A. L. A.
OCT 23 1989

WKM
OCT 25 1989

OCT 25 89

TO	Circ.	Copy
[illegible]		✓ *
B. Boyer J. Su		✓ *
A. Cope		
B. Dann		
B. Heger		
S. Maffett		
E. McGuire		
Y. Shieh		
File		

DATE: October 12, 1989

TO: Alden Andre
Vice President of Operations
Operations Department Staff

cc:

FROM: Delaware City Plant

SUBJECT: Vinyl Chloride Safety Association
1989 Meeting, trip report

also circulate to — RPS ISH CL YHH

The Vinyl Chloride Safety Association (VCSA) held its annual meeting at Boston, Massachusetts on September 28 and 29, 1989. There were 69 attendees representing 29 companies from 14 countries on 3 continents. The agenda included three case studies on explosions and or fires followed by 17 presentations on design, transportation, regulation, management, and statistics relating to the vinyl chloride industry.

Following are summaries of the presentations taken from notes or paper copies.

1. "Explosion in PVC reactor" David DiPiero, Georgia Gulf

Occurred 2/89 in a 5000 gallon Brighton suspension reactor. Black smoke observed coming from reactor, no alarms tripped, VCM fire burned itself out. Fire was in bottom of reactor, occurred while batch was being stripped and dropped. Manway was closed. There was one injury, due to smoke inhalation. A blip had been noted in the temperature - pressure curve of the preceding batch.

Cause was believed to be bent reactor shaft allowing the ajitator blade to strike a protruding temperature probe thereby making a spark. Contributing was a new operator being trained, senior operator was distracted and the new operator didn't realize what was happening.

Remedy was to replace the bent shaft with a higher grade stainless steel shaft of a more rigid welded design. Georgia-Gulf concluded that the fire was due to a mechanical problem coupled with a training problem.

(No paper prepared)

2. "Incident At EDC Cracking Unit" Herbert Deuschl, Wacker

Occurred 12/11/88 when a pipe burst in a cracking furnace allowing VCM, EDC, and HCL to escape into the combustion chamber which was natural gas heated. Operator observed smoke coming from the flue stack and hit the "emergency stop" which shut down the plant and isolated the plant units. Water walls contained the HCL/VCM/EDC and soot and extinguished the fire. No injuries occurred. Plant was shut down 4 days for repairs.

Cause was a failure of an Inconel 600 coil because of high temperature corrosion due to local overheating. Final analyses are pending and will be reported next year.

(Paper available)

3. "Explosion in VCM Plant" Harold Houden, Norsk Hydro

A reflux line ruptured releasing 8 tons of EDC/VCM which was ignited by a cracker gas burner. The liquid hold up tank ruptured and poured 35 tons of EDC/VCM into the fire. The cracker feedline then ruptured, releasing an additional 35 tons of EDC/VCM into the fire. The line feeding chlorine to the reactors then ruptured and 5 tons of chlorine were released. There were no injuries. No main equipment was destroyed. Clean up cost $300,000.

Cause was a thickness reduction in a carbon steel bend due to erosion and corrosion resulting from fluid velocity, coke particles, and the geometry of the fitting.

Remedy was bigger pipe diameter, thicker walls, baffles to retain coke particles, and a thickness measurement program.

(Paper, layouts, piping, and cross-section drawing available)

4. "Emergency Relief Design" W. Janacek, Dow

Reported on a relief valve study conducted by a Dow internal organization referred to a the "Design Institute for Emergency Relief Systems (DIERS)". DIERS is 10 years old and "certifies" Dow engineers as relief valve designers.

The study discovered that varying relief valve sizes were used for similar applications. The goal of DIERS is to standardize relief valve designs.

(No paper prepared)

5. "Groupo Primex Safety Program" J. Zarate Montano, Primex

Described a total safety-health-environmental program established by a major petro-chemical operation in Mexico. Without government regulation, Primex has set up an exemplary system. Discussed were damage data, accident losses, accident cost calculations, investigation reports, priorities for correction, inspections, controls, their safety, medical, ecology, and technology programs. Home safety, motivation, internal policies, and inspection programs are also included.

(Paper available)

6. "Delaware's Risk Management Program" B. Melton, Formosa

Described the Delaware Extremely Hazardous Substance Risk Management Program. A Substance Hazard Index (SHI) was determined for a number of explosive, flammable or toxic chemicals. If the calculated index is greater than 8000, the chemical is regulated. The goal of the regulation is to prevent catastrophic releases of an extremely hazardous substance. The State will be inspecting all plants using chemical products with a SHI over 8000. They will review P&ID's, inventory records, training and operating procedures and will make a physical plant inspection to assess maintenance quality.

(Paper available from B. Melton)

7. "Updat - Short Stop Systems" Frank Borelli, G orgia Gulf
Seventeen companies were surveyed on their use of short stop systems. Half had automatic initiation of the short stop chemical and half had automatic initiation. Six stated that the system was not effective without agitation and seven were concerned that the short stop system would plug lines.

8. "Hazardous Material Transportation" Vergel Perry, Dow
Discussed the lack of design similarity in the construction of Vinyl Chloride tank cars. Suggested an industry committee be formed to review designs in place, propose design criteria, and recommend construction standards for future tank car construction. Related the success of similar efforts in the Chlorine industry with standardization of tank car valves, reliefs, and other fittings which were prone to failure or would pose a problem for an emergency crew to repair in the field.

9. "U. S. Regulatory Update W. C. Holbrook, B.F.G.
Reviewed recent and upcoming Federal regulatory changes in the United States. Discussion included:

1- VCM/NESHAP emissions revisions, EPA, published in the Federal Register for September 21, 1989 page 38938. Concerns pump seal leak requirements. "Relief valve leaks are not ERV discharges". ERV leaks limited to 10 ppm in 3 hours. 3 hour averaging permitted. Leak detection applies to exhaust vent gas lines.
2- Air Toxics legislation, Control of emission sources and the use of best available emission control technology (BAT). Seek source control of emissions.
3- The OSHA Z list for Permissible Exposure Limits (PEL) 1/19/89 revision changes EDC exposure from 50 ppm to 1 ppm on an 8 hour Time Weighted Average (TWA). Otherwise little change from the original listing.
4- Clean Water Act - section 304L imposes restrictions in certain toxic hotspots.
5- Solid/Hazardous waste disposal - New RCRA trigger levels for leachate: VCM = 200 ppb; EDC = 500 ppb.
(No paper available)

10. "A Company's Superfund Experience" J. Sommermann, Formosa
"Elements of a Superfund Project" L. LaCorte, Formosa
Described the chronology, remediation concept, and status of the Delaware City Superfund project. Also described the regulatory mechanics of how a Superfund project evolves from initial violation to final remediation. Includes clippings, flowcharts, and timeframes.
(Paper available from Jeff Sommermann or Louis LaCorte)

11. "C rrosion Thickness Testing In Critical S rvic s"
George Lahde, B. F. Goodrich
Described a number of Non Destructive Test Methods (NDT), their value and their application. Methods included Visual, Leak Testing, Liquid Penetrant, Magnetic particle, Eddy Current, Ultrasonic testing, and the use of thickness gages. The value of recordkeeping for in thickness testing was stressed.
(Paper available)

12. "European Regulatory Update / 1992 EEC Harmonization"
H. Steegenga, AKZO
This was a general discussion on trends in European regulatory trends. Included reasoning (removal of trade barriers to effect cost reduction, efficiency, economy of scale, and the flow of innovative processes) along with upcoming human factors regulations on oxygen availability, stress, and temperature factors. The incineration at sea (North Sea) of organo-halogens will be subject to revised restriction. For example, EDC levels must be below 25 ppm daily with a monthly maximum averaging 5 ppm per day. Land VCM emissions range from 1 to 3 ppm per 8 hour TWA.
(No paper available)

13. "TCLP / TOC Impact" Joe Ledvina, Vista
TCLP (Toxic Characteristic Leaching Procedure) is a proposed procedure to determine if a waste is hazardous. It is planned to replace the existing EP-TOX tests for waste toxicity that have been in use since 1976.
The implications are that more waste will be considered hazardous resulting in higher disposal costs and additional administrative requirements. Under this proposed program PVC and PVC scrap may be hazardous if they contain 200 ppb or more of vinyl chloride. A final rule on this revision is pending publication 12/89 and will be effective 6/90.
(Paper available and recommended reading)

14. "Vinyl Institute Update" Roy Gottesman, Vinyl Institute
Presented statistics on the status of the PVC industry. Largest use of PVC is in building and construction (60%) which is 3 billion pounds. Garbage consists of 0.19% PVC and is recycleable. A solid waste reduction program could consist of source reduction, reuse of shipping containers, incineration, and landfilling. PVC is part of the solution not the problem because of is reusability, recycleability, low bulk/high strength and versatility. Members of the Vinyl Institute are PPG, Oxychem, BFG, Georgia Gulf, Air Products, Dow, Vista, Borden, Certainteed and Vista.
(No paper available)

15. "Survey on State Enforcement Action" Joe King, Oxychem
Tables of statistics are attached

16. "Hurricane / St rm Preparedness" John Yong , Shint ch
Outlined a generic hurricane plan for a chemical plant. Included details on deadlines, sequence countdown schedule, hurricane stages, responsibility, organization, preparations,communications, shutdown plan, and start-up. Includes a hurricane information flow chart.
(Paper Available)

17. "ASL Registry Update" Brian Bennett M. D., ICI
Discussed Angiosarcoma of the liver, the common disease caused by EDC/VC. THis update reported 2 to 7 new cases per year, and about 100 new cases since 1975 worldwide for an incidence rate of 1 per 10 million. Dr. Bennett discussed other causes of this type of tumor, namely vinyl acetate, arsenic, anabolic steroids, and copper. ASL tumors have an average latency of 23.84 years. Also discussed was the development of cartridge filters, by Drager, for EDC/VC, of which there are none on the market yet. The proposed filter must withstand 10,000 ppm for 30 minutes.
(Paper Available)

18. "PVC Dust Fire Testing" H. Waltemate, BF Goodrich
This talk covered the situations under which PVC dust could be ignited. Factors involved are particle size, moisture content, and whether the dust is a copolymer or homopolymer. Described an actual explosion at BFG when an acrylic polymer being transferred exploded in a vessel causing a secondary explosion of dusts outside the vessel. Static electricity was the cause of the internal explosion and poor housekeeping (dust Control) resulted in the secondary explosion. PVC dust per se is not explosive. It requires temperatures of 690-750 degrees C for ignition. Dust tight electrical enclosures (NEMA 4 or 12) are recommended along with good housekeeping, spark proof fork trucks, and explosion proof wiring. Avoid open flames.
(No paper prepared)

19. "Dow Safety Program - Safe Working Style" J. Lippman, DOW
Behavioral problems caused 73% of all accidents. Teamwork and communication skills are developed as a group effort in resource management, delegation of duties, Leader/follower assignment. The goal is to reduce human errors in the workplace.
(Paper available)

Louis J. LaCorte
Regulatory Affairs Manager

Jeffrey M. Sommermann
Plant Manager

COMPANY	STATE	REGION	PRODUCT	INITIATED	CONCLUDED	$ SETTLEMENT	MISC.
A) CASES SETTLED WITH $ PENALTIES:							
AIR PRODUCTS	KY	4		10/78	12/78	$ 24,000	
AIR PRODUCTS	KY	4		5/80	3/83	125,000	
BORDEN	LA	6	VC	6/83	2/88	416,666	
BORDEN	LA	6	VC	3/83	2/88	416,666	
BORDEN	MASS	1	PVC	4/81	5/85	90,000	
CONOCO	MISS	4	PVC	1/80	8/85	100,000	
CONOCO	OKLA	6	PVC	3/83	8/85	125,000	
CONOCO	LA	6	VC	6/83	8/85	100,000	
DOW	TX	6	VC	6/85	3/87	105,000	
GA-PAC	LA	6	PVC	9/84	1/86	625,000	
GOODRICH	KY	4		3/80	2/87	123,500	
GOODRICH		4		10/80	9/87	335,500	
GOODRICH	LA	6		3/86	6/87	75,000	
GOODYEAR/GOODRICH	LA	6		9/83	6/87	395,000	
OCCIDENTAL	NJ	2	PVC	2/85	7/87	490,000	
OCCIDENTAL	LA	6	PVC	3/83	8/87	75,000	
OCCIDENTAL	LA	6	PVC	6/86	10/87	425,000	
PPG	LA	6	VC	9/83	8/87	225,000	
SHELL	LA	6	VC	6/83	6/85	50,000	
TENNECO	NJ	2	PVC	2/80	6/82	50,000	
UCC	NJ	2		10/80	10/83	30,000	
UCC	TX	6		9/85	6/87	142,000	
TOTAL '89						$4,543,332	
(88 TOTAL)						(3,534,500)	
(87 TOTAL)						(3,309,500)	
(86 TOTAL)						(1,916,000)	

U.S. EPA NESHAP LITIGATION - AS OF 9/11/89

COMPANY	STATE	REGION	PRODUCT	INITIATED	CONCLUDED	
B) CASES SETTLED WITHOUT $ PENALTIES:						
BORDEN	ILL	5		10/80	7/82	)
CERTAINTEED	LA	6		1/79	3/80	) WITHDRAWN BY EPA
DIAM.-SHAM.	DEL	3		11/80	6/82	)
FORMOSA	DEL	3		12/84	4/85	)
CONOCO		6		10/78	11/79	) DISMISSED BY EPA
PPG		6		10/78	3/80	)
VULCAN		6			3/80	)--DECLINED BY EPA
GA-PAC		6		12/83	5/85	)--SETTLED WITH CONSENT DECREE
C) CASES PENDING:						
DOW	LA	6	VC	11/84		
ETHYL	LA	6	VC	3/82		
FORMOSA	LA	6		10/83		
OCCIDENTAL	PA	3	PVC	8/89		

FPC 000056