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Interoffice Communication

To D. A. Kuhn

From P. L. Fetzer

Date February 3, 1978

Subject Dockmen VCM Exposure Summary

This report summarizes the VCM exposure during 1977 to the refinery employees working at the VCM ship loading facility. It should be emphasized that the refinery employees wear fresh air protection during each job operation and whenever the operator works the VCM loading dock.

It has been the practice of the VCM plant to monitor each VCM ship loading as thoroughly as possible in order to pin-point problem areas. The normal testing conducted includes the following; hose connection, hose unblinding, hydroquinone addition, cargo sampling, vent recovery and dock shack work areas, hose disconnect and reblinding operations. In addition, 8-hour monitoring is to be conducted which overlaps many of the individually monitored loading operations.

The Ship Loading Summary Report for 1977 is attached which summarizes by ship name and loading dates, the VCM exposure for each operation tested during the loading operation. This information was separated by job operations, tabulated by various VCM exposure levels for complilation in table I.

The work time associated with the loading hose operations ranges between ten and 50 minutes. The fifteen minute VCM exposure limit (5 ppm) was selected as the most applicable criteria to determine if over exposure had occurred. If the exposure had exceeded the 5 ppm VCM value for the duration of these hose operation tests, the individual would have exceeded the exposure limit for a given 15 minute interval.

The work time associated with the hydroquinone addition requires from one to three hours to complete the operation, hence the 8-hour exposure limit (1 ppm) was selected to determine over exposure. Likewise the work conducted in the vent recovery and dock shack areas are of long durations (4 to 8 hours) and the 1 ppm limit was also used in these classifications.

The over exposures are summarized in table II. The data indicates that over exposure occurs between 20 and 50 percent of the time on all job functions. The exposure for the longer duration test indicate that between 10 and 38 percent exceed the 1 ppm 8-hour limit.

The data shown in table I but taken from another source was evaluated on a time-weighted average (TWA) basis. The same criteria used in evaluating the data in table I will be applied to that information found in the 1977

Personnel VCM Exposure Data Log. The resulting data has been summarized in table III and shows the dockmen exposure at several VCM levels and time breakdowns. The over exposure distribution for the TWA data is shown in table IV. The total number of testing of less than one hour (146) agrees quite well to the total number of loading hoses operation testings (142) and the over exposures values also agree quite closely, 45 and 46 ppm respectively. It should be pointed out that the totals in table I and table III differ by four. This difference is due in part to different people being responsible for the two source documents.

It is of concern that the rate of over exposure/violations is so high. It is apparent that the major portion of all violations involve hose operations i.e., unblinding or blinding lines, and connecting or disconnecting loading hoses. It could quickly be assumed that the work practices are inadequate; however, an examination of the attached Ship Loading Summary Report reveals a large difference exists in the actual VCM exposure for the same job operation. This data indicates that it should be possible to reduce the vinyl concentration to the lower exposure levels for each operation.

The work practices used in all loading operations were desinged to minimize the VCM exposure. Based on the data, one can assume that the procedures were followed when the exposure levels are low and conversly not followed when the exposure levels are high. Other possibilities as to the cause of high exposure certainly exist, i.e., bad or leaking valves aboard ship. These causes would be pointed out by repeated high values for the same ship throughout the year. This does not appear to be the case as indicated by the data in table V and further demonstrated by a close examination of the attached Ship Loading Summary Report.

Examination of the data in table IV (the ships selected represents the ones most frequently loaded) indicates a significant spread in the VCM exposure level for each operation for each ship listed. To me, this further indicates that work practices are not followed to the same extent each time. During August and part of September, several changes were made at the VCM loading dock which should have reduced the VCM exposure to the dock employees as these were a source of vinyl emission. However, little change was noted in vinyl exposure results as indicated in the Ship Loading Summary Report.

One area of dosimeter testing where a serious problem exists is with the eight-hour personnel testing. Considering the size of the progression unit of the refinery personnel working at the dock; the frequency and duration of the ship loadings, the total number of 8-hour personnel dosimeter testing should number about 70. The total number of 8-hour or for that matter above four hours only totaled 33, approximately one-half of the expected number. This indicates that there were employees working with the vinyl loadings who were not monitored quarterly and may not have had any 8-hour testings conducted.

I do not feel that it is our responsibility to police the refinery personnel to insure they are complying with the statuates of the OSHA VCM Exposure Standard. We do however, inform the dockmen at each VCM loading as to what

dockmen has worn an 8-hour monitor during a given month. This information is listed on a sheet which also requests the specific job function testings to complete for the loading. This information is taken to the dock when the shift supervisor inspects the ship prior to its loading.

I trust the data presented concerning the dockmen VCM exposure will provide you with the necessary information to discuss with your counterpart in Refining. I am at your service if I may be of further help.

PL Fetzer

P. L. Fetzer

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cc:
JAD-WVH-GLF-HTM-RDG

TABLE I
DOCKMEN VCM EXPOSURE
JOB FUNCTION TESTING DISTRIBUTION (A)

Job Function Testing	PPM VCM	NUMBER TESTED 0 - 1	1 - 5	5 - 15	over 15	Total
Hose Operation:(B)						
Connection		15	15	3*	4*	37
Unblinding		10	19	4*	6*	39
Blinding		10	9	5*	14*	38
Disconnect		6	12	6*	4*	28
Hydroquinone:(C)						
Addition		13	6*	1*	1*	21
Vent Recovery Area (C)		4	0	0	0	4
Dock Shack Area (C) and other 8-hr Tests		28	3*	0	0	31
		86	64	19	29	198

(*) Information taken from 1977 ship loading dosimeter data report
These operations normally require less than 1 hour - Assume 15 minute limit of 5 ppm
(C) These operations normally require 1 to 8 hours - assume 8 hour limit of 1 ppm

* Over exposure

TABLE II
DOCKMEN VCM EXPOSURE
JOB FUNCTION TESTING
VCM OVEREXPOSURE DISTRIBUTION(A)

Job Function	No. Below Limit	No. Over Exposure Limit	No. Tested	% Over The Exposure Limit
Hose Operations:				
Connection	30	7	37	18.92
Unblinding	29	10	39	25.64
Blinding	19	19	38	50.00
Disconnect	18	10	28	35.71
Hydroquinone Addition:	13	8	21	38.10
Vent Recovery Area:	4	0	4	0
Dock Shack Area and other 8-hr tests	28	3	31	9.68
	141	57	198	

(A) Data from table I

TABLE III
DOCKMEN VCM EXPOSURE
TIME-CONCENTRATION DISTRIBUTION(A)

		NUMBER TESTED					
Time (Hours)	PPM VCM	0-0.5	0.5-1.0	1.0-5.0	5.0-15.0	over 15	Total No. by Time Range
0 - 0.25		16	7	31	*11	*10	75
0.25 - 0.5(B)		10	8	17	* 5	*10	50
0.5 - 1.0(B)		3	4	5	* 3	* 6	21
1.0 - 4.0(C)		8	4	* 9	0	* 2	23
4.0 - 8.0(C)		27	1	* 4	* 1	0	33
		64	24	66	20	28	202
% by Range		31.68	11.88	32.67	9.9	13.86	

(A) Data taken from 1977 Personnel Dosimeter VCM Data Log
(B) Exposure limit in this time frame was assumed to be the same as the 15-minute limit
(C) Exposure limit in this time frame was assumed to be the same as the 8-hour limit

* Exceeded VCM exposure limit

TABLE IV
DOCKMAN VCM EXPOSURE
TIME-OVEREXPOSURE DISTRIBUTION(A)

Time-Hours	PPM Limit	No. Below Limit	No. Over Exposure Limit	Total No. by Time Range	% Over Limit
0 - 0.25	5	54	21	75	28.00
0.25 - 0.5	5	35	15	50	30.00
0.5 - 1.0	5	12	9	21	42.86
1.0 - 4.0	1	12	11	23	47.83
4.0 - 8.0	1	28	5	33	15.15
		141	61	202	30.69

(A) Data is taken from table III

TABLE V
DOCKMEN VCM EXPOSURE
EXPOSURE BY SHIP ON HOSE OPERATION TESTING

Ship Name	Times Loaded	PPM VCM							
		Hose Connect		Remove Blind		Insert Blind		Hose Disconnect	
		High	Low	High	Low	High	Low	High	Low
Coral Isis	3	21.2	3.1	2.1	1.58	6.0	0.12	993	6.0
Epsilon Gas	4	1.83	0.9	32.97	1.35	54.5	1.11	204	0.94
Delta Gas	6	4.24	0.20	4.61	0.28	3.96	0.71	566	2.03
Georgia-Pacific Barge	17	400	.01	150	0.01	118	0.01	205	0.01