GENERAL TIRE

INTER-ORGANIZATION MEMO

Annex file in VCSA (Vinyl Chloride Safety Association)

TO: R. L. Jackson

ATTENTION:

FROM: Jerry Brumbaugh

DATE: October 12, 1981

SUBJECT: Vinyl Chloride Safety Meeting
September 24 and 25, 1981

cc: H. E. Jewett
R. W. Laundrie
E. R. Senra
J. E. Simon
H. Graff

There are 46 companies represented in the Vinyl Chloride Safety Association -- 25 from the U.S. and 21 outside the U.S.

1. Major Safety Incidents

a. Furan Process Sewer Explosion — John McCulley, Conoco

A collection vessel for spent furan exploded. This was an above the ground fiberglass lined vessel rated at 50 psig. The tank was not grounded and the incoming pipe was above the liquid level. Traces of copper and peroxides were found in the residue of the plant. There were no injuries from the explosion.

Possible causes of the explosion were -- static spark, peroxides and large volume of air in the vessel. They tried to correct all three causes by --

1) Using a N_2 purge on the vent system.

2) Controlling pH by addition of caustic.

3) Replacing with steel vessel and grounding the vessel.

4) Have incoming line go below liquid level.

b. Control Room - Laboratory Explosion — Bob Oubre, Dow: Canada

In a vinyl chloride plant at Dow an explosion occurred in the laboratory injuring four employees. A leaking caustic drain valve from a scrubber designed to remove acid from VCl drained large amounts of VCl into the process sewer. This was also the process drain from the laboratory. The VCl vapors went backwards in the sewer and out the floor drains into the laboratory. The laboratory is a non-explosion proof area. When sufficient VCl collected in the lab, it exploded, destroying the lab and blowing concrete blocks into their control room. The lab was designed to stand an explosion outside the lab but not an inside explosion. This is another case where flows going the wrong direction from the planned caused a hazardous situation.

The corrective action taken was:

1) Separate lab from process sewer.

2) Blind caustic drain line when not in use.

3) Install liquid traps in process sewer.

c. Nitrogen Inhalation Incident — Glen Schaaf, B. F. Goodrich

A mass autoclave was being prepared for entry for maintenance. The autoclave was pressured to 50 lbs. with nitrogen then vented to atmosphere. The vessel was blanked and locked out. A maintenance man who did not routinely enter vessels, then entered the vessel without purging the vessel or wearing a respirator. The vessel had not been tested for VCM or O_2. The maintenance man passed out for lack of O_2, and his alarm system warned fellow workers. The maintenance man was wearing an alarm system that must be acknowledged or a general alarm is sounded. The lead technician entered the reactor with 2 respirators and rescued the man.

B. F. Goodrich found:

1) People do not understand N_2 -- think it is safe.

2) Do not know the importance of VCM and O_2 analysis.

3) O_2 measurements were not always taken.

4) Check sheet was being filled out prior to doing the work.

B. F. Goodrich has started further training and tighter vessel entry procedures.

d. Lauryl Peroxide Fire — Ron Kalminski, B. F. Goodrich

In the Plaquimine, La. resin plant, an operator added LPO to an empty autoclave through an open manway. The jacket was at 80° C instead of the normal 40° C. The reactor was blanked off and the VCM level in the reactor was low. While he was installing the gasket on the manway, he was badly burned from a fire in the autoclave. The LPO on the bottom of the reactor decomposed into flammable gases which ignited. This was demonstrated to occur by later tests in the lab. Other operators have done this -- put LPO in a hot, empty reactor -- and not been burned, but in some cases the reaction did not start either.

The practice of adding LPO to a hot reactor has been stopped.

e. VCM Column Explosion — Ron Kalminski, B. F. Goodrich

This report was not given in sufficient detail for me to understand. Ron Kalminski was giving this presentation because the person who was familiar with the incident was unable to attend.

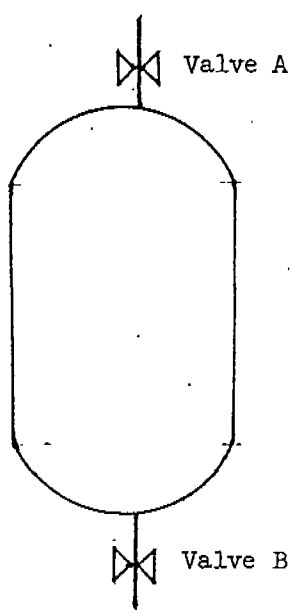
However, B. F. Goodrich at their VCM plant in Convent, La. had a waste gas decomposer explode. This was a liquid scrubber which decomposed the EDC in the vent stream, (a liquid oxidizer serving the same function as our incinerator). On this day the level gage was out of service, and there was a much larger than normal vapor space in the scrubber.

To correct this situation they have taken steps to make sure the column remains full. Any further details may be received by a request to the Convent plant.

f. Reactor Lockout Device Report — Glen Schaaf, B. F. Goodrich

B. F. Goodrich is investigating with the Best Lock Company, a system of manually interlocking valves. This system would be designed to eliminate the possibility of opening a drop valve while the reactor is running. Likewise, it would eliminate the possibility of charging with the drop valve open -- which we do occasionally.

Literature describing a system made by Castell was made available during this session. The idea behind both systems is to have a lock and key system that would force operators to open and close valves in a required sequence. The system could be designed so the operator could never open the drop valve unless the charging valve was locked out. A simple system would be with two valves on a reactor that must not be opened at the same time.



To prevent Valve A and Valve B from being opened at the same time, both valves are locked using the same key. When either valve is open, the key cannot be removed from that valve and the other valve must remain closed.

This system can be made as complex or as simple as you need to control the process. This appears to be something we should investigate.

g. Polypropylene Plant Fire — Darwin Rhoads, Amoco

An explosion destroyed a polypropylene plant at New Castle, Delaware because maintenance employees removed the wrong bolts from a pneumatic valve controller, and the contents of the 10,000 gallon reactor escaped into the atmosphere. See attached OSHA writeup and hazard alert. (Attachment I)

2. Small Reactor Safety Survey Report — Jerry Brumbaugh, General Tire

See Attachment II for summary of this safety survey report.

3. Regulatory Update — John Barr, Air Products; EPA section: Gary Baise, Law Firm of Beveridge & Diamond

a. EPA (our best guess)

The proposed EPA revised VCM standard will be withdrawn, and in its place will be a proposed standard with the following changes:

-- The new standard will not include offsets or a zero goal for VCM emissions.

-- No change on the 10 ppm allowable discharge of vent streams (incinerator discharge)

-- EDC production using oxygen instead of air would be investigated.

-- No change will be proposed on residual VCM in the slurry - present level of 400 ppm will be maintained.

-- Fixed monitoring requirement will be withdrawn from the leak detection program.

-- Will require best available technology (B.A.T.) on leak detection and repair. B.A.T. will be defined by EPA and will be the best system they have seen at PVC plants.

-- Some relief on the requirement to test every reactor opening. No proposal on lowering the reactor opening losses.

-- Do not see any need for further regulation of PVC landfill operations.

b. OSHA

Current OSHA standard will not be changed for 2-3 years until OSHA's carcinogen policy is complete. Cannot use Cost/Benefit for Health standards but must show health effects at present levels.

May be some restrictions placed on union or labor representatives' access to medical records. No further restrictions on the individual's right to see his own records.

4. Hazardous Materials Notification — Harold Dubec, Hooker

Hooker was introducing a new molecular weight modifier (technology purchased from another company) into their plant. The union did not seem upset at the time but later walked out and went on strike. At first the use of this material was not a major issue, then it became the only issue.

Hooker felt it did not properly inform the union personnel of the safety and health concerns with the new material and left themselves open to criticism. Hooker also felt the union used the introduction of this material as a reason for their actions after they had gone out on strike.

Anyway, the news media, OSHA, EPA, and union health experts became involved. After the end of the strike Hooker had 5 OSHA inspectors and 3 EPA inspectors go through the plant, and Hooker received citations from EPA and OSHA.

Hooker stressed the need for communications with the union and the community on the type and amount of chemicals (hazardous or otherwise) handled in a plant.

5. OSHA Respirator Protection — Dave Lull, Diamond Shamrock

Only 3 companies require respirator protection when the monitor registers 1 ppm. All require it when it is at some level higher than this -- 3 ppm or 5 ppm. — How do you determine

Nine companies exclude fertile women from regulated areas, but Diamond has changed its policy and will allow women to work in regulated areas. Air Products has determined they have no reason to exclude fertile women from regulated areas.

6. Operator Training Survey Report — Doug Frey, Diamond Shamrock

See Attachment No. III.

7. Computer Safety Survey Report — Jim Gabbett, Georgia

See Attachment No. IV.

8. VCM Safety Condensation System — B. Terwiesch, Chemische Werke Huls.

A system for condensing the V.C. escaping through a relief valve on a reactor was described. This system is covered by U.S. Patent No. 4004880, dated January 25, 1977. The vapor from a relief valve is vented through a large K.O. tank to a condenser. The condenser is sized so it can handle the maximum flow through the relief valve. The vinyl chloride is condensed and collected as liquid V.C. The cooling water storage is located above the condenser so it will travel by gravity through the condenser. System is designed to be self-sufficient, needs no external energy source.

This is a system of large equipment and high capital investment. It has proven itself in operation in Germany, but I doubt if we could afford this kind of installation.

9. Summary of OSHA/EPA Inspection Questionnaire

See Attachment No. V.

10. Fluid Bed Dryer Explosion and Fire — John McCully, Conoco

During a dryer startup, the inlet air temperature to the plug flow section of the dryer reached 215° C. The dryer was shut down. An exhaust fan was started to purge the HCl from the dryer. Immediately there was a mild explosion and fire inside the plug flow section.

Based on lab tests and other similar experiences Conoco concluded:

-- PVC resin and dry blend decomposition can become exothermic at 185° C when exposed to air at atmospheric pressure. The explosion and fire in the fluid bed dryer probably was an exothermic decomposition of PVC.

11. Vinyl Chloride Rail Car Accident — E. Weekly, Pantasote

A slide presentation of the derailment of VC cars at Point Pleasant was given.

JB:sm

Jerry B.
Jerry Brumbaugh