

FILE

To: R. A. Conrad

From: Near Miss Investigation Team
Date: August 6, 1987

Interoffice
Communication

Subject: Near Miss Investigation
Light Ends Vent Line

VISTA

INCIDENT SUMMARY

On July 13, 1987, Industrial Construction Company was contracted to make revisions to the light ends tankcar vent system at the loading rack. The revisions were required to provide a vent for loading EDC tankcars.

On Monday morning, July 13, a shift supervisor, Clarence Landon, and a mechanical engineer, Guy Bergeron, reviewed the light ends vent system revisions at the loading rack and identified the location where the vent line was to be cut. The revisions required that the 2 inch vent line be cold cut and that two flanges be installed to allow the tie in for the EDC tankcar vent. While reviewing the job requirements with the contractor, Guy identified the old VCM tankcar unloading/recycle line as the one to be cut. This line was located adjacent to the light ends vent line and was the same size. The operations department prepared the light ends vent line for the revisions and at 2:00 p.m., during an unscheduled oxy shutdown, industrial construction requested a work permit to revise the light ends vent line. The shift supervisor issued the work permit. The old VCM unloading line was cut without incident and it was not until the contractor attempted to establish a nitrogen purge on the line that the mistake was discovered. Following consultation with the on-duty shift supervisor, the correct line was cut and the job was completed without incident.

CONCLUSIONS

Opening and/or revising any process equipment requires good planning, proper equipment preparation and good communications. Cutting into the wrong process equipment can cause serious injury, product release and/or fire and explosion. Present operating procedures dictate that the shift supervisor or chief operator approve and issue all safe work and hot work permits in

CWH 000009678

the VCM Plant. Responsibilities include assuring that the equipment to be worked on is properly prepared and safe for the intended work. There are no documented requirements that process equipment be physically marked prior to work being performed on the equipment. Physical identification (Marking) of the light ends tankcar vent line during the planning phase of the job would have prevented the later mistaken identification of the line, and therefore prevented the near miss incident.

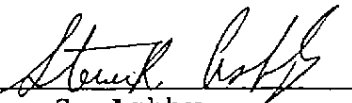
RECOMMENDATIONS

The investigation team recommends the following action steps be taken to prevent a similar incident and improve the VCM Plant's overall job safety program:

1. Develop a workable operating procedure for physically identifying specific work locations on process equipment. The goal of the procedure will be to assure that specific work locations are marked on the equipment during the job planning phase of the work.
2. Establish a team to evaluate the potential benefits of identifying and labeling process piping in the VCM Plant. The team should evaluate and make recommendations related to the feasibility, benefits, and methods for accomplishing a project of this magnitude.


C. Landon


G. Bergeron


S. Ashby

dra (43)

cc PEM, SCR, JRH

Respiratory Protection Policy

Purpose

The purpose of this procedure is to establish a respiratory protection policy at the Lake Charles VCM Plant. The policy will establish a standard for the selection, maintenance, training, inspection and use of respiratory protective equipment at the VCM Plant.

Scope

This procedure establishes the methods for selection and use of respiratory protective equipment which will be used for normal and emergency situations. This equipment includes air line respirators, self contained breathing apparatus, dust masks, and emergency escape devices.

References

- A. Code of Federal Regulation, Title 29, Part 191D, Subpart I, 1910.134, Respiratory Protection.
- B. ANSI Z88.2-1980, Practices For Respiratory Protection

Policy

It is the policy of the Lake Charles VCM Plant that employee exposure to airborne contaminants such as dust, fumes, and harmful gases will be controlled primarily by acceptable engineering controls and good work practices. When these controls are not feasible, while they are being implemented, or during emergency situations, appropriate respiratory protection equipment will be used.

Program Responsibilities

Management Responsibilities

- A. Vista will provide the appropriate approved respiratory protective equipment to protect the health of the employee.
- B. Training in the use, limitations, maintenance, and inspection of respiratory protective equipment will be provided.
- C. An appropriate fit testing program will be provided for those employees who may be required to use respiratory protective equipment other than emergency escape devices.

- D. An annual evaluation of the Respiratory Protection Program will be performed.

Employee Responsibilities

- A. The employee shall use the respiratory protective equipment provided in accordance with the instructions and training received.
- B. The employee will protect the equipment against damage and report any malfunction or defect of that equipment to his/her Supervisor and the Safety Department.
- C. The user must fit test the equipment in the prescribed manner each time it is used.
- D. Ask his/her Supervisor or the Safety Department should any questions arise concerning the proper use of or limitations of that equipment.

Medical Status For Respirator Use

The Vista Medical Director shall determine what physical and psychological conditions are pertinent for the safe wearing of respiratory protective devices. The Medical Director will determine which medical tests are appropriate for the evaluation of respirator users and will review the respirator user's medical status on an annual basis. Employees shall not be assigned to tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment.

Selection of Respiratory Protective Equipment

- A. General
1. The type of respiratory hazard, including physical and chemical properties, toxicity, concentration of material and warning properties, must be considered before respiratory equipment is selected.
 2. Each employee who uses a respirator shall become familiar with the various types of respiratory protective equipment and their limitations, as the conditions encountered may range from nuisance odors or irritation to those which are immediately dangerous to life.
 3. Each employee who uses a respirator shall be responsible for selecting the proper respiratory protective equipment. When uncertainty exists as to the nature or concentration of the contaminant present, or what type of protection is needed, the

employees Supervisor or the Safety Department shall be contacted.

4. A guide to aid in the proper selection of respiratory equipment for the most common atmospheres that may be encountered in the VCM Plant is shown in Appendix A. The equipment listed (or equipment giving a higher degree of protection, if desired) shall be used. Questions concerning unusual circumstances should be referred to the Safety Department.

B. Classification of Respiratory Hazards

The following are general classifications for atmospheres containing specific contaminants, see Appendix C.

1. Oxygen-Deficient Atmospheres

For the purpose of this procedure, any atmosphere that tests lower than 19.5% oxygen is considered to be oxygen-deficient. Non-emergency (planned situations) entry into oxygen-deficient atmospheres will not be permitted without a written work plan and the written approval of the plant manager. Where oxygen-deficient situations occur, alternate means of performing the task should be found if possible. All safety precautions outlined in Appendix B must be followed when entry into oxygen deficient atmospheres is required.

2. Immediately Hazardous Atmospheres

Entry into atmospheres which are immediately hazardous to health will not be permitted without a written work plan and the written approval of the plant manager. Alternate methods of decontaminating the hazardous atmosphere shall be pursued. All safety precautions outlined in Appendix B must be followed when entry into an immediately hazardous atmosphere is required.

3. Contaminated Atmospheres - - Not Immediately Hazardous Atmospheres

Respirators used in these areas must be selected based on the contaminant present and the concentration in which it is present. Consult Appendix A for specific respirator selection criteria.

Use of Respiratory Protective Equipment

A. Face Mask Sealing Standard

1. Respiratory protection equipment will not be worn when any condition prevents a good face to mask seal. Such conditions may include anything that contacts the sealing surface or that could interfere with the mask's valve function. Specifically, these conditions will be caused by facial hair (beards), long sideburns, absence of dentures, or temple pieces on glasses. Any condition which prevents getting an effective seal must be corrected before a respirator can be worn.
2. As a matter of policy, ALL Vista plant employees may be required to use self-contained or other respirators, either in the course of their normal job duties or in emergency situations. Therefore, no Lake Charles VCM Plant employee will be permitted to have facial hair (beards) or other hair that could come in contact with the sealing surfaces of a respirator.
3. Contractors and service companies who regularly have their employees working in the Lake Charles VCM Plant must see to it that all those employees do not have facial hair or other hair that could come in contact with the sealing surfaces of a respirator.
4. Visitors, service representatives, vendors, delivery personnel and others who enter the Lake Charles VCM Plant on a transient and non-frequent basis will not be permitted to have facial hair or other hair that could come in contact the sealing surfaces of a respirator if the work they do will require the use of a respirator.
5. No glasses with temple pieces that pass through the sealing surfaces will be worn with full face respirators. Contact lenses will not be worn in the plant under any circumstances.

Training

- A. For the safe use of any respiratory protective equipment, it is essential that the user be properly instructed in its selection, use and maintenance.
- B. Users shall receive fitting instructions which include:
 - 1. Demonstrations and practice in how the respiratory protective equipment should be worn.
 - 2. How to adjust the equipment.
 - 3. How to determine if it fits properly.
 - 4. Wearing it in normal air and in a test atmosphere for familiarity purposes.
- C. When evaluating whether the employee is wearing the respirator as it was originally designed, all of the following shall be considered:
 - 1. The respirator and all functional parts including straps must be in place and worn in the appropriate positions.
 - 2. All straps shall be secure.
 - 3. Modification to the respirator or straps shall not be evident.
 - 4. The employee using a respirator must test its fit each time it is put on. The respirator fit can be checked by the following method.
 - a. Negative Pressure Test:

Close off the air inlet by placing the palm over the breathing tube or crimping the air line supplying the regulator. Inhale gently so that the facepiece collapses slightly and hold the breath for approximately 10 seconds. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the fit of the respirator is considered satisfactory.

5. Supervisors shall be responsible for assuring that all employees are properly instructed in the use of emergency respiratory protective equipment used in the VCM Plant.
6. After initial training in the use of respiratory protective equipment, a periodic evaluation of the employees ability to use that equipment must be made and refresher training must be conducted when required. In general, respirator training should be conducted on an annual basis and SCBA (Self Contained Breathing Apparatus) training should occur on a 6 month basis for those employees who may be required to use that equipment in an emergency.
7. All respiratory protection training will be documented and the records will be maintained by the VCM Plant Safety Department.

Respirator Fit Testing

- A. Two fit test methods have been developed to satisfy the OSHA test atmosphere requirement. These are:

1. Qualitative Fit Test: Tests the quality of the fit and comfort of the face piece. It is a subjective test relying on the detection of a specific odor inside the face piece.
2. Quantitative Fit Test: Quantifies the actual leakage of a respirator seal by measuring the level of contamination inside the face piece.

In both of these tests it is implied by the OSHA requirements that facial hair must not be present in the sealing area of the respirator.

- B. Respirator Fit Test Practice

On a routine frequency of 3 years, employees who may be required to use respirators will be given a quantitative respirator fit test. The initial testing will be performed in 1985. A specialty contractor will be used to perform the test.

- C. As an interim measure, all new employees will be given a qualitative fit test using an acceptable test protocol in the plant. This will be done for both temporary and permanent employees who may be required to wear a respirator.

Types of Respiratory Protective Equipment

A. Dust, Fume, and Mist Respirators

1. Mechanical filter respirators offer protection against air-borne particulate matter including dust, mists, metal fumes and smoke.
2. Mechanical filter respirators do not provide protection against gases, vapors, or oxygen deficiency.

B. Positive Pressure Air-Supplied Respirators

1. Positive pressure air supplied respirators provide protection against gases, vapors or other respirable contaminants.
2. Positive pressure air supplied respirators may only be used in atmospheres immediately dangerous to health or which are oxygen deficient if they are used in conjunction with a self contained auxiliary air supply (Egress Bottle) as outlined in Appendix B.

C. Self-contained Breathing Apparatus (SCBA)

1. Self-contained breathing apparatus utilizes compressed breathing air and will provide protection in any atmosphere regardless of contamination or oxygen deficiency. Other protection may be required for the skin, depending on circumstances.
2. When anticipating the use of this apparatus, consideration shall be given to the service life of the cylinders. Although this equipment should provide breathing air for approximately 30 minutes, exertion or emotional strain may reduce the rated time.
3. Users of this equipment shall immediately begin exiting the hazardous atmosphere when the low pressure alarm sounds.
4. Whenever compressed air apparatus is used in an atmosphere immediately dangerous to life, a lifeline shall be attached to the person using the apparatus and a standby man or men shall be present in a safe location with suitable rescue equipment.

D. Emergency Escape Respirators

1. These devices are intended for emergency escape from an affected area only.
2. Two type of emergency escape respirators are used in the VCM Plant:
 - A. Mouth bite cartridge type respirators are to be carried by all plant employees when entering any area of the plant, except offices and Laboratory areas.
 - B. Self contained emergency escape respirators (ELSA Units) with a pull over mask and high pressure air supply. This type device provides approximately a 5 minute air supply.

Maintenance and Care of Respiratory Protective Equipment

A. Inspection for Defects

1. All respiratory protective equipment shall be inspected routinely before and after use by the person who will use the respirator.
2. Routine inspection of SCBA and self contained emergency escape devices will be coordinated by the Safety Department. Each inspection will be documented and the records will be kept in the Safety Department.
3. Breathing air cylinders shall be maintained at a minimum of 1900 pounds pressure except while being depleted during use. The regulator and any warning device shall be tested during inspections to determine if they function properly.
4. Inspection of equipment shall include a check of the tightness of connections and the condition of the facepieces, headbands, valves connecting tubes, hoses and regulators. Rubber or elastomer parts shall be inspected for pliability and signs of deterioration.

B. Repair of Respiratory Protective Equipment

1. Repairs shall be made only by authorized trained persons. Equipment needing repair should be returned to the Safety Department.

2. No attempt shall be made to replace components or to make adjustments or repairs beyond the manufacturer's recommendations.
3. Reducing or admission valves or regulators shall be returned to the manufacturer or to a trained technician for adjustment or repair.

C. Storage of Respiratory Protective Equipment

1. Respiratory protective equipment shall be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture or damaging chemicals.
2. Respiratory protective equipment placed in work areas shall be stored in clearly marked compartment which are quickly accessible at all times.
3. Respiratory protective equipment shall be stored so that the facepiece and exhalation valve will rest in a normal position and function will not be impaired by the elastometer becoming set in an abnormal position.

To insure an effective respiratory protection program, the VCM Plant Safety Department will periodically monitor and evaluate various operations to assure that respiratory protective equipment is properly selected, used, cleaned and maintained. This evaluation will be used to determine the effectiveness of the respiratory protection training program.

Author: _____

Steven R. Auld
Safety Director

Approved: _____

Plant Manager

APPENDIX A

APPROPRIATE PROTECTIVE EQUIPMENT FOR RESPIRATORY HAZARDS

Recommended Protective Equipment	RESPIRATORY HAZARDS			
	Oxygen Deficiency (Escape & Rescue)	Gas or Vapor Contaminants		Particulate Contaminants
		Immediate Dangerous To Life or Health	Not Immediately Dangerous To Life or Health	Immediate Dangerous To Life or Health
1) Supplied Breathing Air System	Yes ¹	Yes ¹	Yes	Yes ¹
2) Self Contained Air Mask Systems ⁴ (30 Minute Scott Air Pac).	Yes	Yes	Yes	Yes
3) E.L.S.A. Escape Mask	No	Yes ²	Yes ²	Yes ²
4) Chemical Cartridge Mouthbite	No	Yes ³	Yes ³	No
5) Dust Mask	No	No	No	No

NOTES:

1. Must be used in conjunction with self contained egress bottle.
2. To be used for emergency escape only.
3. Respirator is approved for chlorine and HCL contamination for emergency escape purposes only.
4. Self contained breathing apparatus (Scott Pak) is provided for use in emergency situations only.

CMH 000005689

Appendix B

There will be times during normal operations when employees will be required to use respirators for entry into atmospheres immediately dangerous to life or health. When respirators are required for entry into atmospheres immediately dangerous to life or health (toxic or oxygen deficient atmosphere), at least one standby person shall be present in a safe area. The standby person shall have the proper equipment available to assist the respirator wearer in case of emergency. Communications (visual, voice, signal line, telephone, radio or other suitable means) shall be maintained between the standby person and the respirator wearers. If feasible, respirator wearers in atmospheres immediately dangerous to life or health shall be equipped with safety harnesses or belts and safety line to permit them to be removed from the dangerous atmospheres to safe areas if necessary, or equivalent provisions for the rescue of the respirator wearers from the dangerous atmospheres will be used.

All confined spaces shall be considered to be immediately dangerous to life or health unless proven otherwise. Before a person is allowed to enter a confined space, all lines (piping) to vessel, tank, column etc. will be blinded (blanked) or disconnected. All electrical driven moving equipment will be locked out, only low voltage lights will be used inside and tests will be carried out to determine the concentration of any known or expected flammable or toxic contaminant present and to determine the concentration of oxygen. A person shall not be allowed to enter a confined space without wearing the proper type of respirator if the concentration of any air contaminant is above the permissible time weighted average concentration for toxic substances, or if an oxygen deficiency (less than 19.5%) exists. Even if the concentrations of air contaminants in a confined space are found to be below the established limits and sufficient oxygen is present, the safest procedure is to continuously ventilate the enclosed space and to continuously monitor the concentration of air contaminants and oxygen concentration if persons are to work in the confined space without respirators. Entry into confined spaces will not be allowed if tests indicate the contaminant is present in concentrations above 5% of the lower explosive limit (LEL).

An air-line type supplied-air or a hose mask type supplied-air respirator may be worn by a person in a confined space only if tests indicate that the atmosphere in the confined space contains adequate oxygen and if concentrations of air contaminants are below levels that are immediately dangerous to life or health. If the results of monitoring the atmosphere in a confined space, prior to the entry of a person into the space, shows that the atmosphere is immediately dangerous to life or health, then a person who is required to enter the confined space shall wear either a positive pressure self-contained breathing apparatus or a combination positive pressure airline respirator with an auxiliary self-contained air supply (egress bottle).

Appendix C

Respirator Selection For
Specific Contaminants

Contaminant (For Atmospheres Not Immediately Dangerous to Health and Not Oxygen Deficient)	Supplied Air Respirator	SCBA	Particulate Respirator
Vinyl Chloride Monomer	Yes	Yes ¹	No
Ethylene Dichloride (EDC)	Yes	Yes ¹	No
Chlorine	Yes	Yes ¹	No
Light Ends, Heavy Ends	Yes	Yes ¹	No
HCL (Or Other Acid Gases)	Yes	Yes ¹	No
Oxy Catalyst Dust	Yes	Yes ¹	Yes ²
Flake Caustic, Bauxite Dust	Yes	Yes ¹	Yes

NOTES:

1. To be use for emergencies and as outlined in Appendix A.
2. For normal work situations use 3M Dust Helmet.