



INTER-OFFICE CORRESPONDENCE

To: J. D. Hays

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From: R. E. Stack

Location: General Office--20 North

Subject: Vinyl Chloride Safety
Association Meeting

Summarized below are the highlights of the VCSA meeting held recently at Valley Forge, PA.

A. Vinyl Chloride Physiological Effects - R. W. McBurney, M.D.
Diamond Shamrock

VCM is detoxified in the liver by enzymes containing sulfur compounds. The target organs are the linings of small blood vessels (arterials) and not specific sites such as the liver and the lungs. This is why attacks on the fingers (Renauld's Syndrome) and finally the bones (Acroosteolysis) occurs because of degeneration of the blood vessels. VCM can also cause cirrhosis and enlargement of the spleen because of back up pressure from constriction of blocked blood vessels. Medically speaking, VCM is considered a very weak carcinogen i.e., only 1 in 2400 who were exposed to high concentrations for prolonged periods developed cancer. McBurney believes the Dow studies have pretty definitely established the cancer threshold for rats at 35 ppm. VCM is not considered a primary carcinogen such as bis-chloromethyl ether.

B. Medical Surveillance Problems - H. Lloyd, Georgia Pacific

Medical surveillance falls into three categories: pre-employment, periodic, and after exposure during emergencies. The first two are fairly well detailed under OSHA regulations, but the third is quite ambiguous as to what to do and when they are necessary. Air Products allow exposures for 45 minutes as long as exposure is less than 5 ppm. Dow and Pantasote have no time limit on emergency exposures, but the TWA must be below 1 ppm. After emergency exposures above 100 ppm, most companies simply have a doctor examine the person, but Dow gives blood tests.

C. OSHA Enforcement Action - H. Waltemate, B. F. Goodrich

California under its State Health Department is inspecting plants known to be using carcinogens, suspected carcinogens and even unrelated compounds. For instance, Goodrich was checked for VCM, benzene, ammonia, and asbestos concentrations. They received a potential citation on improper use of respirators. They were also inspected at Louisville during a strike because of a union complaint i.e., the employees did not believe the validity of Goodrich's monitoring program. The inspection lasted 12 days and did not result in a citation.

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Waltemate has requested that OSHA judgments and citations be sent to his attention by the VCSA members. He will correlate an input for distribution to the group. (Attention Lake Charles and Caribe)

D. OSHA Compliances Practices Review - D. Rhodes, Tenneco

Tenneco reviewed their experience with an OSHA inspection on toluene diisocyanate (TDI). OSHA measured a .035 ppm on a TWA at Tenneco's plant where the limit is .02 ppm. This resulted in a serious citation for Tenneco.

They have found that at low VCM levels, area monitoring usually runs heavier than personnel monitoring for TWA's. Air Products confirms this observation.

They also mentioned that they use the "log normal mean" (OSHA recommended) as opposed to the "arithmetic mean". The "log normal" usually gives results about 2/3 the value of the arithmetic mean in calculating the TWA's.

Area monitoring among plants shows that 75% to 90% of the readings are below 1 ppm, although 16 producers reported excursions above 25 ppm more than ten times per month.

E. Emission Control Methods Review - J. Barr, Air Products

J. Barr reviewed various methods of controlling VCM emissions including PPG's work on low temperature catalytic destruction. (Have we published this?) Union Carbide is using an absorption technique in an unidentified solvent. (EDC?)

In a review of methods currently employed:

25 plants use incineration, 17 of which have back-up systems if needed.

6 plants are using carbon adsorption.

5 plants are using solvent absorption including Carbide and Goodrich.

F. Transportation Update - R. Wilson, Stauffer

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Several directives are out covering 112A, 340W, and 114A tank cars. Initial directives cover vertical restraint systems on couplers which should be retrofitted by July, 1979. Other requirements are for retrofitting cars with head protection by December 31, 1981 and thermal protection on the same date. Coating and jacketing requirements may mean reduced loading capacity in order to meet shipping weight restrictions.

G. Major Accidents, Near Misses - J. Alvarez, Primex

Primex in Mexico experienced a major accident where 7 storage tanks exploded resulting in one fatality, three injuries and three million dollars damage. Cause was a VCM breakthrough during maintenance on a 3-inch liquid valve.

Carbide gave a brief description of their accident on September 5, 1977 where an autoclave (not suspension resin) released VCM which ignited resulting in 2 people, 75 feet away burned severely. One, the chief operator has since died, the other remains critical. The explosion was heard 20 miles away and one large piece of the reactor, a 6,000 gallon commercial type, blew a distance of 1600 feet. This confirms previous estimates that evacuation distances should be at least 2,000 feet.

Ethyl in Sarnia, Canada, reported finding stress corrosion on 30SS vessels, but have found none on 316SS construction.

Air Products stated that last January's cold weather caused a shutdown of their PVC plant because of frozen pipelines. On reopening a VCM valve a 500 lb. release occurred which traveled 50 to 100 feet and ignited at a welding machine. The resulting fire damaged instrumentation, but caused little structural damage. However, 8 people were admitted to the hospital for burns and smoke inhalation.

H. Planning For Disasters - J. VanWinkle, Diamond Shamrock

Emergency plans should have shift people as primary respondents. If an emergency happens on a weekend, salaried personnel can be hard to find. Training should be dynamic and continuous, because of turnovers of emergency crews such as a fire brigade. VanWinkle also stated that if you don't belong to an emergency team, don't go to the scene and add to the confusion. Some unions have claimed that a company does not have the right to assign men to an emergency team. This is currently under arbitration in Texas.

I. Catalyst Handling - A. Dixon, Goodyear

In general there are 8 to 10 initiators commonly in use, generally stored at low temperatures. Suppliers are usually Lucidol, PPG, and Noury. Dixon commented that Lucidol has 50%, PPG 30%, and Noury 15%, with the remaining 5% divided among the other organic peroxide producers. He stressed the need to review the producers' technical bulletins on handling and storage. Most companies use electrically refrigerated walk-in type freezers with temperature monitoring and power loss alarms.

Goodyear uses two compressors for a walk-in freezer, backed up by a diesel generator. Factory Mutual's storage code was reviewed outlining requirements on the storage vs. distance. Most plants have a chest type freezer in the reactor area, containing from one shift to one day's supply of initiator. Goodyear uses a small walk-in freezer in the reactor area

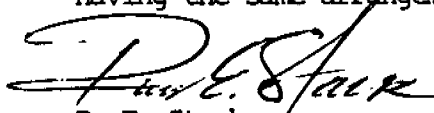
containing one day's initiator requirements. Lab personnel measure required amounts at their primary storage area and transfer it to the reactor area freezer. Unused initiator is never returned to primary storage and they always use the oldest initiator first. Care is taken to store packages allowing an air space between them and an outside wall for air circulation.

Dixon reviewed various methods for charging initiator into the reactor:

1. Some use charge bottles. (Goodyear considers this dangerous)
2. In the bulk PVC process, many charge manually into the reactor.
3. Goodyear pours their catalyst into a styrofoam ice chest. They also pump into the first stage reactor, but have had problems with plugging lines, but no decomposition. They also inadvertently left part of a jug (1/2 gallon) of 75% Lupersol 223 EHP in the reactor area resulting in a "white smoke" type decomposition, but no fire. In another instance 2-1/2 gallons of EHP was left in their styrofoam chest which decomposed on a filter head believed to have been initiated by sparks from an electric cable.

Pete Bogart of Tenneco reviewed an incident involving an unidentified Lucidol or Noury initiator stored below 28° F. They have a walk-in freezer with a water deluge system activated by J & W Heads. The heads got dirty and activated prematurely, flooding the freezer with 75° F river water. The shift foreman reactivated the compressor and confirmed after a period of time that the freezer temperature returned to normal. However, the initiator (EHP?) decomposed the following morning resulting in a \$4,000 catalyst loss. The initiator is used in their co-polymer plant. Tenneco charges their reactors by sucking the initiator up with a vacuum hose. Some producers use liquid nitrogen or carbon dioxide as back-up cooling in case of refrigeration failure. In a survey, 14 producers are using walk-in freezers and 8 have chest-type units. Eight also have back-up sprinkler systems.

- J. Sidelight - Both Lucidol and Noury continue to have hospitality suites promoting their initiators. PPG still gets "friendly" criticism for not having the same arrangement.


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