Confined Space

Entry Programs

**Fill-in-the-Blank Template**

The following is a fill-in-the-blank template for a confined space entry program.

You are responsible for:

* Providing the actual content

**and**

* Implementing and maintaining your written program.

Complete this document by adding your specific information.

***\_\_(Insert company name)\_***

# CONFINED SPACE ENTRY PROGRAM

**Purpose**

The purpose of this written program is to protect the health and safety of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ employees who enter confined spaces and/or are assigned to serve as attendants or rescue personnel. This program is intended to comply with the requirements of OSHA 29 CFR 1910.146. The plan does not include work locations that do not meet the definition of permit-required confined

space or that fall under a different standard, such as trenching.

### Overview

This confined-space entry program:

* Identifies all permit-required confined spaces in our workplace

**and**

* Describes our procedures for worker safety and health in permit-required confined spaces

Employees will participate in developing and implementing the program in the following ways:

\_\_*(Describe how your employees will participate) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*(Insert company name*)\_\_\_\_\_\_\_\_\_\_\_\_\_ will treat all confined spaces as permit-required spaces until they have been evaluated **and** are documented to be nonpermit.

**Conditions**

|  |  |  |
| --- | --- | --- |
|  | **Hazardous Atmosphere** | **Acceptable Entry**  **Atmosphere Without Respirators** |
| **Oxygen** | Less than 19.5%  Greater than 23.5% | 19.5-23.5% |
| **Air contaminants, physical effects**  **Airborne Combustible Dust\* Explosive contaminants** | Lower Flammability Limit (LFL)  Lower Explosive Limit (LEL) | **Less than 10% of the limit** |
| **Air contaminants, health effects** | IDLH\*\*  Greater than exposure limits, Permissible Exposure Limits, Ceiling Limits, Action Limits, Short Term Exposure Limits **In the 1992 1910.1000 adopted by Comm 32.35(1)** | Under exposure limits.  Keep in mind, PELs and ALs are based on 8-hour time weighted average (TWA).  Ceiling limits are DO NOT EXCEED  Short term are average over 15 min. |
| **Sewer\*\*\*** | Greater than 10ppm H2S Greater than 35ppm CO | Less than 10ppm H2S TWA Less than 35ppm CO TWA |

\*OSHA 1910.146 states greater than flammability or explosive limits are hazardous. No entry will be made at a level at or above 10% of the material’s LEL.

\*\*IDLH: Immediately dangerous to life and health, can kill you on entry or soon thereafter.

\*\*\*Appendix E to 1910.146 Sewer System Entry states “hydrogen sulfide or carbon monoxide at or above 10 ppm or 35 ppm, respectively, measured as an 8-hour time-weighted average.”

Confined Space:

* May be difficult to enter but is physically possible to enter
* Limited entry and exit
* Not designed for continuous occupancy

Non-permit spaces do not have additional hazards and are not covered by OSHA 29 CFR 1910.146 and Department of Commerce Chapter 32.28 & 32.29.

Permit-Required Confined Space:

* Meets definition of the standard for confined space;
* Contains an atmospheric hazard (toxic atmosphere, oxygen deficiency, oxygen enrichment or explosive);
* Is so configured that an entrant may not be able to get out unassisted\* or so that entrant could be trapped or asphyxiated;
* Contains a material that can engulf an entrant;
* Has other recognized safety and health hazards (e.g. unguarded electric or moving equipment, significant heat or cold).

\*slightly more than 1910.146 states.

#### Roles & Responsibilities

The following shows which employees are responsible for the tasks outlined:

**For information only**

**Remove this box from your completed program**

In addition to the roles below, you may want to designate:

* Someone with overall responsibilities for your program

**or**

* One person with all the responsibilities.

|  |  |
| --- | --- |
| **Responsibility:** | Person assigned this responsibility: |
| Evaluate our work locations and determine:  [Check appropriate box(es)]   * Confined space(s) exist at the worksite. * Permit-required confined space(s) exist at the worksite. |  |
| Evaluate the confined space(s) to determine whether hazards are present. |  |
| Evaluate hazards and determine the appropriate entry procedure for the space.  ***Note:*** *Until evaluated and documented otherwise, all confined spaces will be considered permit-required spaces. Alternate entry procedure may apply when the only hazard remaining in the space is a potential hazardous atmosphere controlled by the use of forced air ventilation.* |  |
| Re-evaluate the space when the use, configuration, or hazards of a confined space change. |  |
| Monitoring and testing as follows:   * Conduct initial monitoring to identify and evaluate any potentially hazardous atmospheres * Complete atmospheric testing in the following order: * Oxygen * Combustible gases * Toxic gases and vapors * Record the data *(specify location)*\_\_\_\_\_\_\_\_\_ * Keep these records on-site in *(Specify location\_\_\_\_\_\_\_\_\_\_\_\_\_\_*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
| Inform exposed or potentially exposed employees of the existence and hazards of confined spaces using the methods described below under “Control Confined Space Entry.” |  |
| Provide employees entering confined spaces, or their designated representative, an opportunity to observe pre-entry testing and any subsequent testing.   * All test results will be provided to the entrants or their representatives upon request. * The space will be re-evaluated if entrants or their representatives believe that the permit space was inadequately tested. |  |
| Make sure that all equipment needed for safe entry into any confined space is available and in proper working order. |  |
| Conduct a review using the canceled entry permits to identify and correct any deficiencies in our program. |  |

**Identify Confined Spaces and Hazards**

The following table provides a list of our confined spaces and hazards:

**For information only**

**Remove this box from your completed program.**

If you have a list of confined spaces and their hazards, you can attach it instead of completing this table.

**Confined Spaces and Hazards**

|  |  |  |  |
| --- | --- | --- | --- |
| Confined Space  (name or number) | Type of Space (tank, hopper, sump, pit etc.) | Location | **Hazards** |
| (Insert your confined space information) |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

#### Control of Confined Space Entry

We use the following method(s) to inform employees about the existence and hazards of confined spaces, and prevent unauthorized entry:

(Check appropriate box(es))

* Posting danger signs at each permit space reading "Danger- Permit Required Confined Space - Do Not Enter" or similar.

*(Insert additional means you use to prevent entry) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

|  |
| --- |
| **For information only**  **Remove this box from your completed program**  The methods used to prevent entry must be effective. The following are examples of effective methods:   * Using barriers * Specialized tools under management’s control to open the space * Supplementing these measures with training and signs |

**Permit Entry Procedures**

Our entry procedures for permit spaces include the following:

**For information only**

**Remove this box from your completed program**

Examples of entry permits are included in the resource section.

You may have multiple entry procedures. Specific examples of some of the procedures you may use to enter and complete work include the following:

* Procedure 001 Lockout/Tagout (LOTO)
* Procedure 002 Atmospheric monitoring
* Procedure 003 Job Hazard Analysis

#### Alternate Entry Procedures

**For information only**

**Remove this box from your completed program.**

Complete this section **only** when using alternate entry.

Our permit spaces that have as their only hazard an actual or potential hazardous atmosphere may use alternate entry procedures. These alternate entry procedures do not require the use of an entry permit.

Alternate entry procedures can be used for the spaces listed in the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Confined Space Name or Number | Hazards | Method of Hazard Elimination | Potential Hazardous Atmosphere | **Ventilation Equipment Required** |
| *(Insert your specific information)* |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

We will do all of the following when using alternate entry procedures:

* Eliminate unsafe conditions before removing entrance covers.
  + After removing entrance covers, promptly guard the opening with a railing, temporary cover, or other temporary barrier to prevent accidental falls through the opening and protect entrants from objects falling into the space.
  + Certify that pre-entry measures have been taken (i.e. safe removal of the cover and having protection needed to gather pre-entry data), with the date, location of the space, and signature of the person certifying.
  + Make the pre-entry certification available to each entrant before entry.
* Before an employee enters the confined space, test the internal atmosphere with a calibrated, direct-reading instrument for all of the following, in this order:
  + Oxygen content
  + Flammable gases and vapors
  + Potential toxic air contaminants.
* Provide entrants, or their authorized representatives, with an opportunity to observe the pre-entry and periodic testing.
  + Make sure the atmosphere within the space is not hazardous when entrants are present.
* Use continuous forced air ventilation, as follows:
* Wait until the forced air ventilation has removed any hazardous atmosphere before allowing entrants into the space.
* Direct forced air ventilation toward the immediate areas where employees are, or will be, and continue ventilation until all employees have left the space.
* Provide the air supply from a clean source and make sure it does not increase hazards in the space.
* Test the atmosphere within the space as needed to make sure hazards do not accumulate.
* If a hazardous atmosphere is detected during entry, we will do all of the following:
  + Evacuate employees from the space immediately.
  + Evaluate the space to determine how the hazardous atmosphere developed.
  + Implement measures to protect employees from the hazardous atmosphere before continuing the entry operation.
  + Verify the space is safe for entry before continuing the entry operation.
* The written documentation is available to each employee entering the space or to that employee’s representative at the confined space bulletin board.

#### Classify a Confined Space as a Non-permit Space

###### For information only

**Remove this box from your completed program.**

Complete this section **only** when you classify a space as nonpermit.

See non-permit space documentation form in this section.

* A space will be classified nonpermit only for as long as all the hazards remain eliminated.
* If someone must enter the space to eliminate of any of the hazards, we will follow all the requirements listed under the permit entry procedures.
* Documentation that no permit-required confined space hazards exist will include the following:
  + The date, location, and signature of the person making the determination.
  + How we determined that no permit-required confined space hazards exist.
  + Documentation will be available to entrants or their authorized representatives by posting at the entry to the space.

The following spaces can be classified as nonpermit spaces by following the listed methods of hazard elimination:

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Location of Confined Space | Hazards | **Method of Hazard Elimination** |
| (Input your specific information) |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Non-Permit Space Documentation Form

|  |  |
| --- | --- |
| **Non-permit confined space name or number** | *(Insert your specific information here)* |
| **Location** |  |
| **Documentation** |  |
| **Date** |  |
| **Signature** |  |

**Training**

* We will provide permit space training to employees at the following times:
* When hired, so new employees are aware of our confined spaces
* Before they are assigned permit space entry duties
* When their assigned duties change and
* When there is a change in a space that creates hazards for which they have not been trained.

|  |
| --- |
| For information only  Remove this box from your completed program.  Following are 6 basic categories of training, based on duties and potential exposure:   1. Awareness training provided to all employees potentially exposed to permit spaces, covering the following:   a. The location and hazard of each space  b. The company program for confined spaces  c. Emphasis on **not** entering the space for any reason.   1. Entry and exit training for the following team members:   a. Entrants  b. Attendants  c. Supervisors  d. Rescue team members   1. Training on how to manage confined space entries for entry supervisors. 2. Rescue training for rescue team members. 3. Pre-entry procedure training for all: 4. Entrants 5. Supervisors 6. Attendants 7. Rescue team members 8. Training on evaluating and testing confined spaces for: 9. Entry supervisors 10. Staff assigned to test and evaluate the space 11. Retraining for employees who are not believed to be proficient in any way in their confined space duties. |

### Responsibilities for Contractors

**For information only**

**Remove this box from your completed program.**

Complete this section **only** when you hire a contractor to work in your confined space(s).

A copy of this Confined Space Entry Program will be provided to each contractor involved in permit space entry work at our company. Each contractor will be briefed on the following:

* The location of the permit spaces at our facility.
* Entry into permit spaces is only allowed by following the written entry program.
* The reasons for listing the space as a permit space, including both of the following:
  + The identified hazards
  + Our experience with the particular space.
* Precautions we have implemented to protect employees working in or near the space.
* Who will debrief the contractor at the completion of entry operations, or during entry if needed, on whether any hazards were confronted or created during their work.

### Our Responsibilities with Host Employers

**For information only**

**Remove this box from your completed program.**

Complete this section **only** when you are a contractor working in someone else’s confined space.

Our entry supervisor will do the following to make sure entry operations are coordinated with host employers:

* Obtain any information on the hazards of the permit space and information from previous entry operations
* Determine if other workers will be working in or near the space.
* Coordinate entry operations with other workers
* Inform the host employer of the permit space program that we follow.
* Hold a debriefing conference at the completion of the entry operation, or during the entry operation if needed, to inform the host employer of any hazards confronted or created during work in the space.

### Rescue and Emergency Services

We have developed the following rescue and emergency action plan:

**For information only**

**Remove this box from your completed program.**

Insert your specific company rescue and emergency plan here. For more information about rescue from confined spaces, see the tool *Evaluating Rescue Teams or Services*.

You need to use non-entry rescue procedures and equipment, unless this would increase the risk of injury to the entrant or would be ineffective. For entry rescue, see entry rescue plans in this section.

This section is **not** required for the following confined space entries:

* Classified and documented non-permit spaces.
* Proper use of alternate entry procedures.

**Entry Rescue Plans**

Following are three options for you to consider when developing rescue plans as outlined in the evaluating rescue teams or services tool, which is located in the resources section of the Confined Spaces book.

**Option 1**

The entry supervisor will contact \_ *(name of rescue service)*\_\_\_\_\_\_\_\_\_\_\_\_\_ at \_*(phone number)*\_\_\_ to do both of the following:

* Coordinate entry

#### Schedule an entry date and time.

#### Option 2

Complete the following information. Train employees on the specific procedures for summoning the rescue and emergency services.

Name of rescue service: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Telephone number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approximate response time: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name of emergency medical service: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Telephone number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approximate response time: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

#### Option 3

The specific procedures for summoning rescue and emergency services for our workplace are:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Following are the permit spaces that require stand-by rescue services during entry. The rescue service will be available at the space during the entire entry procedure to ensure prompt entrant rescue.

|  |  |
| --- | --- |
| **Permit Spaces Requiring Stand-by Rescue Services** | |
| **Permit space:** | **Stand-by rescue service name and telephone number:** |
|  |  |
|  |  |
|  |  |

Permit-Required Confined Space Program Review

##### For information only

**Remove this box from your completed program.**

This section is **not** required if you only enter non-permit spaces or use alternate entry procedures

At least every 12 months we will conduct a review using canceled entry permits to identify any deficiencies in our program. We will conduct a review immediately if there is reason to believe that the program does not adequately protect our employees, such as in the following situations:

* Unauthorized entry of a permit space;
* Discovery of a hazard not covered by the permit;
* Detection of a condition prohibited by the permit;
* An injury or near-miss during entry;
* Change in the use or configuration of the space; or
* Employee complaints of permit-space program ineffectiveness.

Corrective measures will be documented by revising the program. Employees will participate in revising the program, and will be trained on any changes.

If no permit-space entry operations are conducted during the year, no review is needed.

**Appendix A: Definitions**

1. **Acceptable entry conditions**: The 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.
2. **Alternate Entry Procedures:** Procedures that may be used when the only hazard of a confined space, based upon monitoring and inspection data, is an actual or potential hazardous atmosphere in which continuous forced-air ventilation alone is all that is needed to maintain the permit-required confined space for safe entry.
3. **Attendant:** An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.
4. **Authorized Entrant**: An employee who is authorized by the employer to enter a permit required confined space.
5. **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.
6. **Confined Space**: A space that:

* Is large enough and so configured that an employee can bodily enter and perform assigned work; and
* Has limited or restricted means for entry or exit (for example, tanks vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and
* Is not designed for continuous employee occupancy.

1. **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.
2. **Emergency**: Any occurrence (including any failure of hazard control or monitoring equipment) or event(s) internal or external to the confined space that could endanger entrants.
3. **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.
4. **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.
5. **Entry permit**: The written or printed document that is provided by the employer to allow and control entry into a permit space and contains the information specified in paragraph (f) of this section.
6. **Entry permit system**: The employer's written procedures for preparing and issuing permits for entry and returning the permit space to service following termination of entry and designates by name or title the individuals who may authorize entry.
7. **Entry supervisor**: The term "lead worker" is utilized by The City of Spokane wherever 29 CFR 1910.146 refers to the "entry supervisor." See “lead worker.”
8. **Hazardous atmosphere**: An atmosphere that may expose employees to the risk of death, incapacitation, and impairment of ability to self-rescue (that is, 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 percent of its lower flammable limit (LFL);
* Airborne combustible dust at a concentration that meets or exceeds its LFL;
  + ***Note****: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.*
* Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
* Atmospheric concentration of any substance which may exceed a permissible exposure limit.
  + ***Note****: An airborne concentration of a substance that isn’t capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects isn’t covered by this definition.*
* Any other atmospheric condition that is immediately dangerous to life or health.
  + ***Note****: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard 1910.1200, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.*

1. **Hot work permit**: The employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.
2. **Immediately dangerous to life or health (IDLH)**: Any condition which poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

* ***Note****: Some materials - hydrogen fluoride gas and cadmium vapor, for example - may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12 to 72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.*

1. **Inerting**: The displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

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

1. **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; or blocking or disconnecting all mechanical linkages.
2. **Lead Worker (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, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section. The term "lead worker" is utilized by the City of Spokane wherever 29 CFR 1910.146 refers to the "entry supervisor."

* ***Note****: A lead worker 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 lead worker may be passed from one individual to another during the course of an entry operation.*

1. **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.
2. **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.
3. **Oxygen-deficient atmosphere**: An atmosphere containing less than 19.5 percent oxygen by volume.
4. **Oxygen-enriched atmosphere**: An atmosphere containing more that 23.5 percent oxygen by volume.
5. **Permit-required confined space**: Also known as permit space; A confined space that has one or more of the following characteristics:

* Contains or has a potential to contain a hazardous atmosphere;
* Contains a material that has the potential for engulfment of an entrant;
* Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or a floor which slopes downward and tapers to a smaller cross-section; or,
* Contains any other recognized serious safety or health hazard.

1. **Permit required confined space program**: The employer's overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.
2. **Permit system**: The employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.
3. **Prohibited condition**: Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.
4. **Rescue service**: The personnel designated to rescue employees from permit spaces.
5. **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.
6. **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 permit space. 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.

**Appendix B: Atmospheric Testing and Monitoring**

**Procedures for Atmospheric Testing and Monitoring**

Atmospheric testing is necessary for two purposes: evaluation of the hazards of the permit space and verification that acceptable entry conditions for entry into that space exist.

1. **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 entry procedures can be developed and acceptable entry conditions stipulated for that space. A minimum of three tests should be performed to identify atmospheric hazards in confined spaces. These tests must be performed in the following sequence:

* Oxygen content
* Flammability
* Toxicity

1. **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.
2. **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.
3. **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 four feet 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.
4. **Equipment Calibration:** To ensure that the atmospheric testing equipment is functioning properly, any direct reading test device should not be used without performing the following three operations:

* Inspection
* Calibration
* Function test

All three operations should be performed according to specific manufacturer’s instructions.

**Air Monitoring Guide**

1. Calibrate Instrument
2. Inspect Instrument
   * Check physical condition of instrument (case, meter, attachments, hoses for cracks). Review instructions to ensure you know how to use the device and interpret results.
3. Perform Function Test

* Oxygen sensor: Breathe into sampling device to reduce the oxygen level below 19.5%. The oxygen alarm should sound.
* Combustible gas sensor: Remove cap of solvent magic marker or open a cigarette lighter without a flame near the sampling device until it reaches a 10% reading. The gas sensor should sound.
* Always perform a function test in the field before use.
* Never perform a function test in the suspected atmosphere.

1. Pre-Test the Space

* Zero instrument in known fresh air.
* Test entire space, top to bottom, every four feet and in the direction of travel.
* Remember order of tests:
* Oxygen
* Flammability
* Toxicity

1. Monitor the Space

* If continuous monitoring is required, position the instrument near the workers’ breathing zone.

**Appendix C: Ventilation of Confined Spaces**

Ventilation is one of the most effective means of controlling hazardous atmospheres in confined spaces. In this procedure, clean air replaces contaminated air by natural or forced (mechanical) ventilation.

**Factors in Ventilating Confined Spaces**

When ventilating a confined space, the following factors must be taken into consideration:

1. **Volume of air:** Determines the capacity of the blower or ejector.
2. **Type of atmosphere:** Determines the type of blower or ejector used and the length of time needed to ventilate until it is safe for people to enter the space.
3. **Access to space:** Determines how to get the ventilating air into and out of the space.
4. **Power requirements and availability:** Influences the power source and fan motor size. A portable generator may be required as a source of power.
5. **Cost, efficiency, and maintenance:** May have an effect on the type of device that is selected and what is necessary to keep it working properly.
6. **Shape of space:** Will affect the type of directional device needed and the amount of air pressure required to provide sufficient ventilation.
7. **Source of clean air:** Necessary to ensure adequate ventilation.
8. **Length of time ventilation is needed:** Determined by the type of contaminant and the work that is to be done in the space.
9. **Type of work to be done:** Determines whether local exhaust ventilation or general ventilation is required.

**Ventilation Guide**

1. Select fan with a capacity to quickly replace the air in the space. Limitations are pasted on the fan housing.
2. Use reliable, grounded electrical power.
3. Eliminate any hazardous atmosphere. Exhaust toxic and flammable air and supply fresh air when oxygen-deficient.
4. Provide constant circulation of fresh air while space is occupied.

* Natural ventilation is allowable only on non-permit entry.
* Direct high-velocity supply ventilation to mix the air throughout the space.
* Capture contaminants during hot work or cleaning with solvents by using additional local (or point) exhaust.
* Pure oxygen is not fresh air. Never use bottled oxygen for ventilation.

1. Arrange ductwork to ensure safety:

* Locate supply fan intake away from flammable or toxic air.
* Position exhaust fan outlet to avoid recirculation of bad air or endangering others outside the space.
* Position exhaust duct inlet next to the source of contaminants.
* Keep ducts short and straight.
* Make sure air circulates through entire space and does not short-circuit.

1. Monitor the air to ensure ventilation is keeping the air safe to breathe.

**Appendix D: Basic Confined Space Entry and Rescue Equipment**

**Necessary Safety Equipment**

Equipment shall include, but is not limited to:

* Safety cones
* Safety vest
* Barricades (as required)
* Men working signs (as required), safety flags
* Manhole hook (or pick)
* Combustible gas/oxygen/co2/toxic gas detector utility ropes
* Full body harness retrieval line
* Mechanical retrieval device
* Tri-pod or other anchoring point, forced air ventilation blower and hose fire extinguisher
* First aid kit, safety ladder
* Manhole access bracket
* Self-contained air units, hard hats
* Safety glasses, safety shoes
* Rescue telephone number

**Appendix E: Employee Duties**

**Duties of Authorized Entrants:**

1. Know the hazards that may be faced during entry.
2. Recognize the signs and symptoms of hazard exposure.
3. Understand the consequences of hazardous exposure.
4. Use equipment properly.
5. Communicate with the attendant.
6. Alert the attendant of hazards.
7. Exit the permit space quickly when required.

**Duties of the Attendant:**

1. Know entry hazards.
2. Know behavioral effects of exposure.
3. Maintain accurate entrant identification.
4. Remain outside the permit space.
5. Communicate with entrants.
6. Monitor entry activities.
7. Summon rescue and emergency services.
8. Prevent unauthorized entry.
9. Perform non-entry rescue.
10. Perform no conflicting duties.

**Duties of the Lead Worker (Entry Supervisor):**

1. Know the potential hazards during entry and work.
2. Determine if acceptable entry conditions are present at a permit space where entry is planned.
3. Terminate entry as required by the standard.
4. Verify that rescue services are readily available and the means for summoning them are operable.
5. Remove unauthorized individuals who enter or try to enter the permit space during entry and work.
6. Determine that entry and work operations remain consistent with entry permit terms and that acceptable entry conditions are maintained.

Note: The person authorizing the entry may also serve as the entrant or attendant for the entry

**Appendix F: Confined Space Entry Procedure**

1. Determine if entry into confined space is necessary to perform work.
2. The following minimum-required equipment should be on hand:

* Ventilation,
* Barrier and warning signs,
* Gas monitor capable of measuring concentrations of oxygen, flammable gases, hydrogen sulfide and carbon monoxide.

1. Eliminate any unsafe conditions before the access door or cover is opened.
2. Immediately guard the entry by some barrier and signs to prevent people or objects from accidentally entering the confined space.
3. Conduct hazard assessment:

* Test the real or potential atmospheric hazards
  + Oxygen content less than 19.5% or greater than 23.5%
  + Flammable gases and vapors greater than 10% of the LEL (Lower Explosive Limit)
  + Hydrogen sulfide concentrations greater than 10 ppm (parts per million)
  + Carbon monoxide concentrations greater than 35 ppm
  + Other toxic gases or vapors greater than PEL (Permissible Exposure Limit)

Note: For more information, see Air Monitoring Guide (Appendix B).

* Review the space for other observable serious safety and health hazards:
  + Mechanical,
  + Electrical,
  + Burn,
  + Heat stress,
  + Engulfment, or
  + Entrapment hazards, etc.

1. If any hazardous atmosphere exists, do the following:

* If possible, determine and eliminate the source of the atmospheric hazards (for example: carbon monoxide from nearby truck or gas-powered generator).
* When the atmosphere contains toxins or flammables, ventilate the space by drawing air out until the air has been changed over several times.
* When oxygen deficient, ventilate by pushing air into the space until the air has been changed over several times.
* Verify the hazardous atmosphere has been eliminated by testing the air.

Note: For more information, see Ventilation Guide (Appendix C).

1. Determine from information gathered above which of the following entry procedures is appropriate:

* **Non-Permit Space:** If there are neither real nor potential atmospheric hazards and no observable serious safety and health hazards, this should be certified in writing.
* **Alternative Entry Procedures:** If no observable serious safety and health hazards exist and atmospheric hazards are controlled with continuous ventilation, this should be certified in writing.
* **Permit-Required Space:** If there are any observable serious safety/health hazards in addition to potential or real atmospheric hazards, all procedures here must be followed. Authorize permit with signature.
* **Non-Respirable Atmospheres:** If hazardous atmosphere cannot be eliminated by continuous ventilation, contact EHS before continuing.

1. Follow pre-entry precautions:

* Notify affected departments of service interruption.
* Lock-out/tag-out all sources of energy (e.g. steam, electric, mechanical) posing a risk to workers.
* Install blank in affected pipes where valves are not secure or seated.
* Clean and/or purge any chemical storage vessel.
* Wear appropriate personal protective and respiratory protection.
* Have lights and or ladder available.
* If coordination is needed with contractors, see contractor checklist.
* Have appropriate MSDS's (material safety data sheet).
* Determine how often air monitoring will be conducted.

1. Additional precautions necessary for permit-required spaces:

* Determine start and end times for authorized entry.
* Assign roles and responsibilities as entrant(s), attendant(s), lead worker(s).
* Set up non-entry rescue equipment (tri-pod, harness).
* Identify rescue service.
* Determine communication method between entrant/attendant.
* Conduct pre-entry briefing: review hazards, procedures, and precautions.

1. Sign and post the permit/certification at the site.
2. Continually ventilate the space by pushing air so that a positive pressure changes the air over several times every hour. Direct the clean air toward the worker.
3. Test the air periodically while personnel are in the confined space to ensure the ventilation is preventing any accumulation of a hazardous atmosphere.
4. Under the following conditions, personnel must exit the confined space, re-evaluate hazards, and modify entry procedures.

* If any hazardous atmosphere is detected after entry.

Note: If a hazardous atmosphere has been detected after entry, EHS staff should be notified before re-entry.

* If any health or safety hazard develops which was not anticipated.
* If attendant (on permit-required confined space entry) cannot effectively perform duties.
* If personnel in confined space are experiencing symptoms from heat stress or over-exposure to atmospheric hazards.

1. When work is completed, return the space to original condition. Close out the permit/certification and submit the completed paperwork to your supervisor.

**Appendix G: Confined Space Entry Permit Template**



