

Interoffice Communication

To File P-47.3

From W. R. Finch

Date April 25, 1979

Subject Meeting Notes--Relief Valve and Rupture Disc Failures in PVC Plants
(Meeting Held on April 17, 1979)

A meeting was held to discuss relief valve (RV) and rupture disc (RD) failures at our PVC plants. Attending were:

CED

Bob Prescott (RRP)
Boyd Christensen (BAC)
Bill Kitchen (WAK)

PED

Walt Finch (WRF)
Al Peck (ARP)

WRF defined the problem. EPA regulations state that there will be no discharges of VCM to the atmosphere from relief devices except during emergencies which cannot be prevented. It is the intent of Conoco management to be in complete compliance. The Engineering Center is to examine and evaluate any possible improvements in the existing relief system. WRF outlined the history of the problem and had available a letter that the Aberdeen plant had sent the EPA concerning four previous VCM releases. WRF also stated that the Aberdeen plant is going to resubmit an action plan to the EPA as to what they are doing and are planning to do to prevent future RV and RD reliefs. Operational and maintenance factors are important in past VCM releases, but the main thrust of the present work is to design relief systems that do not fail prematurely and that will reseal so as to minimize the size of the VCM release.

ARP described the existing relief systems on the PVC reactors and VCM receivers, noting the sizes and set points of the components in each system. It was also noted that the current available relief area for the PVC reactors is based on historical precedent and that the relief area could not be reduced without considerable study. The factors that would tend to make an RV reseal were discussed. In particular, it was pointed out that, if the relief of a PVC reactor was considered a liquid discharge, the blowdown ring of the RV should be adjusted to the liquid position (if it is not already in this position), which would allow the relief valve to reseal at a higher reactor pressure. WRF explained that a PVC reactor relief was actually a complicated four-phase fluid system (solid PVC particles, liquid water, VCM liquid, and VCM vapor) but that it is predominantly liquid phase. BAC cautioned that an adjustment of the blowdown ring to a liquid position would reduce the "popping" action of the RV (it would open less at small reactor overpressure) and that this suggestion should be studied further before any recommendations are made.

RRP proposed that, as a part of the prevention program, a joint team of MED, CED, and PED examine the problem at the Aberdeen PVC Plant in a meeting designed to address the specific past history of the problem. It was proposed that experts from MED examine the RV and RD maintenance procedures and RD installation procedures at Aberdeen. WAK said he would talk to MED.

BAC discussed the workings of RV's and stated that the standard nozzle type without bellows appears to be well suited for the PVC reactor service. He also said that neither of two leading RV manufacturers (Ferris and Consolidated) had an RV design that was superior for PVC reactor service. Pilot-operated safety valves were discussed, but BAC said that he would be concerned about slurry plugging of the pilot line. BAC also proposed that CED consult with the engineering staffs of Ferris and Consolidated RV manufacturers and the engineering staffs of RD manufacturers such as BS&B (our current supplier) about RV and RD operation in PVC reactor service. BAC also suggested contacting other PVC producers concerning their experience in this area. WRF said that he did not have any contacts with other PVC producers and that these may be hard to set up. Dow may be a possibility.

WRF mentioned that long range plans would probably call for the double rupture disc assembly to be replaced with a rupture disc-relief valve combination. WRF also said that the plant contact at the Oklahoma City PVC Plant is Paul Warner (Senior Process Engineer) and at the Aberdeen PVC Plant is Dick Frohreich (Chief Process Engineer) and that the Aberdeen plant is preparing a file on all RV and RD VCM releases since 1975.

WRF asked that CED take responsibility for the engineering evaluation of relief valves and rupture discs in PVC plants with emphasis on (but not limited to) PVC reactor relief. PED and plant engineering would handle the evaluation of reactor kill systems. WRF said that he is coordinating the EPA Compliance efforts and wanted to work closely with CED in the evaluation.

R&D have been requested to determine a method to prevent the secondary RD or RV from opening upon failure of the primary RD. However, their involvement was not discussed during the meeting. Greg Husen has brought back some failed RD from Aberdeen to give to MED for examination.

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CC:

JHM:CLM:JF:BAF:JPW:LH:FCH:GJH

Attendees

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