



## Interoffice Communication

To R. A. Conrad  
From M. J. Allen  
Date August 31, 1983  
Subject Administrative Actions to Prevent  
Relief Valve Discharges

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A study was conducted to examine the causes of past relief valve liftings in vinyl chloride service and to determine possible administrative actions which would help prevent future relief valve discharges. Some administrative actions evaluated include tagging of selected valves, a check out form for equipment in vinyl chloride service, warning signs on pump start buttons, etc. Based on the study, it is recommended that warning signs be installed on the start button of five pumps in vinyl chloride service with the potential for creating an overpressure condition. In addition, it is recommended that annual relief valve training sessions be upgraded to supplement the reinforcing effect of counseling and add to the Plant's training program. The training sessions will be conducted by the Operations Department following a monthly safety meeting.

The study showed that the relief valve discharge prevention methods used by the VCM Plant, including the Caustic Decanter Containment system and present administrative actions, account for 82.3% of past relief valve incidents. The addition of the warning signs and annual relief valve training sessions will increase the prevention statistic towards the goal of 100%.

In addition to this study of possible additional administrative actions, the Process Engineering Department will be conducting a specific study concerning thermal relief valve discharges.

Attached is a detailed discussion of the administrative action study including a breakdown of the causes of each past relief valve incident. If you have any questions or comments, please contact me at 5128.

M. J. Allen  
Process Engineer

br  
cc: JWW-RB-MLA-DLD-ESW-JCL-MGH-PE

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## Relief Valve Lifting Prevention Study

A study was conducted to examine the cause of each relief valve lifting in vinyl chloride service since January 1977, the present actions which are taken to prevent recurrences, and possible additional administrative actions to prevent future releases. The causes have been arranged into three general groups: Valve Misalignments, Nitrogen in Equipment, and other. Below is a breakdown and discussion of each group.

### Valve Misalignments

Seven relief valve incidents, or 41.2% of all relief valve incidents since January 1977, were caused by valve misalignments. Four incidents involved the Check Tanks, two incidents involved the Flake Caustic Dryers, and one incident involved the Vinyl Column.

The six incidents which involved valve misalignments at the Check Tanks and Flake Caustic Dryers all resulted in relief valve liftings on the Caustic Decanter (S-206) and /or the Flake Caustic Dryers (S-207 A&B). The Caustic Decanter Containment System was installed in November 1982 and now eliminates discharges to the atmosphere from these three vessels (both S-206 and S-207 A and B relieve into the containment vessel). Nonetheless, some additional administrative actions were considered to supplement the containment system. A valve tagging procedure on the rundown line to the Check Tanks and a check out form for switching Flake Caustic Dryers were investigated. But because the end result of these two types of valve misalignments (i.e. a discharge to the atmosphere from S-206, S-207 A and B) is now prevented by the containment system, these redundant administrative actions are unnecessary. The containment system's "track record" is 2 for 2 in successfully preventing a discharge to the atmosphere (May 8, 1983 and August 23, 1983).

The third type of valve misalignment involved the Vinyl Column. During startup of the column, a pump was started to inventory the column with vinyl. A misaligned valve on the feed line to the column caused the feed line to pressure up and a relief valve to lift. The outside operator was counseled on the correct procedures he had been trained to perform. In addition, a survey was made of all pumps in vinyl chloride service to determine the deadhead pressure of each pump and the relief valve set pressure of the relief valves downstream of each pump. The results of the survey show seven pumps with the potential for lifting a relief valve: the Vinyl Column Feed Pumps (P-203 A/B), the Vinyl Column Reflux Pumps (P-204 A/B), and the Vinyl Transfer Pumps (P-401 A/B) in series with the Vinyl Rework Pump (P-415).

The Vinyl Column Reflux Pumps have the potential to lift the relief valve on the Caustic Decanter. Because the containment system protects S-206 from relieving to the atmosphere, no action is required for the reflux pumps. However, a warning sign on the start button of the five remaining pumps (feed pumps, transfer pumps, and rework pump) should be installed as a reminder to re-check the valve line up before starting the pump (see next page). This action serves not only to prevent an identical incident on the vinyl column, but also to prevent a relief valve incident with a similar underlying cause in other areas of the plant.

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WARNING: CHECK VALVE LINE-UP BEFORE STARTING PUMP  
TO PREVENT A POSSIBLE VCM RELIEF VALVE DISCHARGE

## Nitrogen in Equipment

Three relief valve incidents (17.6% of total) were caused by nitrogen in equipment. Two incidents involved N<sub>2</sub> in the Check Tanks, and one involved N<sub>2</sub> in the Cracking Furnaces.

The end result of both cases with N<sub>2</sub> in the Check Tanks was a relief valve lifting on the Caustic Decanter. Again, the containment system now eliminates this source of discharge and requires no further redundant action. Following the Cracking Furnace incident, a new procedure was instituted to purge the Cracking Furnaces of N<sub>2</sub> before startup. This procedure has been successful in preventing a relief valve lifting of the same type.

## Other

Seven relief valve incidents (41.2%) were caused by the unique occurrences included in this group. The causes in this group include a manufacturing defect, mechanical failure of equipment, thermal expansion, and failure to properly adjust a controller.

The two incidents caused by a manufacturing defect, one incident due to mechanical failure of equipment, and one of the relief valve liftings due to failure to properly adjust a controller resulted in relief valve liftings on S-206 and/or S-207 A and B. The containment system now eliminates this source of discharge regardless of the cause and, therefore, requires no further action.

The second relief valve lifting due to the incident of failing to properly adjust a controller resulted in a lifting on the Vinyl Column. The operator was counseled on the cause of the incident, proper operation of the controller, and how to prevent a recurrence.

The remaining two incidents were caused by thermal expansion. As a result of the first case of thermal expansion, a new line packing procedure was instituted along with installation of a thermal relief valve which relieves to the storage spheres. In the second case of thermal expansion, the operator was counseled on the cause of the incident and how to prevent a recurrence. These measures have been successful in preventing relief valve liftings of the same type.

The table below summarizes the three general groups:

| CAUSE                       | Form of Prevention |                           |            |
|-----------------------------|--------------------|---------------------------|------------|
|                             | Containment System | Administrative Action (1) | Counseling |
| Valve Misalignments         | 35.3%              | 0%                        | 5.9% (2)   |
| N <sub>2</sub> in Equipment | 11.7%              | 5.9%                      | 0%         |
| Other                       | 23.5%              | 5.9%                      | 11.8%      |
|                             | 70.5%              | 11.8%                     | 17.7%      |

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- (1) Administrative actions include new procedures, methods, checklists, etc.
- (2) In addition to counseling, warning signs will be placed on the start button of five pumps in vinyl chloride service.

The present prevention methods used by the VCM Plant, including the containment system and administrative actions, account for 82.3% of the relief valve incidents. With the addition of warning signs to the five pumps in vinyl chloride service with the potential for creating an overpressure condition, the prevention statistic increases to 88.2% (82.3 + 5.9). The remaining 11.8% due to unique occurrences are prevented by counseling of the operator. It is the VCM Plant's philosophy that a thorough training program is an effective procedure to prevent relief valve discharges due to employee inattention. Therefore, it is recommended that annual relief valve release avoidance training sessions be added to the plant's existing training program and to supplement the reinforcing effect of counseling. The training sessions, conducted by the Operations Department following a monthly safety meeting, should cover the causes of past relief valve incidents along with action steps to prevent a recurrence to be used in day-to-day operation of the plant.

CONSENT DECREE ADMINISTRATIVE  
MEASURES

I. Operator Training

A) New Hires

1) For new hires training, a structured training program of 112 hours during the first three weeks of employment is conducted. This program focuses on many different areas related to plant operation.

2) Day Two (2) of the program consists of a detailed environmental overview (4 to 6 hrs.) of the plant focusing mainly on:

a) Relief Valves and Liquid Full Systems

- 1) Anatomy and purpose of relief valves
- 2) Liquid full systems (ie: S-206 and the check tanks) and operation of the Caustic Decanter Relief Valve Containment System.
- 3) Thermal reliefs: situations to avoid; purpose
- 4) Relief valve inspection log
- 5) Tour unit to point out above mentioned items
- 6) Discussion of past releases, their cause, and preventive measures taken

b) Incinerator Activities

- 1) Communications
- 2) BL-410 - venting while loading
- 3) Venting of hoses and lines
- 4) BL-412 operation & purpose
- 5) Tour unit to point out above mentioned items
- 6) Discussion of past bypasses, their cause, and appropriate preventive measures taken

c) Comprehensive Test on the Environmental Subject Matter Covered and Section Tests on Other Subjects Covered

## d) Document Training for File

B. Experienced, Permanent Employees

- 1) For permanent experienced employees, 8 hours of review training annually to cover such items as:
  - a) Relief valve release avoidance
  - b) Incinerator bypass prevention and proper communications as it relates to their job, including discussions of past bypasses (including bypass incidents identified pursuant to Section III.A of the Consent Decree and those initiated by incinerator flame failure due to excessive vent flow occurring during loading of ships), their cause, and appropriate preventive measures
  - c) Emergency Situations
    - 1) Situations of emergency will be covered along with safety meetings as "Emergency Drills". Emphasis on the environmental aspects of a situation will be stressed (1 hr./session).
    - 2) Power failure "First Action Steps" will be developed for each job classification and a training session scheduled annually (1 hr./session).
    - 3) Steam outage "First Action Steps" will be developed and training sessions held annually (1 hr./session).
    - 4) Nitrogen outage "First Action Steps" will be developed and training sessions held annually (1 hr./session).
    - 5) Proper response procedures should impurities be introduced into reactor feeds (i.e. off spec chlorine) will be covered annually (1 hr./session).

C) Operator Progression

- 1) Operators who are promoted from one classification to the next will be tested on job functions along with environmental aspects of their new assignment.
  - 2) Safety Certification at each level will have points focusing on environmental matters.
- D) All training will be documented and will include employee names, dates, subject matter covered and any important

points addressed during the training. Documentation will be retained for at least 2 years.

## II. Operating Procedures

- A) The operating manual for the VCM Plant will be updated to include a section on environmental awareness concerns.
- B) Unit operators and supervisors will receive specific notice of any major change in plant equipment or operating procedures affecting their unit.
- C) New procedures, when written will be added to the appropriate operating manuals (ongoing). New procedure discussions will be held on shift as required.
- D) Prior to startup, critical procedures that could have environmental impact will be reviewed with the operators (ie: removing nitrogen from C-202 before furnace startup).
- E) Charts listing relief valve set pressures will be available in the main control room to aid operators during abnormal situations.
- F) Prestartup checklists for critical operating columns will be developed to include:
  - 1) Purge requirements
  - 2) Potential upsets or things to watch for
  - 3) Listing of cookbook steps to bring on line
- G) Incinerators when brought on line following major maintenance will be placed in standby for 24 hours before introducing vent streams. This will allow for proper checkout of the unit in a standby mode.
- H) Procedures for actions to be taken in emergency situations (e.g., automatic oxychlorination section shutdown and failure of the HCl Column condenser refrigeration system) to minimize emissions from the HCl Column overhead will be incorporated in the operating manual.

## III. Inspections and Preventive Maintenance

The program is designed to cover all equipment in vinyl chloride service and also the vent incinerators. The program includes inspection and fixed maintenance schedules which would be used to detect conditions which could lead to potential environmental excursions involving relief valves or the incinerators. The program consists of but will not be limited to:

- A) Weekly inspection of incinerator combustion air control system to include air readouts, oxygen sensors and cascaded controllers.

- B) Daily inspection of rotating equipment for proper oil levels, bearing temperature and noise levels.
- C) Bi-monthly inspection of incinerator burner inserts for corrosion and pluggage.
- D) Quarterly inspection of product sphere and rundown tank pressure, level and alarm instrumentation.
- E) Quarterly inspection and check of column instrumentation to include alarm checks.

1) C-203, Vinyl Column

- a) Overhead pressure transmitters and alarms
- b) Bottoms and condenser level transmitters <
- c) Temperature controllers on the column steam < reboiler

2) C-202, HCl Column

- a) Overhead pressure transmitters and alarms; to include vent valves to incinerator and C-500
- b) Seal tray level and temperature control transmitters and alarms

3) S-206, Vinyl Caustic Decanter

- a) Pressure and level transmitters
- b) S-203, Relief Valve Collection Pot, pressure transmitters

- F) The safety check program will be used before startups (as needed).
- G) Relief valve maintenance P.M. program (to coincide with plant turnarounds).
- H) Incinerator Blower controls P.M. (semi-annual).
- I) Vessel inspection program (set schedule on certain vessels and others to coincide with turnaround). 
- J) The caustic dryer pressure drop will be routinely observed and complete dryer washouts will be done as required.
- K) Annual checkout of incinerator instrumentation to include:
  - 1) Shutdown devices and setpoints
  - 2) Flame arrestor instrumentation

Records of inspection and preventive maintenance activities will be retained for at least 2 years. Such records shall include the following information:

- 1) Date on inspection/maintenance activity
- 2) Equipment/instrument identification

- 3) Reason for inspection/maintenance activity (i.e., scheduled, failure, or other)
- 4) Results of inspection and/or description of maintenance performed

#### IV. Miscellaneous

##### A) Incident Investigation

- 1) Investigation - a formal investigation by a team of employees (Operations Supervisor, Environmental Coordinator and others as needed) will be conducted following each incident involving an environmental matter. The investigation will include a detailed report of the incident including future preventative actions to be taken.
- 2) Counseling - special counseling of operators (documented) will be conducted following any incident involving an environmental concern.

##### B) New Projects and Designs

- 1) Designs - designs associated with the VCM Plant will include an "Environmental Checklist" and a statement regarding the "Environmental Impact" of the design on the unit.
- 2) New Projects - following installation of new and/or replacement equipment, the various departments in the plant will conduct a "Safety and Environmental Audit" of the installation before startup.
- 3) Leak Checking - vessels and equipment will be leak checked and/or hydrotested before being placed on line.

##### C) Documentation and Followup

- 1) Environmental Reporting Manual - a manual including procedures and proper documentation for environmental matters will be formulated and revised as needed.

##### D) Maintenance Department

- 1) Communications between departments will be stressed at monthly safety meetings and during safe work permit issuance.
- 2) For permanent maintenance employees, 8 hours of annual training covering environmental matters, e.g., incinerator bypass prevention as it relates to their job, including discussions of past bypasses (including bypass incidents identified pursuant to Section III.A. of the Consent Decree and those initiated by incinerator flame failure due to

excessive vent flow occurring during loading of ships), their cause, and appropriate preventive measures, will be conducted.

- E) Training - all training sessions and related items in the environmental area will be accompanied with written documentation to be retained for at least 2 years. A policy statement by the Plant Manager, emphasizing the importance of a trained and knowledgeable plant maintenance and operating staff to an effective vinyl chloride compliance program, will be presented at each training session.
- F) Followup - a checking procedure to assure environmental compliance will be developed and reviewed monthly. The checklist will include present requirements and near future requirements so that scheduling can be arranged.

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JUN -6 1984

ESTELA WACKERBARTH

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U. S. DISTRICT COURT  
WESTERN DISTRICT OF LOUISIANA

FILED

JUN -1 1984

IN THE UNITED STATES DISTRICT COURT FOR  
THE WESTERN DISTRICT OF LOUISIANA  
LAKE CHARLES DIVISION

ROBERT H. SHENWELL, CLERK

BY ma  
DEPUTY

UNITED STATES OF AMERICA

VS.

CONOCO, INC.

CIVIL ACTION NO. 83-2518

FOR THE UNITED STATES

Messrs. & Mesdames  
Henry Habicht, II  
Ruthann McQuade  
U. S. Dept. of Justice  
Washington, D.C. 20530

Joseph S. Cage, Jr.  
U. S. Attorney  
Claude W. Bookter, Jr.  
3B12 Federal Bldg.  
500 Fannin Street  
Shreveport, LA 71101

Jan Horn  
U. S. Environmental  
Protection Ag. Reg. VI  
1201 Elm Street  
Dallas, TX 75270

Elliott Gilberg  
U. S. Environmental  
Protection Agency  
401 M Street, S.W.  
Washington, DC 20460

FOR THE DEFENDANT

J. Berry St. John, Jr.  
Liskow & Lewis  
P. O. Box 52008  
Lafayette, La 70505

Estela Wackerbarth  
P.O. Box 2197  
Houston, TX 77252

Robert Brager  
Beveridge & Diamond  
1333 New Hampshire Ave.,  
N.W., Washington, DC 20036

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RULING ON DEFENDANT'S MOTIONS  
FOR SUMMARY JUDGMENT OR FOR A STAY OF LITIGATION

The United States, at the request of the Administrator for the Environmental Protection Agency ("EPA"), filed a complaint against defendant Conoco, Inc. alleging violations of the emission standards for Vinyl Chloride ("VC") under the Clean Air Act at its plant in Westlake, Louisiana. Conoco moves for summary judgment on all claims or, in the alternative for a stay of litigation on 18 of the United States' 20 claims since two other cases involving the same issue are now before the Fifth Circuit Court of Appeals. The United States opposes any stay and argues that issues of material fact exist on its remaining two claims, making summary judgment inappropriate. After hearing oral argument on May 9, 1984, and analyzing the parties' submissions and applicable caselaw, the court stays litigation on the claims involving issues presently before the Fifth Circuit and grants Conoco summary judgment concerning the remaining two claims.

Briefly stated, the United States alleges that Conoco's plant discharged VC into the atmosphere from relief valves on equipment in VC service on some 14 occasions between 1978 and 1983 in violation of 40 C.F.R. § 61.65 (a) and 42 U.S.C. § 7412 (c). The complaint also charges that Conoco failed to report 4

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of these discharges within a ten-day period under the same regulations. Conoco contends that § 61.65 (a) is a work practices standard (requiring the use of certain techniques to limit emissions) rather than a maximum emissions standard, per se. Therefore, as their argument goes, EPA had no authority in 1976 when § 61.65 (a) was implemented, to promulgate such work practices until the Clean Air Act was so amended in 1977. See, e.g., Adamo Wrecking Co. v. United States, 434 U.S. 275, 287-89 (1978). Conoco further states that if § 61.65 (a) is not an emission standard and its purpose is to determine work practice violations, the 10-day reporting requirement is ineffectual and is so intertwined with the invalid portion of the regulation as to forbid enforcement. See Spokane Arcades, Inc. v. Brockett, 631 F.2d 135 (9th Cir.), aff'd. 454 U.S. 1022 (1981). The United States counters that 42 U.S.C. § 7607 (b) deprives this court of jurisdiction to determine whether or not § 61.65 (a) is an emission standard.

In any event, issues identical to the instant litigation are currently before the Fifth Circuit in United States v. Ethyl Corp., No. 83-3537 and United States v. Occidental Chemical Corp., No. 83-3656. These consolidated cases relate directly to 18 of the United States' claims in this matter. Consequently, it is in the interests of judicial economy that this litigation be stayed. See Landis V. North American, 299 U.S. 248, 253-55

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(1936). The United States, nonetheless, contends that a stay will work damage to the public's interest in the environment since additional relief valve discharges and incinerator bypasses indicate a continuing problem at the Westlake facility. The court invites the United States to amend its complaint to add any additional alleged violations which have occurred prior to our present ruling.

Next, some comments on Conoco's remaining alleged two violations are in order. It appears that no existing caselaw addresses the claims the United States makes as to these two discharges. In any event, the court finds that the facts are not in dispute. Thus, this court need only make a legal determination as to these facts under F.R.Civ.P. 56.

The September 11, 1980 discharge occurred when the "B" flake caustic dryer, which is used in series with the "A" flake caustic dryer to reduce the concentration of water in VC prior to testing it for finished product specifications and storing it for shipping, was taken off line, emptied of VC, nitrogen purged, and opened for recharging with flake caustic. Residual nitrogen vapors are then vacuumed out of the dryer with the "Supersucker," an industrial vacuum. Conoco's established procedures require the operator to close the two valves to the Supersucker prior to putting the dryer back on line to receive VC. On this date, however, the operator failed to close the valves to the

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Supersucker. Consequently, when the dryer was put back on line and VC reintroduced, the liquid VC was discharged onto the plant floor, which quickly changed into a gas and escaped into the atmosphere.

The November 3, 1981, discharge occurred under different circumstances. All major VC monomer vent streams (except the oxychlorination vent) were ducted to an incinerator to control the VC monomer emissions to the atmosphere to a concentration of less than 10 ppm. Before entering the incinerator, each vent stream flows through a knockout pot, which separates out entrained liquid from the gas going to the incinerator. Two high pressure protection systems, located at the exit of each knockout pot, protect the incinerator from over pressure. These systems are ducted separately to the C-500 vent scrubber, which vents to the atmosphere.

On the instant November date, Conoco detected a leak when a routine C-500 vent gas sample showed a VC monomer concentration of 3862 ppm and a second sample yielded 4602 ppm. Ultimately, Conoco found that the leak was caused by corrosion of the rupture disc in the vent line on the knockout pot exit of the wet vent header on the incinerator. Conoco then replaced the disc with a nickel, non-corrosive element.

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Basically, the United States charges that Conoco's two VC releases violated, among other possible regulations, 40 C.F.R. § 61.63 (a), which states in pertinent part:

Vinyl Chloride formation and purification:  
The concentration of vinyl chloride in all exhaust gases discharged to the atmosphere from any equipment used in vinyl chloride formation and/or purification is not to exceed 10 ppm except as provided in § 61.65 (a). ...

As to the September 11, 1980 incident, Conoco argues that the Supersucker is not involved in the formation and/or purification of VC and/or that only liquid, final-product VC was spilled, thus not constituting an exhaust gas. Alternatively, Conoco argues that this discharge is subject only to regulations concerning fugitive emissions. (See discussion, infra). The United States counters that exemption of the Supersucker from any formation and/or purification status would be analogous to allowing outfall pipes to release gases in circumvention of the spirit of EPA's regulations. It also argues that any liquid VC quickly changes to a gas at 7°C and thus becomes an exhaust gas.

As to the November 3, 1981 discharge, Conoco argues that the escaping gases left the system before entering the exhaust gas incinerator and/or tower and that, in any event, the gases were fugitive emissions under the meaning of 40 C.F.R. § 61.65 (b).

Section 61.65 (b) explicitly regulates fugitive emissions and consists primarily of work practices which are

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