

ETHYL CORPORATION

INTER-OFFICE

To Project File ADDRESS

FROM D. V. Melville ADDRESS

SUBJECT **Project 20281** - VCI Emissions Reduction - EPA DATE July 14, 1978
Item PVC-22, Emergency Vent Prevention

A meeting attended by representatives of PVC Operations, PVC Maintenance, Tech Services, and Engineering was held on July 6, 1978 to develop a program for prevention of emergency vents to the atmosphere from the PVC plant. Present at the meeting were:

R. V. Boyd (Engineering)	J. D. Joseph (PVC Maintenance)
M. R. Dupuy (PVC Maintenance)	D. V. Melville (Engineering)
J. L. Griffin (Tech Services)	E. F. Perkins (Tech Services)
G. W. Johnston (PVC Operations)	F. J. Weimer (Engineering)

Tech Services presented the attached letter dated June 28, 1978 which describes the EPA vent team and covers their recommendations for items of work required to prevent atmospheric vents. In addition to the instrumentation and piping changes to be covered by this project (changes listed below), the attached letter covers maintenance and operating procedures needed to minimize the number of emergency atmospheric vents.

The following is a list of work to be covered by this project:

1. Install a dual cut-off system on the vinyl chloride charge meter systems for both the GJ-3 and GJ-6 autoclaves.
2. Install a back pressure controller on the vinyl chloride charge meter systems for both the GJ-3 and GJ-6 autoclaves.
3. Install new water charge meters in series with the existing autoclave water charge meters.
4. The EPA Vent Team had recommended that the water purge system for the reactor pressure transmitters be modified to ensure that the purge water is flowing whenever the autoclave is running to prevent pluggage of the transmitter lines. However, the decision was reached at this meeting to provide a new purge water supply header to the transmitter pressure leads with a tie-in to the high pressure water system of all other items to ensure an adequate supply of purge water to the transmitter leads at a pressure greater than the operating pressure of the autoclaves.

-2-

5. Purchase a spare pressure safety valve set at 250 psi for the GJ-6 autoclaves.

The work mentioned above will be included in an Engineering Scope letter for Item PVC-22 "Emergency Vent Prevention".

D. V. Melville

/mbt

Attmt.

cc: Messrs. R. M. Carlson
W. E. Martin
R. K. Roy

EC 2468

ETHYL CORPORATION

INTER-OFFICE

DVM

TO: Mr. D. E. Park

FROM: E. F. Perkins

SUBJECT: EPA Vent Team Report

DATE: June 28, 1978

Team Members: R. V. Boyd C. L. Mehl
M. R. Dupuy E. F. Perkins

Purpose

This team was established to identify which atmospheric vents from the PVC plant were caused by instrument or equipment malfunctions, to determine which instruments need repair or replacement to prevent ventings in the future, to develop a list of critical instruments whose failure could result in atmospheric vents and to establish if a preventative maintenance program is needed to help reduce or prevent ventings.

Background

Through June 28, 1978, there have been 79 atmospheric vents that required reporting to the EPA. Of these 31 can be attributed to equipment or instrument malfunction. The vents are categorized as follows:

Injection water or VCM meter malfunction	- 9
Temperature overshoot on heatup (mostly SM-160)	- 7
Limit switch failures on degassing system	- 4
Partially plugged autoclave pressure transmitter lines	- 3
Premature disc rupture	- 3
Premature vent valve opening	- 2
Others	- 3
Total	31

The new autoclave pressure alarm system which is now in service is designed to alarm before the automatic vent valve opens. This system could have (theoretically) prevented 24 of the above vents and as many as 34 of the remaining 48 vents.

In spite of the significant reduction in vent frequency that is anticipated as a result of the autoclave pressure alarm system, additional corrective action seems necessary in light of EPA's definition of an "emergency" discharge (H. G. Bergman to W. C. Strader - 6/16/78). This definition of "emergency" discharge implies that only discharges that result from natural disasters are acceptable and no other causes are acceptable if they could have been prevented. Since virtually all vents could be prevented (ducting all vent points to a recovery system, replacing pneumatic instrumentation with electronic instrumentation, reducing the potential for human error through increased automation, etc.) if cost and economic reality are ignored, this report will deal only with identifying the cause of prior vents and making recommendations to prevent similar vent occurrences in the future.

Vent Analysis

Injection Water or VCM Meter Failure - Both the water injection and VCM meters are high reliability instruments suitable for their present service. Initial failure of these units in the past has been non-routine and non-preventable. Repeated failure of a unit in a short period of time indicates that maintenance of the unit following the initial failure was inadequate rather than an equipment deficiency. In order to prevent future vents as a result of failure of an injection water or VCM meter the following course of action is recommended:

1. Maintain both the controlling and checking VCM meters at all times. Provide additional spare parts as needed so that the check meter is not used as a source of spare parts for the controlling meter. Modify the existing meter system, if necessary, to insure acceptable, simultaneous operation of the control and check meter. Train operating personnel to monitor both meters so that any discrepancy can be identified and appropriate action taken if a mischarge is suspected.
2. Install an additional meter/timer in series with the existing injection water meter to provide increased assurance that the system will turn off at the proper time.
3. When a meter failure occurs as shown by the dual system, the exact cause of the meter failure is to be identified and the meter repaired accordingly.

Autoclave Temperature Overshoot - Since the same instrument tuning is used on all resin types, temperature response on SM-160 during heatup has been inconsistent, resulting in loss of operator confidence in the temperature instrument. This loss of confidence results in the operator putting the TRC in manual (possibility of overshoot because of operator inattention) or accepting temperature overshoot because of poor instrument tuning. To correct the temperature overshoot problem, it is recommended that:

1. All autoclave TRC's should be retuned one at a time so that no overshoot occurs on SM-160. This may result in the need for two sets of instrument settings on each autoclave (one for SM-160, one for all other resins). Proper instrument settings will be documented and will be adjusted when changing resin types as required.
2. Coordination between Maintenance and Operations should be increased so that instrument tuning problems can be identified, documented and corrected before it is severe enough to cause a vent.
3. Spare parts needed by Maintenance to maintain the proper level of TRC tuning should be procured.

Degassing System Limit Switches - Interlocks built into the automatic degassing system that are designed to prevent opening the gasholder to a vacuum source can cause vents from the degassers if limit switches on the gasholder, vacuum pump or barometric condenser valves fail in a "not closed" position. These failures should be reduced or eliminated when the existing gasholder and vacuum pump valves are replaced with ball valves that have more reliable limit switch arrangements. These valves should be installed before 8-31-78. In addition to the new valves it is recommended that:

1. The limit switches on the degasser, vacuum pump and barometric condenser valves be inspected on a weekly basis by Maintenance to identify potential mechanical problems.

Partially Plugged Pressure Transmitter Lines - If the leads to the autoclave pressure transmitter plug, erroneous pressure reading can result in premature vent valve openings. To reduce the chance of partially plugged leads it is recommended that:

1. The water purge system on the pressure leads be modified to ensure that the purge water is on whenever the autoclave is running.

Premature Disc Rupture - As a result of repeated cleaning or cycling, autoclave rupture discs occasionally fail below their rated range. If the pressure relief valve is set substantially below the disc rupture setting a vent could occur. To minimize this occurrence it is recommended that:

1. The pressure relief valves (PSV's) on autoclaves with 270 psig disc ratings be reset from 225 psig to 250 psig.
2. That an additional PSV be purchased and set at 250 psig as a spare so that both a 225 psig and 250 psig spare will be available.

General

In addition to the above recommendations that apply to specific vent occurrences, it is recommended that the following items be implemented:

1. That vent related maintenance be established as a high maintenance priority item.
2. That more complete maintenance records be kept on items that fail and cause vents or near vents.
3. That abnormal operation be identified and investigated before actual failure so that vents will be avoided.
4. That a team be established to investigate vent occurrences (and close calls) so that the cause of the vent can be accurately determined and proper corrective action initiated.

EFP

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