Input transistor or amplifier has failed

      (1) Rotate zero control; meter should deflect up/down as control is turned.

      (2) Open probe. Both transistors should be fully seated in sockets.

0 Troubleshooting

5.3 Specific Faults (cont'd)

C. Input signal connection broken in probe or readout

(1) Check input connector on printed circuit board. Should be firmly pressed down.

(2) Check components on back side of printed circuit board. All connections should be solid and no wires should touch any other object.

(3) Check all wires in readout for solid connections.

3. Instrument responds correctly in BATT CHK, and STBY, but not in Measuring mode.

A. Check to see that light source is on. (See General Faults section).

(1) Check high voltage power supply (see Figure 11).

(2) Open end of probe, remove lamp and check high voltage on lamp contact ring.

(3) If high voltage is present at all above points, light source has most likely failed. Consult the factory.

4. Instrument responds correctly in all positions, but signal is lower than expected.

A. Check span setting for correct value.

B. Clean window of light source.

C. Double check preparation of standards.

D. Check power supply 180 V output. (See Figure 11).

E. Check for proper fan operation. Check fan voltage. (See Figure 11).

5. Instrument responds in all switch positions, but is noisy (erratic meter movement).

A. Open circuit in feedback circuit. Consult factory.

B. Open circuit in cable shield or probe shield. Consult factory.

6. Instrument response is slow and or irreproducible.

A. Fan operating improperly. Check fan voltage. See Figure 11.

B. Check calibration and operation.

TENNECO POLYMERS DIVISION

AUTHORIZED OPERATING PROCEDURES

PASADENA PLANT

Procedure No.: 9
Date: 8/28/84

TITLS: Vinyl Chloride Leak Detection and Elimination

AUTHORIZED BY:

Manufacturing Manager	- C. A. Hendricks	Rev. Date	8/24/84
Mgr. Envir. Sciences	- J. W. Kachtick	Rev. Date	8/28/84
Plant Manager - PVC	- J. W. Bonnette	Rev. Date	8/24/84
Mtce. Manager	- L. Cox, Jr.	Rev. Date	8/24/84
Safety Manager	- J. L. Oliver	Rev. Date	8-27-84

PURPOSE: The purpose of this procedure is to minimize Vinyl Chloride emissions to the environment by detection and elimination of Vinyl Chloride leaks. The National Emission Standard for Vinyl Chloride promulgated by the Environmental Protection Agency requires that a formal leak detection and elimination program be operated. The section of the Emission Standard which defines the requirements for an acceptable program is 61.65(b)(8)(i) to (vi). The procedure which follows makes specific reference by number to each item of the standard.

EQUIPMENT:

1.0 Continuous Sequential Monitoring System 61.65(b)(8)(i)

Vinyl chloride leaks will be detected by six Arcas gas chromatographs monitoring four areas of the plant on a continuous sequential basis. The four areas of the plant are: (1) Reactor, (2) Recovery, (3) Dryer, and (4) Warehouse/VCM Loading. Each area has 15 sample points and a sample frequency of one sample point per minute. In addition to monitoring, the Arcas chromatograph system will sound an alarm for vinyl chloride concentrations above a limit defined as a leak. For more information on the continuous monitoring system, refer to Authorized Operating Procedure No. 6, Arcas Gas Chromatograph System Operation and Maintenance Procedure.

2.0 Portable Hydrocarbon Detector 61.65(b)(8)(ii)

A portable hydrocarbon detector will be used routinely to find small leaks and to pinpoint major leaks indicated by the Arcas gas chromatograph system. Primarily, the portable hydrocarbon detector used is a HNU Systems Photoionization Analyzer, Model PI-101. This device has a sensitivity of at least 10 ppm and is of such design and size that it can be used to measure emissions from localized points. For information on the calibration and maintenance of this device, refer to Authorized Operating Procedure No. 7, Century Organic Vapor Analyzer Operation and Maintenance Procedure, and to Authorized Operating Procedure No. 8, HNU Systems Analyzer Operation and Maintenance Procedures.

Calibration and Maintenance Schedule 61.65(b)(8)(iii)

For the Arcas gas chromatograph system, a daily span check will be conducted with a concentration of vinyl chloride equal to the concentration defined as a leak in 61.65(b)(8)(vi) of the Emission Standard in Section 1.0 of this procedure.

The specific leak concentration for each area will always be listed in Appendix A of this procedure. A calibration gas cylinder containing the specific leak concentration will be used for the daily span check. The calibration gas cylinder will be supplied by Precision Gas Products, Inc. and will be prepared gravimetrically. The provision of the Emission Standard that the calibration cylinder analysis must be tracable to the National Bureau of Standards cannot be met at this time. (See Appendix C for explanation from Precision Gas Products, Inc.)

Calibration and maintenance schedules for the Arcas gas chromatograph system and the portable hydrocarbon detectors are detailed in Authorized Operating Procedures 6 and 8.

.0 Location, Number of Points and Frequency of Monitoring 61.65(b)(8)(iv)

Three of the four areas monitored by the Arcas gas chromatograph system contain equipment in vinyl chloride service, as defined by 61.64(1).

4.1 Reactor Area - The reactor area contains 10 reactors with reflux condensers operating in vinyl chloride service, with a total of 32 points monitoring the area. The reactor area is approximately 30 ft. x 270 ft. and has five operating levels, three of which are of open non-enclosed construction.

4.2 Recovery Area - The recovery area contains 7 storage tanks, 5 treatment columns, 5 exchangers, 14 pumps, 2 compressors, and 12 filters operating in vinyl chloride service, with a total of 9 points monitoring the area. The recovery area is approximately 160 ft. x 240 ft., with a 60 ft. diameter gasholder adjacent to the area. The treatment columns, pumps, compressors, and 5 of the filters are located along a central pipe alley which increases the monitoring efficiency.

4.3 Loading/Unloading Area - The loading/unloading area contains 2 storage tanks, 4 pumps, 2 compressors and 2 scrubbers. The pumps, compressors, and scrubbers are located in a 40 ft. x 60 ft. area with the 2 storage tanks on adjacent sides. A total of 5 points monitors this area. The loading/unloading rack is 100 ft. long with 3 tank car stations and is monitored by 3 points.

PROCEDURE:

1.0 Definition Of Vinyl Chloride Leak 61.65(b)(8)(vi)

A vinyl chloride leak has been defined as an increase above the background concentrations of vinyl chloride in the area. The definition of a leak may vary among the three areas of the plant and may change over time as background concentrations are reduced.

The background concentration of vinyl chloride in all areas is less than 1 ppm. It has been determined that in order for a leak source to be pinpointed with the portable hydrocarbon detector the leak must be a minimum magnitude and duration. This minimum magnitude and duration has been defined as a leak. Since the leak definition for each area may vary over time, the current specific leak definition for each area will always be listed in Appendix A. Appendix A will be revised as required.

2.0 Vinyl Chloride Leaks Detected by Continuous Monitoring System 61.65(b)(8)(v)

2.10 Whenever vinyl chloride concentrations are measured which exceed the area leak definition, an alarm will be sounded in the control room. The Shift Supervisor or his designee will use a portable hydrocarbon detector to attempt to pinpoint the source of the leak. Appropriate respiratory protection for VCM exposure must be used as required while searching for leak sources.

2.20 When the source of the leak has been pinpointed, the leak will be repaired in an expeditious manner to minimize VCM emissions. The actual course of action to be taken for each leak is a matter of judgement and will depend upon the cause and severity of the leak. The severity of a leak will be determined by its relationship to a reading on the portable HC detector of 100 ppm at a distance of 2 feet.

2.21 If a leak can be repaired in operation, such as tightening a flange or packing, this repair should be made. Considerable caution should be exercised when making repairs in operation to prevent over-stressing of equipment which could cause sudden failure.

2.22 A leak which requires scheduling of equipment preparation, downtime, and maintenance crews will be listed on the VCM Leak Report for scheduling of repairs. See Appendix D for sample copy of VCM Leak Report.

2.30 If a leak alarm is received, and the source cannot be pinpointed, the Shift Supervisor or his designee will initial the leak alarm report. This indicates an attempt was made to locate the leak source.

PROCEDURE:

2.0 Vinyl Chloride Leaks Detected by Continuous Monitoring System 61.65(b)(8)(v) (cont'd)

2.40 The procedure used in the event the fixed continuous monitoring system becomes inoperative is:

2.41 Temporary assignment of a technician to monitor (using a monitor) the same areas of the plant covered by the fixed system.

2.42 This coverage would be on a three shift/day basis until the continuous system was returned to operation.

2.43 Routine logging of observed levels would be made.

2.44 Immediate notification to the control room on "high" VCM values will be accomplished via the plant intercom system ("high" meaning 25 ppm or more).

3.0 Vinyl Chloride Leaks Detected by Portable Hydrocarbon Detector 61.65(b)(8)(ii)

3.10 A portable hydrocarbon detector will be used on a routing basis to search for small vinyl chloride leaks. The "routine" leak patrol is done on day shift, five days a week. The portable monitor is used on a non-routine basis at other times to trace and locate leaks detected by the fixed monitoring system.

3.11 The primary direction for the search program will be the vinyl chloride concentrations measured by the continuous monitoring gas chromatograph system. These measurements may indicate small increases in the area background concentrations which have not yet reached the leak definition level.

3.12 The search program will also include as a secondary priority a routine check of specified equipment operating in vinyl chloride service. The current list of equipment for the routine check is shown in Appendix B.

3.20 Leaks detected during routine monitoring with the portable hydrocarbon detector that registers 100 ppm or more at a distance of 2 feet will be recorded on the VCM Leak Report form. See Appendix D for sample copy of the VCM Leak Report.

3.30 The VCM Leak Report will be used to schedule equipment preparation, downtime and maintenance crews for leak repairs in an expeditious manner to minimize vinyl chloride emissions.

4.0 Recordkeeping 61.71(a) and (2)

4.10 A record of vinyl chloride leaks as specified below will be kept for a minimum of two years at the Pasadena plant. This record will be made available for inspection by the EPA Administrator upon request.

4.20 It will be the responsibility of the PVC Laboratory Supt. to keep a record of leaks detected by the vinyl chloride monitoring system. The record will include the following information.

4.21 Concentration of vinyl chloride as measured

4.22 Location of measurement

4.23 Date and approximate time of measurement

4.0 Recordkeeping 61.71(a)(1) and (2) (cont'd)

4.30 It will be the responsibility of the PVC Operations Superintendent to keep a record of the completed copies of VCM Leak Reports. The completed copies of the VCM Leak Report will include leaks detected during routine monitoring with the portable hydrocarbon detector and the following information:

4.31 Location of vinyl chloride leak

4.32 Cause of vinyl chloride leak

4.33 Date and time of vinyl chloride leak

4.34 Action taken to repair vinyl chloride leak

APPENDIX A

Date:_____

LEAK DEFINITION

AREA	LEAK DEFINITION
1. Reactor	2 successive samples above 25 ppm for any sample point
2. Recovery	2 successive samples above 25 ppm for any sample point
3. Dryer	2 successive samples above 25 ppm for any sample point
4. Warehouse/VCM Loading	2 successive samples above 25 ppm for any sample point
Portable Hydrocarbon Detector	1 sample above 100 ppm taken at a distance of 2 feet

APPENDIX B

Date_____

EQUIPMENT IN VINYL CHLORIDE SERVICE

EQUIPMENT NO.	DESCRIPTION
C-301	Reactor
C-302	Reactor
C-303	Reactor
C-304	Reactor
C-305	Reactor
C-306	Reactor
C-307	Reactor
C-309	Reactor
C-310	Reactor
C-316	Shortstop Tank C301
C-320	Shortstop Tank C302
C-324	Shortstop Tank C303
C-328	Shortstop Tank C304
C-332	Shortstop Tank C305
C-379	Shortstop Tank C-306
C-383	Shortstop Tank C-307
C-387	Shortstop Tank C-308
C-430	Shortstop Tank C-309
C-434	Shortstop Tank C-310
C-336	Agitator Seal Oil Tank T-301
C-337	Agitator Seal Oil Tank T-302
C-338	Agitator Seal Oil Tank T-303
C-339	Agitator Seal Oil Tank T-304
C-340	Agitator Seal Oil Tank T-305
C-342	Pressurized BD Tank
C-343	VCM Weigh Tank
C-344	Water Wash Column
C-345	Water Wash Column
C-346	Caustic Scrubber
C-347	Purification Column
C-348	Discharge Surge Tank
C-349	Discharge Surge Tank
C-350	Gasholder Drain Tank
C-351	Gasholder KO Pot
C-352	Crude Storage Tank
C-354	Column Overhead Accumulator
C-355	Column Bottoms Drain Tank
C-356	Recovered Storage Tank
C-362	Flare KO Tank
C-367A/B/C	Recovery Compressor KO Pots
C-368	Recovery Compressor Pulsation Bottle
C-369A/B/C	1st Stage Discharge Pulsation Bottles
C-370A/B/C	1st & 2nd Stage Suction Bottles
C-371A/B/C	Recovery Compressor Pulsation Bottles
C-372	Vacuum Pump Separator
C-373	Vacuum Pump Separator

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Equipment In Vinyl Chloride Service (cont'd)

C-375A/B	VCM Absorbers
C-376A/B	Evacuation Pump Separators
C-377	Compressor KO Pot
C-391	Reactor Discharge Surge Tank
C-392	Reactor Discharge Surge Tank
C-393	Water Wash Column
C-394	Vacuum Pump Separator
C-395	Reactor Wash Water Tank
C-396	Reactor Wash Water Tank
C-397	Water Stripper
C-398	VCM Gasholder Inlet KO Pot
C-399	VCM Gasholder Outlet KO Pot
C-400	Sweep N2 KO Pot
C-401	Toluene Decanter
C-402	Caustic Stripper
C-407	Slurry Stripper
C-408	Slurry Stripper
C-409	Slurry Stripper
C-410	Slurry Stripper
C-411	Slurry Stripper Flash Tank
C-412	Slurry Stripper Flash Tank
C-413	Slurry Stripper Flash Tank
C-414	Slurry Stripper Flash Tank
C-416	Stripper Vac. Pump Separator
C-417	Slurry Stripper Barometric Tank
C-418	Caustic Stripper Barometric Tank
C-419	Methyl Chloride Column
C-421	Waste Solvent Storage Tank
C-424A/B	Primary Absorber
C-425	Caustic Tails Tower
C-428	Blower Knockout Pot
C-429	Vent Condenser
C-438	1st Stg Suction Pulsation Bottle
C-439	1st Stg Dischg Pulsation Bottle
C-440	1st Stg Separator
C-441	2nd Stg Dischg Pulsation Bottle
C-442	Reactor Discharge Surge Tank
C-443	VCM Weigh Tank
C-444	Reactor Water Wash Tank
C-445	Slurry Stripper
C-446	Slurry Stripper Flash Drum
C-447	T-U/MeOH Separator

Equipment In Vinyl Chloride Service (cont'd)

D-301	Slurry Tank
D-302	Slurry Tank
D-303	Slurry Tank
D-304	Slurry Tank
D-340	Gasholder
D-342	Centrifuge Effluent Tank
D-346	VCM Gasholder
D-347	T-U/TCE Surge Tank
D-364	Slurry Tank
D-365	Slurry Tank
D-366	Slurry Tank
D-367	Slurry Tank
D-374	Water Stripper Feed Tank
D-375	Incinerator Seal Drum
D-378	Vent Gas Flash Drum
D-384	Gasholder K/O Sump
D-391	Slurry Tank
D-392	Slurry Tank

E-301	Reflux Condenser C-301
E-302	Reflux Condenser C-302
E-303	Reflux Condenser C-303
E-304	Reflux Condenser C-304
E-305	Reflux Condenser C-305
E-306	Reflux Condenser C-306
E-307	Reflux Condenser C-307
E-308	Reflux Condenser C-308
E-309	Reflux Condenser C-309
E-310	Reflux Condenser C-310
E-336	Regeneration Heater
E-337	Regeneration Heater
E-338	Slurry Tank Vent Cooler
E-339	Regeneration Gas Cooler
E-340	Circ. Caustic Cooler
E-342A-D	Compressor Intercooler K-301A
E-343	Compressor Intercooler K-301B
E-344	Column Overhead Condenser
E-345	Column Reboiler
E-346	Vent Condenser
E-347	Seal Water Cooler
E-348	Seal Water Cooler
E-349A/B	Seal Water Cooler w/H-301A/B
E-355	Seal Water Cooler
E-358	Water Stripper Overhead Trim Condenser
E-359	DMW Heat Exchanger
E-363	Inert Vent Condenser
E-364	Circulating Caustic Cooler
E-365	Sweep N2 Comp. w/Cooler

quipment In Vinyl Chloride Service (cont'd)

E-401	Caustic Stripper Reboiler
E-402	Caustic Stripper Cooler
E-403	Methyl Chloride Col. Condenser
E-405	Slurry Stripper Condenser
E-407	Waste Solvent Cooler
E-409	Slurry Stripper Condenser
E-413	Stripper Vacuum Pump Feed Cooler
E-414	Stripper Vacuum Pump Recycle Cooler
E-415	Evacuation Precondenser
F-301A/B	Incinerators
G-331A/B	Reactor Discharge Pumps
G-332A/B	Reactor Discharge Pumps
G-334A/B	Seal Water Pumps
G-336A/B	Seal Water Pumps
G-337A/B	Seal Water Pumps
G-351	Slurry Pump
G-352	Slurry Pump
G-380	Water Wash Circulation Pump
G-381	Water Wash Circulation Pump
G-385A/B	Crude Feed Pumps
G-386A/B	Reflux Pumps
G-387A/B	Recovered Transfer Pumps
G-388A/B	Charge Pumps
G-400A/B	Reactor Slurry Discharge Pumps
G-401A/B	Reactor Slurry Discharge Pumps
G-402	Water Wash Circulating Pump
G-403A/B	Seal Water Pumps
G-404A/B	Centrifuge Feed Pumps
G-405A/B	Centrifuge Feed Pumps
G-406A/B	Reactor Slurry Discharge Pumps
G-409A/B	Caustic Transfer Pumps
G-413A/B	Reactor Wash Water Transfer Pumps
G-416A/B	Water Stripper Bottoms Pumps
G-417A/B	Slurry Stripper Feed Pumps
G-418A/B	Slurry Stripper Feed Pumps
G-419A/B	Slurry Stripper Feed Pumps
G-420A/B	Slurry Stripper Feed Pumps
G-421A/B	Stripper Quench Circ. Pumps
G-425A/B	Slurry Stripper Vac. Circ. Pumps
G-429A/B	Caustic Stripper Feed Pumps
G-431A	Waste Solvent Transfer Pump
G-432A	Waste Solvent Unloading Pump
G-436A	Slurry Stripping Toluene Trans. Pump
G-441A/B	Gasholder Inlet Line Water Pumpout
G-442A/B	Carbon Adsorber Condensate Pumps
G-451A	Centrifuge Feed Pump
G-452A	Centrifuge Feed Pump
G-453A/B	Reactor Wash Water Trans. Pumps
G-454	Slurry Stripper Feed Pump
G-471	Slurry Stripper Feed Pump
G-474A/B	Gasholder Drips

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uipment In Vinyl Chloride Service (cont'd)

[redacted]A/B	Evacuation Pumps
[redacted]-302	Vacuum Pump
[redacted]-303	Vacuum Pump
[redacted]-304	VCM Recovery Vacuum Pump
K-29	Compressors A&B
K-301A/B	Crude VCM Compressors
L-302A-F	VCM Charge Tank Filters
L-304	Crude VCM Strainer
L-305	Reflux VCM Strainer
L-306	Recovered VCM Strainer
L-330	Flare Seal
L-354	Recovered Water Strainer
L-355	Water Wash Strainer
L-364A/B	Water Stripper Feed Filters
L-374	Slurry Stripper Ovhd Desuperheater
L-395	Slurry Stripper Steam Filter
L-399	Sweep N2 Filter
T-306	Agitator Seal Oil Tank
T-307	Agitator Seal Oil Tank
T-308	Agitator Seal Oil Tank
T-309	Agitator Seal Oil Tank
T-310	Agitator Seal Oil Tank
[redacted]-352	VCM Removal Unit
Z-17-D5	Storage Tank
Z-17-D6	Storage Tank
Z-36-C46	Scrubber
Z-36-T23	Filter
Z-36-C4	Scrubber
Z-36-T7	Filter
Z-36-C47	Scrubber
Z-36-T24	Filter
Z-36-G8	Pump
Z-36-G9	Pump
Z-36-G103	Pumps A&B