

Division of Control
P.O. Box 81, New Highway
Aberdeen MS 39730

On January 19, 1980, at approximately 6:15 p.m., our plant experienced a minor relief valve discharge. Pursuant to the National Emission Standard for Vinyl Chloride (40CFR, Part 61, Subpart F, paragraph 61.65a) we are reporting this incident to your office.

The vessel involved was polymerization reactor D-400. The vessel relieved momentarily thru a 6" x 8" relief valve which had a 6" rupture disc between it and the reactor. The rupture disc was rated at 185 psig at 200°F and 187 psig at 72°F. The relief valve setting was 185 psig. The reactor design pressure is 200 psig at 200°F. The stack from the relief valve is 50 feet above grade.

Regional Administrator
Region IV
United States Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, GA 30308

Dear Sir:

On January 19, 1980, at approximately 6:15 p.m., our plant experienced a minor relief valve discharge. Pursuant to the National Emission Standard for Vinyl Chloride (40CFR, Part 61, Subpart F, paragraph 61.65a) we are reporting this incident to your office.

The vessel involved was polymerization reactor D-400. The vessel relieved momentarily thru a 6" x 8" relief valve which had a 6" rupture disc between it and the reactor. The rupture disc was rated at 185 psig at 200°F and 187 psig at 72°F. The relief valve setting was 185 psig. The reactor design pressure is 200 psig at 200°F. The stack from the relief valve is 50 feet above grade.

The release occurred as reactor batch D-400 - 4544 was being charged. The cause of the release was hydrostatically filling the reactor during the charge. This happened because the rinse water from the previous batch was not completely dumped from the reactor before this batch was charged. The previous batch did not completely drain from the reactor because the dump line was plugged with large chunks of polymer. When this reactor charge was about 87% complete, the panel operator observed the pressure in the reactor was increasing rapidly; the pressure was approximately 110 psig at this time. This rapid increase in pressure indicated the reactor to be full. The panel operator immediately shut off the VCM and water charge pumps. Before the panel operator could put the reactor on the recovery system, the pressure in the reactor reached 182 psig as indicated by the reactor strip chart. At this time, there was a momentary release thru the relief valve. The shift supervisor was outside near the reactor at the time. He heard the release but it was of such short duration that by the time the shift supervisor could turn his head and look up to see what was relieving, the relief valve had reseated. At this time, the shift supervisor closed two water flush streams to the reactor. The combined flow of the flush streams is 0.8 gallon per minute. The pressure in the reactor dropped rapidly when recovery was started on the batch and no more vinyl chloride was released.

DTH 000088127

After the batch was recovered, the water in the reactor from the previous batch and the water from this charge would not dump from the reactor. At this time, it was determined the dump line contained chunks of polymer which prevented the reactor from draining. The chunks were dislodged and removed from the line by back flushing with water.

After the reactor was emptied, the relief valve was tested. The valve was found to relieve at 184 psig and reseated properly. All rupture discs on the reactor were removed and replaced with new discs and the relief valve was re-installed on the reactor.

No personnel were exposed to vinyl chloride from the release. The weather conditions from the plant weather station at the time of the release were as follows:

Barometric pressure 30.14 in. mercury, temperature 50°F,
wind direction N.W. but zero miles per hour at the time.

The amount of vinyl chloride released is estimated to be twenty-four (24) pounds. This is based on a relief valve capacity calculation procedure provided by Farris, the manufacturer of the relief valve. The calculation was based on a two-second release, one percent overpressure of the relief valve and the reactor containing 34% vinyl chloride by volume at the time of the release. A copy of the calculation is attached.

To prevent future discharges of this type, the standard operating procedure has been modified as follows:

1. After reactor rinse is complete, the panel operator will check the reactor agitator ammeter to assure that it indicates no-load on the agitator.
2. The outside operator will check the drain bullseye and indicate to the panel operator there is no flow from the reactor.
3. The panel operator will then put rinse water into the reactor and the outside operator will observe the dump bullseye to determine flow from the reactor is normal and thus will completely drain.
4. The outside operator will continue to observe the bullseye and inform the panel operator when flow stops.
5. The reactor will then be evacuated and charged if the previous steps proceed normally.

If high amperage on the agitator or improper draining are detected, the shift supervisor will be notified and he will further check to assure the reactor is empty before charging.

The reporting requirements of the standard pertaining to relief valve discharges are summarized below for this release:

DTH 000088128

Source: ~~RELIEF VALVE DISCHARGE CAL~~ D-400 Reactor

Nature: ~~D-400 REACTOR~~ Discharge thru relief system on D-400 reactor.

Cause: ~~6:15 P. M. - JANUARY 19 1980~~ Overpressure of D-400 reactor due to overfilling.

Date: ~~RELIEF VALVE DISCHARGE CAL~~ January 19, 1980

Time: 6:15 p.m.

Approximate Discharge: 24 pounds of vinyl chloride.

Method of Determining Discharge: Relief valve calculation

Action Taken to Prevent Discharge:

1. Charge stopped when high pressure observed.
2. Reactor put on recovery system.
3. Flush water to reactor stopped.

Measures Taken to Prevent Future Discharges: Changes to the standard operating procedures.

If there are any questions on this matter, please contact me at (601) 368-8111, Extension 239.

Sincerely,

R. A. Frohreich
R. A. Frohreich
Chief Process Engineer

jf

c: Wayne B. Anderson - Bureau of Pollution Control
BCC: CLM, CRM, JEB, MPB, SJV

DTH 000088129