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July 3, 1986

CONFIDENTIAL

Mr. Jerry Banks, P.E.
Mississippi Department of Natural Resources
Bureau of Pollution Control
P. O. Box 10385
Jackson, MS 39209

VISTA

Dear Mr. Banks:

At approximately 4:50 a.m. on June 27, 1986, our plant experienced an emergency 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. I advised you of this release by phone on June 27, 1986.

The vessel involved was the fresh vinyl chloride (VCM) receiver in reactor Module No. 2. The vessel relieved through a 3"x4" relief valve which had a three-inch diameter rupture disk between the relief valve and the vessel. The relief valve setting was 150 psig and the rupture disk was rated at 150 psig at 72°F.

The amount of VCM discharged to the atmosphere from the relief valve is estimated to be 88 pounds. There was no evidence of a liquid discharge. Therefore, we are reporting the maximum amount of VCM which could have been released, which is the total amount of vapor contained in the receiver at the start of the discharge. The relief valve discharge stack is 45 feet above grade.

The weather conditions at the time of the release according to the plant's weather information instruments were as follows:

Barometric Pressure	-	30.06 inches of mercury
Temperature	-	74°F.
Wind Direction	-	Calm
Wind Speed	-	0 mph
Sky Condition	-	Clear

The first indication of a VCM release was about 4:50 a.m. when a dryer operator called the control room and asked if any of the fixed point monitoring systems were indicating any VCM readings. The operator called because he thought he smelled VCM. The fixed point monitoring systems did not indicate VCM in any area of the plant at this time. An operator from the control room immediately took a portable hydrocarbon detector to the dryer building to determine if VCM was in the area. He found readings of 10 ppm VCM in the area but could not locate the source. Just after the operator left the control room with the portable detector, the 75% level alarm on the new module fresh VCM receiver sounded. Also about this time, the Honeywell fixed point monitors began to indicate VCM in the plant as samples from the various locations were sequentially analyzed.

At this time, the shift foreman and the operators went out into the plant with portable hydrocarbon detectors to determine the source of the VCM emission. No readings greater than 40 ppm VCM could be found and the source of the VCM emission could not be located.

As the search for the source was continuing at about 5:15 a.m., the shift foreman determined the rupture disk under the relief valve on the fresh VCM receiver in Module No. 2 was blown. The relief valve was sweating indicating that it had recently relieved. Since the relief valve was not iced up, it is more likely vapor rather than liquid VCM was discharged during the release. No one saw or heard the relief valve discharging during the search for the source of the VCM emission. Due to the fact that operators were in the general area looking for the source and no one saw or heard the release, this is a good indication the release was of short duration.

The fresh VCM receiver is used as an intermediate storage vessel for the VCM charged into each reactor batch. Prior to the charging of each reactor batch, VCM is pumped from the VCM tank farm to the receiver. The last transfer of VCM from the tank farm to the receiver was completed at about 3:40 a.m. The next reactor charge would have taken place about 5:30 a.m. if the release had not happened.

The transfer of VCM from the tank farm to the receiver is automatically controlled by the level in the VCM receiver. The receiver normally contains 75% VCM prior to a reactor charge. After a reactor charge is started and the VCM level in the receiver is reduced to an indicated level of 61%, the transfer pumps at the tank farm automatically start to pump VCM into the receiver. The rate of charging out of the receiver is considerably greater than the rate of transfer from the tank farm so that during charge the level in the receiver continues to drop. After charge is completed, the level in the receiver begins to increase and the transfer from the tank farm is automatically stopped when the level in the receiver indicates 75% full.

Investigation after the release revealed that the level indicator for the receiver was not functioning properly. Two problems were found with the level indicator. One was the actual level in the receiver was greater than the level indicated and the other was that the level indication for the receiver was periodically fluctuating with a fixed amount of VCM in the receiver. The sensing element for the level indicator is a differential pressure cell.

We believe that the overpressurization of the receiver resulted because of the problems with the level indicator. The receiver contained more VCM than normal because the level indicator was providing an incorrect low reading. We think the level indication fluctuated below 61% and that the sphere transfer pumps automatically kicked on and started transferring VCM into the receiver which already contained a higher than normal amount of liquid. The pressure in the receiver increased to 150 psig before the level indication reached 75% to shut off the transfer pumps and the release occurred.

The inaccurate level indication is substantiated by the fact that an independent high level alarm, which is set at a level higher than the normal operating level of 75%, was coming on before the level indication reached 75%. The control panel operator believed that the signal from this high level alarm was the faulty signal and that the receiver level indication was correct.

A reactor was charged at 6:20 a.m. to reduce the amount of VCM in the fresh receiver and thus lessen the chance of another release due to thermal expansion of the overfilled receiver. The normal procedure of refilling the receiver during charge was not followed so that after the charge there would be a low level of VCM in the receiver. The charging of reactors in this module was held up until an investigation to determine the reason for the release was conducted.

A field test was conducted to test the operation of the level instrumentation and then the VCM receiver was cleared so that the differential pressure cell could be removed and tested in the shop. The differential pressure cell was found to be faulty and a new one was installed on the receiver. Before charging was again started, an interlock was added such that the tank farm pumps cannot run if the high level alarm is activated. Prior to this time, only the 75% level indication was interlocked with the tank farm pumps to prevent overfilling. The relief valve was removed and taken to the shop to check the relieving pressure and the condition of the valve. The relief valve relieved at 146 psig and was in good mechanical condition.

Also prior to the commencement of charging the reactors, the Vinyl Operations Supervisor reinstructed the panel operators in each module on the fresh VCM receiver level and alarm instrumentation. The operators were instructed to cease operations if the high level alarm ever comes on and to determine the cause for the alarm being on. A weekly procedure to check the calibration of the differential pressure cell level indicator with the sight glass level gauge on each fresh VCM receiver was incorporated into the standard operating procedure. Charging was restarted in Module No.2 at 11:45 p.m. on June 27, 1986.

In order to ensure that a similar problem did not exist in the other fresh VCM receiver (Module no. 1), the differential pressure cell on this receiver was also removed and taken to the shop for testing. This differential pressure cell was found to be operating correctly and was reinstalled on the receiver. An interlock was added to prevent the tank farm pumps from running if the high level alarm is activated.

Retraining on the level control and high level alarm systems on each of the fresh VCM receivers was provided for all the control panel operators on the other three shifts as their shifts came back to work.

As an added precaution to prevent another release due to overfilling, a pressure indicator for each of the fresh VCM receivers will be installed in the control room. A high pressure shutdown will also be included to shut the tank farm transfer pumps off to prevent the pumps from running if the receivers reach a certain pressure. These features will be installed by November 1, 1986.

The reporting requirements of the Standard pertaining to the relief valve discharge are summarized below:

Source:	Fresh VCM receiver in Module No. 2.
Nature and Cause:	Overpressuring the receiver with the tank farm transfer pumps because of faulty level indication in the receiver.
Date:	June 27, 1986.
Time :	Approximately 4:50 a.m.
Approximate Size of Discharge:	88 pounds of VCM
Method of Determining Discharge:	Estimate based on the VCM vapor in the receiver at the start of the discharge.
Action Taken to Prevent Discharge:	Relief valve reseated.

Measures adopted to prevent future discharges:

1. Already completed:

   a. New differential pressure cell installed on receiver. (Module No. 2)

   b. Differential pressure cell removed from receiver and tested in the shop. The cell was found to operate properly and was reinstalled on the receiver. (Module No. 1)

   c. Relief valve removed and taken to shop to check relief pressure setting and condition of the valve. (Module No. 2)

   d. Interlocking of the independent high level alarm to prevent operation of the transfer pumps if the alarm is actuated. (Module No. 1 and 2)

   e. Operator retraining. (Module No. 1 and 2)

   f. A weekly procedure to check the calibration of the differential pressure cell level indicator with the sight glass level gauge on each fresh VCM receiver. (Module 1 and 2)

2. Future measures to be taken:

   a. Instrumentation will be installed to provide an indication of the fresh receiver pressure in the control room and associated high pressure shutdown of the tank farm transfer pumps. These modifications to be complete by November 1, 1986. (Module No. 1 and 2)

If there are any questions concerning this report, please contact me at (601) 369-3609.

Sincerely,

R. A. Frohreich

R. A. Frohreich
Director of Environmental Control

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cc: Director, Air, Pesticides and Toxics
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