Firestone

INTEROFFICE

DATE November 4, 1974

TO DR. R. S. BROOKMAN

FROM R. A. PARK

REFERRING TO LETTER OF

SUBJECT

"VCM - THE PROCESSOR'S PERSPECTIVE"
SPE RETEC

RECEIVED
NOV 8 1974
F. F. HOY

October 31, 1974 and November 1, 1974 I attended subject conference in New York City. As preparation for this meeting, I collected questions to be asked government representatives from the chemical plants in Pottstown, Perryville, your ORC Meeting letter dated 10/21/74, plus my own questions raised during my examination f the standard. Unfortunately, the large attendance at this RETEC (over 960, unofficial count from RETEC Chairman) prevented me from directing these questions to appropriate speakers. The RETEC Chairman promised to submit them in writing to the speakers and have their answers printed in the "Post Print" book, which will be mailed out at a later date to those attending the RETEC.

A copy of the original program is attached (Attachment A). We were told that the program was changed as per Attachment B due to the "press of business" preventing the OSHA representatives from attending. As a substitute, a conference call was set up between the OSHA office and the RETEC meeting hall with both conversations being carried on the PA system. Attachment C cites the exhibitors who displayed equipment. Note that only two companies are cited as supplying "respiratory equipment", i.e., 3M and MSA. MSA was the only company displaying masks. I collected literature from exhibitors which furnished product data. These brochures are available for perusal.

Using the program as an outline, I will cite what I felt were the highlights of this meeting.

I. Keynote address by Richard Fleming (V.P. Chemicals Group, Air Products & Chemicals, Inc.) - "What is the Vinyl Chloride Monomer (VCM) Problem?"

Mr. Fleming's talk was a review, familiar to us all, with respect to the history of the VCM problem. He quoted the FDS report as recommending:

1. No detectable VCM level as impracticable.
2. Ten to fifteen (10-15) ppm lower limit for polymer industry.
3. Area monitoring.
4. Phased requirements to lower levels.

He then stated that OSHA even ignored FDS with their final standard. This new standard has the following discrepancies with respect to respiratory equipment:

1. NIOSH has granted approval only for the "over 3600 ppm" apparatus.
2. NIOSH has not approved cannister masks.
3. NIOSH has not approved portable bottle masks.
4. At least six months will be required by mask suppliers to go into production after approval is given.
5. Not everyone can wear a mask.

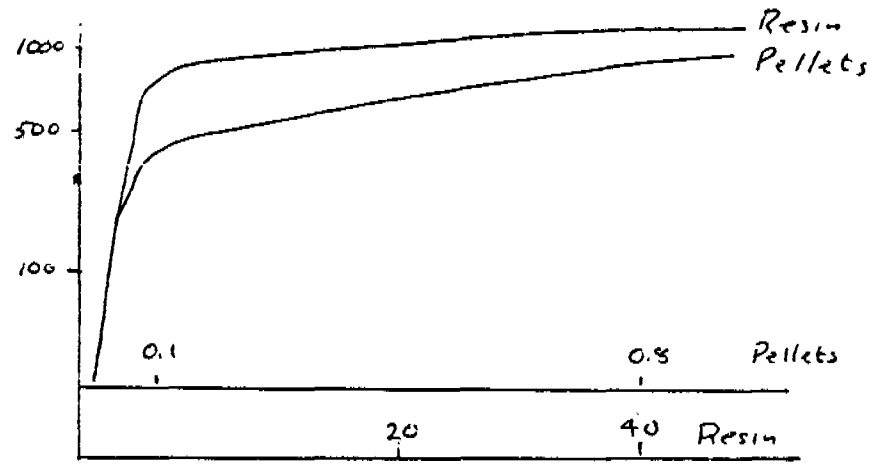
Dr. Fleming stated that OSHA can give waivers, if they want to!

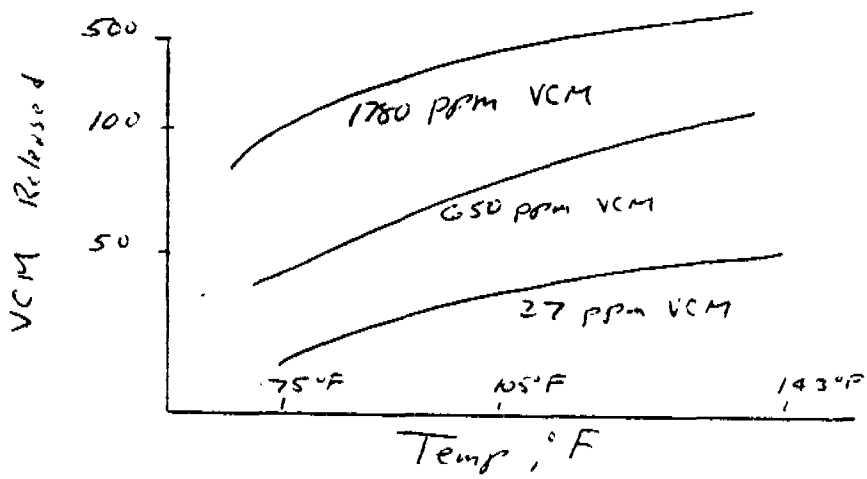
II. Dr. Paul Lobo (Tenneco) - "VCM & PVC Resin Manufacture"

Dr. Lobo cited various techniques for VCM and PVC production. He stated odor detectable levl for VCM was 1200-2000 ppm. Low molecular weight resins have about 200 ppm. Pilot Plant work at Tenneco was able to achieve no detectable levels, but production capacity and product quality suffered, thus cost would go up. He closed with the statement that "PVC manufacturers will reduce VCM levels to the no detectable levels, thus save the fabricators from the VCM problem".

III. Frederick Sacks (Diamond Shamrock) - "VCM From Resin Shipment Through Fabrication"

Mr. Sacks related lab studies with respect to resins and pellets. He said they range in VCM levels from 1 to 1500 ppm. In the lab it takes seventy-two (72) hours storage for an equilibrum level to be reached for resin; over thirty (30) days for pellets. The pellets are ten to twenty times lower in VCM than resin however. He showed curves of these relationships as follows:





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As maximum figures he cited 73 ppm VCM in pellet box; 9 ppm in warehouse.

IV. Gerald L. McCowin (FDA) - "VCM - The FDA Viewpoint"

Mr. McCowin related that VCM must become a food additive before FDA can become involved. He cited the 20 ppm VCM recently found in liquor from PVC bottles. Although VCM is a known carcinogen from inhalation, its behavior when ingested is unknown. FDA has five courses of action it could follow:

1. Maintain status quo.
2. Place limitations on VCM in articles by end tests.
3. Place limitations on VCM in food contact alone.
4. Place limitations on VCM that can be extracted into food.
5. Ban PVC.

Courses #1 and #5 have been rejected. Numbers 2, 3, and 4 are still being reconsidered. Date and form of proposal are currently unknown. An interim regulation is being proposed. Animal feeding studies will be required. Drug and cosmetic area will also be affected.

Twenty (20) pp billion accuracy can be obtained in VCM measurements.

Since water is food, potable water pipe may be involved. He stated that thin coatings were not of concern. Water pipe being much thicker could pres nt more VCM contact. Low temperatures and short contact time are factors in favor of a higher VC level.

V. Glen E. Schweitzer (Director, Office of Toxic Substances, EPA) - "VCM - The EPA Viewpoint"

"Health problems will continue to be evident in the next five to fifteen years due to incubation or latent periods... Other problem chemicals will come up." Note: Copies of his paper were available, but only given out to members of the press.

Mr. Schweitzer reviewed the VCM-EPA position. He related how he made a statement that the VC pestiside sprays were of no danger. Five days later the agency did an "about face" because tumors were possible in mice at 50 ppm; VCM remained in the air for a significant period of time; FDA recalled VCM food sprays. He cited some of their problems such as:

May, 1974: VCM monitoring data collected in New Jersey indicated that levels at the plant fence line were one half the level of the site 25 miles distant.

June, 1974: Clean Air Act required action, yet Maltoni data showed 50 ppm VCM caused AGS in 3 rats. These rats, however, lived longer than the controls.

July, 1974: Economic impart surfaced.

He stated that for the 90 seconds he was on CBS VCM shows, eleven CBS personnel were in his office for 2 hours (with cameras, lights, etc.). He did not have a say in how they edited his comments.

With respect to the fabricators, they will have to consider

1. VCM in effluent waste.
2. Breathing dust.

They have data to indicate few people exposed to high levels are equal to many people exposed to low levels. At this time, EPA has no basis to establish a VCM level standard for fabricators. Disposal of PVC products by burning and incineration is being studied.

EPA is establishing VCM standards for VC and PVC plants. It will call for the best available control technology. When controls are in place, 90 pp billion highest levels anticipated for VC and PVC plants. Monitoring data will be obtained by EPA. He reviewed the recent EPA paper issued in September (?).

Medical surveillance outside of the plant may be an industry requirement. More aggressive monitoring outside of the fence line may be required. He complained that industry has not started very low ppm VCM level studies (toxicity) to date. We will also need studies requiring VCM reactivity by products. According to Mr. Schweitzer, VCM levels in resin should be a part of the buyers spec.

In August, 1974, at Pinehurst, N. C. many chemicals were discussed by government agencies. The World Health Organization is discussing flame retardants and plasticizers. A Toxic Substances Act is currently being considered by Congress. "Industry must recognize health risks before government gets involved, i.e., "Head them off at the pass"."

A few questions were asked from the floor.

Question: What is a safe level of VCM?

Answer: We don't know. Any at all is some risk. Risk must be balanced against what we are doing.

Question: OSHA tells us to vent VCM out of the plant. What does EPA say about this?

Answer: I doubt that OSHA recommends this. EPA talks to OSHA frequently about this. (Why do they talk about it if OSHA does not recommend it?)

Question: What is the cost of reducing levels at PVC plants?

Answer: $2,000,000 for 100-200,000,000 lbs./year plant; $80,000,000 for the industry as a whole.

September, 1975 is the target for EPA Standard.

Question: Does EPA intend to regulate air emussion regarding cigarette smoking.

Answer: A special law covers tobacco; therefore, EPA does not become involved.

VI. Dr. R. H. Hill (NIOSH) - "Determination of Vinyl Chloride in Workplace Air"

Dr. Hill explained that NIOSH is a research organization, i.e., it has no enforcement powers. OSHA is a regulating agency and has enforcement powers.

He described work done with solid sorbants (charcoal, silica gel, porous polymers). He recommended charcoal tube type using activated coconut charcoal.

Precision @ 1 ppm was ± 7.54%.
@ 50 ppm was ± 7.45%.

A copy of this test method can be obtained by writing for Test Method P & CA 178, Office of Technical Publications, NIOSH, 1014 Broadway, Cincinnati, Ohio 45202.

VII. OSHA Conference Call

At New York City end of phone was Joe Darby of Monsanto.

At OSHA's end were Dr. Grover Wrenn, Chief of Health Standards Division, Dr. Don Lassiter, Special Assistant for Health, and Ms. Flo Ryer, Industrial Hygienist, Office of Compliance Program.

Dr. Wrenn started by saying that "because of litigation, they won't discuss the rational of the standard or decision making process. The following questions and answers were noted:

Question: What is new from OSHA?

Answer: More medical surveillance data are available. Vinylidene chloride is now a suspect. There are 26 AGS deaths recorded worldwide.

Question: Will educational information be available from OSHA?

Answer: OSHA admits that the standard is a poor instructional tool. They recommend that the SPE get involved in this area. (Implied - No help from OSHA.)

Question: Will data collected in 1974 under TPS be acceptable for regulated area of permanent standard?

Answer: Yes, if methods are accurate enough (sensitivity of 1 ppm).

Question: What advice would you give with respect to a 5+ ppm area where no people are involved with respect to monitoring?

Answer: No people, no problem. If people may be involved, it would be prudent to monitor. Warning signs are mandatory.

Question: Our overseas plants are allowed higher VCM levels. Your comments?

Answer: USA leads the field except for animal experimentation. Through labor attaches in other nations, they will probably follow.

Question: Will processors' monitoring data taken by OSHA be published?

Answer: No. It will not be made public except in summary form.

Question: What technique can be used to calibrate and measure 0.5 ppm as required for "Action Level" in the standard?

Answer: N restriction regarding method is made in the standard. It is left to the empl yer to "do it right".

Question: When charcoal air samples are used, what is the minimum volume of air that must be used for 8 hours?

Answer: Not specified. It depends upon the technique. OSHA will soon publish sampling data sheets for their employees. There is no duty to use NIOSH or OSHA techniques, i.e., it is up to the employer.

Question: Is continuous monitoring sufficient to replace all other monitoring (TWA, ceiling, etc.)?

Answer: Procedure preferred is personal sampling, although other systems are acceptable if it tells the employee exposure. In effect, OSHA is saying (again) it is up to the employer.

Question: Is there a residual VCM level where labelling can be discontinued?

Answer: No.

Question: Regulated Area: Is it based on TWA? What if area above extruder is over 1 ppm?

Answer: Two conditions (both) must be met: (1.) VC or PVC is manufactured, reacted, repackaged, stored, handled, or used, and (2.) VC concentrations are in excess of the PEL.

Question: If VCM level is over 1 ppm in the warehouse, what precautions must be made regarding lift trucks?

Answer: This question should be submitted in writing; they will answer in writing. They won't answer hypothetical questions. The audience in New York City was very unhappy with this response!

Question: In post operations on PVC (thermoforming), is a "Regulated Area" required?

Answer: Same as above. But under further questioning they stated that heat sealing and thermoforming does not come under "mass melting".

Question: How do you determine accidental exposures over 15 minutes limit?

Answer: It is up to the employer to pick an adequate method. NIOSH manual, due to be published next year, might help.

Question: Do medical records of a person changing employers in the industry follow him?

Answer: Yes, the medical records follow if the employee requests.

Question: If the employee goes from a regulated area to an exempt one, does the new employer have to continue medical surveillance?

Answer: A new employer in an exempt industry has no medical record responsibility.

At this point, time ran out. Sixty additional questions will be sent to th OSHA personnel, and hopefully, their answers will appear in the post prints. The OSHA people gave the RETEC audience a very poor opinion of themselves by refusing to give over the phone the address where additional questions could be sent.

It was announced at this time that the SPE is conducting a VCM low level analysis Round Robin. Companies interested should contact Ron Richard through the SPE's Analytical Division.

VII. Dr. F. M. Zado, Dr. J. O. Rosmuson (Western Electric Research Center) - "Monitoring Methods for VCM at Western Electric"

Work regarding monitoring studies were centered around

1. Raw material shipping areas.
2. Raw material storage areas.
3. PVC processing areas.
4. PVC finished products area.

Comments:

Direct outside monitoring by automatic Gas Chromatograph with Flame Ionization Detector (AGC/FID). Reliable; sensitivity meets standard; can be modified to measure other gases.

Remote sampling by trapping; desorption measuring by GC/MS (Mass Spectrophotometer); personnel monitoring easy. People and equipment transportation not necessary. Their unit uses a stainless steel tube with Carbosieve B. VC encapsulation tube gave 1 ppb reading. Very expensive equipment. Good to 1 ppb levels, 100% recovery.

VIII. R. Lancaster (American Can Co.) - "VCM in PVC Resins, Compounds, and Extractants - A Can Makers View"

GC/FID used food simulating extractants. In can coatings, no detectable levels.

IX. P. A. Wilks (Wilks Scientific Corp.) - "Monitoring Ambient VC With Infrared Analysers"

IR analysis is sensitive to 0.2 ppm when using a 20 meter cell.

X. B. A. Denenberg (MDA Scientific Inc.) - "A Continuous Monitor for Vinyl Chloride Monomer, Based Upon An Impregnated Paper Tape"

Mr. Deneberg described a device manufactured by MDA that is sensitive to 0.01 ppm of VCM. It has a running time of 168 hrs. per cassette. It is influenced by TCE and other halogenated compounds.

XI. Otto White (OSHA) - "What Happens During An OSHA Visit"

At the request of OSHA, no mention was made of VCM in the title of the paper given by Mr. White. Note: OSHA has no jurisdiction in industries protected by other agencies, i.e., atomic energy, coal mining, etc. Several emergency standards have been promulgated by OSHA. These include standards regarding asbestos, pesticides, carcinogens, and VCM. Priorities are given to:

1. Imminent danger.
2. Catastrophe (defined as 1 fatality and 5 injuries).
3. Complaints.
4. Target industries (where industry injury rate is twice the national average).
5. Higher risk target industries, i.e., asbestos, lead exposures.

No advance notice is given:

1. Visit by Industrial Hygienist or Compliance Officer.
2. Visitor will meet with top management to relate purpose of visit.
3. OSHA will not tell who made the complaint.
4. Union representative will accompany OSHA visitor on a plant inspection.
5. Visitor will review accident records.
6. Alleged violations will be recorded.
7. Exit interview with employer will be held for the purpose of explaining alleged violations and abatement program.
8. Abatement date will be determined at this time.
9. Notice of violation (and possible penalties) will be stated in writing.
10. Fifteen (15) days are available for appeal of violations to area director.
11. After fifteen (15) days, violation goes before the Review Commission, i. ., the courts.

Mr. White stated that there is no relationship between a call or letter to OSHA for information and an OSHA visit. Questions to OSHA can be addressed to Dr. Daniel P. Boyd, Room 610, 1726 M St. NW, Washington, D. C. 20210.

XII. Paul A. Ketterer (Tenneco Chemicals, Inc.) - "Vinyl Chloride Analysis In PVC Processing Plants"

Based on Mr. Ketterer's work, teflon bags were superior to charcoal tube techniques.

XIII. Mr. David Darwick (ICI) - "VCM - Current European Status"

Mr. Darwick related the following: 3,500,000 tons of PVC/year are produced in Western Europe by 35 polymer producers. Before 1955, 1,000 ppm VCM levels were normal. Now, they are below 50 ppm. Limits now in use are

W. Germany	-	50 ppm maximum plus as low as possible target.
Holland	-	50 ppm maximum.
Italy	-	50 ppm maximum.
Sweden	-	20 ppm, but expected to go to OSHA standard.
Great Britain	-	50 ppm + 25 TWA.
N rway	-	Suspended production until a government committee report is filed.

He doubts if OSHA levels will be used by Europe, except the levels established for processing plants. VCM currently found in Europe will be reduced 25 percent soon.

European studies indicated that hot powders release VC more readily than hot melts. Highest figure found in the United Kingdom was 4 ppm in the processing plant; the average was 2 ppm. The warehouse was in excess of 2 ppm. Dry blend mixers are high VC level areas. A 50 ppb level of VC will be established next year in Sweden.

XIV. R. Voisard (Scott Aviation, Div. of A-T-O, Inc.) - "Respiratory Protection for Vinyl Chloride Monomer"

Mr. Voisard started his talk by saying, "I am not here to sell you respiratory protection equipment, the government has already done this for me". He gave an outline of protective masks, similar to that which I have seen in the literature. Therefore, I will not repeat it here. He did mention that respirators such as listed in 1910.93q (g) (4) (ii) Type C did not exist. He commented that it takes an average of 9 months to get NIOSH's approval for masks; therefore, it is doubtful if additional types will be approved before the new standard goes into effect.

XV. Karl Oelfke (Dow Chemical Co.) - "Respiratory Protective Devices and Protective Clothing Used in VCM Manufacture"

Mr. Oelfke stated that the latest VC plants, even in the north, are open. Tank car gauging and disconnecting hoses were main problem areas. Dow is using air supply respirators. He does not know if any cannister type models have been approved.

XVI. Dr. Maurice Oberg (LFE Environmental Systems) - "Protective Techniques for VCM In Mixing and Extruding Operations"

This paper was the most naive paper I have ever heard. It is doubtful if he attended any of the other papers presented. His simple solution to the problem was to "order resin with low VCM content". If you do have a VCM problem, then ventilate (EPA ?). His slides were illegible. In my opinion, he is FDS material!

XVII. Dr. Mark (Werner-Pfleider Corp.) - "Controlling and Reducing VCM Content In PVC Formulations Through Advanced Compounding Techniques"

"Resins for dry blending purposes are currently supplied in the 20 to several hundred ppm VCM range." If the VCM is removed in the dry blend mixer, it will diminish VC problems in the process plant. He described Werner-Pfleider's air intake-exhaust vent system. Air can be blown in through roto shaft and mixer blades. He showed curves of VCM vapor pressures that indicated that it is more difficult to remove VCM from the hot melt than from the dry blend (Flory-Huggins) vapor pressure considerations).

Heating cycles were increased 10 percent due to the addition of 25 cfm of cold air to the extruder.

XVIII. Dr. Daniel S. Dixler (Keller & Heckman)

Dr. Dixler summarized the meeting as follows:

1. Stay below "action level" and you will get out from under additional controls.

2. Available respiratory equipment is uncomfortable and bulky. Much better equipment is not approved.

3. Fabricators should not have a problem, i.e., if PVC can be manufactured at a cost we can afford.

Miscellaneous:

I asked the Century Systems Corporation personnel if a model 98 can be adapted or converted to a model 118. The answer was no. Model 98 is a log readout type while model 118 is linear.

R. A. PARK

RAP:slp