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INTEROFFICE
MEMORANDUM

Subject Vinyl Chloride Safety Association

Meeting, New Orleans 29 March 1979

To Distribution

From J. T. Barr

(Location, Organization, or Department)

Plastics R&D

(Location, Organization, or Department)

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The Vinyl Chloride Safety Association held a special meeting at New Orleans on 29 March 1979 to discuss matters relating to compliance with the EPA standard for vinyl chloride. Very little discussion was held on strictly safety matters. There were 18 domestic PVC manufacturers represented, along with four monomer producers and two foreign PVC firms.

The date for the next meeting was set for 13-14 September in San Francisco.

Abatement Systems

Carbon Beds

The first major topic was the operation of the end-of-the-pipe abatement systems. A show of hands indicated that five companies use carbon adsorption as the primary abatement method (Georgia-Pacific, Tenneco, Diamond-Shamrock, Firestone and Stauffer) and two others, PPG and Conoco use it in connection with shipping facilities. All of the five primary users have it backed up with incinerators, flares, or discharge to boilers. On-line time is generally poor, and maintenance is high.

The Diamond-Shamrock system is of their own design, and uses two 4 x 18 ft beds of about 5000 lb each. Operation is at 15 psig from a surge tank at the end of the recovery process. It is operated manually on the position of the temperature fronts in the various operations.

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Feed averages 200 lb/hr, of which about 150 lb is vinyl chloride. Service time is about 4.5 hr/bed, and the beds are switched when the bottom temperature rises to 150°F, a sign of near breakthrough. The bed is then steamed to 300°F at 30 psig with 1500 lb/hr live 150 lb steam for 1 hr and the offgas cooled to separate the water. The vinyl chloride is returned to recovery. The bed is then heated to 340°F by passing 750 scfh nitrogen through and when the cool front reaches the bottom it is cooled to 100°F, and is ready for reuse. The total regeneration cycle is about 3-1/2 hrs.

They have experienced problems with:

1. Hot spots in the bed, thought to be due to liquid vinyl chloride. They have installed a water deluge that is activated at 400°F, and have stopped cooling the feed gas, to avoid liquid formation. They also add nitrogen if the feed tank pressure drops to the operating pressure, so that there will be no stagnant periods.
2. Corrosion, particularly of the bottom support screen. They changed to Hastelloy C for this service. This solved the carbon carryover problem also.

The total cost was about \$1 MM, and this has been a very high maintenance item. Now it gives on-stream times of 80-90%. The gases are sent to an incinerator when the unit is down, and this provides sufficient purge that there has been no problem with methyl chloride buildup. The unit is considered to be break-even economically. There has been no loss of carbon activity in the year of operation. The effluent averages 2-3 ppm.

M. Smith of Georgia-Pacific discussed their system which was designed by Oxy-Cat. It has two horizontal beds of 1600 lb each and is fed at 100 lb/hr of 30-40% vinyl chloride - containing gas from a small gas holder. It operates on a 2 hr 20 minute fixed cycle and gives 90% of the effluent under 10 ppm, but has excursions up to 2000 ppm. It was suggested that leakage by the horizontal charge could account for this. Their design uses the vacuum/heat regeneration system rather than steam. They expect to abandon this when they install a large incinerator in conjunction with their monomer plant.

Stauffer has a similar unit, and has had enormous problem with it, but chose not to discuss it publicly because of possible future litigation.

Firestone was not present because of an "emergency" meeting concerning their new plant, thus their system was not discussed.

The original Tenneco unit is in operation, but will not be expanded to cope with their enlarged plant.

PPG reports that the cost of installing a regeneration system for their limited use at the Paulsboro terminal would have been greater than the cost of the carbon, so the adsorbent is used on a once-through basis.

Incinerators

Diamond-Shamrock reported on their John Zinc incinerator. They are getting about 98% on line time from each of the two units, which are operated at 50% rate to provide emergency capacity. Some problems that they have seen are:

1. Plugged flame arrestors from solids carryover.
2. Nuisance breakage of low pressure rupture disks. They now use carbon, rather than metal.
3. Thermal cracking of the lower ceramic packing support in the scrubber.
4. A static induced explosion when a VC-rich stream was accidentally fed to the scrubber.
5. Fire in the plenum chamber from mixing fuel and oxygen-rich streams there.
6. Rain-induced shutdown of the system when the fire-eye was obscured by moisture.

Conoco reported a flash-back through an arrestor, which they believed was due to faulty construction, leaving a gap on the outside of the bundle.

Most companies, especially monomer producers, do not shut down immediately if they lose the abatement equipment, but begin to take action only after 4-6 hrs outage. EDA has stacitly approved of this in several cases, while denying requests for 12-16 hr outages.

PPG uses dual Trane systems. They also report some arrestor pluggage. They had severe mortar problems and corrosion from hypochlorite when they added caustic to the scrubber, so they neutralize after the scrubber. They report problems with: water seepage behind the bricks at the fire box exit, remedied by a redesign of the brick arch; nusiance trips until they installed dual fire-eyes; loss of scrubber water from a frozen flow indicator system. They plan to install an acid recovery system.

Several companies with Hastelloy C downcomers reported severe corrosion problems, as do we at Escambia. Borden uses a graphite piece, and reports no problems.

Borden reports 99% on line time, and only short nusiance trips. They feed constant air, and add fuel to hold the desired temperature. With this arrangement they have enough hydrogen present that almost no free chlorine is produced. However, slow reponse will give particulate problem or fuel-rich mixtures.

Five installations are single incinerators only, the rest are dual.

Solvent Scrubbers

Goodrich, Great American and Union Carbide use solvent scrubbers. Goodrich has six, of which five are identical and perform well at less than 1 ppm in the offgas. The sixth was of earlier design, and has suffered a static-induced explosion inside the packing. They see methyl chloride buildup and do take a slip stream to the boilers, or other combustion points. They estimate a construction cost of about \$500 M, say that it is cheaper to run than our incinerator, and will license their design.

General Compliance Discussion

Highlights of a general discusses are given below:

Several companies have refused entrance to the regulated areas for OSHA/EPA female inspectors of child bearing age. Many require the inspectors to sign secrecy agreements.

Only General Tire and Goodyear have received positive notice of having passed the compliance tests. Only two companies have had any response to the September 1978 semi-annual reports.

Region VI is being firm about hydrocarbon offsets for expansion permits.

Conoco has a show cause order from Region IV on excessive emergency relief valve discharges and BFG has been asked to Atlanta to discuss the same point. Pantasote was notified in a letter that their record was unsatisfactory. Five companies said that they had had no releases since 21 October 1978.

In the long run, many companies got 30 day or longer delays in meeting the 21 October deadline. Borden reported a problem to EPA and said that because so many others had delays, they they would take 30 days to fix their problem, and EPA agreed. We had the only fine.

About 16 companies thought that they were in compliance as of 21 October, 9 more had not been at the time, and 3 have not yet been tested (Goodyear, Hooker, and APCI/CC).

Four companies use cannister masks to some extent.

Conoco and Dow are now using the 3M exposure badges, at a cost of about \$5 each. Georgia-Pacific is testing them. At present, proof of equivalency is on the user.

Miscellaneous

Several companies are upset at BFG statements in public that would support reducing the RVCN to 50 ppm.

Conoco still strips in their reactors and opens after each batch.

Diamond still hand cleans their reactors occasionally (too frequently for them) despite use of the BFG clean reactor technology.

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Shin-Tech and Tenneco are planning expansions. S-T has its permit application on file.

General Tire still has not gotten back the 20% production loss they suffered.

The Pantasote gas holder liners are still in service. General Tire tore theirs when they tried to lift the piston with ice on it.

A handwritten signature in dark ink, appearing to read 'J. T. Barr', written over a horizontal line.
J. T. Barr

sjd

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