

To: T. G. Grumbles

From: J. V. Uptain
Date: February 3, 1988

Subject: VCM EXPOSURE LEVELS

Interoffice
Communication

VISTA

As you requested, a review of the Aberdeen Plant's VCM exposure records was made to determine exposure levels for employees not directly involved with VCM but who may handle or process resins or materials made from VCM. As a result, I am enclosing five tables extracted from as many statistical studies covering the period July 1, 1976, through December 31, 1981.

In comparing this older data with the more recent results shown below, please note that of the seventy-three samples taken in Compound ("Compound Supervisors" and "Compound Workers...") during the period July 1, 1976 through December 31, 1976, only two were above the "action level" of 0.5 ppm:

Dry Blend Compounder - 0.54 ppm

Compound Operator - 0.77 ppm

Similarly, for the six samples taken in Compound during the period March 1, 1977 through August 31, 1977, only one sample was above the action level:

Compound Shift Supervisor - 0.82 ppm

More recent results are tabulated below for the plant's current "yearly" dosimetry samples (see attached sampling frequency plan). This sample category includes jobs not normally directly exposed to VCM. Those jobs are:

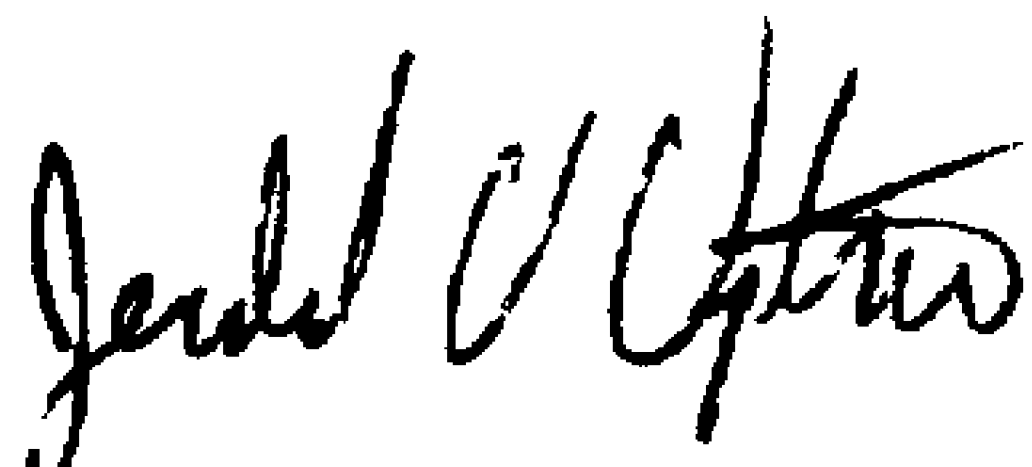
1. Lead Warehouse Worker
2. Lab Lead Technician
3. Lab Technician
4. Receiving Lead
5. Storekeeper
6. Compound Shift Supervisor
7. Compound Operations Supervisor
8. Compound Operations Superintendent
9. Chief Plant Chemist
10. Development Technician
11. Draftsman
12. Manufacturing Chemist

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Yearly Sampling

<u>Year</u>	<u>Total Number Samples</u>	<u>Number Samples > PEL (1 ppm)</u>
1983	20	0
Jan. - Sept., 1984	20	0
Fiscal 1985	18	0
Fiscal 1986	15	0
Fiscal 1987	20	0

I hope this provides you with the information you need. If not, please do not hesitate to call me.



Jerald V. Uptain
Safety Supervisor

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enclosures

cc: KLF

TABLE I

SUMMARY OF VCM PERSONNEL DOSIMETRY RESULTSMARCH 1, 1977 - AUGUST 31, 1977

<u>Current Sampling Frequency</u>	<u>Workforce Group</u>	<u>No. Samples</u>	<u>Mean (PPM,VCM)</u>	<u>STD Deviation (PPM,VCM)</u>	<u>2-Sigma Upper Control Limit (PPM,VCM)</u>
<u>I. YEARLY</u>					
	1. Maint. Elect.	5	0.14	0.08	0.29
	2. Maint. Machinists	0	-	-	-
	3. Maint. Painter/Carpenters	1	0.05	-	-
	4. Maint. General Helpers	1	0.06	-	-
	5. Laboratory Supervisors	2	0.18	0.13	0.44
	6. Vinyl Dryer Lead Operators	3	0.11	0.03	0.17
	7. Compound Supervisors	5	0.27	0.32	0.91
	8. Compound, Dry Blend Workers	1	-.13	-	-
<u>II. QUARTERLY</u>					
	1.* Transportation Warehouse Workers	5	0.09	0.07	0.24
	2. Warehouse Workers	2	0.15	0.21	0.56
	3. Maint. Instrument Technicians	2	0.11	0.04	0.18
	4. Maint. Building Attendants	1	0.03	-	-
	5. Safety Personnel	3	0.16	0.06	0.27
	6. Mechanical Engineers	4	0.12	0.09	0.29
	7. Storekeepers & Stores Supervisor	5	0.26	0.85	1.95
	8. Reactor Lead Operators	5	0.14	0.11	0.36
	9. Vinyl Dryer Supervisors	7	0.26	0.16	0.57
	10. Vinyl Dryer Operators & Utilities	7	0.36	0.37	1.11
	11. Maint. Utility Technicians	2	0.13	0.08	0.28
	12. Laboratory Technicians	6	0.20	0.14	0.47
<u>III. MONTHLY</u>					
	1. Yard Supervisor	2	0.52	0.15	0.81
	2. Maint. Supervisors	12	0.14	0.20	0.53
	3. Maint. "A" Mechanics	12	0.19	0.22	0.62
	4. Maint. "B" Mechanics	2	1.09	1.15	3.38
	5. Maint. Helpers	1	0.18	-	-
	6.* Process Engineers	9	0.09	0.09	0.27
	7. Yard Operators	11	0.13	0.07	0.26
	8. Reactor Supervisors	13	0.51	0.93	2.38
	9. Reactor "A" Operators	12	0.22	0.22	0.66

TABLE I
SUMMARY OF VCM DOSIMETRY RESULTS
MARCH 1, 1978 - MAY 31, 1978

<u>Workforce Group</u>	<u>No. Samples</u>	<u>Mean (PPM,VCM)</u>	<u>Std. Deviation (PPM,VCM)</u>	<u>2-Sigma Upper Control Unit (PPM,VCM)</u>
<u>I. Annual Schedule</u>				
1. Compound Supervisors	6	0.23	0.07	0.26
2. Dry Blend Operators	5	0.12	0.002	0.04
3. Compound Operators	4	0.10	0.00	0.10
4. Trans. Warehouse Workers	3	0.10	0.00	0.10
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<u>II. Quarterly Schedule</u>				
1. Storeroom Supervisor	2	0.15	0.05	0.25
2. Lab Lead Techs	4	0.10	0.00	0.10
3. Lab "A" Techs	9	0.11	0.57	0.23
4. Warehouse Workers	4	0.15	0.09	0.32
5. Storekeepers	3	0.10	0.00	0.10
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<u>III. Monthly Schedule</u>				
1. Maint. Bldg. Attendants	2	0.05	0.05	0.15
2. Maint. Util. Techs	11	0.33	0.47	1.28
3. Maint. Instr. Techs	13	0.12	0.08	0.29
4. Maint. Painters & Machinist	9	0.14	0.13	0.39
5. Maint. Electricians	10	0.09	0.03	0.15
6. Maint. Supervisors	24	0.77	2.90	6.58
7. Maint. "A" Mechanics	54	0.87	5.38	11.62
8. Maint. "B" Mechanics	8	0.19	0.27	0.73
9. Maint. Helpers	7	0.09	0.04	0.16
10. Yard Operators	13	1.69	3.26	8.20
11. Yard Supervisor	4	0.08	0.04	0.16
12. Vinyl Shift Supervisors	16	0.17	0.12	0.41
13. Vinyl LR Lead Oper.	12	0.29	0.44	1.17
14. Vinyl LR Operators	23	1.77	3.69	9.14
15. Vinyl Dryer Lead Oper.	8	0.49	1.55	1.59
16. Vinyl Dryer Util., Oper., Helpers	38	0.23	0.35	0.94
17. Process Engineers	15	0.11	0.03	0.18
18. Safety	11	0.16	0.14	0.43
19. Mechanical Engineers	22	0.12	0.10	0.31
20. Plant Mgr, Supt.	6	0.35	0.36	1.06
21. Dev. Lab. Techs.	5	0.17	0.12	0.40
22. Lab Supervisors	10	0.10	0.00	0.10
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TABLE I
ANALYSIS OF 1979 VCM DOSIMETRY

<u>JOB CLASSIFICATION</u>	<u>S</u>	<u>$\bar{X}$</u>	<u>σ</u>	<u>K</u>	<u>0</u>
1. Vinyl Oper. Superintendent, Supervisor, Relief Supervisor, Operations Engineer	19	.20	.21	11	
2. Vinyl Shift Supervisor	20	.30	.21	10	
3. Chief Leads	20	1.40	3.09	10	20
4. Vinyl Lead Operators	45	.50	1.69	9	4
5. Vinyl Utilities	12	.23	.29		8
6. Yard Supervisor, Operators	27	1.63	6.18	4	7
7. Vinyl Operators	68	.73	1.21	7	19
8. Maintenance Supervisors	25	.31	.50	4	8
9. All Maint. Mechanics, Helpers, Painters, Utility Techs.	45	.40	.89	10	6
10. Process & Mechanical Engineers	7	.07	.12		
11. Safety	3	.03	.06		
12. E & I Supervisor & Workers	11	.14	.11		
13. Compound Superintendent & Supervisors	7	.10	.22	14	
14. Storeroom Supervisor & Workers	7	.03	.05		
15. Lab Supervisors & Workers	15	.13	.24		

S = No. samples. NOTE: In most cases, for last 6 months of year - in others for entire year if needed to increase sample size.

$\bar{X}$ = Average (ppm) sample result.

σ = Standard deviation (ppm)

K = No. of results greater than the "Action Level" (0.5 ppm) but less than or equal to the permissible exposure limit (1.0 ppm) - per 100 samples of the job classification(s).

0 = No. of results greater than 1.0 ppm - per 100 samples of the job classification.

TABLE I

SUMMARY OF 1981 VCM DOSIMETRY RESULTS*

<u>Job Categories</u>	<u>No. Samples</u>	<u>$\bar{x}$ Average (ppm)</u>	<u>S Standard Deviation (ppm)</u>	<u>% > 1 ppm</u>	<u>Upper Confidence Limit ($\bar{x} + 2*S$)</u>
Reactor Operator	87	3.5	17.0	24	37.5
General Mechanic	284	3.7	5.6	5	15.0
Chief Operator	47	1.5	2.8	26	7.2
Vinyl Operations Engineer	9	0.4	0.9	11	2.1
Vinyl Shift Supervisor	54	0.4	0.9	9	2.1
Lead Operator	92	0.2	0.9	2	2.0
Yard Supervisor	8	0.4	0.7	13	1.8
Maintenance Helper	37	0.4	0.7	3	1.7
Instrument Tech.	6	0.4	0.6	17	1.6
Vinyl Operations Supervisor	2	0.6	0.5	0	1.5
Dryer Operator	88	0.2	0.4	1	1.0
Utility Technician	44	0.2	0.4	0	1.0
Painter-Carpenter-Insulator	11	0.3	0.3	0	0.9
Maintenance Supervisor	32	0.2	0.2	3	0.6
Safety Supervisor	1	0.6	0	0	0.6
Yard Operator	49	0.2	0.2	0	0.5
Lead Warehouse Worker	2	0.2	0.1	0	0.5
Dryer Utility	45	0.2	0.1	0	0.4
Lab Technician	12	0.1	0.1	0	0.3
Lab Lead Technician	3	0.2	0.1	0	0.3
Mechanical Superintendent	10	0.1	0.1	0	0.3
Process Engineer	12	0.1	0.1	0	0.2
Safety Director	1	0.2	0	0	0.2
Receiving Lead	1	0.2	0	0	0.2
Maintenance Superintendent (Mech.)	11	0.1	0.03	0	0.2
Storekeeper	3	0.1	0	0	0.1
Contract Supervisor	1	0.1	0	0	0.1
Vinyl Operations Supt.	1	0.1	0	0	0.1
Lab Supervisor	6	0.1	0	0	0.1

TABLE I (Continued)

SUMMARY OF 1981 VCM DOSIMETRY RESULTS*

<u>Job Categories</u>	<u>No. Samples</u>	<u>$\bar{x}$ Average (ppm)</u>	<u>S Standard Deviation (ppm)</u>	<u>% > 1 ppm</u>	<u>Upper Confidence Limit ($\bar{x} + 2*S$)</u>
Electrician	3	0.1	0	0	0.1
Compound Operations Supervisor	1	0.1	0	0	0.1
Compound Operations Supt.	1	0.1	0	0	0.1
Plant Chemist	1	0.1	0	0	0.1
* Dev. Technician	4	0.1	0	0	0.1
Maint. Supt. (I & E)	1	0.1	0	0	0.1
Plant Supt.	1	0.1	0	0	0.1
Mechanical Engineer	7	0.1	0	0	0.1
Draftsman	4	0.1	0	0	0.1
Plant Manager	1	0.1	0	0	0.1
Compound Shift Supervisor	5	0.1	0	0	0.1
Safety Inspector	1	0.1	0	0	0.1

* Note: All dosimeters measure concentration without regard to the use of respirators.

TABLE VI

SUMMARY OF 1980 VCM DOSIMETRY RESULTS

<u>Job Categories</u>	<u>No. Samples</u>	<u>$\bar{x}$ Average (PPM)</u>	<u>S Standard Deviation (PPM)</u>	<u>% 1 PPM</u>	<u>Upper Confidence Limit ($\bar{x} + 2 \times S$)</u>
Vinyl Operator	131	2.7	3.6	5	9.9
Mechanical Helper	9	2.3	6.4	11	15.1
Vinyl Shift Supervisor	54	0.4	1.0	4	2.4
Vinyl Utility	50	0.4	0.9	4	2.2
Vinyl Chief Lead	47	0.4	0.7	6	1.8
Yard Operator	54	0.3	1.1	6	2.5
Maintenance Supervisor	34	0.3	0.7	6	1.7
Maintenance Superintendent (I&E)	3	0.3	0.5	0	1.3
"A" Mechanics	276	0.3	2.0	4	4.3
"B" Mechanics	19	0.2	0.4	5	1.0
Yard Supervisor	10	0.2	0.3	0	0.8
Utility Tech.	28	0.1	0.2	0	0.5
Vinyl Operations Engineer	11	0.1	0.2	0	0.5
Vinyl Lead Operator	88	0.1	0.2	0	0.5
Casual Laborer	8	0.1	0.2	0	0.5
Process and Mechanical Engineer	2	0.1	0.1	0	0.3
Laboratory Lead Tech.	5	0.1	0.1	0	0.3
Painter/Insulator/Carpenter	9	0.1	0.1	0	0.3
Instrumentmen & Electricians	18	0.1	0.1	0	0.3
Maintenance Planner	4	0.1	0.1	0	0.3
Lab "A" Tech.	11	0.1	0.1	0	0.3
Storekeeper	3	0.1	0	0	0.1
Compound Shift Supervisor	3	0	0.1	0	0.2
Vinyl Operations Supervisor	6	0	0.1	0	0.2
Mechanical Supt.	6	0	0.1	0	0.2
Lab Shift Supervisor	4	0	0.1	0	0.2
Maintenance Supt. (Mech.)	13	0	0.1	0	0.2
Safety Director, Supv., Inspector	5	0	0.1	0	0.2
Vinyl Operations Supt.	2	0	0	0	0
Compound Operations Supv., Supt.	2	0	0	0	0
Receiving Lead	1	0	-	0	0
Stores Supv.	1	0	-	0	0
Quality Control Supv.	1	0	-	0	0

ROUTINE DOSIMETRY SAMPLING FREQUENCY PLAN

I. VCM

A. Monthly Samples - One monthly sample of each employee exposure in each of the following job groups:

1. Vinyl Shift Supervisor
2. Chief Operator
3. Lead Operator
4. Reactor Operator
5. Dryer Operator
6. Dryer Utility
7. General Helper
8. Yard Operator
9. Yard Supervisor
10. Vinyl Operations Engineer
11. Vinyl Operations Supervisor
12. Vinyl Operations Superintendent
13. Mechanical Superintendent
14. Maintenance Superintendent (Mech.)
15. Maintenance Supervisor (I&E)
16. Maintenance Area Supervisor
17. Utilities Supervisor
18. Maintenance Planner
19. General Mechanic
20. Electrician
21. Instrument Technician
22. Painter-Insulator-Carpenter
23. Utility Technician
24. Maintenance Helper

B. Yearly Samples - One yearly sample from each of the following job groups:

1. Lead Warehouse Worker
2. Lab Lead Technician
3. Lab Technician
4. Receiving Lead
5. Storekeeper
6. Contract Supervisor
7. Safety Director
8. Safety Supervisor
9. Safety Inspector
10. Process Engineer
11. Lab Shift Supervisor*
12. Compound Shift Supervisor
13. Compound Operations Supervisor
14. Compound Operations Superintendent
15. Chief Plant Chemist
16. Development Technician
17. Plant Superintendent
18. Mechanical Engineer
19. Draftsman
20. Plant Manager
21. Manufacturing Chemist

* JOB ELIMINATED

VAB.0001052880