

Confined Spaces for General Industry Sample Written Program



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Occupational Safety and Health Consultation Program

Confined Spaces for General Industry

Sample Written Program

29 CFR 1910.146



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This sample written program is a guide to help employers and employees comply with the requirements of the Occupational Safety and Health Administration's (OSHA) Confined Spaces General Industry Standard, 29 Code of Federal Regulations (CFR) 1910.146. It contains the basic elements of a Confined Spaces for General Industry Program and is not meant to supersede the standard's requirements. Employers should review the standard for each specific worksite and customize the program accordingly.

This fillable publication is designed to allow your organization to customize the program and replace the blank boxes with your company's name and the responsible individual(s) you assign to meet the OSHA standards for Confined Spaces for General Industry.

This sample written program is provided as a public service by the Texas Occupational Safety and Health Consultation Program (OSHCON).

Important Notes: A separate standard for Confined Spaces for Construction went into effect in August 2015. When working in confined spaces in construction, such as attics, basements, and crawl spaces, refer to CFR 1926 Subpart AA.



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Confined Spaces for General Industry

29 CFR 1910.146

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Confined Spaces for General Industry Program for

OBJECTIVE

The purpose of the Confined Spaces for General Industry Program is to set procedures for employees' safe entry into confined spaces and permit-required confined spaces to do routine tasks associated with their employment. This procedure is designed to meet the minimum safety requirements of the Occupational Safety and Health Administration's (OSHA) Confined Spaces General Industry Standard, 1910.146.

BACKGROUND & DEFINITIONS

Many workplaces contain spaces that are considered "confined" because the configurations hinder the activities of employees who must enter, work in, or exit from these spaces. In many instances, employees who work in confined spaces also face increased risk of exposure to serious physical injury or death from dangers such as entrapment, engulfment, and hazardous atmospheric conditions. Confinement itself may pose entrapment hazards and work in confined spaces may keep employees closer to hazards such as machinery components than they would be otherwise. For example, confinement, limited access, and restricted airflow can result in hazardous conditions that would not normally arise in an open workplace.

By definition, a **confined space** is:

- large enough for an employee to enter fully and perform assigned work;
- not designed for continuous occupancy by the employee;
- limited or restricted in its means of entry or exit; and
- so enclosed that natural ventilation may not reduce air contaminants to levels below the threshold limit value (TLV).

These spaces may include underground manholes, pipes, vaults, tanks, storage bins, trailers, pits, diked areas, vessels, silos, and other similar areas.

By definition, a **permit-required confined space** has one or more of these characteristics:

- contains or has the potential to contain a hazardous atmosphere;
- contains material with the potential to engulf someone who enters the space;
- has an internal configuration that might cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section; and
- contains any other recognized serious safety or health risk.

Additional **definitions are listed in Appendix D**. To evaluate the workplace to determine if a permit is required, see the **Permit-Required Confined Space Decision Flow Chart in Appendix E**.



ASSIGNMENT OF RESPONSIBILITY

Employer

In administering this Confined Spaces Program, will:

- monitor the program's effectiveness;
- provide atmospheric testing and equipment as needed;
- provide personal protective equipment (PPE) as needed;
- provide training to affected employees and supervisors;
- provide technical assistance as needed; and
- review and update the program as needed and at least once a year.

Program Manager

**is responsible for managing the Confined Spaces Program for
, and will:**

- evaluate the workplace to determine if any spaces are permit-confined spaces;
- maintain a list of confined spaces at all worksites;
- inform exposed employees of the existence, location, and dangers of a permit space by posting a sign reading, "DANGER--PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" or similar language;
- ensure that if employees are not to enter and work in a permit space, will take effective measures to prevent employees from entering these spaces;
- train employees and document performance;
- coordinate with outside responders;
- ensure equipment complies with OSHA standards;
- complete entry requirements before entry is authorized;
- eliminate any conditions making it unsafe to remove an entrance cover before the cover is removed;
- perform confined space monitoring by personnel who are qualified and trained in confined space entry procedures;
- maintain a list of monitoring equipment and personnel qualified to operate the equipment;
- ensure rescue service personnel have simulated a rescue in a confined space within the past year;
- know the potential hazards employees may face during entry, including the mode of exposure (how the contaminant gets into the body), signs or symptoms of exposure, and consequences of exposure;

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- complete confined space permit(s);
 - determine the entry requirements;
 - require a permit review and signature from the authorized Entry Supervisor;
 - notify all involved employees of the permit requirements;
 - post the permit in an obvious location near the job;
 - renew the permit or have it reissued as needed (a new permit is required every shift);
 - determine the number of attendants required to perform the work;
 - verify attendant(s) know how to communicate with the entrants and how to obtain assistance;
 - stay alert to changing conditions that may affect the permits' conditions, that is, require additional atmospheric monitoring or changes in PPE;
 - change and reissue the permit, or issue a new permit as necessary;
 - ensure periodic atmospheric monitoring is conducted according to permit requirements;
 - ensure workers performing tasks outside a confined space do not introduce hazards into the space;
 - remove employees from the space immediately if a hazard is detected during entry;
 - evaluate the space if a hazard is detected during entry to determine how it developed;
 - implement measures to protect employees from the hazard before any subsequent entry takes place
 - ensure personnel doing the work and support personnel follow permit requirements;
 - ensure the confined space is safely closed and all workers are cleared from the area;
 - cancel the permit when work is completed; and
 - review canceled permits for lessons learned.

Entry Supervisors

will serve as the Entry Supervisor(s). This individual or individuals will be qualified and authorized to approve confined space entry permits. The Entry Supervisor(s) will:

- determine if conditions are acceptable for entry;
- know space hazards including information on the mode of exposure, signs and symptoms, or consequences;
- verify emergency plans and specified entry conditions such as permits, tests, procedures, and equipment before allowing entry;
- authorize entry and oversee entry operations;



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- terminate entry procedures and cancel permits if a new condition exists or when entry operations are completed;
 - serve as an attendant, if the person is trained and equipped for that role;
 - ensure measures are in place to keep unauthorized personnel clear of the area;
 - check the work at least twice a shift -- more often if operations or conditions demand -- to verify and document that permit requirements are observed;
 - keep required information on chemical hazards at the worksite for the employees and rescue service personnel;
 - ensure an onsite rescue team or an outside rescue service is available and instructed in its rescue duties;
 - ensure rescue service personnel have current certification in first aid and cardiopulmonary resuscitation (CPR); and
 - post an upstream observer or use an electronic sensor to alert employees of the first sign of a hazard when working in a storm sewer.

Attendants

will function as an attendant(s) and will be stationed outside of the confined workspace. The attendant(s) will:

- understand and be able to recognize potential confined-space hazards;
- maintain a sign-in/sign-out log with a count of all persons in the confined space, and ensure that all entrants sign in and out;
- monitor surrounding activities to ensure the safety of personnel;
- remain outside the permit space during entry operations unless relieved by another authorized attendant;
- maintain effective and continuous communication with personnel during confined space entry, work, and exit;
- perform non-entry rescues when specified by the employer's rescue procedure;
- order evacuation of the permit space when:
 - a prohibited condition exists;
 - a worker shows signs of physiological effects of hazard exposure;
 - an emergency outside the confined space exists; and
 - the attendant cannot effectively and safely perform the required duties.
- summon rescue and other services during an emergency; and
- keep unauthorized persons out of the confined space, order them out, or notify authorized personnel of an unauthorized entry.



Rescue Service Personnel

The rescue service members will:

- respond to an emergency promptly;
- complete authorized entrants training and be trained to perform assigned rescue duties;
- participate in training drills using mannequins or personnel in a simulation of the confined space before issuing an entry permit for any confined space;
- practice rescue operations in permit spaces yearly;
- respond immediately to rescue calls from the attendant or any other person recognizing a need for rescue from the confined space;
- receive the same training, in addition to emergency response training, as that required of the authorized entrants;
- maintain current certification in first aid and CPR; and
- maintain respirator qualifications.

Authorized Entrants/Affected Employees

Employees permitted to enter a confined space will:

- read and observe the entry permit requirements;
- know space hazards, including information on the means of exposure such as inhalation or dermal absorption, signs of symptoms, and consequences of the exposure;
- remain alert to the hazards they could come across while in the confined space;
- use the appropriate PPE required by the permit;
- maintain communication with attendants as necessary to monitor the entrant's status and alert the entrant to evacuate when necessary;
- wear a chest or full-body harness or wristlets (if body harness creates a greater hazard) with a retrieval line attached to a mechanical device or a fixed point outside the permit space;
- exit the confined space immediately when:
 - ordered by an authorized person,
 - recognize warning signs or symptoms of exposure,
 - a prohibited condition exists, or
 - an automatic alarm system sounds.
- alert attendant(s) when a prohibited condition exists or when warning signs or symptoms of exposure exist.



TRAINING

will provide training so that all employees whose work is regulated by this Confined Spaces Program acquire the knowledge and skills necessary to perform their duties in confined spaces safely.

Training Frequency

will provide training to each affected employee:

- before the employee's first assigned duties within a confined space;
- before there is a change in assigned duties;
- when there is a change in permit space operations that presents a danger for an employee not trained in that hazard; and
- when _____ has reason to believe that there are deviations from the confined space entry procedures required in this program, or when there are inadequacies in the employee's knowledge or use of these procedures.

The training will establish employee proficiency in the duties required in this program and will introduce new or revised procedures, as necessary, for compliance with this program.

General Training

All employees who will enter confined spaces will be trained in entry procedures in a language, and vocabulary employees will understand. Personnel responsible for supervising, planning, entering, or participating in confined space entry and rescue will be adequately trained in their functional duties before entering any confined space. Employees should be trained to:

- recognize hazards associated with confined spaces;
- know confined space hazards associated with the facility, location, or operation;
- use PPE and other safety equipment required for entry into confined spaces, as well as the reasons for and limitations of use;
- understand permits and other procedural requirements for conducting a confined space entry;
- identify conditions prohibiting entry;
- utilize proper procedures for responding to emergencies;
- demonstrate knowledge of the duties and responsibilities of the confined space entry team;
- recognize symptoms of overexposure to air contaminants personally and in co-workers, and method(s) for alerting the attendant(s); and
- conduct self-rescue methods in emergencies.

Refresher training will be conducted as needed so that employees remain competent in entry procedures and precautions.



Specific Training

Teach employees about the specific dangers of confined spaces at the workplace. The following workers will require specific training in these areas:

- **atmospheric monitoring personnel**- the proper use of monitoring instruments, calibration, sampling techniques, and permissible exposure limits (PELs), including threshold limit values (TLVs), lower explosive limits (LELs), and upper explosive limits (UELs).
- **attendants**-procedures to call rescue or other emergency services and the proper use of equipment to communicate with entry and emergency rescue personnel.
- **emergency response personnel**-rescue procedures for each type of confined space potentially encountered, use of emergency rescue equipment, first-aid and CPR techniques, and confined space location and configuration to lower response times.

Verification of Training

_____ will conduct periodic assessment of the effectiveness of employee training and will repeat training sessions as often as needed so that employees stay competent.

IDENTIFICATION OF HAZARDS AND EVALUATION OF CONFINED SPACES

Survey

_____ will ensure that a worksite survey is done to identify confined spaces. This survey can be partially completed from initial and continuing site characterizations, but also from other available data, including blueprints and job safety analyses. The survey's purpose is to develop an inventory of locations or equipment at _____ that meet the definition of a confined space. This information will be communicated to personnel, and appropriate confined space procedures will be followed before entry. The initial surveys will include air monitoring to determine the air quality in the confined spaces. _____ will evaluate the potential for:

- flammability or explosive potential;
- oxygen deficiency; and
- presence of toxic and corrosive material.

Hazard Reevaluation

_____ will identify and reevaluate hazards based on possible changes in activities or other physical or environmental conditions that could negatively affect work. A master inventory of confined spaces will be maintained. _____ will route to all affected personnel any change in designation of a confined space.



Pre-entry Hazard Assessment

_____ will complete a hazard assessment before any entry into a confined space. The hazard assessment should identify:

- the sequence of work to be performed in the confined space;
- the specific hazards known or anticipated; and
- the control measures to be implemented to eliminate or reduce each of the hazards to an acceptable level.

No entry will be permitted until each person engaged in the activity has reviewed and discussed the hazard assessment. Personnel who are to enter confined spaces will be informed of known or potential hazards associated with the confined spaces.

Hazard Controls

Hazard controls will be established to address changes in the work processes or working environment. Hazard controls must be able to control the health hazards by eliminating the responsible agents, reducing health hazards below harmful levels, or preventing workers' exposure to contaminants.

The following order of precedence will be followed in reducing confined space risks.

1. Engineering controls

Engineering controls eliminate or reduce a hazard through sound engineering practices. Ventilation is one of the most common engineering controls used in confined spaces. Using ventilation to remove atmospheric contaminants from a confined space will ventilate the space until the atmosphere is within the acceptable range. Ventilation will be maintained during the occupancy if there is a potential for the atmospheric conditions to move out of the acceptable range. When ventilation is not possible or feasible, _____ will determine alternate protective ways to remove air contaminants and protect occupants before authorizing entry. When conditions necessitate and can accommodate continuous forced air ventilation, use the following precautions:

- Employees will not enter the space until the forced air ventilation has eliminated any hazardous atmosphere;
- Forced air ventilation will be directed to ventilate the immediate areas where an employee is or will be present.
- Continuous ventilation will be maintained until all employees have left the space.
- Air supply or forced air ventilation will originate from a clean source.

2. Work practice (administrative) controls

Work practice (administrative) controls to eliminate or reduce a hazard through changes in work practices, including rotating workers, reducing the amount of worker exposure, and housekeeping.

3. Personal protective equipment (PPE)

If the hazard cannot be eliminated or reduced to a safe level through engineering or work practice controls, PPE should be used. The _____ will determine the appropriate PPE needed by all personnel entering the confined space, including rescue teams. PPE meeting the specifications of applicable standards will be selected in accordance with the requirements of the job to be performed.

ENTRY PERMITS

The Confined Space Entry Permit is the essential tool for assuring safety during entry into confined spaces with known hazards or with unknown or potentially hazardous atmospheres. The entry permit process guides the supervisor and workers through a systematic evaluation of the space to be entered. The permit should be used to establish appropriate conditions. Before each entry into a confined space, _____ will complete an entry permit. _____ will then communicate the contents of the permit to all employees involved in the operation and post the permit at all entrances or before employees enter a permit space. The permit must verify the pre-entry preparations outlined in the standard were completed. The duration of entry permits must not exceed the time required to complete an assignment. A standard entry permit will be used for all entries.

Key Elements of Entry Permits

A standard entry permit must include:

- name of the space to be entered;
- purpose of entry;
- date and authorized duration of the entry permit;
- name of authorized entrants within the permit space;
- means of identifying authorized entrants inside the permit space, for example, rosters or tracking systems;
- name(s) of personnel serving as an attendant(s) for the permit duration;
- name(s) of personnel serving as Entry Supervisors, with a space for the signature or initials of the Entry Supervisor who originally authorized the entry;
- hazards of the permit space;
- measures used to isolate the permit space and to eliminate or control permit space hazards before entry, such as lockout/tagout of equipment and procedures for purging, ventilating, and flushing permit spaces;
- acceptable entry conditions;
- results of initial and periodic tests performed, accompanied by the names or initials of the testers and the date(s) when the tests were performed;



- rescue and emergency services that can be summoned, and the means of contacting those services, for example, equipment to use and phone numbers to call;
- communication procedures used by authorized entrants and attendant(s) to maintain contact during the entry;
- equipment to be provided for compliance with this Confined Space Program, including PPE and testing, communication, alarm, and rescue equipment;
- other information necessary for the circumstances of the confined space that will help ensure employee safety; and
- additional permits, such as for hot work, that have been issued to authorize work in the permit space.

Permit Scope and Duration

A permit is only valid for one shift. For a permit to be renewed, the following conditions must be met before each reentry into the confined space:

- conduct atmospheric testing and ensure that the results are within acceptable limits.
- take precautions to protect entrants against the hazards addressed in the permit if atmospheric test results are not within acceptable limits;
- verify all precautions and other measures called for on the permit remain in effect; and
- conduct only operations or work originally approved on the confined space permit.

Issue a new permit, or reissue the original permit if possible, whenever changing work conditions or work activities introduce new hazards into the confined space. will
retain each canceled entry permit for at least one year to facilitate the review of the Confined Space Entry Program. Any problems encountered during an entry operation will be noted on the respective permit(s) so that appropriate revisions to the confined space permit program can be made.

Alternative to a Full Permit Entry

Under certain conditions described in (c)(5)(ii), may use an alternate
procedure for worker entry into a permit space. For example, if will
can demonstrate with monitoring and inspection data that the only hazard is an actual or potentially hazardous atmosphere that can be made safe for entry using continuous forced air ventilation, will
may be exempted from some requirements, such as permits and
attendants. However, even in these circumstances, must test the
internal atmosphere of the space for oxygen content, flammable gases and vapors, and the potential for toxic air contaminants before any employee enters it. must also
provide continuous ventilation and verify that the required measurements are performed before entry.



ENTRY PROCEDURES

When entering a confined space is necessary, either the Entry Supervisor or _____ may initiate entry procedures, including the completion of a confined space entry permit. Entry into a confined space will follow the standard entry procedure below.

Before Entry

The confined space entry permit must be completed in entirety before a standard entry. All requirements of the permit must be met, reviewed, and signed by an Entry Supervisor. Additionally, the following conditions must be met before standard entry:

- train affected personnel to establish proficiency in the duties these employees will perform within the confined space;
- test the internal atmosphere within the confined space with a calibrated, direct-reading instrument;
- provide personnel with necessary PPE as determined by the Entry Supervisor; and
- conduct atmospheric monitoring during the entry.

Note: If a hazardous atmosphere is detected during entry, personnel within the confined space will be evacuated by the attendant(s) or Entry Supervisor until the space can be evaluated by to determine how the hazardous atmosphere developed. Additionally, controls will be put in place to protect employees before reentry.

Opening a Confined Space

Eliminate any conditions that make it unsafe to remove an entrance cover before the cover is removed. When entrance covers are removed, promptly guard the opening by a railing, temporary cover, or another temporary barrier that will prevent anyone from falling through the opening. This barrier or cover will protect each employee working in the space from foreign objects entering the space. If the space is in a traffic area, adequate barriers will be put up.

Atmospheric Testing

Atmospheric test data is required before entry into a confined space for evaluation of the hazards of the permit space and verification that acceptable conditions exist for entry.

If a person must go into the space to obtain the needed data, the person will follow confined space entry procedures. Before entering into a confined space, _____ will conduct testing for hazardous atmospheres. The person will test the internal atmosphere with a calibrated, direct-reading instrument for oxygen, flammable gases, vapors, and potential toxic air contaminants, in that order.

Testing equipment must be approved by _____ for use in specialty areas. Additionally, all testing equipment must be approved by a nationally recognized laboratory, such as Underwriters Laboratories or Factory Mutual Systems.



1. Evaluation testing

The atmosphere of a confined space should be analyzed using equipment of adequate sensitivity and specificity. The analysis will identify and evaluate any hazardous atmospheres that may exist or arise, so that appropriate permit entry procedures and conditions can be developed for that space. A technically qualified professional, such as a consultant, certified industrial hygienist, registered safety engineer, or certified safety professional should evaluate and interpret this data and use it to develop the entry procedure.

2. Verification testing

A confined space that might contain a hazardous atmosphere will be tested for residues of all identified or suspected contaminants. The evaluation testing should be conducted with specified equipment to determine that residual concentrations at the time of testing and entry are within acceptable limits. The person performing the tests will record the test results on the permit. The atmosphere will be periodically retested (frequency to be determined by entry parameters) to verify that atmospheric conditions remain within acceptable

3. Acceptable limits

The atmosphere of the confined spaces is within acceptable limits when the following conditions are maintained:

- **oxygen:** 19.5 percent to 23.5 percent;
- **flammability:** less than 10 percent of the lower flammable limit (LFL); and
- **toxicity:** less than recognized American Conference of Governmental Industrial Hygienists (ACGIH) exposure limits or other published exposure levels, including OSHA permissible exposure limits (PEL) or National Institute of Occupational Safety and Health (NIOSH) recommended exposure limits (REL).

Isolation and Lockout/Tagout Safeguards

All energy sources that are potentially hazardous to confined space entrants must be secured, relieved, disconnected, or restrained before personnel can enter the confined space. Equipment systems or processes must be locked out or tagged out or both as required by the Lockout/Tagout Program (which complies with OSHA's 29 CFR 1910-147 and American National Standards Institute (ANSI) Z244.1-1982, Lockout/Tagout of Energy Sources) before permitting entry into the confined space. In confined spaces where complete isolation is not possible, will evaluate the situation and make provisions for as rigorous an isolation as practical. Special precautions will be taken when entering double-walled, jacketed, or internally insulated confined spaces that may discharge hazardous material through the vessel's internal wall.

Where there is a need to test, position, or activate equipment by temporarily removing the lock or tag or both, a procedure must be developed and implemented to control hazards to the occupants. Any removal of locks, tags, or other protective measures must be done in accordance with the Lockout/Tagout Program.

Ingress/Egress Safeguards

Ingress (going in) and egress (going out) safeguards provide the means for safe entry and exit for confined spaces. _____ will evaluate each entry and exit point to determine the most effective methods and equipment that will enable employees to enter and exit the confined space safely.

Appropriate retrieval equipment and methods must be used whenever a person enters a confined space. Use of retrieval equipment may be waived by _____ if the use of the equipment increases the overall risks of entry or does not contribute to the rescue. Make available a mechanical device to retrieve personnel from vertical confined spaces greater than 5 feet deep.

Warning Signs and Symbols

Any confined space that can be inadvertently entered must have a sign identifying it as a confined space. Maintain the signs in a legible condition and make sure each contains a warning stating a permit is required before entry. Prominently mark accesses to all confined spaces.

EMERGENCY RESPONSE

Emergency Response Plan

_____ must maintain a written plan of action with provisions for conducting a timely rescue of people in a confined space should an emergency arise. The written plan must be kept at the confined space worksite. All affected personnel must be trained in the Emergency Response Plan.

Retrieval Systems and Methods of Non-entry Rescue

Retrieval systems must be available and ready when an authorized person enters a permit space unless such equipment increases the overall risk of entry, or the equipment would not contribute to the rescue of the entrant. Retrieval systems must have a chest or full-body harness and a retrieval line attached at the center of the back near shoulder level or above the head. If harnesses are not feasible or would create a greater hazard, wristlets may be used instead of the harness. The retrieval line must be firmly fastened outside the space so that rescue can begin as soon as anyone is aware it is needed. A mechanical device must be available to retrieve personnel from vertical confined spaces more than 5 feet deep.



Appendices

APPENDIX A: SAMPLE PROCESS DUTY ROSTER

Process: Tank Steam/Wash Rack

- Entry Supervisor:**
1. Upon receipt of a tank for cleaning, do a visible check for product. If product is visible in the tank, then the tank will be refused.
 2. Complete and attach certification and danger tag to tank.
 3. Provide confined space entry permit for the tank.
 4. Verify that entrants have proper training and knowledge of known hazards, including the mode of exposure (how it gets into the body), signs or symptoms, and results of exposure.

- Entrants:**
1. Purge tanks with cold water prior to steam cleaning.
 2. Obtain the confined space entry permit and authorized signature.
 3. Complete a safe entry checklist prior to entering the confined space.
 4. Fill out and attach the caution tag after tank is purged and cleaned.
 5. Know space hazards, including information on the mode of exposure (how it gets into the body), signs or symptoms, and results of exposure.
 6. Use the correct personal protective equipment (PPE) properly.
 7. Maintain communication with standby persons to enable them to monitor entrant's actions and alert the entrant to evacuate if necessary.
 8. Exit from permit space as soon as possible when ordered to by authorized persons; when entrant notices or recognizes the signs or symptoms of exposure; when a prohibited condition exists; or when the automatic alarm system sounds.
 9. Alert the standby person when a prohibited condition exists or when warning signs or symptoms of exposure exist.



Process: Tank Maintenance

- Entry Supervisor:**
1. Upon receipt of a tank for maintenance, do a visible check for product. If product is visible in the tank, then the tank will be refused.
 2. Complete and attach certification and danger tag to tank.
 3. Provide confined space entry permit for the tank.
 4. Verify that entrants have proper training and knowledge of known hazards, including the mode of exposure (how it gets into the body), signs or symptoms, and the results of exposure.

- Entrants:**
1. Prior to moving any tank into the maintenance bay, ensure tank has been cleaned and purged per attached caution tag, test atmosphere, and record results on hot tag. (Tank will not be moved into bay until the atmosphere has been tested and is determined to be within acceptable limits.)
 2. In bay, if work will require confined space entry, obtain confined space entry permit from the Program Manager.
 3. Obtain the confined space entry permit and the authorized signatures.
 4. Complete the safe entry checklist prior to confined space entry.
 5. Know space hazards, including information on the mode of exposure (how it gets into the body), signs or symptoms, and results of exposure.
 6. Use the correct personal protective equipment (PPE) properly.
 7. Maintain communication with standby person to enable monitoring of the entrant's actions and alert the entrant to evacuate if necessary.
 8. Exit from permit space as soon as possible when ordered to by authorized persons; when entrant notices or recognizes signs or symptoms of exposure; when a prohibited condition exists; or when the automatic alarm system sounds.
 9. Alert the standby person when a prohibited condition exists or when warning signs or symptoms of exposure exist.



APPENDIX B: OSHA RESOURCES

Download or order the following items from [osha.gov](https://www.osha.gov) or call 800-321-6742 (OSHA).

- **Confined Space Safety on Commercial Fishing Vessels Fact Sheet** (2011, English)
- **Confined Spaces** (2004, OSHA 3138, English)
- **Confined Spaces: Atmospheric Testing in Confined Spaces Fact Sheet** (2005, English)
- **Confined Spaces: Is 911 your Confined Space Rescue Plan? Fact Sheet** (2016, OSHA FS 3849)
- **Confined Spaces: Permit-Required Confined Spaces QuickCard™** (2011, OSHA 3214, English; 2011, OSHA 3214, Spanish)
- **Confined Spaces: Protecting Construction Workers in Confined Spaces – Small Entity Compliance Guide** (2015, OSHA 3825, English)

OSHA's 1910.146-Confined Space Pre-Entry Checklist and Sample Permits are available at <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.146AppD>



APPENDIX C: DWC RESOURCES

DWC features a free occupational safety and health DVD lending library. For more information, call 512-804-4620 or visit the Resource Center at www.tdi.texas.gov/wc/safety/videoresources/avcatalog.html.

DVDs on confined spaces include:

Basic Training about Confined Spaces and the Entry Permit System

DVD1750, DVD1750S, 20 min.

Makes viewers aware of confined space hazards and steps required to prevent these hazards from contributing to injuries and deaths. Features a modular format, with each 3-4 minute block of instruction followed by a review. Covers differences between permit and non-permit-required spaces, the written confined space entry program, types and characteristics of confined space hazards, and responsibilities of entry team members. 2002. ERI-Safety.

Confined Space Atmospheric Testing

DVD1932ES, 17 min.

Reviews how and when to test, what steps to take when air is unsafe, atmospheric hazards, procedures for proper pre-testing, and how to respond when air is unsafe. 2007, 1993. Coastal. Includes quiz.

Confined Space Entry: Investigation

DVD1933ES, 23 min.

Two confined-space accidents teach employees how to work safely in confined spaces and how to prevent serious accidents from occurring. Reveals what happened and what went wrong. Covers four areas to investigate, and surviving in a confined space. 2008, 2003. Coastal. Includes quiz.

Confined Space Entry: Permit Required!

DVD1291ES, 21 min.

Complies with OSHA 1910.146. Covers entry permit requirements, safe atmospheric testing, and training the entry team. 2006, 1993. Coastal. Includes employee handout/quiz.

Confined Space Entry Responsibilities

DVD1030, DVD1030S, 20 min.

Addresses the risks and operational safety standards for confined spaces commonly found in public works and construction. Includes testing, ventilation and rescue procedures. 2001. Digital 2000/ERI-Safety.

Confined Space Hotwork: Checklist to Safety

DVD1934ES, 19 min.

Covers proper safety procedures for confined space hotwork, including entry permits and hotwork permits. Also reviews emergency rescue. 2008, 1993. Coastal. Includes quiz.

Confined Space: Inside Maneuvers

DVD2211ES, 23 min.

Compares confined space work to a submarine environment – tight space, critical atmospheric conditions, many potential hazards. Presents the USS Atlanta, a U.S. Naval submarine, and its crew, as a dramatic backdrop to the discussion. Covers space hazards, atmospheric testing, confined space entry permit requirements, confined space rescue, and team responsibilities. Coastal. Includes employee quiz.



Confined Space: Keeping Public Employees Safe

DVD1937ES, 15 min.

Trains public employees to work safely in these dangerous spaces and to keep organizations OSHA-compliant. Covers OSHA permit space requirements, understanding permit spaces and their hazards, entry permits, and training and duties. 2008. Coastal. Includes quiz.

Confined Space: Non-Entry Rescue

DVD1938ES, 20 min.

Covers dangers of confined spaces and the attendant's responsibilities. Teaches employees how to get someone out of a confined space without endangering themselves. Complies with OSHA 1910.146. Discusses the written permit and the retrieval system. 2005. Coastal. Includes quiz.

Cutting Torch Safety

DVD1065, 6 min.

Covers fireproofing floors and workbenches, and oxygen cylinder safety. Discusses importance of ventilation while working in confined spaces. Covers PPE and fire prevention for oxygen tank operations. Training Network.

High-Impact Life & Death Series Confined Space Entry

DVD1793, DVD1793S, 19 min.

Dramatizes how simple mistakes lead to major injuries and even death during a confined space entry operation. Discusses duties and responsibilities of each participant: the entrant, the attendant, and the entry supervisor. Covers the entry permit system, duties of rescue team members, air testing and monitoring, lockout and line-breaking procedures, and use of PPE in confined spaces. No copyright date. ERI-Safety. Includes quiz.

High-Risk Rescue

DVD2334, DVD2334S, 5 min.

Teaches that only trained rescuers should attempt confined-space rescues. Discusses confined-space hazards, proper rescue equipment, and attendant duties. Safety Shorts. Includes brief quiz.

Limited Spaces - Attics, Basements, and Crawl Spaces

DVD2354, 5 min.

Teaches employees to plan and take the precautions necessary to avoid limited-space hazards. Covers potential hazards, proper dress, safe work practices, and handling tools and equipment. Safety Shorts. Includes brief quiz.

Line Breaking: Use a Permit!

DVD1289, 16 min.

After the first 30 seconds of this program, workers will realize the gravity of the training they are about to receive. Covers the great potential for disaster for this relatively easy process. Discusses line and equipment opening (LEO), establishing an effective safety program, LEO permits, lockout/tagout, line-breaking procedures, and emergency response. Coastal. Includes quiz.

Once Too Many - Confined Space Entry

DVD2368, DVD2368S, 5 min.

Reviews basic safety procedures to ensure safe maneuvering in confined spaces. Covers safety rules, buddy systems, oxygen content, and atmosphere tests. Safety Shorts. Includes brief quiz.



Permit Required - Confined Space Entry

DVD2374, DVD2374S, 5 min.

Discusses different types of confined spaces and their different atmospheric conditions. Reviews OSHA requirements and the responsibilities of all involved in confined-space entry. Safety Shorts. Includes brief quiz.



APPENDIX D: ADDITIONAL CONFINED SPACES DEFINITIONS

"Acceptable Entry Conditions" means 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 and work within the space.

"Attendant" means 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.

"Authorized Entrant" means an employee who is authorized by the employer to enter a permit space

"Blanking or Blinding" means 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.

"Confined Space" means a space that:

- is large enough and so configured that an employee can bodily enter and perform assigned work
- 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.)
- is not designed for continuous employee occupancy.

"Double Block and Bleed" means 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" means 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" means 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" means 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, whether such action is intentional, or any work activities are performed in the space.

"Entry Permit (Permit)" means 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 in confined space standards.

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

"Hazardous Atmosphere" means an atmosphere that may expose employees to the risk of death, incapacitation, 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 5 feet (1.52 m) or less;
- atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- atmospheric concentration of any substance for which a dose or 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 more than its dose or permissible exposure limit
- any other atmospheric condition that is immediately dangerous to life or health.

"Hot Work Permit" means the 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)" means any condition that 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 12-72 hours after exposure. The victim feels normal from recovery from transient effects until collapse. Such materials in hazardous quantities are considered immediately dangerous to life or health.

"Inerting" means 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.

"Isolation" means 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.

"Line Breaking" means 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" means 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" means an atmosphere containing less than 19.5 percent oxygen by volume.

"Oxygen Enriched Atmosphere" means an atmosphere containing more than 23.5 percent oxygen by volume.



"Permit-Required Confined Space (Permit Space)" means 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 engulfing an entrant
- 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.

"Permit-Required Confined Space Program (Permit Space Program)" means the employer's overall program for controlling, and protecting employees from permit space hazards, and for regulating employee entry into permit spaces.

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

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

"Rescue Service" means the personnel designated to rescue employees from permit spaces.

"Retrieval System" means 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.

"Test or Testing" means the process of identifying and evaluating the hazards someone may confront when entering a permit space. Testing includes specifying the tests that are to be performed in the permit 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.

APPENDIX E: PERMIT-REQUIRED CONFINED SPACE DECISION FLOW CHART

