

HW

DATE: November 24, 1992
TO: L. A. Grady
FROM: J. E. Dye
RE: **FOLLOW-UP MEETING TO VCM RELEASE ON 10-1-92
IN OUR HIGH PRESSURE REBOILER**

Those in attendance:

H. J. Kletke	J. Harris
L. A. Grady	S. Clark
A. D. Simpson	N. Bradford
F. M. Schuler	P. Kane
A. Line	J. Dye

We went over the corrective actions, listed as follows:

- #1 Obtain expert analysis of failed piping.

Done - see attached letter from Bob Jordon.

- #2 Conduct sampling/testing.

Sampling has been done - pH varies 3.5 - 6.0. Material contains no unknowns.

- #3 Implement appropriate changes in materials/operations.

Carbon steel used is OK. We will continue to monitor system. Pipe involved has twice been checked since this incident. No abnormalities have been found. We will check this again during the Christmas shutdown.

- #4 Review Management Systems for design, construction, start-up and operation of new process or changes to existing processes.

Corrosion is now listed on HAZOPS.

- #5 Review emergency spills/releases.

Each foreman will spend some time with Alice Simpson to go over EV-7.

- #6 Review the incident with all department personnel.

This has been done with shift foremen.

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#7 Conduct follow-ups until all corrective actions have been completed.

We will have another meeting in approximately one month.

J. E. Dye

sjm
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To: L. Grady
From: R. E. Jordan

Failure of Reboiler at Louisville Latex

Two items were sent to me for inspection from the SP&C Latex plant in Louisville. The first piece was a section of stainless steel tubing from the upper section of the reboiler in the recovery system. The tubing section was found to have two pin holes that had penetrated the tube and was full of a medium hard and spongy residue. When heated this residue gave off no sign of HCl vapors. No sign of stress corrosion cracking was evident, and it appears that the stainless steel tube had failed due to pitting. Several other pits that had not penetrated the tube were also found. This is a normal mode of failure for stainless steel in the presence of chlorides. It is my understanding that previous to the leaks appearing in the tubing the system had experienced a high temperature episode. It is possible that the hydrochloric acid that caused the pitting failure could have been generated during this period.

The second piece was a section of carbon steel pipe from the bottom of the reboiler. This pipe was seriously corroded in the bottom half where the concentrated liquid would lay. The top portion of the pipe where the vapor would collect did not show any visible signs of deterioration. It is believed that the corrosion of the bottom carbon steel was caused by the same episode as caused the failure of the stainless steel tubing.

The most likely failure sequence was as follows.

1. The high temperatures encountered would first degrade any vinyl chloride and vinyl acetate in the liquid at the bottom of the reboiler into HCl and acetic acid, which would then dissolve in the water to create a mixture of hydrochloric acid and acetic acid. This would cause the rapid corrosion of the carbon steel.
2. The vapors from the mixture in the bottom of the reboiler would condense in the cool section of the stainless steel causing pitting of the tube. No

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