

TO	FIELD POINT OR DEPT. & BLDG. NO.	DATE YOUR LETTER
Mike Guyer/Jim Krumholz		
FROM	FIELD POINT OR DEPT. & BLDG. NO.	DATE THIS LETTER
Diana Friesz		January 18, 1993
SUBJECT		

Fourth Quarter 1992 Industrial Hygiene Summary - Henry Plant

Henry Plant personnel monitoring results for October through December of 1992 are summarized as follows:

- I. NOISE (BFG Exposure Limit = 50% dose)
(OSHA PEL = 100% dose)

NOISE EXPOSURE BY AREA

AREA	JOB CLASS	NO. OF MONITORINGS	NO. OF MONITORINGS >50%/>100%	EXPOSURE AVERAGE (% DOSE)	MAXIMUM EXPOSURE (% DOSE)
Compounding (GVD)	Mill Operator	3	1/2	141.0	167.7
	Relief Operator	1	0/1	131.7	131.7
	Henschel Operator	2	1/1	109.1	126.5
Dryer Bldg. (GVD)	Dryer Operator	4	1/3	112.7	149.7
	Bagger	5	4/0	63.9	88.4
Poly Bldg. (GVD)	HRC Poly Cleaner	1	1/0	87.9	87.9
	Paste LoSope Charge	2	2/0	63.6	77.4
	Recovery Operator	1	1/0	61.9	61.9
	Valve Cleaner	3	1/0	42.3	59.2
	S & E Operator	1	0/0	34.8	34.8
	Catalyst Make-up	2	0/0	33.7	33.7
Polymer Chemicals (712) (SP&C)	Foreman	1	1/0	79.9	79.9
	OBTS Operator (Back-end)	2	1/0	51.5	56.1
	Stalite/Van Lube Oper.	4	0/0	37.9	48.0
	Bagger	3	1/0	36.4	65.1
	50% NAMBT	1	0/0	34.6	34.6
	OBTS Oper. (Front-end)	2	0/0	33.1	46.7
	MBTS Operator	1	0/0	24.2	24.2
	X-70 Operator	3	0/0	19.6	25.8
	Geltrol Operator	1	0/0	18.9	18.9
	S&E Operator	1	0/0	11.4	11.4
A&E Bldg. (SP&C)	CureRite 18 Operator	2	1/0	44.8	57.8
	BBTS Operator	4	1/0	32.7	51.9
3114/3125 Bldg. (SP&C)	3114 Back-end Operator	3	0/0	44.7	49.4
PC Tank Farm (SP&C)	Tank Farm Operator	3	0/0	27.3	38.3

NOISE EXPOSURE BY AREA (Continued)

<u>AREA</u>	<u>JOB CLASS</u>	<u>NO. OF MONITORINGS</u>	<u>NO. OF MONITORINGS >50% / >100%</u>	<u>EXPOSURE MAXIMUM</u>	
				<u>AVERAGE (% DOSE)</u>	<u>EXPOSURE (% DOSE)</u>
PC Maintenance (SP&C)	Maintenance Man	11	2/0	25.3	66.1
	Welder	1	0/0	12.4	12.4
Crude Bldg. (SP&C)	MBT-C Operator	2	0/0	20.2	20.2
PC Warehouse (SP&C)	Warehouse Man	1	0/0	13.8	13.8
Boiler House (GVD)	Gas Boiler Operator	2	1/0	57.0	76.5
	Coal Boiler Operator	2	0/0	27.9	36.9
General Maintenance	Greaser/Oiler	2	1/0	42.3	58.0
	Tractor Driver	1	0/0	38.6	38.6
	Electrical	2	0/0	31.8	42.5
	Testers	1	0/0	31.1	31.1
	Instrument	2	0/0	15.2	17.1

II. ACETONITRILE (OSHA PEL = 40 ppm, 8-HR TWA)
(SP&C) (OSHA STEL = 60 ppm, 15-MIN.)

One 3114 operator was monitored for short-term acetonitrile exposure while making premix. The result was 3.0 ppm.

III. FORMALDEHYDE (OSHA PEL = 0.75 ppm, 8-HR TWA;
(SP&C) OSHA STEL = 2.0 ppm, 15-MIN.TWA)

Three 3114 operators were monitored for short-term formaldehyde exposure while making up premix. The results were 0.80 ppm, 3.56 ppm and 1.04 ppm. A full-face, airline respirator is worn during the premix makeup job.

One PC warehouse man was monitored for short-term formaldehyde exposure while using the forklift to unload skids of paraformaldehyde from a delivery truck. The result was 1.38 ppm. No respirator protection is worn during this task. Additional monitoring will be done to make sure that there is no exceedence during unloading.

IV. TOLUENE (OSHA PEL = 100 ppm, 8-HR TWA)
(SP&C)

The following job classes were monitored for full-shift toluene exposure using a 3M gas badge.

<u>JOB</u>	<u>NO. OF MONITORINGS</u>	<u>AVERAGE EXPOSURE (ppm)</u>	<u>MAXIMUM EXPOSURE (ppm)</u>
MBT-C Operator	3	2.30	4.89
X-70 Operator	2	1.00	1.00
Stalite/VanLube Oper.	1	1.00	1.00
Geltrol Operator	3	1.00	1.00
PC Laboratory	1	1.00	1.00

NGC 14696

V. CARBON MONOXIDE (OSHA PEL = 35 ppm, 8-HR TWA)

The following job classes were monitored for full-shift carbon monoxide exposure generated from the operation of fork-life trucks or from welding.

<u>JOB</u>	<u>TYPE OF TRUCK</u>	<u>NO. OF MONITORINGS</u>	<u>AVERAGE EXPOSURE (ppm)</u>	<u>MAXIMUM EXPOSURE (ppm)</u>
Compound Ware-houseman (GVD)	Propane w/ enclosed cab	3	21.8	25.0
PC Warehouseman (SP&C)	Propane w/open cab	2	18.3	24.0
Dryer Operator (GVD)	Propane w/open cab	3	4.8	6.3
Finished Goods Warehouseman (GVD)	Electric	3	2.9	4.1
PC Welder (SP&C)	N/A	2	1.3	2.6

VI. CYCLOHEXANONE (OSHA PEL = 25 ppm, 8-HR TWA) (SP&C)

One polymer chemicals laboratory operator was monitored for cyclohexanone exposure. The monitoring result was 0.04 ppm.

VII. MERCURY (OSHA PEL = 0.05 mg/M³, 8-HR TWA)

One personnel and one area monitoring were done in the PC laboratory (SP&C) for full-shift mercury vapor exposure using a hopcalite tube and monitoring pump. The results were 0.005 mg/M³ and 0.002 mg/M³, respectively. The result of an area sample in the wastewater treatment laboratory (GVD) was 0.002 mg/M³.

A one-hour monitoring was done on an instrument maintenance man while he was separating mercury from manometer sludge. The result was 0.015 mg/M³. A full-shift area sample in the instrument department showed 0.002 mg/M³ of mercury vapor in the work area. Although the PEL was not exceeded, there should be some type of hood or ventilation in the instrument area for cleaning and working with instruments containing mercury.

VIII. ANILINE (OSHA PEL = 2 ppm, 8-HR TWA) (SP&C)

Four MBT-crude building operators were monitored for full-shift aniline exposure. The average result was 0.07 ppm and the maximum was 0.1 ppm.

A fifth MBT-crude building operator was also monitored but the result of 8.13 ppm was not representative of normal building exposure. During this monitoring the raffinate tank vent line became full of liquid which the operator drained out to a drum. Respirator protection was not worn. A Board of Inquiry was held for this incident.

IX. CHLORINE (OSHA PEL = 0.5 ppm, 8-HR TWA)
(SP&C)

Two PC tank farm operators were monitored for chlorine exposure using Sensidyne Passive Dosimeter tubes. Chlorine cans were changed out during the monitoring period. There was no color change at all in the tubes indicating negligible exposure.

X. DOWTHERM (OSHA PEL = 1 ppm, 8-HR TWA)
(SP&C)

Four stalite/VanLube operators in Building 712 were monitored for full-shift exposure using a silica gel tube and a personal monitoring pump. The average result was 0.025 ppm and the maximum was 0.04 ppm.

XI. HYDROGEN SULFIDE (OSHA PEL = 10 ppm, 8-HR TWA)
(SP&C) (OSHA STEL = 15 ppm, 15-MIN. TWA)

All PEL monitorings were done using a Draeger long-duration dosimeter tube. Two MBT-crude operators were monitored and negligible exposure was indicated. Three PC laboratory operators were monitored on days when OBTS purity tests using H₂S were being run. Again, there was no color change on the monitoring tubes.

Two short-term samples were taken right at the work area for laboratory operators running OBTS purity tests. A Draeger pump with H₂S color tubes was used. No exposure was observed.

XII. AMMONIA (OSHA STEL = 35 ppm, 15-MIN. TWA)
(GVD)

Two poly building operators were monitored for short-term ammonia exposure during the task of making up ammonia laurate. An acid washed silica gel tube was used with a personal monitoring pump. The exposure results were 1.7 ppm and 1.4 ppm.

XIII. ETHANOL (OSHA PEL = 1000 ppm, 8-HR TWA)
(SP&C)

Four 3125 operators were monitored for full-shift ethanol exposure. The average result was 2.49 ppm.

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XIV. ISOPROPYL ALCOHOL (OSHA PEL = 500 ppm, 8-HR TWA)
(SP&C)

Three OBTS back end operators and five OBTS front end operators were monitored for full-shift IPA exposure. The average results were 2.1 ppm and 4.6 ppm, respectively.

Two PC laboratory operators were also monitored for IPA exposure. The average was 1.99 ppm.

XV. MORPHOLINE (OSHA PEL = 20 ppm, 8-HR TWA)
(SP&C)

Four OBTS operators (front-end) were monitored for full-shift morpholine exposure using an XAD tube and personal sampling pump. The average exposure was 0.21 ppm.

XVI. METHANOL (OSHA PEL = 200 ppm, 8-HR TWA)
(SP&C) (OSHA STEL = 250 ppm, 15-MIN. TWA)

Two 3125 operators were monitored for short-term exposure while drumming methanol from the receiver. The results were 20.7 ppm and 2.0 ppm.

Two PC laboratory operators were monitored for full-shift exposure. These results were 5.8 ppm, and 2.0 ppm.

XVII. METHYLENE CHLORIDE (CURRENT OSHA PEL = 500 ppm, 8-HR TWA)
(SP&C) (PROPOSED OSHA PEL = 25 ppm, 8-HR TWA)

Six Cure-Rite 18 operators were monitored for full-shift exposure. The results continue to be very low with an average of 2.3 ppm.

Two PC maintenance men were monitored while in the shop area due to the methylene chloride content of certain maintenance chemicals that are used. Their average exposure was 2.9 ppm.

XVIII. ACRYLONITRILE (OSHA PEL = 2 ppm, 8-HR TWA)
BUTADIENE (OSHA PEL = 1000 ppm, 8-HR TWA)
STYRENE (OSHA PEL = 50 ppm, 8-HR TWA)
(GVD)

Two compounding mill operators were monitored to determine if there is any exposure during the processing of ABS resins. All exposures were less than 0.16 ppm acrylonitrile, 0.06 ppm butadiene and 2 ppm styrene.

XIX. NUISANCE DUST (OSHA PEL TOTAL DUST = 15 mg/M³, 8-HR TWA)
(OSHA PEL RESPIRABLE DUST = 5 mg/M³, 8-HR TWA)

Operators in the Compounding building, Dryer building, Resin Reclaim, PC building (712), Boiler House, and at Wastewater Treatment were monitored for total dust (unspecified and PVC) and respirable dust (unspecified and PVC).

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TYPE	JOB CLASS	NO. OF MONITORINGS	AVERAGE EXPOSURE mg/M ³	MAXIMUM EXPOSURE mg/M ³
Total-PVC	Dryer Leaderman (GVD)	1	0.71	0.71
	Dryer Operator (GVD)	1	0.49	0.49
	Bagger (GVD)	1	0.30	0.30
Respirable-PVC	Bagger (GVD)	5	0.63	0.90
	Dryer Operator (GVD)	5	0.28	0.43
Total- Unspecified	Compound Relief (GVD)	4	4.0	6.2
	Henschel Operator (GVD)	4	1.65	3.1
	PC Bagger (SP&C)	4	1.3	3.6
	Mill Operator (GVD)	4	0.95	3.3
	WWT Operator (SP&C)	2	0.43	0.53
	Compound Packager (GVD)	5	0.32	0.82
Respirable- Unspecified	*Utility Maintenance (GVD)	3	1.7	2.7
	Henschel Operator (GVD)	1	0.29	0.29
	Mill Operator (GVD)	4	0.28	0.39
	Comp. Relief Oper. (GVD)	3	0.23	0.35
	PC Bagger (SP&C)	2	0.17	0.20
	Comp. Packager (GVD)	4	0.15	0.25

*Loading flyash to disposal trucks

A. OBTS DUST (OSHA PEL AS NUISANCE DUST = 15 mg/M³, 8-HR TWA)

Four polymer chemicals baggers were monitored for total dust exposure on days when they only bagged OBTS. The average exposure was 0.28 mg/M³ and the maximum was 0.73 mg/M³.

B. WELDING FUME (OSHA PEL = 5 mg/M³, 8-HR TWA)

Four polymer chemicals welders were monitored for welding fume exposure in the 712 shop. The average exposure was 4.0 mg/M³ and the maximum was 14.5 mg/M³. Spot ventilation is typically used so that respirators are not worn. The maximum exposure occurred on 12/11/92, but to date a Board of Inquiry has not been able to be scheduled due to the work load in the welding area.

C. CRYSTALLINE FREE SILICA (RESPIRABLE FRACTION EXPOSURE LIMIT = 0.1 mg/M³) (GVD)

Analysis of the coal boiler fly ash disclosed a crystalline free silica content of 28% in the combustion chamber fly ash. Because long-term exposure to crystalline silica can cause a chronic, fibrogenic lung disease known as silicosis, several boiler house operators were spot checked for silica exposure while loading fly ash from the silo to the disposal trucks. A monitoring pump (drawing air at 1.7 lpm flow) was set up to capture only the respirable fraction of the dust using a cyclone collector and a PVC-5 filter. The filters were then laboratory analyzed for silica content. The results (as 10-hour TWA's) were 0.5 mg/M³, 0.13 mg/M³ and 0.16 mg/M³.

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Boiler House personnel have routinely used a 3M-8710 dust mask for protection against the silica content in the coal boiler flyash. However, a powered air purifying respirator with full-facepiece and HEPA filter cartridges has been ordered and will replace the 3M-8710 for any flyash exposure. Disposable coveralls will also be worn while loading flyash to the disposal truck.

D. HEAVY METALS

Polymer chemicals welders, compound Henschel operators, compound relief operators, and the maintenance department machinists were monitored for heavy metals exposure. A personal monitoring pump (2 lpm flow) with a 0.8 micron, mixed-cellulose ester filter in a 3-piece cassette were used. Samples were sent to an outside laboratory for analysis.

There were no exposures exceeding the permissible exposure limits. The PEL's are shown in parenthesis next to the metal name. The number of samples taken is shown in parenthesis next to the average exposure.

<u>AVERAGE EXPOSURE</u>				
<u>HEAVY METAL</u>	<u>WELD SHOP</u>	<u>HENSCHEL OPER.</u>	<u>RELIEF OPER.</u>	<u>MACHINIST</u>
Antimony (500 ug/M ³)		0.31 ug/M ³ (4)	1.7 ug/M ³ (4)	
Cadmium (5 ug/M ³)	0.13 ug/M ³ (3)			0.13 ug/M ³ (2)
Chromium (50 ug/M ³)	1.76 ug/M ³ (3)			0.13 ug/M ³ (2)
Copper (100 ug/M ³)	1.0 ug/M ³ (1)			
Ironoxide (10 mg/M ³)	0.13 mg/M ³ (2)			
Lead (50 ug/M ³)	0.50 ug/M ³ (3)			0.26 ug/M ³ (2)
Nickel (1 ug/M ³)		0.00 mg/M ³ (4)	0.06 mg/M ³ (4)	
Zinc (10 mg/M ³)	0.02 mg/M ³ (1)	0.00 mg/M ³ (1)		

E. CARBON DISULFIDE (OSHA PEL = 4 ppm, 8-HR TWA) (SP&C)

One MBT-C operator and one PC laboratory operator were monitored for CS₂ exposure. The exposures were 0.14 ppm and 0.04 ppm, respectively.

F. VINYL CHLORIDE (OSHA PEL = 1 ppm, 8-HR TWA) (GVD) (OSHA STEL = 5 ppm, 15-MIN. TWA)

During the 4th quarter of 1992, there were 18 monitorings completed for vinyl chloride exposure (15 poly/3 dryer). Of the total monitorings, three exceeded 1 ppm and 11 (61%) were below 0.5 ppm. The exposures are summarized below:

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>
Resin Reclaim Operator	2	1*	0.77	1.4
Recovery Operator	3	1	0.66	1.3
Paste/LoSope Charge	7	1	0.62	1.8
PVC Tank Farm Operator	1	0	0.61	0.61
PVC Foreman	3	0	0.32	0.78
Dryer Operator	1	0	0.16	0.16
PVC Engineer	1	0	0.08	0.08

*Exposure occurred w/o respirator and a B of I was held.

- G. ACETONE (OSHA PEL = 750 ppm, 8-HR TWA)
(OSHA STEL = 1000 ppm, 15-MIN. TWA)
CARBON TETRACHLORIDE (OSHA PEL = 2ppm, 8-HR TWA)
CHLOROFORM (OSHA PEL = 2 ppm, 8-HR TWA)

One PC laboratory operator was monitored for exposure to full-shift acetone and carbon tetrachloride. The results were 5.4 ppm and 0.56 ppm, respectively.

Two PC laboratory operators were monitored for full-shift exposure to chloroform. The average result was 0.52 ppm.

One PC laboratory operator was monitored for short-term acetone exposure while cleaning glassware at the sink. The result was less than 2.0 ppm.

H. MEDICAL SURVEILLANCE SUMMARY

Total number of Examinations - 91

Number of Examinations which showed:

- a. Hearing loss - 3
- b. Report by Department

PVC - 1 (Confirmed by initial audiogram, repeat audiogram and noise dosimeter monitoring. Referred to physician.)

PC - 2 (Confirmed by initial audiogram, repeat audiogram and noise dosimeter monitoring.)

I. PEL EXCEEDENCE INVESTIGATIONS

1. Vinyl Chloride - on November 16, 1992 a resin reclaim operator received a VCL exposure of 1.4 ppm without a respirator.

The resin reclaim dryer had been shutdown and when started up again the operator found that the acrison auger wasn't turning. In order to work on the auger, the wet hopper needed to be empty. The contents of the wet hopper were

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then dumped to the floor and shoveled into gaylord boxes. The operator's contact with the wetcake during shoveling seems to have caused the exposure.

Corrective actions include:

- a. Install an alarm to alert operators when the wet hopper exhaust fan is off.
 - b. Any significant exposure to slurry or wetcake in resin reclaim will require a fresh air mask.
 - c. Check other non-routine activities that could cause exposure and determine exposure level with an OVA: wet hopper door open, cross-conveyor plugging, duplex strainer change.
2. Aniline - On December 2, 1992 an MBT-C operator received an aniline exposure of 8.13 ppm without a respirator.

Liquid had built up in the MBT-crude bldg. vent line header. The MBT-C operator drained the line out to a drum by manually lifting the protectoseal. Liquid splattered out onto the operator's splash vest when he first opened the line. The operator immediately changed the vest and his work shirt, then continued the job. There was no pressure on the protectoseal the second time it was lifted. No strong odors were noticed and aniline is not normally expected to be present at this point in the process. A toluene monitoring that was done at the same time came back with a low result of 4.89 ppm.

Corrective actions include:

- a. A full-facepiece airline mask is now required for this job along with rain gear and rubber gloves.
- b. The drain line has been revised so that the valve can be opened at ground level and the line extends directly into the drum by way of a nipple.
- c. Since the operator did not notice any odor of aniline or toluene during the incident, additional monitoring will be conducted during the line draining (which is done weekly) in order to determine if the exposure was actually aniline or if BT or ABT are acting as an interference.

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


Diana Friesz

DF/bs/9302

NGC 14703

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PVC Foreman (4)
PC Foreman (5)
File

NGC 14704