CHEMICALS

PPG INDUSTRIES

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INTEROFFICE / LAKE CHARLES

TO Distribution

DATE February 8, 1982

FROM Ben Reynolds BDR

SUBJECT Vinyl Chloride Safety Association Meeting September 24-25, 1981 Hilton Head, S. C.

The 1981 meeting of the Vinyl Chloride Safety Association was held in Hilton Head, South Carolina, on September 24 and 25, 1981. There were 60 attendees from the U. S. and abroad at the meeting representing 33 of the Association's 46 member companies. Highlights of the discussions were as follows:

1. Furan Process Sewer Explosion - CONOCO VCM, Westlake, Louisiana

   A closed underground process sewer had been installed to reduce personnel exposure to chlorinated hydrocarbons. Material in the sewer gravity drained to an underground tank and was pumped to a stripper. Vapors in the sewer/tank were vented to the atmosphere. While the system was being used for washing an EDC column, an explosion occurred. The top was blown off of a 6' drum (Furan-lined - FRP composite) rated at 50 psig. There were no injuries and no fire. The investigation revealed that the vessel was not grounded and the liquid entered above the liquid level. It was felt that possibly air had been introduced and the flammable mixture was ignited by a static charge. Testing by SWRI showed only low levels of static buildup, however. The vessel was replaced with a steel drum (with pH control), equipped with N_2 purges, and the liquid inlet was relocated beneath the liquid level.

2. Control Room/Lab Explosion - Dow, Ft. Saskatchewan, Canada

   On May 27, 1981, a VCM explosion totally destroyed the laboratory and seriously damaged the adjacent control room. The VCM entered the lab through the floor drain which was connected to the plant's "acid sewer". A leaking block valve on the neutralizer drain system allowed the VCM to enter the sewer. Flashing VCM backed up into the lab. They theorized that the boiling VCM may have frozen water in the sewer creating a plug and causing it to back up. Flammable vapor detectors in the lab and other areas of the plant detected the leak, but it was too late. The vapors ignited in the lab, which was not classified "explosion-proof". There were 4 injuries, burns, which required hospitalization. The blast-resistant building contained the explosion. A 20' x 40' section of the roof, weighing 90,000 lbs., fell in and the internal walls collapsed. The laboratory was totally destroyed.

Regulatory Update

September 1981

OSHA

Carcinogen Policy

Amended to meet benzene case, January. Other amendments proposed and withdrawn. Under review, with 2-3 year goal. Candidate list unlikely.

Cotton Dust case stops cost/benefit analysis for health, reaffirms need for rule.

Lead Standard

Some details of rate retention still unsettled.

Qualitative mask fitting proposed.

Partial stay until October 11.

Medical Records Access

Proposal to tighten labor access to data.

Labeling

Reproposal scheduled for September-October.

Women in Workplace

General acceptance of employer right to exclude.

Reopening of VC/PVC Standard (Including trichlor, vinyl acetate, PVC dust)

Not expected for 2-3 years.

EPA

Carcinogen Policy

Being rewritten as response policy. Timing uncertain.

Vinyl Chloride Standard

Administrative changes this fall?

SL 089099

General Fugitive Rule

Hearings last spring.

Water Quality Criteria

Revised version out-lowered limit.

RCRA Listing - improbable.
Superfund reporting limit due next year. Spill (w) 1# or more.

All RCRA, Pretreatment, etc. rules reviewed.
Flurorcarbon action likely delayed.

FDA

Still no final action on rigid PVC packaging, BATF request no help.

Plasticizer action unlikely until more tests.

di-ethyl hexyl phthalate)
di-ethyl hexyl adipate)--? carcinogens

Corrective action included re-routing of the lab sewer, isolating the neutralizer drain sewer, and blinding neutralizer drain lines except during wash out.

3. N_2 Inhalation Incident - B. F. Goodrich, Pedricktown, N. J., PVC Plant

A reactor was taken down to repair an agitator stuffing box leak. It was N_2 purged, blinded, and locked out. Maintenance had put N_2 pressure on the reactor in an attempt to dislodge the packing. A maintenance mechanic entered the reactor with no respirator, no safety harness, and without testing for O_2. He passed out, but was removed from the vessel and revived. He had not followed the vessel entry procedure.

A poll was taken after the incident which revealed that safety procedures were not being followed. An employee re-education program was initiated. It was emphasized that willful violation of a safety rule would result in severe disciplinary action and possibly discharge. They are attempting to increase overall safety awareness so the unsafe actions of others will be seen and corrected.

4. Decomposer Explosion - B. F. Goodrich, Convent, EDC Plant

A decomposer column (CAT-OX) handling waste vent gases ruptured, rupturing an EDC line. A fire was started by electrical sparks. It was believed to have been caused by an explosive mixture in the vapor space, or perhaps nitrogen trichloride. The vessel purging procedure was modified to prevent stagnation of gases.

5. PVC Reactor Lock-Out Device - B. F. Goodrich

They surveyed 48 VCM releases over the last 10 years to develop a sophisticated interlock system in the reactors. The system is similar to the Kirk-Key locks used on electrical equipment in our plant. Drain valves, manway, and VCM charge valves are all to be tied together. Zero pressure on the reactor is required before the key can be pulled from the key box to open the manway. The system will cost $1,000-$1,500 per reactor. None had been put into service at the time of the meeting.

6. Lauroyl Peroxide Fire - PVC Plant

Lauroyl peroxide, a PVC initiator, decomposed and ignited during charging of an autoclave. The operator received burns on 25% of his body. The autoclave had not been cooled down according to procedure and was at 80°C instead of 40°C. The flash fire lasted several seconds.

7. Polypropylene Plant Fire - AMOCO, Delaware

This explosion was reviewed because the properties of the materials involved are similar to VCM. Five people died in the fire/explosion and 29 were injured. Damage to the plant totaled $65 million. Because of the extensive damage, the plant was not rebuilt, and 200 jobs were lost.

On the day of the incident, the last game of the World Series was being played 35 miles away. None of the regular mechanics were available for overtime work to clean the 4" recirculation line on the reactor. Three men who were not familiar with the job were forced to hold over. The job involved removal of an actuator on a Tufline plug valve. The mechanics removed the wrong bolts and a 10,000 gallon reactor containing propylene and hexane was dumped to the atmosphere when the plug came out. They don't know what ignited the cloud. The blast knocked out an 8" deluge riser. The boiler house lost the electric and steam driven fire water pumps and with the 8" line severed, the diesel pump couldn't keep up. Several men were killed in the concrete block control room when heavy equipment on the roof fell in.

8. Questionnaire/Survey Reviews

Four surveys which had been sent to VCSA members during the past year were reviewed. I have copies for those who are interested.

The surveys were:

a. Small PVC Reactor Safety Survey - Sent to all domestic PVC producers - 20 replies. Pertains mostly to PVC reactors, but has some comments on VCM storage, vessel entry, and general safety considerations.

b. Operator Training Questionnaire - 32 responses. Overview of training methods used in the industry.

c. Computer Control Safety Questionnaire - 6 responses. Survey of computer-operated PVC plants regarding training, computer/manual operation, and operator interface.

d. OSHA/EPA Inspection Questionnaire - Summary of the 26 responses to the questionnaire.

9. Regulatory Update - John Barr of Air Products, Summary Attached

10. Hazardous Materials Notification - Hooker, Burlington, N. J.

The union walked out of their Burlington, N. J. plant for 2 weeks after some new chemicals were brought in for use as short-stops in

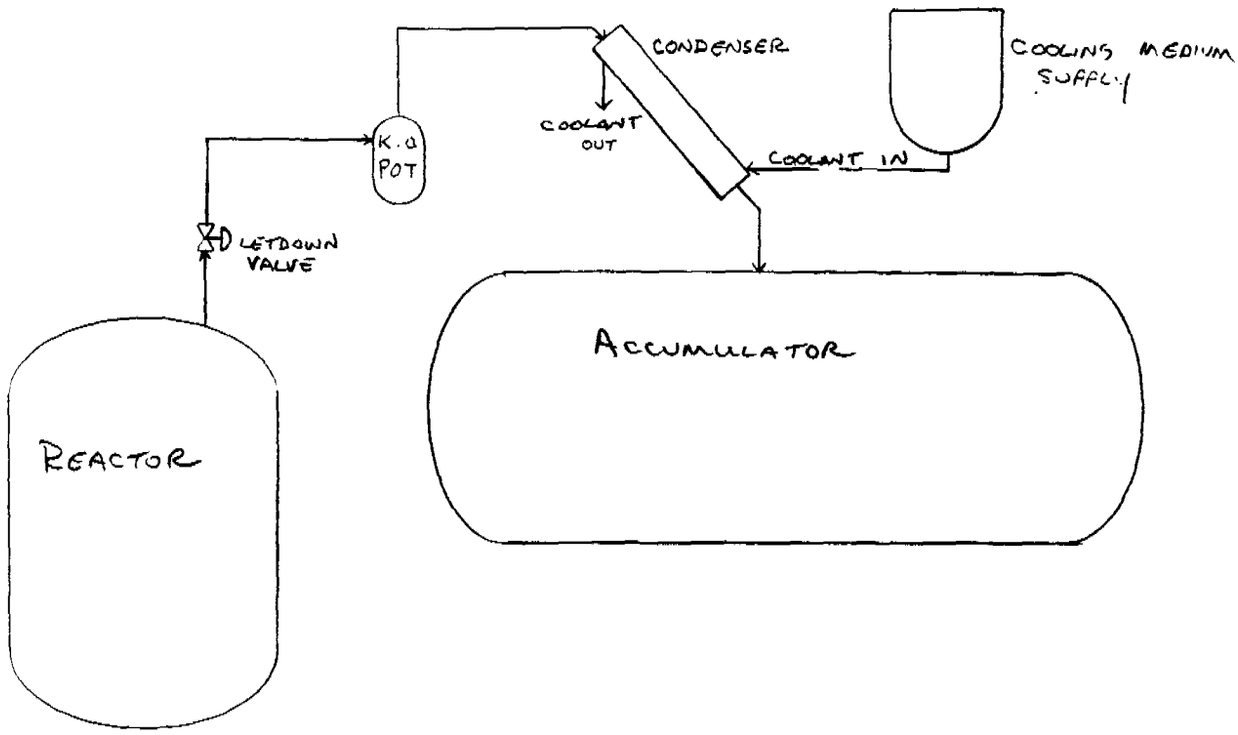
their resin reactors. The walkout probably could have been prevented if they had spent more time discussing the situation and had done more training on the use of hazardous materials.

11. VCM Training Film - Air Products

Air Products and OSHA worked together to produce a training film for new operators at Air Products plants. The film was very well done and could be used as a model for a PPG training film. A copy has been ordered from Air Products.

12. VCM Safety Condensation System - Hüls

Chemische Werk Hüls Ag. has developed a system (U. S. Patent No. 4,004,880 - January 25, 1977) to prevent VCM releases from an emergency pressure letdown on a reactor. Today's 'large' PVC reactors could potentially release as much as 70 T of VCM on an emergency letdown. The concept is fairly simple as shown below.



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11. VCM Tank Car Derailment - Pantasote

On January 8, 1981, two hopper cars and five PPG VCM cars bound for Pantasote were involved in a derailment near Point Pleasant, West Virginia. The dome of one VCM car was completely sheared off in the accident and a large vapor cloud developed. It was later determined that 60 T (approximately 2/3 of the cargo) were released. The derailment was caused by a broken rail which was attributed to extreme weather conditions.

Several families were evacuated. It was also necessary to shut down the city's water wells which were nearby. It was felt that the electrical equipment could be an ignition source.

The response to the accident, in Pantasote's opinion, was excellent. A patch was devised and fabricated, and all of the lines on the damaged car (safety, gauge, vapor, liquid) were sealed off within 36 hours of the accident. The cars were raised, set back on the tracks, and moved to Pantasote for unloading. Those participating in the emergency operation included: Pantasote, PPG, Chessie System, state and local authorities, Hulcher Emergency Service, and Huntington Piping.

A Century organic vapor analyzer was used to determine VCM levels in the surrounding area. Six hours after the accident, VCM concentrations were 60 ppm at 500 yards and 150 ppm at 200 yards. EPA, West Virginia Department of Health, and West Virginia Air Pollution Control Commission were all informed of the accident and sent representatives to the scene. Pantasote was commended by EPA for the way they handled the incident.

14. VCM Regulatory Status

Gary Baise of the law firm of Beveridge and Diamond spoke on the status of the current VCM regulations and what we can expect in the future. Mr. Baise has been counsel to the Society of Plastics Industries, and has worked for industry in litigations with EPA.

In his opinion:

a. Plant shutdowns in the event of control device malfunctions may no longer be required in the future. EPA now appears to understand that VCM losses are frequently higher during shutdown than in normal operation.

b. Fugitive Emission Monitoring - Fixed point monitors may no longer be required (1-2 years away).

c. New Emission Sources - Tri-Ethane manufacture via VC route and pesticide manufacture using VCM will be studied further by the regulatory agencies.

d. OHC Process - Regulatory agencies will investigate further the differences in emission levels from O_2 and air-based processes.

e. 10 ppm Level - Lowering of the emission standard to 5 ppm will probably not be pursued.

f. Fugitive Emissions - The industry will have to measure up to the 'best' programs now being used as far as leak detection and control are concerned.

g. SRV Discharges - EPA will investigate further to determine if more regulation is required.

The 1981 VCSA meeting was very informative and I highly recommend that we continue to send representatives from VCM operations at Lake Charles. The 1982 meeting will be held in Toronto, Canada in mid-September.

BDR/bjm

Attachment

Distribution

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