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From: S. R. Ashby
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Subject: Safety Procedures
Confined Space Entry

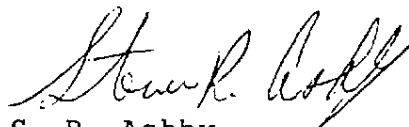
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VISTA

The attached Confined Space Entry Procedure has been revised in its entirety. This revised procedure should be placed in the Safety Procedures section of your Safety and Health Manual, and any previously issued Confined Space Entry Procedure should be removed from the manual.

All plant employees must be thoroughly familiar with the requirements for confined space entry. Each supervisor should review and discuss this procedure as soon as possible during departmental safety meetings.

If there are any questions concerning the Confined Space Entry Procedure, please contact me.



S. R. Ashby

kf

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Procedure Placed in Safety & Health Manual _____
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by _____
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Please Return to Safety Department.

CWH 000008187

Effective Date _____
Revised _____
Approved By RA Connel
Plant Manager

CONFINED SPACE ENTRY PROCEDURE

I. Purpose

The purpose of this procedure is to establish a confined space entry procedure at the Lake Charles VCM Plant. This procedure will establish the minimum safety precautions to be followed when entering a confined space.

II. Definitions

"Confined Space" - a confined space is defined as any enclosed space in which a potentially harmful atmosphere could exist, such as a vessel, drum, tower, or ditch greater than 5' in depth.

III. References

- A. Code of Federal Regulations, Title 29, Part 1910, Subpart Q, 1910.252(d)(4), welding, cutting, brazing.
- B. ANSI Z 117.1: Working in tanks and confined spaces.

IV. General

Entry into confined spaces may present several potential hazards to workers. The atmosphere in a confined space may contain an insufficient amount of oxygen, may be explosive, or may contain toxic materials. In addition to these problems, workers could be exposed to hazardous chemicals should a valve fail, or electrocution should a ground fault occur in an electrical system used in a confined space. Those personnel working in confined spaces, and those who supervise such work must be aware of each of these hazards and those hazards which might develop in order to assure proper precautions are taken. Although the degree of the hazard may vary with different situations, in all cases the potential hazards must be evaluated by the Operations Department Supervisory personnel, and acceptable safety control measures established. This procedure attempts to outline the

method for establishing these safety control measures. However, good judgement should always be exercised.

V. Required Permits

A properly approved VCM Plant hazardous work permit shall be required for any entry into a confined space, regardless of the amount of time to be spent in the confined space.

VI. Isolation of the Confined Space

A. General - entry into any tank, vessel, or other confined space shall not be allowed until the space is properly isolated from all process or utility services. Lines entering a confined space shall be isolated at the point where the line is connected to the confined space. If isolation at this point is not possible the isolation shall be at a point as close to the confined space being entered as possible.

B. Methods - the following methods, listed in order of preference, shall be the only acceptable methods of isolation used for personnel entry:

1. Blinds shall be installed to isolate all process and utility lines opening into the space to be entered. Closed valves alone shall not be considered sufficient protection.

a. Blind Pressure Rating. Blinds used to isolate confined spaces shall have a pressure rating at least equivalent to the maximum potential pressure of the process or service line it isolates. Blinds must be suitably resistant to the materials they must contain.

b. "Steam-Out" Blinds. When used to steam clean a space, steam-out blinds shall not be held in place by substandard methods such as welding rods or unattached spacers. Any spacer used in conjunction with a blind shall be welded to the face of the blind.

2. Alternate Method - as an alternate to blinding, the line may be physically disconnected, with the following precaution. In such cases, flat caps or plugs, impervious to the

material in the line, shall be placed to assure that contamination cannot enter the confined space from the open line or other lines.

VII. Atmosphere and Residual Contents Checks

- A. General - unless tests prove otherwise, flammable, and/or toxic mixtures shall be assumed to be present in all tanks which have contained or have been exposed at any time to flammable or toxic materials. In addition, an oxygen deficiency can easily be present in any confined space. An oxygen deficiency can occur in a closed metal container, such as a tank which has been closed for a long time, as a result of oxygen consumption from rusting.
- B. Evaluation - prior to any entry into a confined space, the atmosphere and the residual contents of the space must be evaluated with regard to:
1. Fire/Explosive Vapor - an approved combustible gas-meter shall be used to determine the quantity (% of lower explosive limit is indicated) of explosive gases or vapors present in the space.

No person shall be permitted to enter or remain in a confined space that registers more than 5% of the lower explosive limit on the meter.
 2. Chemical Exposure - tests shall be made to determine the concentration of toxic chemical contaminants in the confined space atmosphere. This test, along with the oxygen deficiency test, will determine the respiratory protection required. Such tests will be conducted by the Operations Department and Laboratory.
 3. Oxygen Deficiency Testing - tests to determine the oxygen concentration in air shall be made with an approved oxygen percentage meter. Entry into confined spaces containing insufficient oxygen (19.5% or less) should be avoided if possible. If it becomes necessary to enter a confined space under such conditions, special precautions must be taken. These must include:

- a. All provisions of section C.1. must be followed.
- b. An approved air supplied respirator with escape air bottle shall be used.
- c. Thorough, on site instruction to personnel performing the entry, and to the manway watch.
- d. A safety harness and tag line, with a tag line tender (may be same as manway watch) outside of the vessel at all times, shall be used. Wristlet safety lines should be used in tight places and are acceptable for most entry jobs.

C. Classification of Respiratory Hazards

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 A must be followed when entry into an oxygen-deficient atmosphere 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 A 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 guidelines established in the VCM Plant Respiratory Protection Policy, No. VCM 005.

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- D. Residual Contents - a confined space, tested before or after being cleaned, may be found vapor-free. However, if it contains sludge or scale, flammable or toxic vapors may be released as soon as the sludge or scale is disturbed. No confined space shall be considered free from the possibility of dangerous vapors as long as sludge or scale exists. Such conditions must be evaluated by Operations Department Supervisory personnel.

VIII. Manhole Watch

- A. A manhole watch shall be provided whenever personnel are working in a confined space. This manhole watch shall understand his duties and shall be equipped with some means of notifying the Control Room in the event of an emergency. A two way radio shall be used unless other acceptable means of communications can be established.
- B. The specific duties of the manhole watch shall be as follows:
1. The manhole watch shall not leave his position while personnel are in the confined space.
 2. The manhole watch must remain in a position such that he can properly monitor the activities inside the confined space.
 3. The manhole watch must have capability of warning inside personnel of hazardous situations which might develop.
 4. The manhole watch shall have in use adequate protective equipment to protect him from any exposure that may exist at the entrance, and shall have on hand adequate protective equipment for entry should an emergency occur.
 5. The manhole watch shall not enter the confined space, except in an emergency situation, and then only after protective equipment has been donned and emergency assistance has arrived at the site.
- C. Standby Emergency Equipment - emergency respiratory equipment, equal or greater in protection to that equipment required for entry is required at the entrance to the confined space for any hazardous atmosphere entry. Means shall always be provided for the manhole watch to quickly contact the Control Room for emergency assistance if needed. A two way radio shall be used unless

other suitable means of communications can be established.

IX. Ventilation

- A. Proper and adequate ventilation shall be provided for all work in confined spaces to assure that trapped vapors or fumes from work such as welding do not build up. Air moving equipment should be arranged to pull air through (not blow air through) the confined space. Plant air shall not be used to ventilate confined spaces, except to power ventilation equipment.
- B. Whenever possible, at least two openings, as remote from each other as practical, should be provided.
- C. Mechanical air moving equipment, when used, shall be rated for N.E.C. Class I, Division II explosion proof, electrical service, or shall be powered by compressed air (Lam Air Mover).
- D. Compressed air type air movers shall be equipped with a bonding wire and clamp. The bonding wire shall be attached to the confined space at all times.

X. Electrical Equipment

- A. All electrical power and equipment used inside metallic confined spaces shall be "low voltage" (36 volt maximum), or must be protected by a ground fault circuit interrupter.

XI. Welding and Cutting in Confined Spaces

- A. Special precautions must be taken when welding or cutting operations must be performed in confined spaces.
 - 1. Compressed gas cylinders, except those containing breathing air, shall not be allowed inside confined spaces.
 - 2. All oxy-acetylene and inert gas hoses must be removed from the confined spaces, or the hoses must be disconnected at the cylinder regulator during breaks or other non-working periods.

3. Arc welding leads and hoses for oxy-acetylene must be checked by the welder and his leadman prior to use in a confined space. Leaks in hose, or poor insulation on leads, shall be repaired prior to use.
4. Welding machines shall be shutdown if leads are to be left in the confined space.
5. Welding will not be allowed if explosive meter shows other than zero % of the lower explosive limit (LEL), or if combustible sludge or scale exists in the tank.
6. Confined space welding may require a supplied air respirator if ventilation does not adequately remove welding fumes.
7. An approved 30 pound dry chemical extinguisher shall be provided at the entrance to the vessel.
8. Any jobs which could increase flammable gas levels in the space must be discontinued until the entry/weld job is complete.

XII. Safe Access/Egress

- A. In all cases, adequate and safe access shall be provided for normal and emergency entry and egress into the confined space. The means for entry/egress must be in place throughout the duration of the job.
- B. Personnel should not be lowered into confined spaces, if at all possible, without facilities to climb back out themselves.
- C. Personnel shall not be required to go into an opening that they must squeeze through, as they cannot be removed quickly in an emergency.

XIII. Lifelines

Approved lifelines shall be used for confined space entries which involve hazardous atmospheres. Where an employee must enter a confined space, containing a hazardous atmosphere, through a manhole or other small opening, means shall be provided for quickly removing him/her in case of an emergency. When using safety belts or harnesses and lifelines for this purpose, they shall be attached to the employee's body so they cannot become jammed in a small opening. Wristlet safety lines are preferred for this service.