

CONFINED SPACES**DEFINITION AND ENTRY PROCEDURES:****PERMIT SYSTEM**

The permit is an authorization and approval in writing that specifies the location and type of work to be done, and certifies that all existing hazards have been evaluated by the qualified person, and necessary protective measures have been taken to ensure the safety of each worker.

QUALIFIED PERSON

A person designated by the employer, in writing, as capable (by education and/or specialized training) of anticipating, recognizing, and evaluating employee exposure to hazardous substances or other unsafe conditions in a confined space. This person shall be capable of specifying necessary control and/or protective action to ensure worker safety.

THE TEN BASIC RULES FOR CONFINED SPACE ENTRY:

- 1) **Planning sessions by qualified person.**
 - A) **Definite time and date of entry.**
 - B) **Work to be accomplished.**
 - C) **Designated Personnel.**
 - D) **Hazard Assessment.**
 1. **Listing all materials stored/used in space.**
 2. **Research on Hazardous properties or combinations of by-products.**
 - E) **Methodology of operation.**
 1. **Cleaning.**
 2. **Purging.**
 3. **Ventilating.**
 4. **Safe work practices.**
 - F) **Backup safety procedures.**
 1. **First aid.**
 2. **Showers/Decontaminations.**
 3. **Rescue equipment.**
 - G) **Pre-Entry session time and date**
 - H) **Commitment for safe work practice.**

- 2) **Test of Atmosphere.**
 - A) **Evaluation Testing**
 - B) **Verification Testing**
 - C) **Duration of Testing**
 - D) **Stratified Atmospheres**

- 3) Ventilation.
 - A) Drawing air out of space.
 - B) Blowing air into space.
 - C) Explosion proof equipment required.

- 4) Training the personnel.
 - A) Emergency entry/exit procedures.
 - B) Use of applicable respirators.
 - C) First Aid/CPR.
 - D) LockOut/TagOut procedures.
 - E) Rescue/Training drills.
 - F) Applicable safety equipment.

- 5) LockOut/TagOut
 - A) Blind flanging of pipes.
 - B) Electrical.
 - C) Mechanical.

- 6) Stand-by people/communication.

- 7) Tools and equipment.

- 8) Entry permit.

- 9) Continuous monitoring of atmosphere.

- 10) Record keeping.
 - A) Training.
 - B) Safety drills.
 - C) Inspection of equipment.
 - D) Test results of atmosphere.
 - E) Maintenance of equipment.

The following INSERT, pages 3 - 22, contains "Confined Space Entry" (Appendix A)

SOURCE: OSHA Part 1926, CONSTRUCTION SAFETY & HEALTH COMPLIANCE

OSHA 1926 CONSTRUCTION MANUAL

Confined Space Entry

Introduction	3
Confined Space and Construction	3
Contractors	3
Existing Regulations	4
How Can You Identify A Confined Space?	7
Limited Openings for Entry and Exit	7
Unfavorable Natural Ventilation	8
Not Designed for Continuous Worker Occupancy	8
Examples of Confined Spaces	9
What Are The Hazards?	10
Hazardous Atmospheres	10
Testing The Atmosphere	13
Procedures for Atmospheric Testing	13
Ventilation	14
Isolation	15
Respirators	16
Attendants	18
General Physical Hazards	19
Recommendations For Safe Entry—A Checklist	20

OSHA 1926 CONSTRUCTION MANUAL

Introduction

Most every workplace presents some kind of hazards — exposure to fire or explosion, toxic chemicals, moving machinery — but when these hazards are encountered inside a confined space, the risk to workers is compounded many times.

OSHA has determined that asphyxiation is the leading cause of death in confined spaces, and that atmospheric hazards cause most confined space asphyxiation fatalities. However, atmospheric hazards are not the only causes of asphyxiation fatalities in confined spaces. Confined space workers confront significant risks of death, injury, or impairment of health due to the following conditions:

- Atmospheric hazards
 - a. fatalities in asphyxiating atmospheres
 - b. fatalities in toxic atmospheres
 - c. fatalities due to flammable or explosive atmospheres
- Fatalities from engulfment
- Fatalities due to mechanical hazards
- Fatalities among untrained rescuers

Confined Space and Construction

OSHA has recently finalized a standard (1910.146) for confined space entry which applies to general industry. The new standard became effective April 15, 1993. It will not apply to construction, however, since confined space entries for construction employees pose conditions that are unique to the industry. The general industry standard may, however, apply to construction companies that perform confined space work at industrial sites.

Contractors

Paragraphs (c)(8) and (9) of the standard require every contractor performing work at a general industry site to have a permit-required confined space program in place.

Paragraph (c)(8) specifies that when a host employer arranges to have employees of another employer perform work that involves permit space entry, the host employer must inform the contractor that the workplace contains permit spaces and that permit space entry is only allowed through compliance with a permit space program meeting the requirements of the confined space standard. The need for the contractor to have the permit-required confined space program in place is implicit in this specification.

OSHA 1926 CONSTRUCTION MANUAL

To make the contractor's entry into the permit-required space safer, the host employer must also:

- Provide to the contractor information on the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space.
- Provide to the contractor information on any precautions or procedures that the host employer has implemented in or near permit spaces where contractor employees will be working.
- Coordinate entry operations with the contractor, when both employers' employees will be working in or near permit spaces.
- Debrief the contractor at the conclusion of entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

Paragraph (c)(9) states that in addition to complying with the permit space requirements that apply to all employers, contractors must:

- Obtain any available information regarding permit space hazards and entry operations from the host employer.
- Coordinate entry operations with the host employer, when both host employer personnel and contractor personnel will be working in or near permit spaces.
- Inform the host employer of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.

Construction employers likely to be affected most by this standard include HVAC installation and maintenance companies, electrical contractors, and any other contractors performing services, maintenance, or repair work in a permit-required confined space on a general industry site.

Existing Regulations

Some confined space entry restrictions are already built into the 1926 Regulations. Some examples of the construction confined space regulations are:

1926.21(b)(6)—Safety Training and Education

(i) All employees required to enter into confined or enclosed spaces shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of protective and emergency equipment required. The employer shall comply with any specific regulations that apply to work in dangerous or potentially dangerous areas.

(ii) For purposes of paragraph (b)(6)(i) of this section, "confined or enclosed space" means any space having a limited means of egress, which is subject to the accumulations of toxic or flammable contaminants or has an oxygen deficient atmosphere. Confined or enclosed spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventila-

OSHA 1926 CONSTRUCTION MANUAL

tion or exhaust ducts, sewers, underground utility vaults, tunnels, pipelines, and open top spaces more than 4 feet in depth such as pits, tubs, vaults, and vessels.

1926.154—Temporary Heating Devices

(a) Ventilation. (1) Fresh air shall be supplied in sufficient quantities to maintain the health and safety of workmen. Where natural means of fresh air supply is inadequate, mechanical ventilation shall be provided.

(2) When heaters are used in confined spaces, special care shall be taken to provide sufficient ventilation in order to ensure proper combustion, maintain the health and safety of workmen, and limit the temperature rise in the area.

1926.350(b)—Gas Welding and Cutting

(4) Cylinders containing oxygen or acetylene or other fuel gas shall not be taken in to confined spaces.

1926.352(g)—Fire Prevention

For the elimination of possible fire in enclosed spaces as a result of gas escaping through leaking or improperly closed torch valves, the gas supply to the torch shall be positively shut off at some point outside the enclosed space whenever the torch is left unattended for a substantial period of time....Open end fuel gas and oxygen hoses shall be immediately removed from enclosed spaces when they are disconnected from the torch or other gas-consuming device.

1926.353(b)—Ventilation and Protection in Welding, Cutting, and Heating Welding, cutting, and heating in confined spaces.

(1) ...Either general mechanical or local exhaust ventilation meeting the requirements of paragraph (a) of this section shall be provided whenever welding, cutting, or heating is performed in a confined space.

(2) When sufficient ventilation cannot be obtained without blocking the means of access, employees in the confined space shall be protected by air line respirators...and an employee on the outside of such a confined space shall be assigned to maintain communication with those working within it and to aid them in an emergency.

1926.651—General Requirements

(g) Hazardous atmospheres. (1) Testing and controls. In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50 - 1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22m) in depth.

(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. There pre-

cautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.

(iii) Adequate precaution shall be taken such as providing ventilation to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the lower flammable limit of the gas.

(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(2) Emergency rescue equipment. (i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

(ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

§ 1926.956 (a) and (b)—Underground Lines

(a) *Guarding and ventilating street opening used for access to underground lines or equipment*

(2) Before an employee enters a street opening, such as a manhole or an unvented vault, it shall be promptly protected with a barrier, temporary cover, or other suitable guard.

(3) When work is to be performed in a manhole or unvented vault:

(i) No entry shall be permitted unless forced ventilation is provided or the atmosphere is found to be safe by testing for oxygen deficiency and the presence of explosive gases or fumes:

(ii) Where unsafe conditions are detected, by testing or other means, the work area shall be ventilated and otherwise made safe before entry;

(iii) Provisions shall be made for an adequate continuous supply of air.

(b) *Work in manholes.* (1) While work is being performed in manholes, an employee shall be available in the immediate vicinity to render emergency assistance as may be required. This shall not preclude the employee in the immediate vicinity from occasionally entering a manhole to provide assistance, other than emergency. This requirement does not preclude a qualified employee, working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of inspection, house-keeping, taking readings, or similar work if such work can be performed safely.

(2) When open flames must be used or smoking is permitted in manholes, extra precautions shall be taken to provide adequate ventilation.

(3) Before using open flames in a manhole or excavation in an area where combustible gases or liquids may be present, such as near a gasoline service station, the atmosphere of

OSHA 1926 CONSTRUCTION MANUAL

the manhole or excavation shall be tested and found safe or cleared of the combustible gases or liquids.

Other confined space requirements may be found throughout *Subpart S (1926.800-1926.804 Underground Construction, Caisson, Cofferdams and Compressed Air.)*

General information defining what a confined space is and how to minimize the danger of working in one follows.

How Can You Identify a Confined Space?

If you are required to construct or work in a:

BOILER
CUPOLA
DEGREASER
FURNACE
PIPELINE
PIT
PUMPING STATION
REACTION OR PROCESS VESSEL
SEPTIC TANK
SEWAGE DIGESTER
SEWER
SILO
STORAGE TANK
SHIP'S HOLD
UTILITY VAULT
VAT

or similar type enclosure, you are working in a confined space.

A confined space is a space which has any one of the following characteristics:

- Limited openings for entry and exit
- Unfavorable natural ventilation
- Not designed continuous worker occupancy.

Limited Openings for Entry and Exit

Confined space openings are limited primarily by size or location. Openings are usually small in size, perhaps as small as 18 inches in diameter, and are difficult to move through easily. Small openings may make it very difficult to get needed equipment in or out of the spaces, especially protective equipment such as respirators needed for entry into spaces with hazardous atmospheres, or life-saving equipment when rescue is needed. However, in some cases openings may be very large, for example, open-topped spaces such as pits, degreasers, excavations, and ships' holds. Access to open-topped spaces may require the use of ladders, hoists, or other devices, and escape from such areas may be very difficult in emergency situations.

OSHA 1926 CONSTRUCTION MANUAL

Unfavorable Natural Ventilation

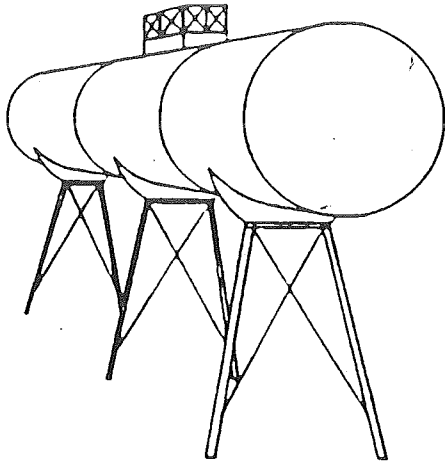
Because air may not move in and out of confined spaces freely due to the design, the atmosphere inside a confined space can be very different from the atmosphere outside. Deadly gases may be trapped inside, particularly if the space is used to store or process chemicals or organic substances which may decompose. There may not be enough oxygen inside the confined space to support life, or the air could be so oxygen-rich that it is likely to increase the chance of fire or explosion if a source of ignition is present.

Not Designed for Continuous Worker Occupancy

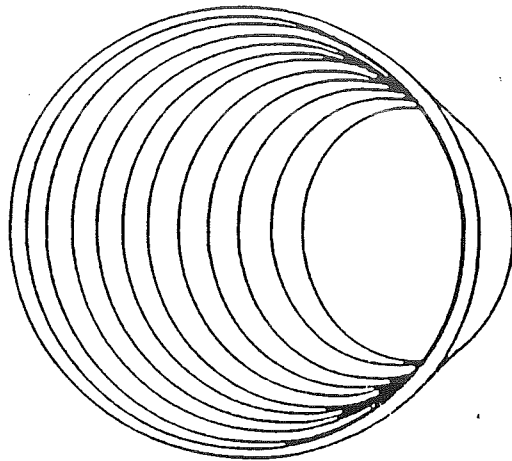
Most confined spaces are not designed for workers to enter and work in them on a routine basis. They are designed to store a product, enclose materials and processes, or transport products or substances. Therefore, occasional worker entry for inspection, maintenance, repair, cleanup, or similar tasks is often difficult and dangerous due to chemical or physical hazards within the space.

A confined space found in the workplace may have a combination of these three characteristics, which can complicate working in and around these spaces as well as rescue operations during emergencies. If a survey of your working area identifies one or more work spaces with the characteristics listed above, **READ THE FOLLOWING INFORMATION — SOMEDAY IT MAY SAVE YOUR LIFE, OR THE LIFE OF A CO-WORKER.**

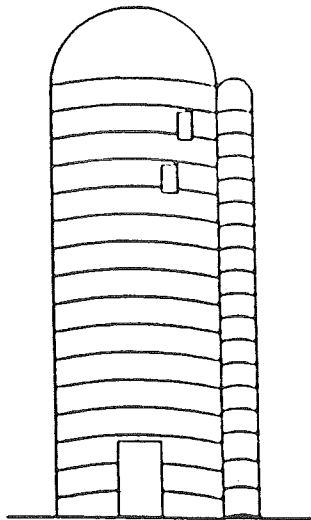
OSHA 1926 CONSTRUCTION MANUAL



Storage Tank

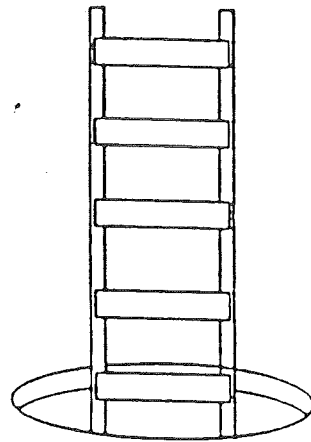


Pipeline

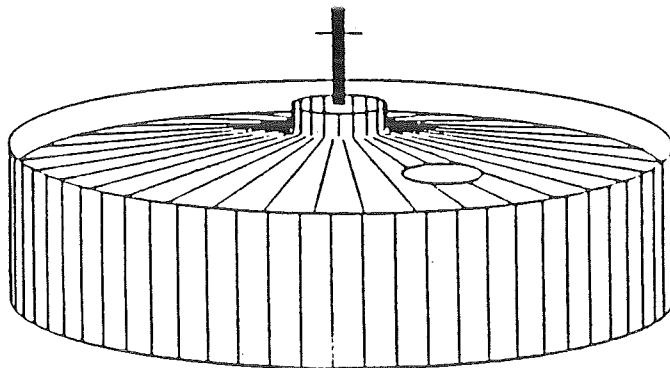


Silo

Examples of Confined Spaces



Manhole



Digester

OSHA 1926 CONSTRUCTION MANUAL

What Are The Hazards Involved In Entering and Working In Confined Spaces?

Hazardous Atmospheres

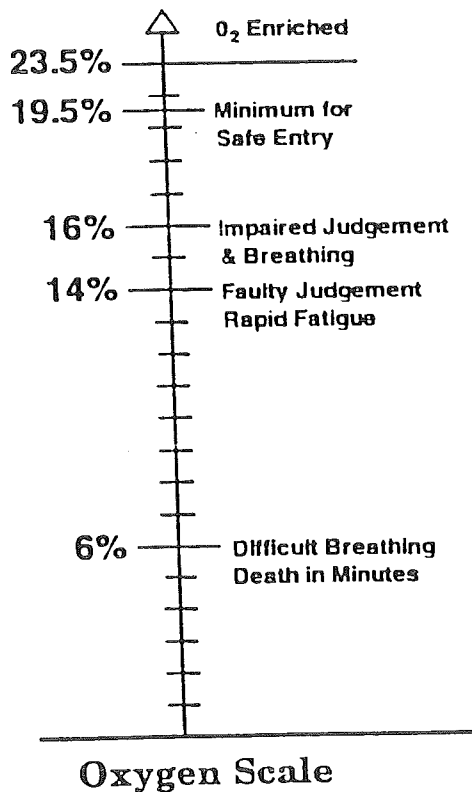
As mentioned, the atmosphere in a confined space may be extremely hazardous because of the lack of natural air movement. This characteristic of confined spaces can result in: 1) Oxygen-deficient atmospheres, 2) Flammable atmospheres, and/or 3) toxic atmospheres.

Oxygen-Deficient Atmospheres

An oxygen-deficient atmosphere has less than 19.5% available oxygen (O₂). Any atmosphere with less than 19.5% oxygen should not be entered without an approved self-contained breathing apparatus (SCBA).

The oxygen level in a confined space can decrease because of work being done, such as welding, cutting, or brazing; or, it can be decreased by certain chemical reactions (rusting) or through bacterial action (fermentation).

The oxygen level is also decreased if oxygen is displaced by another gas, such as carbon dioxide or nitrogen. Total displacement of oxygen by another gas, such as carbon dioxide, will result in unconsciousness, followed by death.

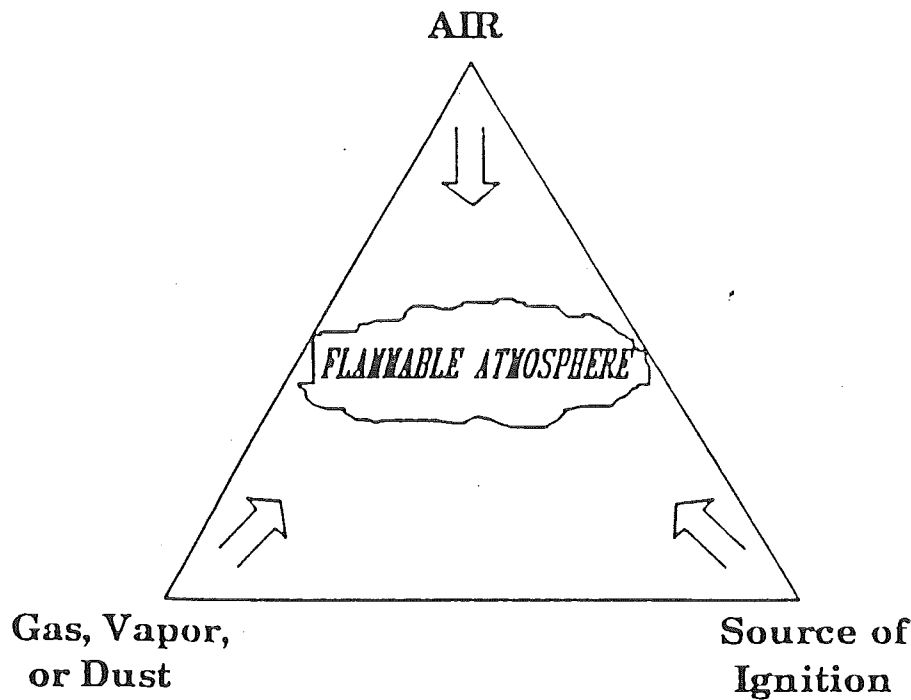


OSHA 1926 CONSTRUCTION MANUAL

Flammable Atmospheres

Two things make an atmosphere flammable: 1) the oxygen in air; and 2) a flammable gas, vapor, or dust in the proper mixture. Different gases have different flammable ranges. If a source of ignition (e.g., a sparking or electrical tool) is introduced into a space containing a flammable atmosphere, an explosion will result.

An oxygen-enriched atmosphere (above 23.5%) will cause flammable materials, such as clothing and hair, to burn violently when ignited. Therefore, never use pure oxygen to ventilate a confined space. Ventilate with normal air.



The Ignition Triangle

Toxic Atmospheres

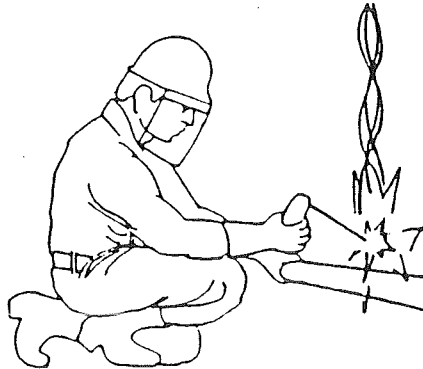
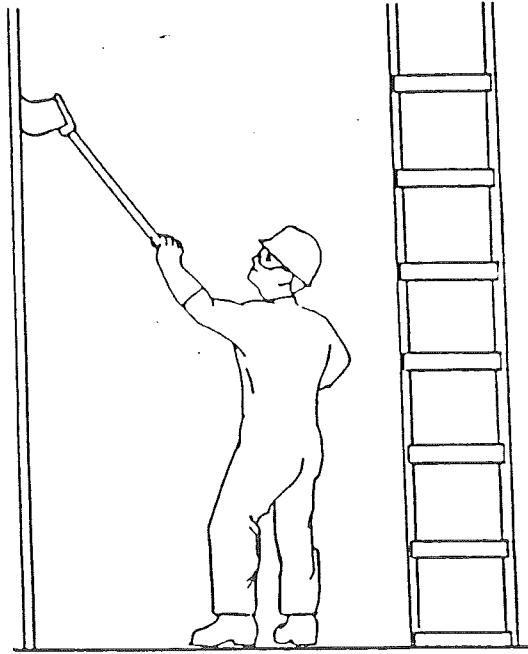
Most substances (liquids, vapors, gases, mists, solid materials, and dusts) should be considered hazardous in a confined space. Toxic substances can come from the following:

- The product stored in the space: The product can be absorbed into the walls and give off toxic gases when removed or when cleaning out the residue of a stored product, toxic gases can be given off. Example: Removal of sludge from a tank — decomposed material can give off deadly hydrogen sulfide gas.
- The work being performed in a confined space: Examples of such include welding, cutting, brazing, painting, scraping, sanding, degreasing, etc. Toxic atmospheres

OSHA 1926 CONSTRUCTION MANUAL

are generated in various processes. For example, cleaning solvents are used in many industries for cleaning/degreasing. The vapors from these solvents are very toxic in a confined space.

- Areas adjacent to the confined space: Toxicants produced by work in the area of confined spaces can enter and accumulate in confined spaces.

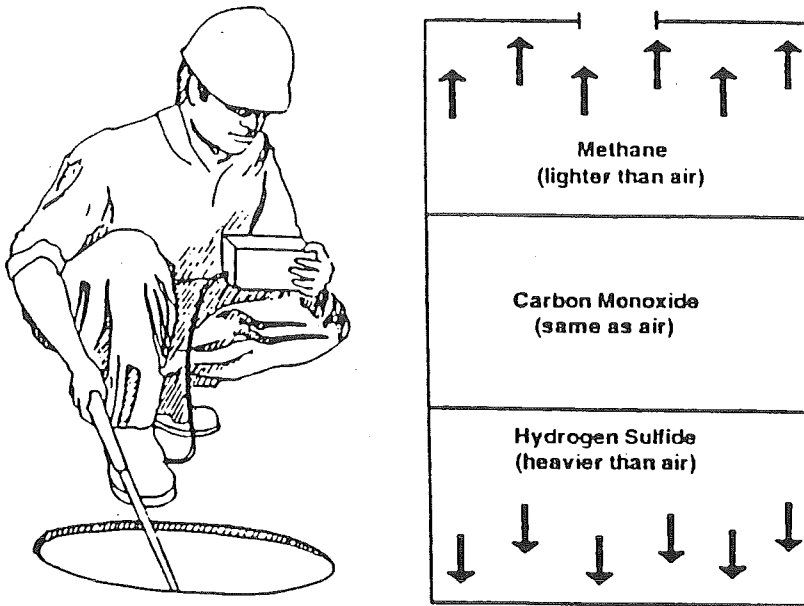


OSHA 1926 CONSTRUCTION MANUAL

Testing The Atmosphere

It is important to understand that some gases or vapors are heavier than air and will settle to the bottom of a confined space. Also, some gases are lighter than air and will be found around the top of the confined space. Therefore, it is necessary to test all areas (top, middle, bottom) of a confined space with properly calibrated testing instruments to determine what gases are present. If testing reveals oxygen-deficiency, or the presence of toxic gases or vapors, the space must be ventilated and re-tested before workers enter. If ventilation is not possible and entry is necessary (for emergency rescue, for example), workers must have appropriate respiratory protection.

NEVER TRUST YOUR SENSES TO DETERMINE IF THE AIR IN A CONFINED SPACE IS SAFE! YOU CAN NOT SEE OR SMELL MANY TOXIC GASES AND VAPORS, NOR CAN YOU DETERMINE THE LEVEL OF OXYGEN PRESENT.



From the Outside, Top to Bottom

Procedures for Atmospheric Testing

Atmospheric testing is required for two distinct purposes:

- Evaluation of the hazards of the permit space.
- Verification that acceptable entry conditions for entry into that space exist.

OSHA 1926 CONSTRUCTION MANUAL

Evaluation testing.

The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity and specificity to identify and evaluate any hazardous atmospheres that may exist or arise, so that appropriate permit entry procedures can be developed and acceptable entry conditions stipulated for that space. Evaluation and interpretation of these data, and development of the entry procedure, should be done by, or reviewed by, a technically qualified professional (e.g., OSHA consultation service, or certified industrial hygienist, registered safety engineer, certified safety professional, etc.) because of the potential for all serious hazards.

Verification testing.

The atmosphere of a permit space which may contain a hazardous atmosphere should be tested for residues of all contaminants identified by evaluation testing using permit specified equipment to determine that residual concentrations at the time of testing and entry are within the range of acceptable entry conditions. Results of testing (i.e., actual concentration, etc.) should be recorded on the permit in the space provided adjacent to the stipulated acceptable entry condition.

Duration of testing

Measurement of values for each atmospheric parameter should be made for at least the minimum response time of the test instrument specified by the manufacturer.

Testing stratified atmospheres.

When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately 4 feet (1.22 m) in the direction of travel and to each side. If a sampling probe is used, the entrant's rate of progress should be slowed to accommodate the sampling speed and detector response.

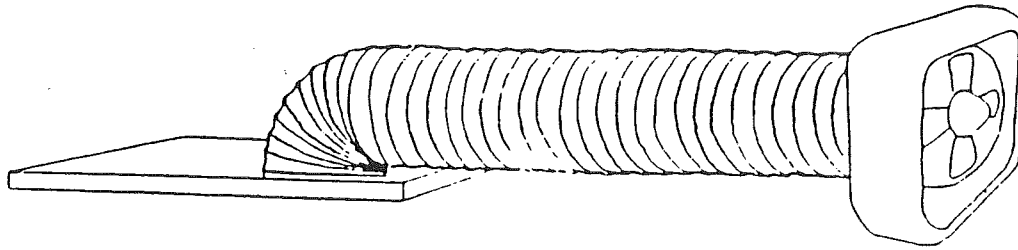
Ventilation

Ventilation by a blower or fan may be necessary to remove harmful gases and vapors from a confined space. There are several methods for ventilating a confined space. The method and equipment chosen are dependent upon the size of the confined space openings, the gases to be exhausted (e.g., are they flammable?), and the source of makeup air.

Under certain conditions where flammable gases or vapors have displaced the oxygen level, but are too rich to burn, forced air ventilation may dilute them until they are within the explosive range. Also, if inert gases (e.g. carbon dioxide, nitrogen, argon) are used in the confined space, the space should be well ventilated and re-tested before a worker may enter.

OSHA 1926 CONSTRUCTION MANUAL

A common method of ventilation requires a large hose. One end attached to a fan and the other lowered into a manhole or opening. For example, a manhole would have the ventilating hose run to the bottom to blow out all harmful gases and vapors (see diagram). The air intake should be placed in an area that will draw in fresh air only. Ventilation should be continuous where possible, because in many confined spaces the hazardous atmosphere will form again when the flow of air is stopped.

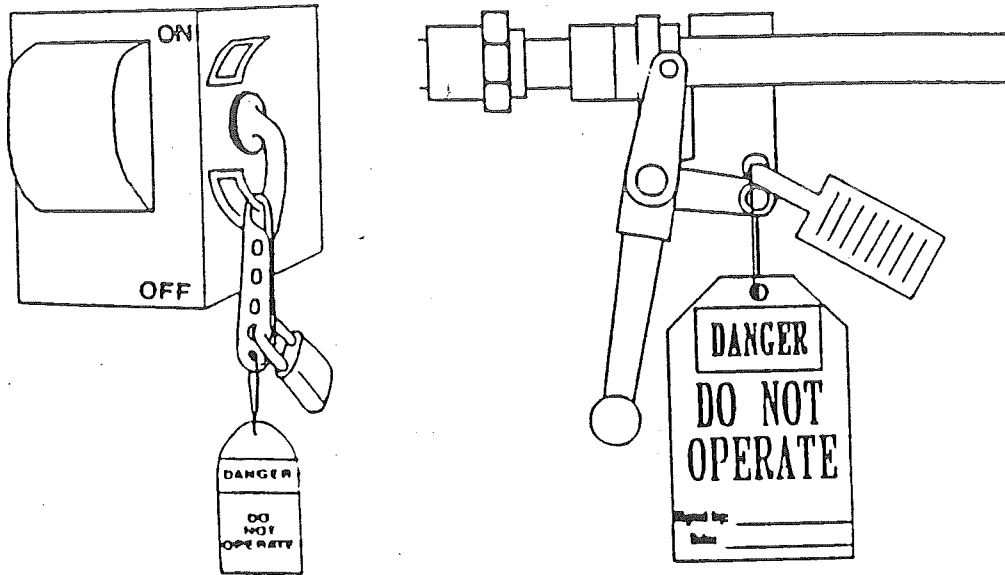


Ventilating with Fan and Trunk Hose

Isolation

Isolation of a confined space is a process where the space is removed from service by:

- Locking out electrical sources. Preferably at disconnect switches remote from the equipment.
- Blanking and bleeding pneumatic and hydraulic lines.
- Disconnecting belt and chain drives, and mechanical linkages on shaft-driven equipment where possible.
- Securing mechanical moving parts within confined spaces with latches, chains, chocks, blocks, or other devices.



Examples of Lockout

Respirators

Respirators are devices that can allow workers to safely breathe without inhaling toxic gases or particles. Two basic types are *air-purifying*, which filter dangerous substances from the air; and *air-supplying*, which deliver a supply of safe breathing air from a tank or an uncontaminated area nearby.

ONLY AIR-SUPPLYING RESPIRATORS SHOULD BE USED IN CONFINED SPACES WHERE THERE IS NOT ENOUGH OXYGEN.

Selecting the proper respirator for the job, the hazard, and the person is very important, as is thorough training in the use and limitations of respirators. Questions regarding the proper selection and use of respirators should be addressed to a certified industrial hygienist, or to the NIOSH Division of Safety Research, 944 Chestnut Ridge Rd., Morgantown, West Virginia 26505.

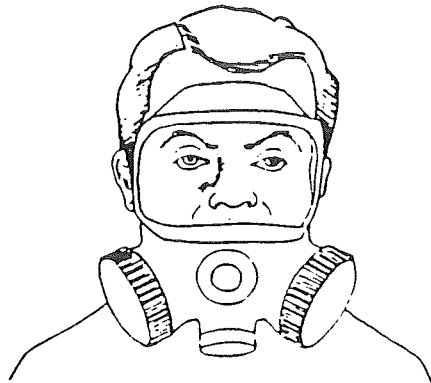
OSHA 1926 CONSTRUCTION MANUAL

Air-Purifying Respirators

(Do Not Use in Oxygen-Deficient Atmosphere)

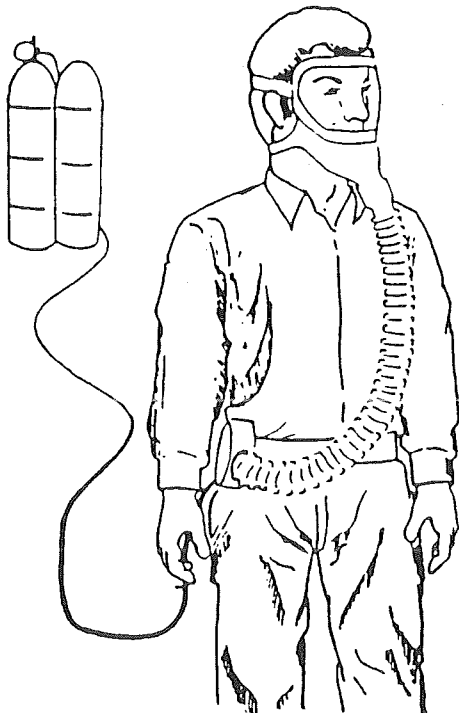


Half-mask

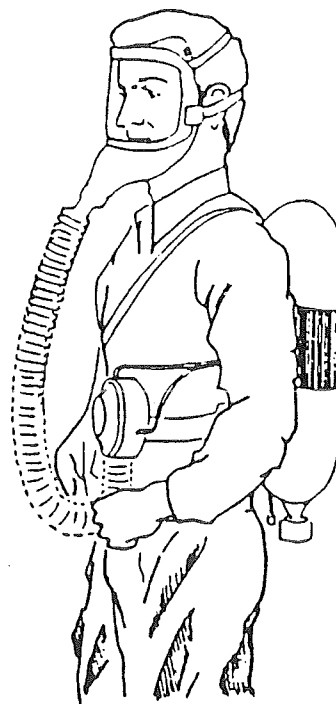


Full-Facepiece

Air-Supplying Respirators



*Supplied Air Respirator with
Auxiliary, Escape-only SCBA*

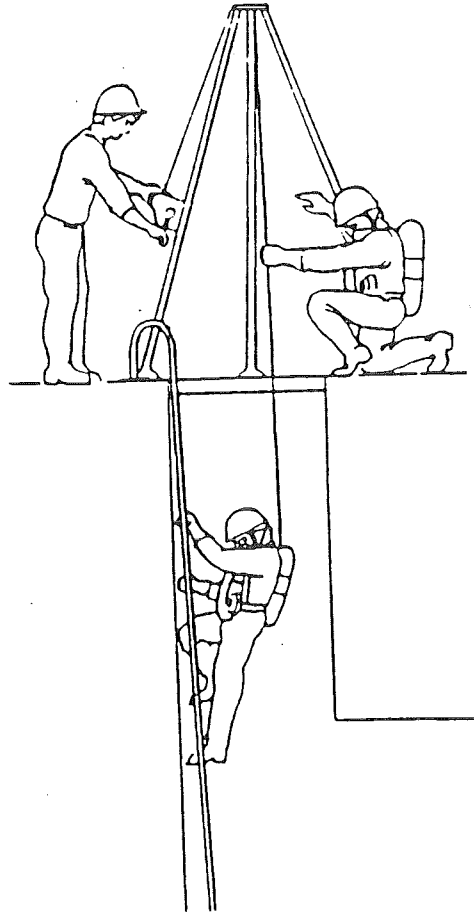


*Self-contained Breathing
Apparatus (SCBA)*

OSHA 1926 CONSTRUCTION MANUAL

Attendants

An attendant should be assigned to remain on the outside of the confined space and be in constant contact (visual or speech) with the workers inside. The attendant should not have any other duties but to serve as standby and know who should be notified in case of emergency. Attendants should not enter a confined space until help arrives, and then only with proper protective equipment, life lines, and respirators.



Entry with Hoist and Attendants

Over 50% of the workers who die in confined spaces are attempting to rescue other workers. Rescuers must be trained in and follow established emergency procedures and use appropriate equipment and techniques (lifelines, respiratory protection, attendants, etc.). Steps for safe rescue should be included in all confined space entry procedures. Rescue should be well planned and drills should be frequently conducted on emergency procedures. Unplanned rescue, such as when someone instinctively rushes in to help a downed co-worker, can easily result in a double fatality, or even multiple fatalities if there are more than one would-be rescuers.

REMEMBER: AN UNPLANNED RESCUE WILL PROBABLY BE YOUR LAST.

OSHA 1926 CONSTRUCTION MANUAL

General/Physical Hazards

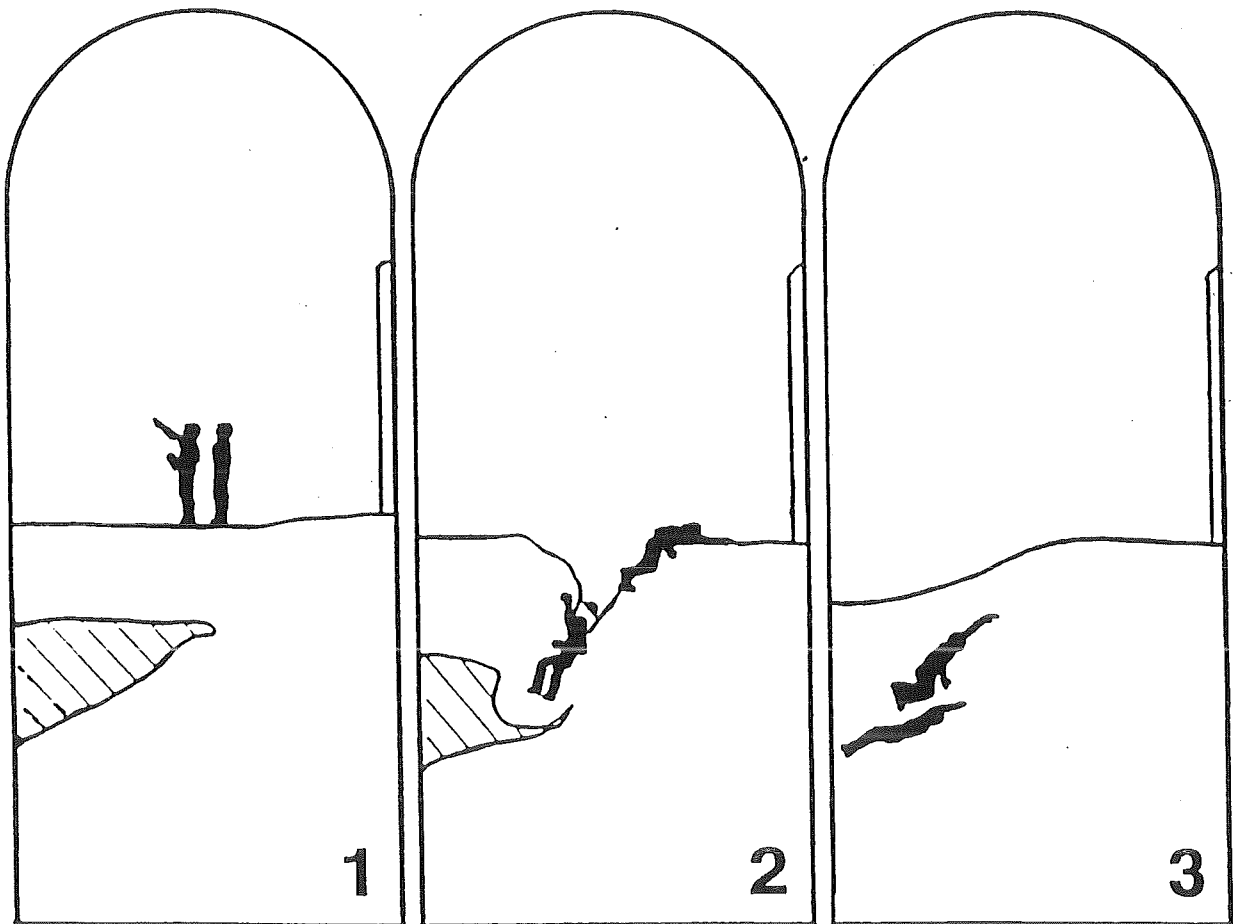
In addition to the areas discussed above, evaluation of a confined space should consider the following potential hazards:

1. TEMPERATURE EXTREMES

Extremely hot or cold temperatures can present problems for workers. For example, if the space has been steamed, it should be allowed to cool before any entry is made.

2. ENGULFMENT HAZARDS

Loose, granular material stored in bins and hoppers, such as grain, sand, coal, or similar material, can engulf and suffocate a worker. The loose material can crust or bridge over in a bin and break loose under the weight of a worker.



3. NOISE

Noise within a confined space can be amplified because of the design and acoustic properties of the space. Excessive noise can not only damage hearing, but can also affect communication, such as causing a shouted warning to go unheard.

4. SLICK/WET SURFACES

Slips and falls can occur on a wet surface causing injury or death to workers. Also, a wet surface will increase the likelihood for and effect of electric shock in areas where electrical circuits, equipment, and tools are used.

5. FALLING OBJECTS

Workers in confined spaces should be mindful of the possibility of falling objects, particularly in spaces which have topside openings for entry, and where work is being done above the worker.

Recommendations For Safe Entry—A Checklist

Use the following checklist to evaluate the confined space.

DO NOT ENTER A CONFINED SPACE UNTIL YOU HAVE CONSIDERED EVERY QUESTION, AND HAVE DETERMINED THE SPACE TO BE SAFE.

YES NO

Is entry necessary?

TESTING

Are the instruments used in atmospheric testing properly calibrated?

Was the atmosphere in the confined space tested?

Was Oxygen at least 19.5% - not more than 23.5%?

Were toxic, flammable, or oxygen-displacing gases/vapors present?

-Hydrogen sulfide

-Carbon Monoxide

-Methane

-Carbon Dioxide

-Other (list) _____

MONITORING

Will the atmosphere in the space be monitored while work is going on?

Continuously?

Periodically? (If yes, give interval: _____)

REMEMBER - ATMOSPHERIC CHANGES OCCUR DUE TO THE WORK PROCEDURE OR THE PRODUCT STORED. THE ATMOSPHERE MAY BE SAFE WHEN YOU ENTER, BUT CAN CHANGE VERY QUICKLY.

OSHA 1926 CONSTRUCTION MANUAL

YES	NO	<u>CLEANING</u>
<input type="checkbox"/>	<input type="checkbox"/>	Has the space been cleaned before entry is made?
<input type="checkbox"/>	<input type="checkbox"/>	Was the space steamed?
<input type="checkbox"/>	<input type="checkbox"/>	If so, was it allowed to cool?
		<u>VENTILATION</u>
<input type="checkbox"/>	<input type="checkbox"/>	Has the space been ventilated before entry?
<input type="checkbox"/>	<input type="checkbox"/>	Will ventilation be continued during entry?
<input type="checkbox"/>	<input type="checkbox"/>	Is the air intake for the ventilation system located in an area that is free of combustible dusts and vapors and toxic substances?
<input type="checkbox"/>	<input type="checkbox"/>	If atmosphere was found unacceptable and then ventilated, was it re-tested before entry?
		<u>ISOLATION</u>
<input type="checkbox"/>	<input type="checkbox"/>	Has the space been isolated from other systems?
<input type="checkbox"/>	<input type="checkbox"/>	Has electrical equipment been locked out?
<input type="checkbox"/>	<input type="checkbox"/>	Have disconnects been used where possible?
<input type="checkbox"/>	<input type="checkbox"/>	Has mechanical equipment been blocked, chocked, and disengaged where necessary?
<input type="checkbox"/>	<input type="checkbox"/>	Have lines under pressure been blanked and bled?
		<u>CLOTHING/EQUIPMENT</u>
<input type="checkbox"/>	<input type="checkbox"/>	Is special clothing required (boots, chemical suits, glasses, etc.)? (If so, specify: _____)
<input type="checkbox"/>	<input type="checkbox"/>	Is special equipment required (e.g., rescue equipment, communications equipment, etc.)? (If so, specify: _____)
<input type="checkbox"/>	<input type="checkbox"/>	Are special tools required (e.g., sparkproof)? (If so, specify: _____)
		<u>RESPIRATORY PROTECTION</u>
<input type="checkbox"/>	<input type="checkbox"/>	Are MSHA/NIOSH-approved respirators of the type required available at the worksite?
<input type="checkbox"/>	<input type="checkbox"/>	Is respiratory protection required (e.g., air-purifying, supplied air, self-contained breathing apparatus, etc.)? (If so, specify type: _____)
		<u>TRAINING</u>
<input type="checkbox"/>	<input type="checkbox"/>	Have you been trained in proper use of a respirator?
<input type="checkbox"/>	<input type="checkbox"/>	Have you received first aid/CPR training?
<input type="checkbox"/>	<input type="checkbox"/>	Have you been trained in confined space entry and do you know what to look for?

YES

NO

ATTENDANTS

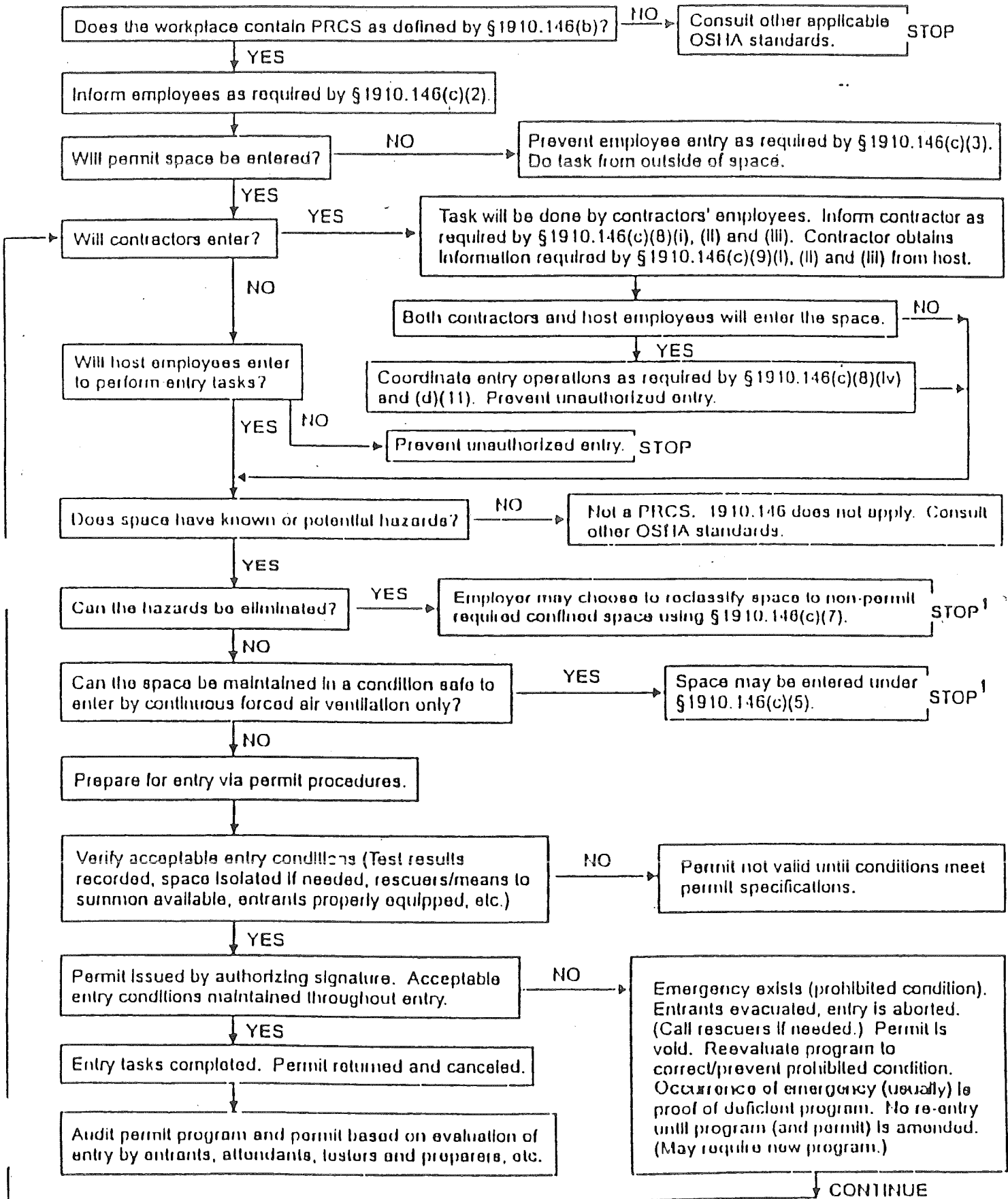
- Will there be an attendant on the outside in constant visual or auditory communication with the person on the inside?
- Will the attendant be able to see and/or hear the person inside at all times?
- Has the attendant(s) been trained in rescue procedures?
- Will safety lines and harness be required to remove a person?
- Are company rescue procedures available to be followed in the event of an emergency?
- Are you familiar with emergency rescue procedures?
- Do you know who to notify and how in the event of an emergency?

PERMIT

(The permit is an authorization in writing that states that the space has been tested by a qualified person, that the space is safe for entry; what precautions, equipment, etc. are required; and what work is to be done.)

- Has a confined space entry permit been issued?
- Does the permit include a list of emergency telephone numbers?

Permit - Required Confined Space Decision Flow Chart



¹ Spaces may have to be evacuated and re-evaluated if hazards arise during entry.

Among other things, the OSHA standard requires the employer's program to:

- identify and evaluate permit space hazards before allowing employee entry;
- test conditions in the permit space before entry operations and monitor the space during entry;
- perform, in the following sequence, appropriate testing for atmospheric hazards: oxygen,³ combustible gases or vapors,⁴ and toxic gases or vapors;⁵
- implement necessary measures to prevent unauthorized entry;
- establish and implement the means, procedures and practices — such as specifying acceptable entry conditions, isolating the permit space, providing barriers, verifying acceptable entry conditions, purging, making inert, flushing, or ventilating the permit space — to eliminate or control hazards necessary for safe permit-space entry operations;
- identify employee job duties;
- provide, maintain, and require, at no cost to the employee, the use of personal protective equipment and any other equipment necessary for safe entry (e.g., testing, monitoring, ventilating, communications, and lighting equipment; barriers, shields, and ladders);
- ensure that at least one attendant is stationed outside the permit space for the duration of entry operations;
- coordinate entry operations when employees of more than one employer are to be working in the permit space;
- implement appropriate procedures for summoning rescue and emergency services;
- establish, in writing, and implement a system for the preparation, issuance, use, and cancellation of entry permits;
- review established entry operations and annually revise the permit-space entry program;
- when an attendant is required to monitor multiple spaces, implement the procedures to be followed during an emergency in one or more of the permit spaces being monitored.

If hazardous conditions are detected during entry, employees must immediately leave the space, and the employer must evaluate the space to determine the cause of the hazardous atmospheres.

FIGURE 1

NEW/TRANSFER EMPLOYEE SAFETY ORIENTATION REVIEW SHEET

Items to be reviewed with new employee by supervisor. Check off items as information is explained to employee.
NOTE: Certain items will not be applicable to all positions.

EMPLOYEE NAME: _____ DATE: _____

DEPARTMENT: _____ JOB TITLE: _____

Safety

- 1. Review hazardous elements specific to job (chemicals; discuss routes of entry and effects of overexposure, extreme heat, machinery, etc.).
- 2. Review engineering controls designed into operation (guards, exhaust, ventilation, hoists, lifts, etc.).
- 3. Review administrative controls in effect (limited exposure time, rotating jobs, distance from operation, etc.).
- 4. Review applicable safe work procedures (proper lifting technique, two-man jobs, etc.).
- 5. Distribute and review use of personal protective equipment required (explain why equipment is needed).
- 6. Review Health and Safety handbook.
- 7. Review written Hazard Communication program and MSDS of chemicals presenting a potential for exposure to new employees.
- 8. Review lockout/Tagout program.
- 9. Review Safe Operating Procedures (SOPs) for equipment employee will be expected to use.

Fire

- 1. Review evacuation procedure in case of fire or disaster. (Walk employee through primary and secondary emergency exit routes from his/her work area.)
- 2. Identify all fire extinguishers, type of fire to be used on, and review fire extinguisher operation.
- 3. Identify all area fire alarm pull boxes.

Health

- 1. Identify first-aid stations and services/equipment available.
- 2. Inform employee of area person(s) to contact in case of emergency.
- 3. Identify emergency response personnel.
- 4. Review employee right-to-access exposure and medical records.

Accident Reporting

- 1. Review accident/incident reporting procedure. (Encourage employee to bring to your attention any unsafe conditions or unsafe work practices. Remember: Employee input is essential to accident PREVENTION.)
- 2. Review rights and internal assistance available with regard to workers' compensation.

Employer and Supervisor agree that this indoctrination has been carried out completely.

(Supervisor's signature)

(Date)

(Employee's signature)

(Date)

This form must be completed and signed before employee is allowed to start work. Supervisor retain copy and return portion to Industrial Relations upon completion.

Figure 1 Confined Space Entry Permit Checklist A

Location and Description of Confined Space _____

Site/Building/Department _____

Purpose of Entry _____

Reasons why work cannot be done without entering the confined space _____

History of the space or potential hazards _____

Date _____ Time _____ Permit Expires _____

Person in charge of work _____

Signature _____ Date _____

Supervisor(s) in charge of crew _____

Name(s) of crews	Training/Experience	Phone #
------------------	---------------------	---------

Detailed procedures and instructions provided Yes No Other

Date _____

Training/Drill Completed (Date) _____

Preparations for Entry

Lockout/Tagout Procedures Followed _____

Electrical Hazards Removed/Isolated _____

Lines Carrying Materials To and From Confined Space Blanked Off, Drained,
Locked by Two Valves and/or Flushed _____

Gases and Chemicals Purged, Flushed, Vented _____

Welding, Cutting, Open Flames Present _____

Welding Permit Approved/Posted _____

