Confined Spaces: A Training Program For Employees

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Overview

Confined Spaces: A Training Program for Employees

This section provides you with an overview of the confined spaces training process. Along with the instructional video tape, it will help you understand and provide the training required under the **Permit-Required Confined Spaces for General Industry Standard**, 29 CFR Part 1910.146, from the Department Of Labor, Occupational Safety and Health Administration.

In addition, this comprehensive training package includes the following four instructor guides based on the specialized training areas required by this regulation:

- Training for Authorized Entrants
- Training for Attendants
- Training for Entry Supervisors
- Training for Rescue and Emergency Services.

Employee handbooks on these four topics are also provided.

The purpose of the Overview section is to acquaint you with the permit-required confined space rule and with the enclosed training package. Specific information on the four areas listed above can be found in the instructor's guides for those topics.

This overview is divided into three sections:

Section I: Review of the Confined Spaces Rule
Getting Ready for Class

Section II: Statement on Class Participation

Section III: Presenting the Program

To the instructor: It is very important to emphasize that no matter how complete this training is, the one essential element confined space work demands is the uninterrupted and concentrated process of **thinking** before, during and after any action!!

This, in addition to providing thorough training, will help insure the safe working environment this regulation requires.

Section I: Review of Permit-Required Confined Spaces for General Industry
&
Getting Ready for Class

Overview of Permit-Required Confined Spaces Rule

Permit-Required Confined Spaces is a new standard requiring specific practices and procedures that will protect general industry employees from the potential hazards of entering confined spaces. All of general industry, including manufacturing, chemical plants, refineries, agricultural services, transportation, utilities, wholesale and retail trade are covered by the standard.

Requirements of this standard include: identification of confined spaces and informing employees of their existence, entry permits, a written permit space program, and training for individuals with active roles in confined space work. This includes the following employees:

- authorized entrants
- attendants
- entry supervisors
- rescue and emergency services personnel.

The standard covers approximately 1.6 million workers who actually enter confined spaces each year, as well as another 10.6 million people who work at sites where confined spaces exist.

Some kind of confined space can be found in over 240,000 workplaces. The work that is done inside of these spaces varies from inspection and testing of equipment, to welding, painting, and general maintenance.

Each year about 63 people die as a result of working in a confined space. OSHA feels that the new standard will prevent 85% (54) of those tragedies, and about 5,000 serious confined space injuries.

Permit-Required Confined Spaces for General Industry is effective as of April 15, 1993.

Definitions and Abbreviations

There are many definitions and agency abbreviations that you should know to increase your understanding of this regulation. Four key definitions are listed here. The remainder of the definitions and a set of confined space abbreviations are listed under *Other Confined Space Definitions* and *Abbreviations* in Section III, Presenting the Program. All definitions and abbreviations are included in the four employee handbooks.

Key Definitions

Confined space—a space large enough and so configured that an employee can bodily enter and perform assigned work. In addition, a confined space has limited or restricted means for entry or exit, and is not designed for continuous employee occupancy.

Permit-required confined space or **permit space**—a confined space that has, or may have, one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere. This could mean that the oxygen content of the space is inadequate, or that toxic or explosive gases, fumes, or vapors are present.
- Contains a material that has the potential for engulfing an entrant. For example, a bin filled with sawdust is an engulfment hazard.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- Contains any other recognized serious safety or health hazard, such as turning, exposed blades on equipment, or a hole where a worker could drop through to another level.

Note: A permit space has one or more features that require the worker to take special precautions. These spaces are considered an immediate health and safety risk.

Entry—the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry Permit–the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified by this section.

Goals and Objectives of the Program

Goals:

- To utilize the requirements of the Permit-Required Confined Spaces standard to increase the awareness level and safety of all employees who work in or near confined spaces.
- To provide confined space workers (authorized entrants, attendants, entry supervisors, and rescue and emergency services personnel) with the information and skill training needed to safely do their jobs.

Objectives:

1. Define all words and phrases associated with confined spaces.
2. Discuss atmospheric, engulfment, and other physical hazards that may be present in confined spaces.
3. Discuss the general requirements of the standard.
4. Discuss the use of entry permits.
5. In separate training sessions, discuss the role and duties of these confined space employees:
   a. Authorized Entrant
   b. Attendant
   c. Entry Supervisor
   d. Rescue and Emergency Services personnel.

Included in this package are:

- Video tape, **Confined Spaces: A Training Program for Employees**
- Instructor's Guide: Authorized Entrant Duties
- Instructor's Guide: Attendant Duties
- Instructor's Guide: Entry Supervisor Duties
- Instructor's Guide: Rescue and Emergency
- Employee Handbooks for each section (including test)
- Wallet Cards (to verify course completion)
- General Training Log
- Confined Space Pre-Entry Checklist—example
- Confined Space Entry Permit—example
- Confined Space Entry Sign
- Employee Certificates
- Posters

Getting Ready to Present Permit-Required Confined Space Training

Here is a checklist of items to help you prepare for the class.

- ☐ Decide when and where the class sessions will be held. If this has been done, make sure the training area or classroom is available for your class.
- ☐ Check on availability of AV equipment, such as video player and overhead projector for transparencies. (See section below on using AV materials.)
- ☐ Make a list of materials you'll need for class. Here are some things you'll want on hand:
  - Listing of confined spaces within your company.
  - Confined space procedures used by your company.
  - Samples of entry permits, pre-entry checklists, appropriate MSDS and all forms, reports, etc., that deal with confined spaces.
  - If possible, company statistics on confined space injuries or deaths.
  - Chalk or special writing tools for white boards.

List any additional items you'll need for the class:

1.
2.

- ☐ Preview and prepare audio-visual (AV) and written course materials. Here are some tips.

Video Tape

The video is divided into six sections. These are:

1. Introduction
2. Key Definitions
3. Confined Space Hazards
4. Standard Requirements
5. Entry Permits
6. Training Requirements.

All sections are clearly identified in the video. You may want to show the entire video, or show the video in sections, following each with a discussion and question/answer period.

- Preview the tape at least once before you show it to the class.

Tip: If you decide to show the video in sections, watch the video counter to identify the exact location of each section.

- The day of the class, make sure video player is in proper working order.
- Insert tape and advance to where the tape actually begins.
- After tape is shown, stop the video and rewind with audio turned down.

Transparencies

You may want to prepare transparencies to highlight important pieces of material. Suggested uses are:

- Listing of all confined spaces as identified within your company
- Confined space statistics from your company
- Key definitions: confined space, permit-required confined space, entry permits, and entry
- Definitions and examples of atmospheric hazards.

Preparing transparencies:

1. Make sure the print size or drawing is large enough to be seen from the back of the classroom.
2. Practice using a transparency before class time:
   a. Lay a transparency on the overhead projector face up and towards you
   b. Adjust the light so that the image is squarely on the screen
   c. Use the focus knob to make the image as clear as possible.
3. Use the paper copy of each transparency to separate the transparency sheets. By doing this, you keep track of which transparency is next.
4. Use a pencil or pen to point to items on the overhead project rather than your finger.

Tests

To help ensure that confined space workers are prepared for their various tasks, a short test has been designed for each of the following areas:

- Authorized Entrants
- Attendants
- Entry Supervisors
- Emergency and Rescue Services personnel.

These tests are included in the Employee Handbooks for these groups.

Review each test prior to class. Make sure you have enough copies of each.

Instructor Notes:

Section II: Statement on Class Participation

The training requirements of Permit-Required Confined Spaces revolve around job specific training for four employee groups:

- Authorized Entrants
- Attendants
- Entry Supervisors
- Emergency and Rescue Services personnel.

OSHA feels that a performance-oriented approach should guide this training. Most importantly, *this training must impart the understanding, knowledge, and skills necessary for the safe performance of the duties assigned to authorized entrants, attendants, entry supervisors and rescue and emergency services personnel.* In fact, OSHA specifies what those duties are.

OSHA requires the employer to provide whatever training is necessary to achieve this goal. The employer has been given the freedom to develop and implement the most effective confined space training program to meet the needs of their specific workplace. By defining duties for authorized entrants, attendants, entry supervisors, and rescue and emergency services personnel, the final ruling does however, provide guidance as to how the training must be directed and what the content should be.

In order to make training more efficient as well as more meaningful, we suggest that all of the above employees attend an overview session prior to or in conjunction with their job specific section.

The Overview session could cover the following general information about the permit-required confined space standard:

- Confined space definitions
- Hazards of confined spaces
- Standard requirements, including entry permits.

Definitions, hazards, and standard requirements can be found in the training manuals for each worker group.

Employees should then attend one or more of the four training sessions that addresses their specific duties. The instructor's guides and employee handbooks on authorized entrants, attendants, entry supervisors and rescue and emergency services will assist with this training.

Section III: Presenting the Program

Confined Spaces: A Training Program for Employees

Note: *This outline covers the main points of the permit-required confined space standard. Space is provided throughout for your own notes. Review the entire training program prior to class and pencil in any ideas and examples you want to use. The class participants may also have examples that you can use in other class sessions.*

The course is divided into two parts:

A. Overview—all permit space employees

1. Introduction
2. Video
3. Definitions and Abbreviations
4. Who and What the Standard Covers
5. Permit-Required Confined Space Hazards
6. General Requirements of the Standard
7. Permit System and Entry Permits
8. Training Requirements
9. Question and Answer, Wrap-Up

Note: *All information needed for the overview session is contained in the employee handbook for each work group.*

B. Individual Training Sessions for the following groups:
- authorized entrants
- attendants
- entry supervisors
- emergency and rescue services personnel

A question & answer session and a wrap-up should also follow the job specific training sessions.

Time Allotment:

Since specifics of training are the responsibility of the employer, you will need to decide the amount and depth of training required at your facility.

Some Suggestions:

Overview Session: 1 to 1 1/2 hours.

Training sessions for authorized entrants, attendants, entry supervisors and rescue and emergency services personnel: entirely dependent upon the job duties of each of these groups. ***Note:*** *All of the duties outlined by OSHA for each of the above work groups must be covered.*

Documentation and Recordkeeping information can be found on page 23 of this Overview section.

Suggested activities for participants are shown as: ☞ ***Learning Activity.***

Suggested Course Outline

1. Introduction

A. Purpose of the program:

- To increase understanding of the potential hazards of confined spaces
- To provide appropriate skill training for each of the following worker groups:
  a. authorized entrants
  b. attendants
  c. entry supervisors
  d. rescue and emergency services personnel.

Note: *Each year approximately 63 people die as a result of working in a confined space. OSHA feels that the permit-required confined space standard will prevent 85%, or roughly 54 of those tragedies, as well as about 5,000 serious injuries each year.*

- Discuss key definitions: confined space, permit-required confined space, entry permit, and entry.
- Review how training program will be presented:
  a. Overview session
  b. Job specific sessions for authorized entrants, attendants, entry supervisors, and rescue and emergency services personnel.

Learning Activity: Have class participants list the confined spaces they enter or work around as well as their specific job duties which could be used as a reference throughout the program.

2. Show Video Tape

Research has shown that the more carefully a video tape presentation is introduced, the more participants will learn from it. It is very important, therefore, that you preview the video so you know which items you want to emphasize. Here are some examples of how to introduce the video and increase learning:

- The goal of the video tape is to explain the training requirements of this new regulation.
- This video covers the permit space regulation. I'd like you to pay special attention to: (*list items you want employees to watch for in the video.*)
- Here are some things to look for in this video: *(list).* We'll discuss them following the tape.

3. Definitions and Abbreviations

The four main definitions of this new regulation are as follows:

Confined space—a space large enough and so configured that an employee can bodily enter and perform assigned work. In addition, a confined space has limited or restricted means for entry or exit, and is not designed for continuous employee occupancy.

This could mean:
a. small, narrow or cramped passageways
b. entry or exit is by means of a ladder
c. other equipment in the space may make evacuation and rescue difficult.

Examples of confined spaces include:

- bins
- boilers
- crawl spaces
- degreasers
- ducts
- furnaces
- hoppers
- incinerators
- pipelines
- pits
- reactor vessels
- scrubbers
- sewers
- silos

- tanks
- tunnels
- utility manholes
- vats
- vaults
- vessels
- and, other areas with limited means of entry.

Permit-required confined space or **permit space**—a confined space that has, or may have, one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere. This could mean that the oxygen content of the space is inadequate, or that toxic or explosive gases, fumes, or vapors are present.
- Contains a material that has the potential for engulfing an entrant. For example, a bin filled with sawdust is an engulfment hazard.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- Contains any other recognized serious safety or health hazard, such as turning, exposed blades on equipment, or a hole where a worker could drop through to another level.

Note: A permit space has one or more features that require the worker to take special precautions. These spaces are considered an immediate health and safety risk.

Entry—the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry Permit–the written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified by this section.

Other Confined Space Definitions

Acceptable Entry Conditions—conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

Attendant—an individual stationed outside of one or more permit spaces who monitors the authorized entrants and who performs all the attendant's duties assigned in the employer's permit space program. [For a complete listing of these duties, see the 'Attendant Duties' Instructor's Guide.]

Authorized Entrant—an employee who is authorized by the employer to enter a permit space. [For a complete listing of these duties, see the 'Authorized Entrant Duties' Instructor's Guide.]

Blanking or Blinding—the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Double Block and Bleed—the closure of a line, duct, or pipe by:

- closing and locking or tagging two in-line valves, and by
- opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency—any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Engulfment—the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry Supervisor—the person (such as the employer, foreman, or crew chief) responsible for:

- determining if acceptable entry conditions are present at a permit space where entry is planned,
- authorizing entry,
- overseeing entry operations, and
- terminating entry as required by this section.

Note: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this section for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

[For a complete listing of entry supervisor duties, see the 'Entry Supervisor Duties' Instructor's Guide.]

Hazardous Atmosphere—an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

- flammable gas, vapor, or mist in excess of 10% of its lower flammable limit (LFL)
- airborne combustible dust at a concentration that meets or exceed its LFL

Note: This concentration can be approximated to a condition where dust obscures vision at a distance of 5 feet or less.

- atmospheric oxygen concentration below 19.5% or above 23.5%
- atmospheric concentration of any substance for which a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or PEL

Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

- any other atmospheric condition immediately dangerous to life or health.

Note: For air contaminants where OSHA has not determined doses or permissible exposure limits, other sources of information, such as MSDS, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Hot Work Permit—an employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

Immediately Dangerous to Life or Health (IDLH)—any condition that:

- poses an immediate or delayed threat to life
- would cause irreversible adverse health effects
- would interfere with an individual's ability to escape unaided from a permit space.

Note: Some materials, such as hydrogen fluoride gas and cadmium vapor, may produce immediate effects that, even if severe, can pass without medical attention; however, sudden, possibly fatal collapse can occur up to 12 to 72 hours after exposure. In fact, victims may feel normal after they

recover from the temporary effects until they collapse. Such material, in hazardous quantities, are immediately dangerous to life or health.

Inerting—the displacement of the atmosphere in a permit space by a non-combustible gas (such as nitrogen) to such an extent that the resulting atmosphere is non-combustible.

Note: This procedure produces an IDLH oxygen-deficient atmosphere.

Isolation—the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as:

- blanking or blinding
- misaligning or removing sections of lines, pipes, or ducts
- a double block and bleed system
- lockout or tagout of all sources of energy
- blocking or disconnecting all mechanical linkages.

Line Breaking—the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure or temperature capable of causing injury.

Non-Permit Confined Space—a confined space that does not contain, or with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Oxygen-deficient Atmosphere—an atmosphere containing less than 19.5% oxygen by volume.

Oxygen-enriched Atmosphere—an atmosphere containing more than 23.5% oxygen by volume.

Permit-Required Confined Space Program or **Permit Space Program**—the employer's written overall program for controlling and, where appropriate, for protecting employees from permit space hazards, and for regulating employee entry into permit spaces.

Permit System—the employer's written procedure for preparing and issuing permits and for returning the permit space to service following termination of entry.

Prohibited Condition—any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Rescue Service—the personnel designated to rescue employees from permit spaces. [For a complete listing of these duties, see the 'Rescue and Emergency' Instructor's Guide.]

Retrieval System—the equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Testing—the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the space.

> *Note: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.*

Abbreviations (Listed alphabetically, not in order of importance)

ANPR	Advance Notice of Proposed Rulemaking
ANSI	American National Standards Institute
APR	Air Purifying Respirator
CSP	Certified Safety Professional
DHHS	Department of Health and Human Services
DOL	Department of Labor
EPA	Environmental Protection Agency
FACE	Fatal Accidents Circumstances and Epidemiology
IDLH	Immediately Dangerous to Life or Health
LEL	Lower Explosive Limit
LFL	Lower Flammable Limit
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety & Health
NPRM	Notice of Proposed Rule Making
OSHA	Occupational Safety and Health Administration
OSHRC	Occupational Safety and Health Review Commission
PE	Registered Professional Safety Engineer
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
SAR	Supplied Air Respirator
SCBA	Self-Contained Breathing Apparatus

TLV Threshold Limit Values
UEL Upper Explosive Limit

4. Who and What the Standard Covers

The permit-required confined space standard requires specific practices and procedures that will protect general industry employees from the potential hazards of entering permit-required confined spaces. All of general industry, including manufacturing, chemical plants, refineries, agricultural services, transportation, utilities, wholesale and retail trade are covered by the permit-required confined space standard.

Requirements of this standard include: identification of confined spaces and informing employees of their existence, entry permits, a written permit space program, and training for individuals with active roles in confined space work. This includes the following employees:

- authorized entrants
- attendants
- entry supervisors
- rescue and emergency services personnel.

The standard covers 1.6 million workers who actually enter confined spaces each year, and another 10.6 million people who work at sites where confined spaces exist.

Confined spaces can be found in over 240,000 workplaces. The work that is done inside of these spaces includes inspection and testing of equipment, welding, painting, and general maintenance.

☞ ***Learning Activity:*** *List 3 confined spaces at your facility:*

-
-
-

List your job duties in or around permit spaces.

-
-
-

5. Review of Permit-Required Confined Space Hazards

The main goal of the standard is to protect workers from the hazards associated with confined spaces. Confined space hazards can be:

A. atmospheric
B. engulfment
C. physical.

A. Atmospheric Hazards

According to accident reports, hazardous atmospheres account for most of the deaths and injuries in confined spaces. These atmospheres can be either asphyxiating, toxic, or flammable/explosive.

- **Asphyxiating Atmospheres**

Asphyxiation, or suffocation, accounts for 47% of all confined space deaths. Normally, the air we breathe contains 20.9% oxygen.

Note: When an oxygen level falls below 19.5% there is an asphyxiation danger.

Here are some work situations that may reduce the oxygen level:

- Certain chemical reactions, such as metal oxidation—rust. Metal oxidation is common in tank cleaning operations because the chemicals in the cleanser can react with the wall of the tank.
- Oxygen is replaced by other gases. Nitrogen is an example of a gas that may replace oxygen. If a vessel has been used to transport nitrogen, the oxygen level may be inadequate.
- Oxygen is consumed by burning processes such as welding or flame cutting operations.
- Simple repair or clean-up jobs may also reduce the oxygen level, such as exposure to fumes from open containers of solvent within the confined space.

Note: Oxygen levels should be monitored continuously.

- **Toxic Atmospheres**

Regardless of the oxygen level, the toxic effect of certain gases, vapors or fumes can occur. The most common toxic materials found in permit spaces are: carbon monoxide and hydrogen sulfide.

Hydrogen sulfide (H_2S) has the odor of a rotten egg. Be aware however, that the fumes dull the sense of smell, which could cause you to believe the danger has passed.

Carbon monoxide (CO) on the other hand has no odor and must be detected with a monitor.

Due to decaying organic material, both carbon monoxide and hydrogen sulfide can be present in sewer systems and septic tanks.

Toxic atmospheres may also result from the activities within the confined space. Vapors from cleaning solvents or fumes from welding can present a danger to confined space workers.

- **Flammable/Explosive Atmospheres**

Within a confined space, the combination of a flammable gas, vapor, or dust, with oxygen and an ignition source can produce a very dangerous atmosphere.

A flammable/explosive atmosphere might contain:

- methane or acetylene gases
- solvent or fuel vapors
- coal or grain dust.

Note: In these atmospheres a spark from a tool or discharge of static electricity may be all that is needed to create an explosion.

Material Safety Data Sheet (MSDS) information should be available at all times on any substances found in confined spaces. The MSDS will help identify the hazards of these substances.

B. Engulfment Hazards

Engulfment or entrapment occurs when a worker becomes trapped by a dry, loose, bulk material. This can happen in vats, bins or vessels that contain such materials as sand, sawdust, or grain. The most immediate danger with this situation is asphyxiation or suffocation.

C. Physical Hazards

Confined space accidents and deaths can also occur if energy sources are not properly secured and isolated from the space. Because of this potential:

- all valves and electrical equipment must be properly locked out according to the OSHA Lockout/Tagout Standard
- connecting pipes should be blanked off, separated, or sealed
- pipelines must be flushed, drained and isolated to prevent unexpected exposure to contaminants.

Other physical hazards of confined spaces include:

- heat stress
- falls from ladders or railings
- falling objects
- wet surfaces
- noise
- becoming wedged in a narrow part of the structure.

6. General Requirements of the Standard

(1) All permit-required confined spaces in the workplace must be identified.

(2) Unauthorized entry into permit spaces must be prevented.

(3) Permit space hazards must be identified and evaluated before employees are permitted to enter.

(4) Development and implementation of procedures and practices needed for safe permit space entry. These include, but are not limited to:

a. **Specifying acceptable entry conditions.** This ensures that the hazards have been identified, and that acceptable limits have been set. These conditions must be met before entry is permitted.

b. **Isolating the permit space.** This includes the use of proper lockout/tagout procedures to control electrical and mechanical hazards.

c. **Purging, flushing, and/or ventilating the space** to eliminate or control hazards.

d. **Using barriers** to protect unauthorized entrants from external hazards.

e. **Verifying that conditions are acceptable for entry.**

(5) All workers with active roles in and around permit spaces must be provided with the proper training and equipment. These workers include authorized entrants, attendants, entry supervisors, and rescue and emergency services personnel.

Equipment, to be provided and maintained by the employer, should include any or all of the following:

- testing and monitoring devices
- ventilating equipment
- communication devices
- personal protective equipment
- proper lighting
- barriers and shields

- ladders
- rescue equipment (unless supplied by off-site rescue services).

(6) Test and monitor permit space conditions. Atmosphere must be checked for oxygen first, followed by combustible gases and vapors, then toxic gases and vapors.

(7) An attendant must be stationed outside the permit space as long as an authorized entrant remains inside. Attendants control and monitor all entry operations, and maintain on-going contact with authorized entrants.

Note: If the only risk to entrants is a hazardous atmosphere that can be eliminated by purging or ventilating, attendants are not required. Purging/ventilating cleans the air within the permit space so that the atmosphere is no longer hazardous to life and health, and therefore is safe for employees to breathe. Under certain specific conditions and evaluations, if the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a "non-permit confined space" for as long as the non-atmospheric hazards remain eliminated.

*A **non-permit confined space** means a confined space that does not contain or, with respect to the atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.*

(8) If one attendant must monitor multiple spaces, a procedure must exist to allow that attendant to respond to an emergency while another employee takes over the attendant's duties for the other spaces.

(9) Persons with active permit space roles must be identified, their duties clearly spelled out, and proper training provided.

(10) Since rescue attempts account for over 60% of all confined space fatalities, a procedure must be in place for an emergency service (on-site or off-site) to rescue entrants from permit spaces and provide care to those who are rescued. This plan must also prevent unauthorized workers from attempting a rescue.

(11) A process for the use of entry permits must be developed.

(12) Contractors must be informed by the host employer about the permit spaces and related hazards, as well as the entry procedures and precautions that are used at that facility.

(13) A procedure must be in place for concluding entry operations.

(14) All elements of the permit space program must be reviewed at least annually and revised as needed.

7. Permit System and Entry Permits

Entry permits are an essential part of the overall permit-required confined space program. These permits document and verify that entries are conducted properly.

A permit system must be in place to handle entry permits. This system defines how permits are prepared, issued, and canceled.

The entry permit must contain the following information (show example entry permit included in this package):

- confined space site
- reason for entry
- date and time period of permit
- names or other means of identifying entrants
- names of attendants and entry supervisor
- permit space hazards
- measures used to isolate, remove or reduce confined space hazards, such as lockout procedures, purging, ventilating, inerting, flushing
- acceptable entry conditions
- all test results with name or initials of tester(s)
- name of rescue service and how to contact it
- communication system to be used between attendant and entrant
- all equipment needed for entry
- other information needed to ensure worker safety
- any additional permits issued for work in the permit space (i.e., a hot work permit).

A permit system requires that:

1. Before permit space entry, the entry permit must be signed by the entry supervisor. This signature confirms that all safety procedures have been reviewed and that authorized entry is permitted.

2. The permit must be posted or made available to the authorized entrants. This notifies the entrant:

   - that all pre-entry safety checks have been completed
   - of the hazards associated with the permit space.

3. Permits be issued only for the length of time needed to complete the job listed.

4. When the assigned task is completed, the permit be canceled by the entry supervisor.

5. Canceled permits be kept for at least one year. They are used to assist with the annual permit space program review.

8. Training Requirements

One of the major factors contributing to confined space fatalities and injuries is a lack of awareness on the part of the authorized entrant that the atmosphere in a confined space can be hazardous, even lethal. In addition, many untrained, but well meaning individuals try to rescue a fallen co-worker without fully understanding the hazards involved or the procedures required for safe entry and rescue. Because of this, training of permit space workers is required. This includes the following worker groups:

- authorized entrants
- attendants
- entry supervisors
- rescue and emergency services personnel

The standard requires that training be completed:

a. Before a worker can be assigned a permit space job

b. Before any changes in work assignment are made, or whenever a new hazard changes permit space operations.

Note: Additional training may not be needed if a worker has already been trained in the new duties or procedures and if the employer believes the employee understands and can perform the appropriate permit space procedures.

c. If an employer feels that entry procedures are not being followed, or if a worker does not appear to have the skills needed to safely do the job.

d. As 'performance oriented.' In other words, training must zero in on the skills needed to safely perform specific job duties.

9. Question & Answer, Wrap-Up

When class material has been presented:

- Outline how and when the four job specific sessions will be presented. If possible, have written class schedules for participants.
- Ask for any questions the participants may have.
- Have employees sign training log before they leave the classroom.

Documentation and Recordkeeping

This section contains important information for those in administration and training.

Training

Training, proper documentation, and accurate recordkeeping are important aspects of this new regulation. Here is an overview of the process.

1. A company can provide Permit-Required Confined Space training to their employees or use outside training sources.

2. Training must be completed:

   - Before a worker can be assigned a permit space job.
   - Before any changes in work assignment are made, or whenever a new hazard changes permit space operations.

   Note: Additional training may not be needed if a worker has already been trained in the new duties or procedures and if the employer believes the employee understands and can perform the appropriate permit space procedures.

   - If an employer feels that entry procedures are not being followed, or if a worker does not appear to have the skills needed to safely do the job.

3. It is the employer's responsibility to certify that employees completed Permit-Required Confined Space training. This certification must include:

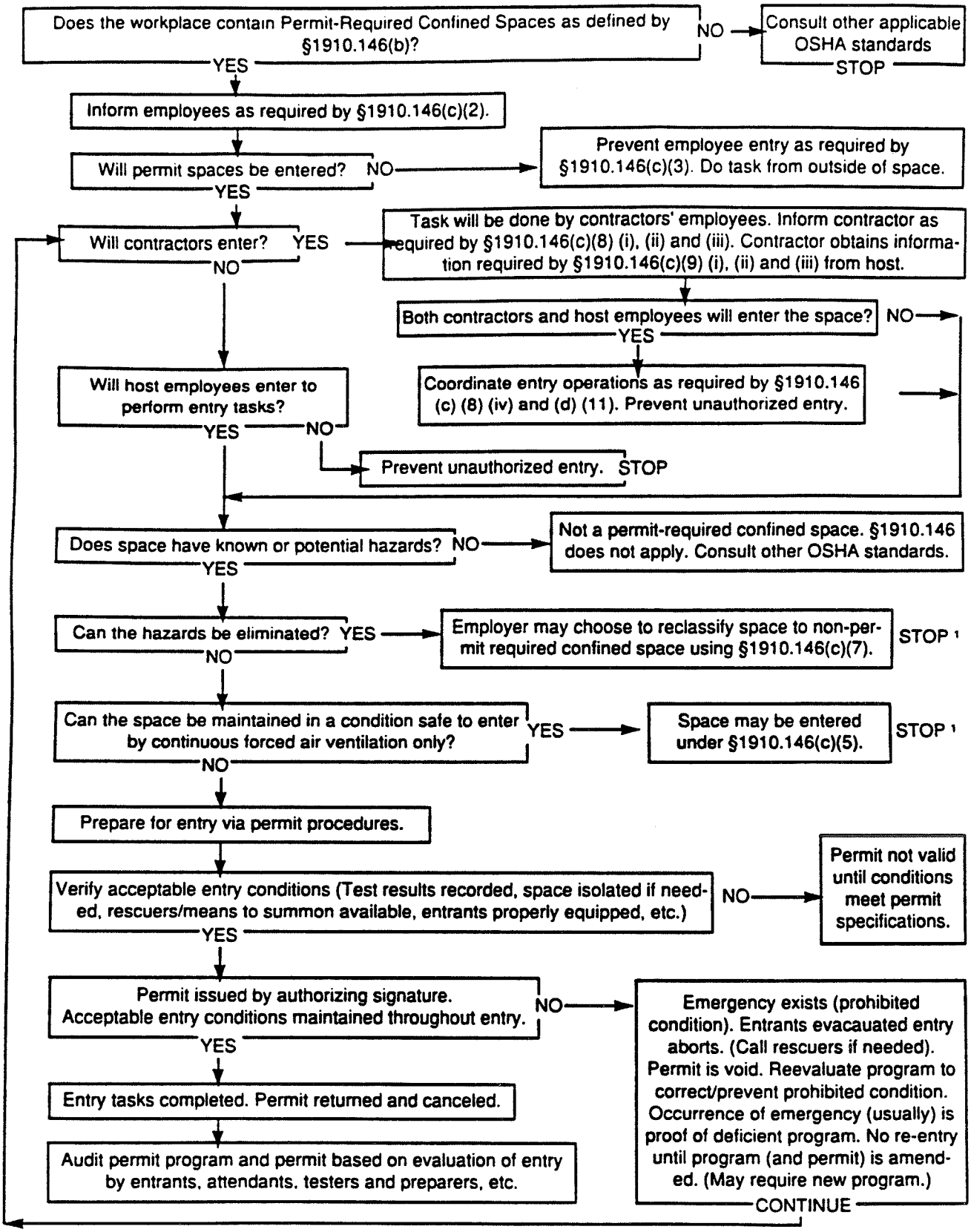
   - employee's name
   - signature or initials of trainer
   - dates of the training.

The enclosed training log and certification documents are provided to help you comply with the requirements of Permit-Required Confined Spaces.

Entry Permits

All cancelled entry permits must be kept for at least one year. These documents are then used in the annual permit-required confined space program review.

Appendix A - Permit-Required Confined Space Decision Flow Chart



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