

*Bob Adams*

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## Interoffice Correspondence

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To: R. P. Becker  
From: T. M. Guth  
Date: May 24, 1978

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D 118-C

Subject: OSHA Inspection - Closing Conference

cc: S. Brouillard W. R. Bailey - Delaware City  
D. Frey V. Heble/W. C. Hutton - Pasadena  
D. Lull R. Henderson - Independence  
R. Sutch - Cleveland D. P. Tech. File 16.17.(b)

On May 22, 1978, Mr. Richard Miller, Industrial Hygienist with OSHA, arrived at the plant at 0530 A.M. to interview the employees that were exposed to VCM during the spill which occurred on May 18, 1978.

The employee interviews ranged from 15 to 30 minutes each and employees were allowed to leave after the interview since they had worked the night shift. All of the employees who had stayed over for the interviews were instructed to fill out overtime cards.

After the interviews Mr. Miller requested a conference with Rod Becker and myself to discuss the results of the interviews and of his inspection.

Mr. Miller informed us that he was surprised that our employees were so concerned about the spill and of their responsibility to prevent spills from occurring.

Mr. Miller stated that he could understand how a spill of this nature could occur even though the employee's error was unacceptable.

Mr. Miller stated that we would be expected to install a handle on the reactor evacuation valve that was involved in the release, but he had no other requests.

Mr. Miller stated that his recommendation to the Dallas office would be to not issue any citations as a result of his inspection and that no additional sampling be conducted.

Mr. Miller was informally asked his opinion of our plant. Mr. Miller stated that he was impressed by the attitude of our people and by our monitoring program.

Mr. Miller was asked how frequently disciplinary action was taken to prevent employee errors. Mr. Miller stated that normal procedures were to address letters to the employee's file. The conference adjourned and Mr. Miller was bid farewell.



Diamond Shamrock

TMG:lmr

*Ted Guth*  
Ted Guth

OCC 10008



**Diamond Shamrock**

bcc: W. R. Bailey - Delaware City  
S. Brouillard  
D. E. Frey  
V. Heble/W. C. Hutton - Pasadena  
R. Henderson - Independence  
D. L. Lull  
R. J. Sutch - Cleveland  
J. E. Zimmerman - Cleveland  
D. P. Tech. File 16.17.(b)  
File 712L

May 24, 1978

Mr. Richard Miller  
Industrial Hygienist  
Occupational Safety and Health Adm.  
2320 LaBranch Street  
Houston, Texas 77004

Dear Mr. Miller:

Attached is the additional information you requested during your inspection of our Deer Park PVC Plant on May 18 and May 22, 1978. Exhibit numbers have been included for each reference:

- Exhibit I - Complete report of May 18, 1978, VCM spill.
- Exhibit II - VCM releases for last nine (9) months involving personnel exposure.
- Exhibit III - Description of VCM monitoring system.
- Exhibit IV - Corrective action for missing valve handles.
- Exhibit V - Personnel sampling data for last six (6) months in general area where spill occurred.

Also, you asked about the source of our monitoring equipment. The vendor who supplied the equipment for our continuous monitoring system is Arcas, Inc., 8500 Commerce Park Drive, Suite 110, Houston, Texas 77036, and their phone number is (713) 777-2392.

If you have any additional questions or comments, please do not hesitate to contact us.

Sincerely,

*Rodney P. Becker*

Rodney P. Becker  
Plastics Plant Manager

RPB:lmr

Enclosures

OCC 10009

## EXHIBIT I

### INTRODUCTION

Polyvinyl chloride is made by polymerizing vinyl chloride monomer. In the initial charging operation, water, catalyst, suspending agents and vinyl chloride monomer are manually charged through meters to an agitated pressure vessel where they are then heated to initiate the reaction process under controlled conditions.

### LOCATION

The #4 Plant process area where the spill occurred contains ten (10) 2000 gal. reactors and allied equipment such as charge pumps, instruments, piping, and compressors.

The #3 Plant process area just South of #4 Plant and adjacent to #4 Plant contains the same inventory of equipment. The manpower required to operate these process areas include a total of nine (9) men. These men are engaged in the charging, dropping, cleaning of the reactors and for the drying of the finished product. The personnel responsible for the drying area are also required to monitor the operation of the charge pumps, compressors, and other equipment located in the ground level area since the charging operation takes place on the second level.

### INCIDENT

On the morning of May 18, 1978, an operator who was in the process of charging #44 reactor had completed the addition of all of the raw materials except the vinyl chloride monomer and was pulling a vacuum on the reactor prior to the addition of the VCM. (The reactor evacuation process is a standard operating step in the reactor charge procedure.)

When the desired vacuum was reached on #44 reactor, the operator proceeded to open the VCM valve and meter the VCM to the reactor. Standard operating procedure for this step is to close the evacuation valve and then open the VCM valve but for some reason the operator failed to close the evacuation valve.

### EVACUATION

Evacuation of the reactor is done via a Nash water sealed compressor that pulls the reactor vapors from the reactor and discharges them to a gasholder collection system where they are later condensed and returned to the process. The seal water for this compressor is recycled through a small tank which is an allied part on the Nash compressor. Since the VCM vapors that are being removed from the reactor are laden with water, a level controlled dump valve is installed on the seal water pot to control the water level. When the water level gets high, the dump valve opens and discharges this water to a process sewer.

### SPILL

When the operator failed to close the evacuation valve on the #44 reactor, the liquid VCM that was being charged was carried into the evacuation compressor and compressor seal water pot. The automatic dump valve then opened up to reduce the seal water pot liquid level and discharged the liquid VCM to the open process sewer.

SPILL (Cont'd)

Operating personnel in the Number 3 and 4 process areas immediately rushed to the compressor area to isolate the spill by closing the suction and discharge valves at the compressor.

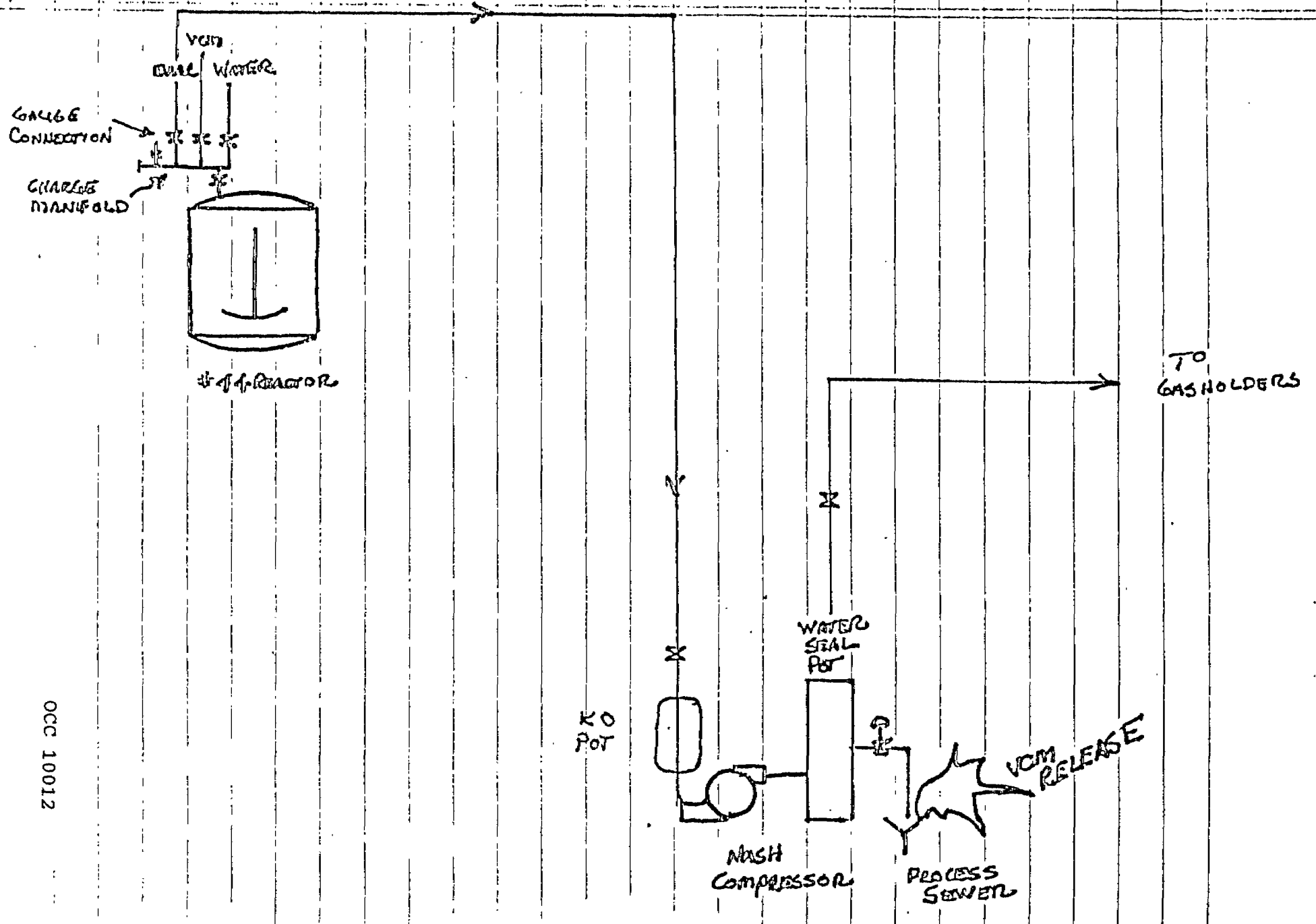
A diagram of the poly evacuation process is attached to this report.

*Ted Guth*  
Ted Guth

TMG:lmr

5/19/78

OCC 10011



OCC 10012



**Diamond Shamrock**

bcc: L. G. Davison  
N. F. Fahnoe  
T. O. Isbell  
COPY FOR ~~D~~ P. Tech. File 16.03.b(1)

November 29, 1977

Mr. Ronald McCann  
Safety and Health Director  
U. S. Department of Labor (OSHA)  
2320 LaBranch Street  
Houston, Texas 77004

Dear Mr. McCann:

At 11:51 A.M. on November 26, 1977, a VCM release occurred at our Deer Park Poly Vinyl Chloride Plant as a result of metal fatigue to a screen pot stud bolt which allowed the screen pot lid to blow off and discharge water, PVC and residual amounts of VCM vapors to the atmosphere.

The total time of the emergency was estimated to be 30 seconds and the highest reading recorded on the Personnel Monitoring System was 861 ppm of VCM.

There were two (2) operating personnel who stated that they had smelled VCM during the release and they were sent to First Aid for medical examination. Neither one of the operators were wearing respiratory protection. Operators involved were Rudy Ybarra and Mike Mulkey.

The VCM release amounted to 184 lbs./VCM.

Events leading up to the release are as follows:

An operator, Rudy Ybarra was in the process of discharging a finished batch of PVC slurry from #51 poly (which is located in our #4 Plant Expansion Area) through the screen pot and into the blowdown tank. The screen pot lid blew off releasing water, PVC and VCM vapors to the atmosphere. Mike Mulkey who heard the noise caused by the release immediately rushed over and closed the drop valve on the poly. A VCM sensor located approximately six (6) feet from the screen pot detected a concentration of VCM and sounded an alarm located in the Poly Control Room.

Corrective action to prevent personnel exposure from releases occurring at the screen pots will include the isolation or closing of the drop valve and the evacuation of the affected area by all personnel.

Sincerely,

DIAMOND SHAMROCK CORPORATION

*Rodney P. Becker*

Rodney P. Becker  
Plant Manager

OCC 10013

RPB:lmr



**Diamond Shamrock**

bcc: L. G. Davison  
D. E. Frey  
D. L. Lull  
R. J. Sutch  
COPY: D. P. Tech. File 16.03.b(1)

May 18, 1978

Mr. Richard Miller  
Industrial Hygienist  
Occupational Safety and Health Adm.  
2320 LaBranch Street  
Houston, Texas 77004

Dear Mr. Miller:

At 0511 A.M. on May 18, 1978, a VCM release occurred at our Deer Park Polyvinyl Chloride Plant and seven (7) of our employees were exposed to VCM. The highest level recorded by our monitoring system during the release was 971.3 ppm/VCM. All of the employees exposed to VCM were examined by our First Aid Department and no ill effects were reported. The names of the employees exposed are as follows:

|              |          |
|--------------|----------|
| L. Singleton | B. Byous |
| J. Davis     | E. Lujan |
| L. Verrette  | J. Jonas |
| R. Corpus    |          |

The total amount of the release is estimated to be 380 lbs./VCM and was a result of an operator error. The operator involved was in the process of charging a reactor in our #4 process plant. During the charging operation he failed to close an evacuation valve on the reactor before commencing to charge the liquid VCM.

The liquid VCM escaped through the open evacuation valve to the water sealed Nash compressor. The dump valve on the Nash seal water pot then discharged the liquid VCM to the process sewer.

In their haste to isolate the spill, none of the employees wore respiratory protection although each employee is provided with approved respiratory equipment.

Sincerely,

Rodney P. Becker  
Plant Manager

RPB:lmr

OCC 10014



**Diamond Shamrock**

October 21, 1977

Mr. Ronald McCann  
Occupational and Health Administration  
Room 2118  
2320 LaBranch Street  
Houston, Texas 77004

Dear Mr. McCann:

On October 21, 1977, at 0920 hours a VCM release occurred at our East Polyvinyl Chloride Plant in the monomer recovery area when a safety valve blew on an accumulator.

The VCM release was caused by a mechanical failure of the high level alarm on the reclaimed monomer pump-back-tank normally referred to as the accumulator.

Two operators, Mr. Lonnie Follis and Mr. Melvin Eudy, who were near the scene, immediately shut down the reclaim compressor, but were exposed to an undetermined amount of VCM during the process. Neither one of the operators were wearing respiratory protection.

Both of the employees reported to First Aid for medical examination with no ill effects reported.

The VCM release was calculated to be 658 lbs./VCM and total time of the emergency was two (2) minutes. The highest concentration of VCM recorded by our continuous monitoring system was 38.9 ppm.

The accumulator level alarm was repaired before the recovery system was put back in operation. The relief valve discharge stacks will be elevated to avoid future employee exposures in case of an emergency relief valve discharge.

Sincerely,

DIAMOND SHAMROCK CORPORATION

E. Zinn  
Plant Manager

EZ:lmr

bcc: L. G. Davison  
N. F. Fahnoe  
W. C. Hutton  
T. O. Isbell  
S. A. Metelko

✓ P. Tech. File 16.03b(i)

OCC 10015



**Diamond Shamrock**

August 23, 1977

Mr. Roy Piggee  
Occupational and Health Administration  
Room 2118  
2320 LaBranch  
Houston, Texas 77004

Dear Mr. Piggee:

On August 22, 1977, at 2347 hours, VCM vapors were released to the atmosphere when a 3/4" plug blew out of a monomer recovery compressor.

The monomer recovery compressor is operated in intermittent service and had just been put on-stream. The operator who was at the scene, immediately shut down the compressor, but was exposed to an undetermined amount of VCM during the process as he was not wearing respiratory protection.

No ill effects to the employee occurred as a result of the exposure and the employee reported to first-aid for medical examination.

The VCM vapor release was estimated to be 5 lbs./VCM and the total time of the emergency was two (2) minutes. An L.E.L. (Lower Explosive Limit) sensor detected the VCM vapors and tripped our recovery area sprinkler system as added protection.

No high VCM readings were recorded on our continuous monitoring system during the time of this emergency.

The plug was replaced in the compressor and normal operations were resumed.

Sincerely,

DIAMOND SHAMROCK CORPORATION

E. Zinn  
Plant Manager

EZ:lmr

bcc: L. G. Davison  
N. F. Fahnoe  
W. C. Hutton  
T. O. Isbell  
D. P. Tech File 16.03.b(1)

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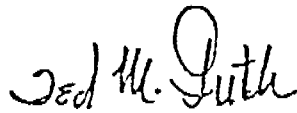
OCC 10016

EXHIBIT III

ARCAS VCM MONITORING SYSTEM

The Arcas System is basically a communications system. It sequentially analyzes 80 designated sample points strategically located throughout the Plant on five separate G.C. Units. The most recent analyses from the five systems (No. 1, 2, 3, 4 & 5 Plants) are stored in the multiplexer. The multiplexer scans all data sending out the most recent information to the Environmental Head Operators decwriter and to the remote warning stations if an exposure is imminent. Each time the next higher level is exceeded, a visual light is displayed. The primary function that the system serves is to feed back VCM concentrations and designate respiratory protection to be used by way of the remote exposure warning stations the operating areas and the personnel in those areas. Action levels displayed at the designated warning stations are 5 ppm (white), 25 ppm (blue), 1000 ppm (yellow), and 3600 ppm (red).

If a warning light is displayed and respiratory protection is not available, you must IMMEDIATELY LEAVE THE AREA.



Ted M. Guth

TMG:lmr

5/11/78

OCC 10017



ANALYTICAL EQUIPMENT

ARCAS INC.

8300 COMMERCE PARK DR., SUITE 110

HOUSTON, TEXAS  
(713) 777PROGRAMMER DATA SHEETCustomer Diamond Shamrock Date -December 1975Address Deer Park, TexasJob # 511054 P.O. # H95368-7 Model # 505D FIDType of Mount: ☐ Panel ☐ Rack ☒ FieldElectrical Classification: ☐ General Purpose☒ Explosion ProofCycle Time: 1 minutes 0 secondsTimer: ☒ S. M. DigitalCount Rate one secondNo. of functions (slots) 7Function slots not used 2☐ Cramer CamMotor Speed            Gear Rack           No. of Cams           No. of Cams Not Used           ☐ Other           Number of Streams 16 ☐ Manual Switching☒ Automatic SwitchingDetector Current            ma. (T.C. units only)No. of Attenuators 1 ☐ Dual RangeNotes:           

OCC 10018



ANALYTICAL EQUIPMENT

ARCAS INC.

8500 COMMERCE PARK DR., SUITE 110

HOUSTON, T  
171

Job # 511054

| Timer Functions          | Time |                 | Time |
|--------------------------|------|-----------------|------|
| 1A End of cycle - inject | 060  | 1B Sample block | 057  |
| 2A Auto zero             | 024  | 2B              |      |
| 3A Column switch         | 058  | 3B              | 020  |
| 4A Peak One              | 027  | 4B              | 039  |
| 5A                       |      | 5B              |      |
| 6A                       |      | 6B              |      |
| 7A                       |      | 7B              |      |
| 8A                       |      | 8B              |      |
| 9A                       |      | 9B              |      |
| 10A                      |      | 10B             |      |
| 11A                      |      | 11B             |      |
| 12A                      |      | 12B             |      |
| 13A                      |      | 13B             |      |
| 14A                      |      | 14B             |      |
| 15A                      |      | 15B             |      |
| 16A                      |      | 16B             |      |
| 17A                      |      | 17B             |      |
| 18A                      |      | 18B             |      |
| 19A                      |      | 19B             |      |
| 20A                      |      | 20B             |      |

| Components     | Attenuator # | Streams | Range %/ppm |
|----------------|--------------|---------|-------------|
| Vinyl Chloride | 1            | 1-16    | 0-3.6%      |
|                |              |         |             |
|                |              |         |             |
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Notes \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

OCC 10019

A DIVISION OF ANACON, INC.

VALVE #1Sample valve type 6 port s.s.-1/8"-Arcas sliderSample loop External Length 6" x 1/8" Volume Carrier gas Helium Bottle regulator 50 PSICarrier pressure Reg 1 30 PSI Reg 2 23 PSIColumn configuration Precut with backflush to ventPrecut column 1' chromosorb 102 80/100Analytical column 2' chromosorb 102 80/100Other Flows: measured with bubble tubeReference  cc/m Column  cc/m Backflush 45 cc/mVALVE #2Sample valve type Sample loop  Length  Volume Carrier gas  Bottle regulator  PSICarrier pressure Reg 1  PSI Reg 2  PSIColumn configuration Precut column Analytical column Other Flows: measured with bubble tubeReference  cc/m Column  cc/m Backflush  cc/mNOTES:

Model # 905 FID Job # 511054

Separation of vinyl chloride from air

Oven type Air Bath Field electronics ☒ Purged  
(check one) ☐ Condulet

Detector type FID

F.I.D. Units only - Bottle regulators supplied by customer.

Zero hydrogen bottle:

Pressure setting 40 PSI Flow 60 cc/min

Restrictor type fixed capillary

Zero air bottle:

Pressure setting 40 PSI Flow 300 cc/min

Restrictor type variable needle valve

Instrument air pressure:

Source 50 PSI Oven air pressure 40 PSI  
setting

Operating temperature 230 °F  °C

Temperature controller zero crossing

Check one ☐ Plug Card ☒ Gup Mounted

Temperature probe thermistor 1 meg @ 250 C

High Temp. Cut-off standard on all units/set at 300°F  
Switch

Carrier Protection standard on all thermal cond. units

Power Switch ☐ yes ☒ no

|                                                                                                                                                                                                                                                                                                                                                                                                                    |                                 |                                 |                                             |                   |                    |                       |                    |                    |                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------------------|-------------------|--------------------|-----------------------|--------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PRIORITY<br><b>A</b>                                                                                                                                                                                                                                                                                                                                                                                               | DATE OF ORDER<br><b>5-22-78</b> | DATE REQUIRED<br><b>5-22-78</b> | DIV.<br><b>06</b>                           | FLT.<br><b>20</b> | MAIN<br><b>243</b> | SUB.<br><b>564</b>    | CAT.<br><b>301</b> | AUX.<br><b>301</b> | <b>33716</b>                                                                                                                                                                                                                                                                                           |
| DESCRIPTION OF WORK-NAME OR NUMBER OF EQUIPMENT-REASON FOR WORK<br><br><div style="font-size: 1.2em; font-family: cursive;">PLEASE INSTALL HANDLES ON VALVES<br/>PER ATTACHED LIST.</div> <div style="text-align: right; font-size: 1.2em; font-family: cursive;">THANKS</div> <div style="font-size: 2em; font-family: cursive; transform: rotate(-15deg); position: absolute; left: 10%; top: 50%;">SAFETY</div> |                                 |                                 |                                             |                   |                    |                       |                    |                    | EQUIP. READY FOR REPAIR<br><br>_____ A.M.<br>_____ P.M.<br><br>OUTAGE REQUIRED <input type="checkbox"/><br><br>SAFETY PERMIT REQUIRED<br>RED <input type="checkbox"/> YELLOW <input type="checkbox"/><br>BLUE <input type="checkbox"/> GREEN <input type="checkbox"/><br>NONE <input type="checkbox"/> |
| REQUESTED BY-SIGNATURE<br><i>[Signature]</i>                                                                                                                                                                                                                                                                                                                                                                       |                                 |                                 | APPROVED BY-SIGNATURE<br><i>[Signature]</i> |                   |                    | APPROVED FOR CONTRACT |                    |                    |                                                                                                                                                                                                                                                                                                        |

| ESTIMATED |     | ACTUAL |     | MATERIALS REQUESTED | REQ'N NO. | DATE | REC'D MAINT. | BY | CATEGORIES   |
|-----------|-----|--------|-----|---------------------|-----------|------|--------------|----|--------------|
| SKILL     | NO. | HOURS  | NO. |                     |           |      |              |    |              |
| PF        |     |        |     |                     |           |      |              |    | 1-P.M.       |
| MW        |     |        |     |                     |           |      |              |    | 2-ROUTINE    |
| W         |     |        |     |                     |           |      |              |    | 3-EMERGENCY  |
| E         |     |        |     |                     |           |      |              |    | 4-PROJECT    |
| I         |     |        |     |                     |           |      |              |    | 5-OUTAGE     |
|           |     |        |     |                     |           |      |              |    | 6-PAINTING   |
|           |     |        |     |                     |           |      |              |    | 7-FUNCTIONAL |
|           |     |        |     |                     |           |      |              |    | 8-REWORK     |
| TOTALS    |     |        |     |                     |           |      |              |    |              |

D-881-2
MAINTENANCE WORK ORDER
CENTRAL CONTROL

**5-22-78**

DACO 287

## MEMORANDUM

To TED GUTH Date 5-23-78

Subject VALVE HANDLES

THIS IS TO CONFIRM THAT EVERY VALVE ON  
EVERY POLY IN 3-4-4X HAS A HANDLE  
ON IT.

I PERSONALLY MADE THIS INSPECTION  
MYSELF.

FRANK FOLLIS

MAY 23, 1978

TO: TED GUTH

FROM: FRANK FOLLIS

SUBJECT: VALVE HANDLE INSPECTION (3-4-4x)

BEGINNING IN JUNE, A VALVE HANDLE  
INSPECTION WILL BE INCORPORATED IN THE  
MONTHLY LEAK PATROL INSPECTION.

CC: RAY STELLENBERG

*Frank*

ENVIRONMENTAL Hd. OPER (4)

RICH CASKEY

OCC 10024

## DEER PARK PLASTICS VCM CEILING EXPOSURE

| DATE     | JOB        | NAME          | TIME | DESCRIPTION       | VCM  | MASK |
|----------|------------|---------------|------|-------------------|------|------|
| 11/21/77 | 3-4 DRYING | J. VALENZUELA | 15   | OPER. DRYER       | 0.49 |      |
| 12/14/77 | 3-4 DRYING | D. HERNANDEZ  | 15   | SWITCHED BINS     | 0.63 | 1    |
| 01/04/78 | 3-4 DRYING | R. MURPHY     | 15   | ROUTINE DUTIES    | 0.74 |      |
| 02/09/78 | 3-4 DRYING | T. CASKEY     | 320  | WASHED DOWN       | 0.28 |      |
| 03/02/78 | 3-4 DRYING | R. MURPHY     | 15   | ROUTINE DRY.      | 1.53 |      |
| 04/03/78 | 3-4 DRYING | D. HERNANDEZ  | 15   | SAMPLED, TOWER #3 | 0.54 |      |

## DEER PARK PLASTICS VCM TWA EXPOSURE

| DATE     | JOB        | NAME          | TIME | DESCRIPTION     | VCM  | MASK |
|----------|------------|---------------|------|-----------------|------|------|
| 11/08/77 | 3-4 DRYING | R. MURPHY     | 320  | NORMAL OPER.    | 0.60 |      |
| 11/30/77 | 3-4 DRYING | J. NARVAEZ    | 320  | SAMPLE VCM      | 0.02 | 1    |
| 01/19/78 | 3-4 DRYING | D. WILLIAMS   | 320  | SAMPLING & DRY. | 0.33 | 1    |
| 02/09/78 | 3-4 DRYING | T. CASKEY     | 320  | WASHED DOWN     | 0.28 |      |
| 03/15/78 | 3-4 DRYING | J. VALENZUELA | 320  | OPER. DRYER     | 0.99 |      |
| 04/19/78 | 3-4 DRYING | J. NARVAEZ    | 320  | CATCH SAMPLE    | 0.26 |      |