

V. C. M. HEALTH

The personnel monitoring program continued during September using the gas bag method of collection. Tabulated below is a summary of VCM monitoring data for August and September.

VCM PERSONNEL MONITORING SUMMARY

Gas Bag Method
(1 - 1-1/2 hours)

<u>Location</u>	<u>August VCM, ppm</u>	<u>September VCM, ppm</u>
Main Offices	1	1
Engineering Offices	1	1
Main Maintenance Shop	1	1
Instrument Shop	1	1
Compound Lab Tech.	1-2	1
Resin Lab. Tech.	1-2	1
Quality Control Supervisor	1-2	1
Compound Operator	1	-
Compound Helper	2	3
Dry Blend Operator	9	25
Dry Blend Helper	3	-
Plasticizer Operator	-	1
Plasticizer Utility	1	-
Warehouseman at "Compress"	36	16
"Compress" Warehouse	4-62	-
Lift Truck Operator	3-18	6-12
Yard Operator	1-13	3
Resin Dryer Operator	11-21	6-12
Resin Dryer Lead Operator	-	3
Resin Dryer Utility	2-11	4-11
Resin Dryer Bagger	11-13	-
V-11 Charge Operator	10-42 (230)	9-18
V-11 Recovery Operator	7-50	6-35
V-11 Reactor Utility	4-102	5-12
V-11 Maintenance Mechanic	1	5
V-12 Charge Operator	1-21	3-5
V-12 Recovery Operator	1-7	6-7
V-12 Lead Operator	-	5
V-12 Reactor Utility	1-22	4-22
V-12 Maintenance Mechanic	1-12	3
Large Reactor Lead Operator	1-7	1-11
Large Reactor Operator	2-11	-
Resin Area Maintenance Shop	1-3	3

Data from compound and compound dry blend have shown an increase in VCM concentration during September. To reduce exposure in these areas resin used for compound and compound dry blend is being aged as much as possible before being fed to the blenders. In addition wall fans are to be installed at the dry blend blender-coolers to improve air flow in this area. Further study is planned.

The VCM levels in the work area of the large reactor lead operator have

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increased slightly during September. Extension of the V-11 slurry blend tank exhaust stack and relocation of the control room pressurization intake duct will reduce the exposure in this area. These modifications should complete in October.

The M.E.D. analyzer was assigned to monitor in the V-11 Building area in September. It shall remain in this area for some time.

VCM health meetings are continuing on a weekly basis to update the status and priority of the VCM health related projects. The following is a summary of the VCM health program projects.

- A. In the reactor area, the number one priority project is steam stripping the reactor slurry. The advantages of steam stripping are reduced VCM exhaust from slurry blend tanks, reduced VCM emissions from the dryer exhaust to the atmosphere, reduced residual VCM in the finished resin product and increase recovery of unreacted monomer which improves efficiency. Production from two lines have been steam stripped since the first of September. The remaining six lines were completed October 5.
- B. In the small reactor buildings, hoods are being fabricated and will be installed around the recovery area to reduce operator exposure and exhaust any VCM resulting from compressor seal leaks. V-12 Building has been completed and V-11 Building will be completed by October 15.
- C. In the small reactor buildings, pressurized control rooms will be constructed and the charge instruments will be relocated in them. This will reduce the time weighted average exposure and improve operating safety. This project will be completed in various stages from October 1 thru December 15.
- D. In the small reactor areas, a new reactor cleaning system will be installed in V-11 and modifications on the present V-12 B.F. Goodrich HRC unit is in progress. The improved cleaning system will reduce the number of reactor entries and therefore reduce operator exposure to VCM. Improved cleaning also will improve product quality. This project will be completed in stages from September 20 thru November 15.
- E. In the large reactor area, revisions will be made to improve the dump system. These revisions will consist of fabricating an exhaust system and improving the present method of collecting skins from the Sweco. This project will be completed by October 18.
- F. In the large reactor area, the fresh air system for the control room will be relocated and the intake duct extended to a height of 50 feet. In the past, high VCM levels have been detected by the OVA meter in the control room. This is a potential source of operator exposure. This project has been completed.
- G. In the large reactor area a program is currently underway to reduce the residual VCM in the finished resin by tail peaking the reaction to 170° and holding at this temperature during recovery. This program has begun. Results will be reported in October.

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H. The following are smaller items related to VCM exposure in the reactor area and their completion dates:

1. Drain the reactor cleaning water outside V-11 and V-12. This project has been completed.
2. Install full port suction valves to improve V-11 dumping system. Three of the four lines have been completed and are being evaluated. The fourth line will be completed October 15.
3. Install recovery line to receivers in V-11 and V-12 to prevent venting. This project has been completed.
4. Continuous survey of the tops and bottom dump valves of each reactor to detect leaks. This project has been completed.
5. Plug all valves and flanges on the recovery knockout tanks. This project has been completed.
6. Install a water flush on the recovery knockout tank site glasses. The project has been completed.
7. Replace present manheads on V-11 reactors with Lenape manheads. 14 out of 20 manheads have been installed at present. The other 6 manheads will be installed by October 18.
8. Evacuate the reactors to 28" after dumping. Further investigation of this method and alternate methods will be conducted during October. Completion date October 23.
9. Monitor final recovery vacuum with a monometer. Continuing project.
10. Install a Honeywell instrument for continuous VCM monitoring. Material has been ordered. The project completion date will be January 1975.
11. Repair leaks on all compressors. Additional information has been transmitted to MED for their study. A plan of action will be formulated during October.
12. Pipe V-11, V-12 and D-300/400 VCM filter to the blowdown tanks for recovery. Project has been completed.
13. Pipe VCM return line at V-11 from V-12 to the blowdown tank to prevent venting. Piping has been completed. The tie ins will be made when the D-500/600 shutdown is scheduled.
14. Install lock nuts on reactor seals to prevent them from loosening during the reaction. This project has been completed.
15. Extend the V-11 slurry blend tank exhaust duct to a height of 20 feet. This will disperse the VCM higher in the air and away from the vinyl area control rooms and the V-11 dryer building. This project will be completed October 11.

16. Revise and refurbish the VCM unloading equipment. A work list will be evaluated in early November.

In the dryer area, several projects are underway to determine the level of residual vinyl in the final product and to reduce VCM exposure in the drying area.

- A. A program was initiated during August to evaluate the residual VCM in the finished resin shipped to customers in bulk. The goal for residual VCM in the PVC resin sold to customers from the Aberdeen Plant is 100 ppm or less. Tests to determine residual VCM versus silo storage time on 5406, 5385, and 5446 were conducted in August. The results show that with a silo retention time of 3 days, the residual VCM in 5385 and 5446 is reduced to 270 ppm and 155 ppm, respectively. After 2 days silo retention time, the residual VCM in 5406 resin dropped from 1360 ppm to 465 ppm. Evaluation of a mixture of steam stripped and non-steam stripped 5446 during September showed a drop from 380 ppm in the initial dryer product to 20 ppm in the finished product after 4 hours of silo retention time. An evaluation of tail peaked (170°F) 5385 resin showed a drop from 530 ppm in the initial dryer product to 230 ppm in the finished product after 4 hours of silo retention time. Testing of (1) 100% steam stripped, (2) further testing of tail peaked and (3) possibly post heated resins will be conducted during October.
- B. A program was set up during August to evaluate the amount of residual VCM in the finished bagged resin versus warehouse storage time. During September the VCM residual weathering tests were conducted on 1250 pounds of bagged standard produced 5446 and 1250 pounds of bagged tail peaked (157°F) 5385. Two storage shelters were constructed for this study. The shelter used to house the 5385 resin was completely enclosed and readings with the Century OVA unit were taken at 24 hr. intervals. After each reading the air inside the shelter was purged to the surrounding atmosphere and the reading brought back to background. The shelter used to house the standard 5446 resin was ventilated to the surrounding atmosphere by four one foot square holes cut one in each side of the shelter. Century OVA meter readings were taken at 24 hr. intervals.

The initial VCM content of the 5385 was 328 ppm. After 145 hours the 5385 resin had reached the background reading of 15 ppm on the OVA meter and a residual VCM content of 48 ppm. The initial VCM content of the 5446 was 810 ppm. After 138 hours the 5446 resin reached the background reading of 18 ppm on the OVA meter and a residual VCM content of 24 ppm. The test data shown that the largest amount of weathering occurs the first 24 hours after bagging. Ventilation of the warehouse should be based on the amount of less than 24 hours old product stored.

A warehouse which is 20% full of less than 24 hour old product with an initial residual VCM content of 328 ppm and ventilation of one air exchange every 24 hours will have an atmosphere of 750 ppm VCM. At our present warehouse ventilation rate the 5446 resin with the initial residual VCM content of 810 ppm was reduced to an atmosphere reading of 100 ppm the first 24 hours. In order to better define the VCM content in the warehouse, OVA meter readings will be taken at various locations throughout the warehouse once per day.

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Weathering tests were conducted on 1250 pounds of steam stripped 5446 setting unsheltered in the warehouse. The initial reading was 62 ppm. This dropped to 10 ppm after 48 hours. Further testing of bagged resin that has been tail peaked (170°F) and possibly post heated resin will be conducted during October.

- C. Century OVA readings were taken throughout the V-11 dryer building during August to pin point areas of high VCM emission. The overall V-11 dryer building average was 8 ppm. Three problem areas were identified. They are (1) readings of 10-100 ppm at the rotex overflow, (2) 30 ppm at rotexes where inspection covers had been removed, and (3) 15-50 ppm around the bird centrifuge effluent drains. A proposal for handling rotex overflow via closed system has been submitted and a trial unit for handling the fine resin overflow will be installed on No. 8 dryer during October. The coarse resin overflow handling system has been put on hold pending further evaluation of the exposure readings on steam stripped resin. This evaluation will be conducted during October. Closer operator attention and closer supervision has solved the rotex inspection cover problem. Installation of the Bird centrifuge effluent drain covers October 11 will solve exposure problems in the drain area.
- D. Smaller items related to VCM exposure and the reduction of particulates in the atmosphere are listed below:
1. Install a remote system to monitor the level in all resin silos. System is in operation at present and will be evaluated during October.
 2. Use an air mask when opening the rotexes and switching transfer lines. This project has been completed.
 3. Install dust collectors on the resin baggers. This project has been completed.
 4. Purge resin transfer lines with air before opening. A trial installation on No. 7 dryer was evaluated during September and performed successfully. Work orders have been issued to install purge lines on the remaining dryers. This project will be completed during October.

In the compound and dry blend areas of the plant the following programs are in progress:

- A. The MED analyzer was used to sample the blender ventilation hood system on the Line I. VCM exposure readings higher than expected have been experienced at the corners of the hoods during the charge and immediately thereafter. Damper adjustments have been made in an attempt to reduce the exposure, but at present, no satisfactory adjustment has been found. Study of this system will continue and recommendations for the needed corrections will be made during October.
- B. Ventilation hoods for the Welex mixers, the scrap unit, and the Line III blenders have been designed. The dry blend Welex mixer vents will be completed October 18.

Other projects underway are the following:

- A. Repair of all rail cars with leaking valves and gaskets as they are returned from the plant. A regular inspection procedure has been set up.**
- B. Ventilation improvements in both warehouse buildings and the "compress" warehouse are under consideration. Further data from the residual VCM studies will be gathered during October.**
- C. Continued education of employees on the hazards of VCM and the importance of following procedures. Meetings were held during August with all salaried employees and 1/2 of the hourly employees. The rest of the hourly employees met during September. During October meetings will be held with all plant personnel to discuss the OSHA standard that will go into effect January 1975.**
- D. Monitoring the VCM exposure in the laboratory while testing resin, disposing of tested resin, and while evaporating VCM under the fume hood to test for peroxides. This project has been completed.**