

|         |                                  |                  |
|---------|----------------------------------|------------------|
| TO      | FIELD POINT OR DEPT. & BLDG. NO. | DATE YOUR LETTER |
| FROM    | FIELD POINT OR DEPT. & BLDG. NO. | DATE THIS LETTER |
| SUBJECT |                                  |                  |

Phillip Donataccio

Diana Friesz

March 9, 1992

1991 INDUSTRIAL HYGIENE SUMMARY - HENRY PLANT

During 1991, Henry Plant personnel were monitored for exposure to noise, vinyl chloride, toluene, heavy metals, nuisance dust (total PVC and total unspecified), aniline, methylene chloride, acetone, chlorine, carbon disulfide, and chromic acid.

- A. Noise (OSHA Permissible Exposure Limit - 100% dose/90 decibels)  
(OSHA Action Level for Hearing Conservation Program - 50% dose/85 decibels)  
(BFG Permissible Exposure Limit - 50% dose/85 decibels)

DuPont Mark I noise dosimeters were used to monitor 142 representative employees in different job classifications for noise exposure. The noise dosimeter is worn by the employee to measure his total exposure to noise over the work shift. All continuous, intermittent and impulsive sound levels are integrated during the monitoring period to provide the accumulative noise exposure in percent dose.

NOISE EXPOSURE BY AREA

| <u>AREA</u>        | <u>JOB CLASS</u>      | <u>NO. OF MONITORINGS</u> | <u>NO. OF MONITORINGS &gt;50% DOSE</u> | <u>EXPOSURE AVERAGE (% DOSE)</u> | <u>EXPOSURE MAXIMUM (% DOSE)</u> |
|--------------------|-----------------------|---------------------------|----------------------------------------|----------------------------------|----------------------------------|
| *Comp. Bldg. (741) | Foreman               | 1                         | 1                                      | 87.13                            | 87.13                            |
| PC Bldg. (712)     | PC Bagger             | 5                         | 3                                      | 48.22                            | 61.32                            |
|                    | OBTS (Front End) Op.  | 3                         | 1                                      | 45.27                            | 71.52                            |
|                    | OBTS (Back End) Op.   | 3                         | 0                                      | 31.90                            | 33.21                            |
|                    | Geltrol Op.           | 1                         | 0                                      | 29.86                            | 29.86                            |
|                    | X-70 Op.              | 2                         | 0                                      | 28.34                            | 34.87                            |
|                    | Stalite/Van Lube Op.  | 5                         | 0                                      | 25.32                            | 39.84                            |
|                    | MBTS Op.              | 4                         | 0                                      | 23.69                            | 37.07                            |
|                    | PC Maint. Coordinator | 1                         | 0                                      | 18.56                            | 18.56                            |
|                    | PC Technical          | 1                         | 0                                      | 6.83                             | 6.83                             |
|                    | PC Foreman            | 1                         | 0                                      | 5.30                             | 5.30                             |
| A/E Bldg. (725)    | Curite 18 Op.         | 2                         | 0                                      | 47.10                            | 47.11                            |
|                    | BBTS Op.              | 2                         | 1                                      | 27.12                            | 50.73                            |
|                    | Foreman               | 3                         | 0                                      | 16.53                            | 24.86                            |

# NOISE EXPOSURE BY AREA

| <u>AREA</u>                           | <u>JOB CLASS</u> | <u>NO. OF<br/>MONITORINGS</u> | <u>NO. OF<br/>MONITORINGS<br/>&gt; 50% DOSE</u> | <u>EXPOSURE MAXIMUM</u>     |                              |
|---------------------------------------|------------------|-------------------------------|-------------------------------------------------|-----------------------------|------------------------------|
|                                       |                  |                               |                                                 | <u>AVERAGE<br/>(% DOSE)</u> | <u>EXPOSURE<br/>(% DOSE)</u> |
| MBT-Crude Bldg.<br>(711)              | MBT-C Op.        | 1                             | 0                                               | 20.64                       | 20.64                        |
| Office/Maint.Shop/<br>Warehouse (713) | PVC Maintenance  | 1                             | 1                                               | 116.13                      | 116.13                       |
|                                       | PC Maintenance   | 7                             | 0                                               | 28.09                       | 42.04                        |
| Warehouse Bldg.<br>(735)              | Warehouseman     | 7                             | 0                                               | 14.76                       | 25.13                        |

\*Indicates areas that are currently posted as "High Noise" and hearing protection is required.

The polymer chemicals department baggers are required to wear hearing protection while bagging. The 3114 back end operators also wear hearing protection while packaging.

Noise reduction projects that were completed for the polymer chemicals areas during 1991 are as follows:

1. Building 712 Baggers. Piped discharge air from air baggers to outside the building.
2. Building 725: Third Floor Area - There were two projects completed in this area to reduce the noise level. The first was insulating the filter air receiver. This eliminated the shrill of the air passing through the receiver. The second project completed was to enclose the filter hydraulic skid in a sound curtain. This skid unit had several loud pieces of equipment as a part of it.

## B. NUISANCE DUST (Total Dust Exposure Limit = 10 mg/m<sup>3</sup>)

Operators in the Compounding Building, Dryer Building, Resin Reclaim, PC Building (712), and at Wastewater Treatment were monitored for the total dust (unspecified or PVC). There were no exposures exceeding the permissible limit.

| <u>TYPE</u>       | <u>JOB CLASS</u>                                    | <u>NO. OF<br/>MONITORINGS</u> | <u>AVERAGE<br/>PERSONNEL MAXIMUM<br/>EXPOSURE EXPOSURE</u> |                           |
|-------------------|-----------------------------------------------------|-------------------------------|------------------------------------------------------------|---------------------------|
|                   |                                                     |                               | <u>(mg/m<sup>3</sup>)</u>                                  | <u>(mg/m<sup>3</sup>)</u> |
| PVC Total         | Dryer Op. (732)                                     | 4                             | 1.92                                                       | 5.50                      |
| PVC Total         | PVC Bagger (732)                                    | 4                             | 1.18                                                       | 2.34                      |
| PVC Total         | Resin Reclaim Op. (732)                             | 1                             | 0.59                                                       | 0.59                      |
| Unspecified Total | Compound Packager (741)                             | 1                             | 1.03                                                       | 1.03                      |
| Unspecified Total | PC Bagger (712)                                     | 1                             | 0.96                                                       | 0.96                      |
| Unspecified Total | Compound Henschel Op. (741)                         | 2                             | 0.37                                                       | 0.53                      |
| Unspecified Total | Compound Mill Op.                                   | 1                             | 0.21                                                       | 0.21                      |
| Unspecified Total | Waste Treatment Op.<br>(adding filter aid to press) | 1                             | 0.07                                                       | 0.07                      |

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C. TOLUENE (Permissible Exposure Limit = 100 ppm)

During 1991, personnel monitoring for Toluene exposure was done in the Polymer Chemicals Building 712 and the Crude Building (711). The monitoring results continue to show that there is little toluene exposure. Spot check monitoring will be done quarterly for a representative operator from the X-70/Geltrol and MBT-Crude processes, and annually for a representative operator from each other job classification that may be subject to toluene exposure.

TOLUENE EXPOSURE

| <u>AREA</u>                | <u>NO. OF MONITORINGS</u> | <u>AVERAGE PERSONNEL EXPOSURE (ppm)</u> | <u>MAXIMUM EXPOSURE (ppm)</u> |
|----------------------------|---------------------------|-----------------------------------------|-------------------------------|
| Crude Bldg. Operator (711) | 3                         | 1.27                                    | 1.80                          |
| Geltrol Operator (712)     | 4                         | 1.00                                    | 1.00                          |
| OBTs (Front End) (712)     | 1                         | 1.00                                    | 1.00                          |
| PC Foreman (712)           | 1                         | 1.00                                    | 1.00                          |

D. HEAVY METALS

Two weld shop employees and a compounding Henschel operator were monitored for exposure to heavy metals. A personnel monitoring pump (2 lpm flow rate) with an 0.8 micron, mixed-cellulose ester filter in a 3-piece cassette was used. Samples were sent to an outside laboratory for analysis.

There were no exposures exceeding permissible exposure limits. The permissible exposure limit is shown in parenthesis next to the metal name.

HEAVY METAL

AVERAGE EXPOSURE (mg/m<sup>3</sup>)

|                                           | <u>WELD SHOP</u> | <u>COMPOUNDING</u> |
|-------------------------------------------|------------------|--------------------|
| Antimony (0.5 mg/m <sup>3</sup> )         | ---              | 0.0002             |
| Cadmium, as fume (0.1 mg/m <sup>3</sup> ) | 0.0001           | ---                |
| Chromium VI (0.05 mg/m <sup>3</sup> )     | 0.0032           | ---                |
| Lead (0.05 mg/m <sup>3</sup> )            | 0.0007           | ---                |
| Nickel (1 mg/m <sup>3</sup> )             | 0.001            | 0.0004             |
| Iron Oxide fume (10 mg/m <sup>3</sup> )   | 0.036            | ---                |

E. ACETONE (OSHA Permissible Exposure Limit = 750 ppm 8 hour  
1000 ppm Short-term)

Two laboratory operators were spot-checked for a full-shift and a short-term acetone exposure. The full-shift monitoring was done with a 3m gas badge and the result was 18 ppm. A short-term monitoring was done with a sampling pump and charcoal tube while the operator was cleaning glassware with acetone at the sink. This sample result was 95 ppm. The lab operators will continue to be spot checked periodically for acetone exposure in order to verify that no exposure problem exists.

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**F. ANILINE (OSHA Permissible Exposure Limit = 2 ppm)**

Three operators in the MBT-C building were monitored for aniline exposure using a monitoring pump and silica gel tubes. All exposure results were less than 0.08 ppm. This agrees with past years samples and indicates that there is no aniline exposure problem in the crude building.

**G. METHYLENE CHLORIDE (Current OSHA 8-hour TWA = 500 ppm;  
Proposed OSHA 8-hour TWA = 25;  
Proposed OSHA Action Level = 12.5 ppm;  
Proposed OSHA Short-term Limit = 125 ppm)**

Three A/E building operators were monitored for full-shift exposure to methylene chloride. The average exposure result was 3.46 ppm and the maximum was 4.49 ppm. A short-term sample was also taken while the operator was collecting a column bottom sample. The STEL result was 1.98 ppm. Additional samples will be taken until a representative operator from each shift has been monitored for TWA and STEL exposure.

**H. CARBON DISULFIDE (8-Hour TWA Exposure Limit = 4 ppm;  
Short-Term Exposure Limit = 12 ppm)**

The Polymer chemicals tank farm operator was monitored twice for full-shift exposure to carbon disulfide. The average exposure was 0.16 ppm and the maximum 0.20 ppm. A short-term (15 minute) sample using a charcoal tube and a monitoring pump was also done while the operator worked on the CS<sub>2</sub> pump. The analysis result for this sample was 22.5 ppm which exceeds the STEL. Because of this exceedance, all tank farm jobs involving CS<sub>2</sub> will be evaluated and respirator usage required for any tasks that are suspect of causing exposure. Respirator use during work on the CS<sub>2</sub> pump has been written into the PC tank farm procedure.

**I. CHLORINE (Short-Term Exposure Limit = 1 ppm)**

The Polymer Chemicals tank farm operator was monitored for chlorine exposure over a one-hour period which included the unhooking of a chlorine railcar. A passive diffusion tube for chlorine was used as the monitoring device. There was no color change at all in the tube following the monitoring which indicated negligible exposure. Additional monitoring will be done to verify this result.

**J. CHROMIC ACID (Permissible Exposure Limit = 0.1 mg/m<sup>3</sup> ceiling)**

The raw materials laboratory operator was monitored on a day when he was using chromerge (chromic acid solution) to clean glassware. The monitoring result was 0.0004 mg/m<sup>3</sup> as chromic acid. The wastewater treatment laboratory operators also use chromerge and will be monitored.

K. VINYL CHLORIDE (Permissible Exposure Limit = 1 ppm)

All operators in the Poly and Dryer building as well as the PVC Tank Farm are monitored for vinyl chloride exposure at least once per year. The schedule of monitoring then follows the OSHA VCL standard which requires monthly monitoring for any exposure greater than 1.0 ppm until two consecutive monitorings are less than 0.5 ppm. The employee need not be monitored again during the year if his annual monitoring result or the two consecutive monitorings are below 0.5 ppm. All VCL monitoring samples were collected on Reiszner gas badges and analyzed by an AIHA accredited laboratory.

VINYL CHLORIDE MONITORING (POLY AND DRYER BUILDING)

| <u>Year</u> | <u>No. of People Monitored</u> | <u>Average (ppm)</u> | <u>% Greater Than 1 ppm</u> | <u>% Less Than 0.5 ppm</u> |
|-------------|--------------------------------|----------------------|-----------------------------|----------------------------|
| 1987        | 248                            | 1.06                 | 21                          | 58                         |
| 1988        | 314                            | 1.15                 | 27                          | 48                         |
| 1989        | 403                            | 1.36                 | 35                          | 40                         |
| 1990        | 277                            | 0.72                 | 12                          | 64                         |
| 1991        | 261                            | 0.70                 | 13                          | 65.5                       |

VINYL CHLORIDE EXPOSURE BY JOB CLASSIFICATION

| <u>JOB CLASS</u>            | <u>NO. OF MONITORINGS</u> | <u>NO. ABOVE 1 ppm</u> | <u>AVERAGE EXPOSURE (ppm)</u> | <u>MAXIMUM EXPOSURE (ppm)</u> |
|-----------------------------|---------------------------|------------------------|-------------------------------|-------------------------------|
| Poly Cleaner (enters polys) | 14                        | 10                     | 2.46                          | 15.00                         |
| PVC Poly Cleaner/Helper     | 18                        | 3                      | 1.39                          | 14.00                         |
| Recovery Operator           | 17                        | 1                      | 1.27                          | 18.00                         |
| Waste/LoSope Charge         | 37                        | 14                     | 1.07                          | 8.00                          |
| PVC Foreman                 | 19                        | 4                      | 0.57                          | 2.20                          |
| Earl Charge                 | 42                        | 2                      | 0.47                          | 2.60                          |
| & E Operator                | 5                         | 1                      | 0.45                          | 1.20                          |
| Valve Cleaner               | 3                         | 0                      | 0.41                          | 0.59                          |
| Dryer Operator              | 32                        | 1                      | 0.36                          | 1.40                          |
| Dryer Bldg. Foreman         | 8                         | 0                      | 0.33                          | 0.84                          |
| PVC Bagger                  | 37                        | 0                      | 0.28                          | 0.53                          |
| Tank Farm Operator          | 4                         | 0                      | 0.28                          | 0.37                          |
| Pilo Operator               | 8                         | 0                      | 0.25                          | 0.27                          |
| PVC Engineer/Technician     | 4                         | 0                      | 0.25                          | 0.25                          |
| Catalyst Makeup             | 2                         | 0                      | 0.25                          | 0.25                          |

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RESPIRATOR COMPLIANCE (POLY BUILDING)

| <u>Year</u> | <u>No. of Exposures<br/>Greater than 1 ppm</u> | <u>No. of Exposures<br/>Greater than 1 W/O Respirator</u> | <u>Respirator<br/>Compliance</u> |
|-------------|------------------------------------------------|-----------------------------------------------------------|----------------------------------|
| 1987        | 53                                             | 15                                                        | 72%                              |
| 1988        | 72                                             | 24                                                        | 67%                              |
| 1989        | 140                                            | 40                                                        | 71%                              |
| 1990        | 34                                             | 9                                                         | 74%                              |
| 1991        | 35                                             | 12                                                        | 66%                              |

The job class breakdown is as follows for Poly Building employees exposed to greater than 1 ppm VCL without the use of a respirator.

| <u>JOB CLASS</u>             | <u>NO. OF EXPOSURES</u> |
|------------------------------|-------------------------|
| Paste/LoSope Charge Operator | 10                      |
| Recovery Operator            | 1                       |
| HRC Poly Cleaner/Helper      | 1                       |

Since there have been a number of vinyl chloride exposures to the paste/LoSope charge operator that were greater than 1 ppm without respirator protection, this job is being closely evaluated. One task of the job that has come to light as a source of VCL exposure is opening the poly manhead after the charge has been recovered without valving in the exhaust to the poly. OVA checks of this task have shown zero ppm with the exhaust valve open and as high as 5000 ppm at the manhead with the exhaust closed. The PVC area management has re-emphasized with all operators the necessity of valving in the exhaust before opening the poly manhead to sample the charge.

Another possible source of vinyl chloride is drilling material out of the condensers which is then dropped inside the building. Several high personnel exposures have occurred on the same day as the drilling task. The condenser drilling procedure will be changed to require drilled material to be dropped to the poly and for the poly exhaust to be on while the drilling is taking place.

Other tasks of the paste/LoSope charge operator will be checked with an OVA and/or personal monitoring device. These tasks include changing vinyl filters, sampling seed polys, sampling foam traps, and dropping polys.

L. MEDICAL SURVEILLANCE SUMMARY

Total number of Examinations - 298

Number of Examinations which showed:

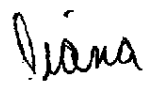
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- a. Hearing loss - 24
- b. Report by Department
  - Whse. - 3
  - Utl. - 1
  - Maint. - 5
  - PVC - 3
  - P.C. - 9
  - Comp. - 3

Follow-up Activities:

- 1. Send letter to each employee stating they have a S.T.S.
- 2. Retest each employee within 21 days.
- 3. Reinstruct each employee in the proper use of hearing protection.
- 4. Reevaluate their working area.

Please call me at 9407 if you have any questions on this information.

  
Diana Friesz

DF/bs/9208

|                        |                             |
|------------------------|-----------------------------|
| cc: D.M. Kidd          | J.B. Mattingly              |
| V.D. Marquis           | T.L. Castor                 |
| <del>B.I. Brandy</del> | J.L. Schwarz                |
| <del>R.D. Moore</del>  | K.E. Musselman              |
| D.L. Piccinelli        | D. Gleghorn - Cleveland     |
| D.E. Giffin            | R.J. Grahek - Cleveland     |
| R.D. Webber            | K.J. Willings - Brecksville |
| W.J. Grudzinski        | S&E Operators (2)           |
| J.D. Krumholz          | PVC Foreman (4)             |
| K.W. Prather           | PC Foreman (4)              |
| M.E. Guyer             | File                        |

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