

Monsanto Chemical Company
Texas City, Texas

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April 9, 1959

TO: File

Ref: My call report 4/8/58

Subj: VISIT TO DIAMOND ALKALI COMPANY
DEER PARK, TEXAS

VINYL CHLORIDE MONOMER

In the reference call report I stated that Diamond had always found our Vinyl Chloride Monomer to have a slower reaction rate than competitors' or their own VCM. This was an error. I should have stated that they had always found our VCM to have a slightly faster reaction rate. The recent complaints from Great American Plastics Co. and General Tire Company have been to the effect that our VCM reacts more slowly. This conflicting information means that either our material is better than some monomers on the market and worse than others or that the rate of reaction of VCM cannot be expected to have the same reaction characteristics in any one customer's process relative to another customer's process.

D M B
D. M. Brown

DMB:rf

CBY 1111869

RSV0031170

MONSANTO CHEMICAL COMPANY

Location: Texas City, Texas

W. R. King
cc: Plant Manager's
Safety Board

Date : November 3, 1959

Subject : Process Hazard Committee Report

To : J. S. Putnam

Early in 1959 a complete and massive report was prepared showing the status of the various items listed by the Process Hazard Committee. Many of these items have been completed or otherwise disposed of and this letter is a summary of the present status. Each general operating supervisor was contacted concerning his particular group of items and present status was determined.

The items on the attached list are grouped into six categories:

1. Those completed.
2. Those which supervision considers non-hazardous.
3. Those which supervision considers non-justifiable for hazard correction.
4. Those for which a continuous program or schedule is now in existence.
5. Those not done.
6. Those that are in active progress toward correction.

I consider the first four of the above categories to be "completed" items because either the work has actually been completed or is not going to be done, or is of such a nature that it requires continuous vigilance and will not reach a status of being completed.

It is suggested that, if another such comprehensive Process Hazard Report is to be prepared, the items in these four categories be dropped from that future report and only the items in categories five and six be included.

CLG
C. L. Gilmore

CLG:lt
Attachment

SC

16667

RSV0031171

I. THOSE COMPLETED

<u>Item No.</u>	<u>Description</u>
5	Fire protection for south tank farm.
18	Portable pumps without relief valves protecting suction and discharge.
25	Air purge failure on non-explosion proof analytical instruments can create explosion.
27	Fire Water Supply
28	Inadequate fire protection at propane storage.
36	Loss of all refrigeration engines at same time.
45	Alkylation liquor (AL)- water separator.
46	Reaction mixture separator
52	HCl feed control
57	Vacuum operation
58	Salt water failure
59	Area Control valves
63	Age of unit
67	Hydrogen flare system
71	Introduction of organic impurities
73	Converter Flame-out
76	Soot Filters
78	Polymer in Compressor
79	Compressor House
80	Water entrainment into compression

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16668

RSV0031172

<u>Item No.</u>	<u>Description</u>
82	Vacuum Columns (18D7 and 8)
84	Acetylene Distribution System
96	Acid Scrubber (19D4)
99	Rerunning off-specification HCN
101	HCN Storage
102	Bypassing Control Valves
106	Reaction
107	Inhibitors
110	Proposed Catalyst System
111	Reactor Spiking
114	Waste Organic Surge Tank (20T16)
116	HCN Vaporizer
121	EDC reactor (23V1) 1) Upset can relieve Cl ₂ to main VCM flare (C ₂ H ₂ present main flare).
125	C ₂ H ₂ Separator (22S3) 1) Vessel relieves through RD to atmosphere.
128	Cracking separator (22S1) coke plugging makes RV undependable
132	VCM storage (22T9)-Insufficient level gauges.
133	CB column (22D8) Corrosive service.
136	Refrigeration turbine (22DT1)
137	Acid unit (department 21) deteriorating.
138	Communications -- One phone in control room. C ₂ H ₄ and C ₂ H ₂ communication easily interrupted.
139	VCM compressor (22C2) - No RV on positive displacement compressor
140	Possible cross connection with sanitary water to contaminate drinking H ₂ O.
141	Reactor (26R1) maintenance decontamination problem.

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<u>Item No.</u>	<u>Description</u>		
149	TBA Tank Cars		
154	CO Concentration in Area		
162	Product Separator (41S17)		
166	Peroxide Storage		
167	Product Separator (41S17)		
170	Proposed use of chilled water in department 41.		
171	Building Evacuation		
173	Styrene tar feed line		
181	General Electric Turbines		
183	Styrene Rack, organics in soil.		
190	Pressure Cells		
191	RPU		
192	Little RPU		
193	Pilot Plant - EMA		
194	Pilot Plant - Cyanuric Chloride		
195	Pilot Plant - Oxidative Chlorination		
196	Pilot Plant - General		
197	High pressure testing		
198	Low pressure testing		
207	Car and Loading Grounding		
208	Operational Procedures and Training not Ready.		
209	HCN Shipping		
211	Piping Around 20P134	SC	16670
216	Pressurizing 7D2 and 7D3		

<u>Item No.</u>	<u>Description</u>
217	Department 5 vent system
218	Department 7 vent system
219	Department 8 common vents
220	16K1 has no relief valve
221	Department 16 expansion contemplates methanol brine system.
222	Oxygen Compressor Fire
226	Drainage
228	Ethylene in Cooling Tower
229	Low pressure Polyethylene Pilot Plant
230	Oxidative Chlorination, 1/29/58

II NON-HAZARDOUS

2	Use of plant air system for respiratory masks
4	Out-of-date flow sheets
6	Inavailability of nitrogen for purge purposes during oxygen plant shutdowns
10	Flame arrestors
14	Reciprocating engine protective devices.
30	Flammable mixture can occur in quenchers during decoking
34	Spill and fire at liquid ethylene storage tank spreading widely because of no fire wall.
37	Emergency disposition of butane in case of tank rupture.
38	Valves in acetylene system contain copper bearing alloys, which can produce copper-acetylide which is spontaneously explosive.

<u>Item No.</u>	<u>Description</u>		
43	Unable to purge acetylene lines during emergencies.		
44	Ethylene feed pressure control		
47	Temperature control on alkylators		
48	Pressure relief of alkylators		
49	Ethylene feed control		
50	Alkylated liquor line from orifice washers to separator		
51	Reaction mixture scrubber		
55	Vent System		
70	Air intake (for plant air)		
72	Excess nitrogen in Oxygen		
81	Off-gas flare system		
83	Oxygen Analyzers		
86	Product Acetylene Column (18D5)		
87	Adsorber (18D1)		
88	Gas Holder		
90	Reactor Interlock		
93	Spent Catalyst		
108	AN Storage		
109	AN Storage		
113	Light Ends Column Surge Tank (20T10)		
117	Reactor Relief	SC	16672
118	Cycle Gas System		
126	C ₂ H ₂ driers (22A1)		
	1) Possible to inject C ₂ H ₂ into hot (275°C) dry bed by human error		
	2) Possible to send C ₂ H ₂ mixed with NG to boiler house through human error.		

<u>Item No.</u>	<u>Description</u>
127	Reaction off-gas flare has standard type flame arrestor but must burn some C_2H_2
131	VCM storage (22T4). Three rundowns in single tank wall.
142	Explosive mixture in flare due to O_2 and C_2H_4 low conversion.
146	Lime Slaker
147	TBA Product Column (25D1)
148	TBA Storage
163	Xylol Handling
164	Experimental superpressure line.
165	Recycle Gas
179	Waste gas line from department 18
185	LPG Truck Rack - Fire Hazard.
187	Empty Transport Containers Contain Explosive Mixtures.
202	Chlorine Barge Unloading
224	Single means of access or exit from the cold boxes.

III NO JUSTIFICATION

33	Rupture of compressor discharge line can cause fire and spill.		
66	Salt Water failure		
77	Recycle Gas Control		
94	Reactor Cone	SC	16673
97	HCN Stripper		

<u>Item No.</u>	<u>Description</u>
103	Unit Cyanide Vent
115	Acetylene System
161	Compressor House
172	Oilfield boilers
175	Expansion joints in steam distribution system.
177	Gas shut-off valve
185	LPG Truck Rack --Fire Hazard
186	VCM and Chlorine Tank Car Rack Near Residences.

IV CONTINUOUS

3	Identification of material in piping by color code.
7	Unauthorized personnel entering operating areas.
9	Railroad cars dispatched to railroad shops in contaminated condition.
11	Priority of expansions vs. existing plant engineering and research work.
12	Field Communications
16	Routine inspection of turbine over-speeds not followed.
17	Routine relief valve inspection not followed.
20	Minimum job training of Operators
23	Equipment is being operated at above design conditions.
24	Caustic piping
29	Wsystemic poisoning of personnel by lead oxide in lead pot area.

SC

16674

RSV0031178

<u>Item No.</u>	<u>Description</u>		
31	Failure of reciprocating engine parts due to old age.		
32	Pyrophoric polymer is made in LD3 stripper.		
42	Sparks from Dept. 1 and 10 flare can start fires on ground and on near-by wooden buildings.		
53 <i>agree</i>	Finely divided aluminum		
54	Off-gas water scrubbing towers		
60	Condition of piping in department 5-7		
62	Storage tank polymerizations		
65	Main condenser		
95	HCN absorber (19D5)		
104	"Buddy" System		
105	Area Sump		
123	23T5 vapor space explosive		
130	Cracker condenser (22E4) tube leaks to CTW side		
134	Air in organic columns on shutdown		
156	Methanol Storage. Tank Blanketing.		
160	Area Spill Alarm		
174	Mixed gas control		
176	Emergency air compressors	SC	16675
178	Control valve servicing		
182	Chlorine distribution		
184	Acid loading lines in poor condition.		
189	Dock and Bay Area Fire Protection Inadequate.		
199	Shop testing and repair		
200	Gas cylinder handling		

<u>Item No.</u>	<u>Description</u>
201	Drum Handling
203	Acetaldehyde Tank Car Loading
204	HCN Tank Car Loading
214	Explosive mixture in tanks and towers
223	Oxygen Line Labeling in Pipe Racks

V NOT DONE

<u>Item No.</u>	<u>Description</u>	<u>Comments</u>
16	Routine inspection of turbine over-speeds not followed.	Action on this item not decided on nor justification developed.
61	Runaway polymerizations	Status unknown
64	Relief System	Hazard exist, but repeated studies indicate excessive cost to correct.
68	Salt Water Failure	Hazard exist, but repeated studies indicate excessive cost to correct.
91	Test Ignitor	No comments
92	Main Flare	Entrainment exists, no change on procedure yet.
112	Acetylene Feed Control	Engineering study to be made, Research work completed.
119	Acetylene Compressor	No action as yet.
120	Acetylene Stripper	No action as yet.
129	Quench tank (22T18) RV discharges to atmosphere on west side of distillation structure.	Engineering study required, no priority.
143	Plant Sewers	Sewer model unsuccessful
144	Reactor	a) Completed b) Not done
SC 16676		

<u>Item No.</u>	<u>Description</u>	<u>Comments</u>
144 Continued		c) Not Done d) Not done e) Not done
145	IBY-HCN Mix Tank	No Action
150	Hydrolyzer	No Action
158	Relief Venting	Originally considered no hazard, but with expansion, needs re-evaluating.
205	MVA Concentration in 20E44	No test as yet
212	Alkylation liquor (AL) - water separator	No comments
232	Fire Water Supply	
<u>VI ACTIVE</u>		
1	Use of Sanitary water for process purposes.	Completion date January 1, 1960
8	Fire Alarm System	System has been changed and an operable better system being investigated .
13	Momentary fuel gas failures cause explosions in direct fired vessels.	a) Completed b) No Justification c) No hazard d) Active Responsibility of Utilities Section.
19	Operating and Design Manuals out of Date.	Manuals in various degrees of completeness. Continuous item once brought up to date.
21	Expansion of units produces undersized relief valves.	Various plant expansions now in progress.

SC

16677

RSV0031181

<u>Item No.</u>	<u>Description</u>	<u>Comments</u>
26	Pipe racks	Signs are being re-requested and installed.
35	Use of drummed methanol creates sources of fire while drum is open	Will be installed.
56	Benzene column, 4D1	Engineering study required.
69	Air intake (for Oxygen Plant)	Tech Services has completed study, report and evaluation in progress.
74	Converter Stacks	Engineering Study
75	Soot	Long term study - Progress
85	Higher Acetylene Stripper (18D4)	Now testing analyzer
89	NH ₃ Storage	Valves exist on vertical tank, RVs plan similar for horizontal tank.
98	Polymerization control by acid inhibition	Inhibitor system completed. Polymerization hazards under study.
100	Waste Streams	Evaluation in progress in department 24.
122	Off-Gas System	RV in early 1960. Chromatograph instrument is under study.
124	Chlorine Storage	1) Not justifiable 2) Completed 3) Active 4) Continuous
135	EDC-H ₂ O separator (22S7); H ₂ O saturated with organics goes to sewer.	Another tank to be installed.

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16678

RSV0031182

<u>Item No.</u>	<u>Description</u>	<u>Comments</u>
151	Hydrogenation Unit	a) PAFE Approved b) PAFE Approved c) Completed
152	Linde Unit	a) Continuous b) Active c) Active
153	Waste Gas Line	Awaiting approval
155	Waste Gas Header	Awaiting approval
157	Compressor House	Awaiting approval
159	High Pressure Piping	Considered no personal hazard probable, however, test program in progress.
168	Polyethylens Storage	Study in Progress
169	Polyethylene Dust	Study in Progress
180	Instrument Air	30 lb. System study.
188	Old Seatrain Tanks in Poor Repair	Tanks being sold
210	Acetaldehyde Rundown Tanks	Research Study in Progress. Engineering Study in Progress. Target Date November 1959
213	Reaction Mixture separator	Part of expansion work
215	Sulfur pots	1) Research work discontinued. 2) Completed 3) Active.
225	Vacuum Trip on Feed Gas Compressors (31C5)	Approval requested
227	Catalyst Spill	Requires fire training. Grounds and testing program will become active soon.

<u>Item No.</u>	<u>Description</u>	<u>Comments</u>
231	General Problem of transmission system seems to indicate a thorough safety study is needed.	Engineering study

SC 16680

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