Environmental Health and Safety

Confined Space Entry Program

Pursuant to 29 CFR § 1910.146
[Permit required confined spaces]

Revised November 2023

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Purpose and application

This document is a campus-wide Confined Space Entry Program for Arizona State University. Its purpose is to ensure personnel and entrant safety and prevent personal injury from work in confined spaces per the requirements of the Occupational Safety and Health Administration's (OSHA) Permit Required Confined Space Entry Standard, 29 CFR §1910.146.

OSHA requires ASU to do the following:

- Conduct a review of individual operations involving confined spaces and a program review.
- Develop and enforce a written confined space entry program.
- Identify and classify confined spaces at the university, determine their hazards, and address the reclassification of spaces.
- Identify rescue and emergency procedures for confined spaces and the responsibilities of authorized employees in such instances.
- Identify the ASU Permit System for confined space entry including preparation, use, and cancellation of permits. The Permit System includes outside contractors.
- Identify the necessary steps for entry into confined spaces including monitoring and equipment that may be required.
- Provide training to employees involved with confined space work and identify their duties.

Roles and responsibilities

Environmental Health and Safety

- Assist departments or unit supervisors with classifying confined spaces.
- Assist each department or unit supervisor in identifying confined spaces encountered by their employees.
- Assuring that a confined space entry program is established on campus that provides maximum employee protection and complies with state industrial safety and health regulations.
- Audit departments for compliance with the program during routine and special inspections.
- Investigate and document all accidents or near misses reported as a result of a confined space entry or an aborted entry attempt.
- Maintain program documentation including a written program, establish program standards, maintain an inventory of confined spaces and records of all evaluations, advise departments on compliance and provide employee training.

- Permits will be kept on file for at least one year, or at least 30 years if the permit includes air monitoring data.
- Revise the program as needed.
- Work with departments to fully implement the program for the confined spaces they manage.

Departments

- Assist with maintaining an inventory of confined spaces.
- Complete the Confined Space Evaluation Form when new confined spaces are identified, and contact EHS for assistance when needed.
- Identify and report job areas and locations that are or may be confined spaces. When a new confined space is created or an existing confined space changes in configuration, use or hazard potential submit a list of identified confined spaces to EHS.
- Identify authorized confined space entrants and ensure that each entrant attends confined space entry training.
- Implement the confined space entry program for their employees who enter or assist those who enter confined spaces.
- Mandate all employees who enter or assist with confined spaces to attend and successfully complete confined space training.
- Notify the contractor of permit-required confined spaces where contractors will require access in order to complete work under the scope of a contract.
- Oversee contracts requiring confined space entry.
- Permits will be kept on file in the department for at least one year, or at least 30 years if the permit includes air monitoring data.
- Provide the proper protective equipment and rescue equipment necessary to protect the health and safety of the employee.
- Supervisors must ensure that the procedures are followed whenever employees enter a confined space.

Personnel

- Employees who enter or assist with entering spaces are required to complete confined space training.
- Follow prescribed safety practices and procedures.
- Fully complete confined space permits when the space is deemed permit required.
- Fully complete confined space pre-entry checklists.
- Report issues with confined spaces to their supervisor.
- Use appropriate personal protective equipment when entering a confined space.

Confined space evaluation

Identification, classification, and inventory

- Confined spaces are evaluated using the Confined Space Evaluation form.
- EHS and corresponding departments maintain an inventory of confined spaces and records of all evaluations.
- EHS is responsible for classifying confined spaces on campus.
- The confined space evaluation is a process that identifies and classifies all potential confined spaces and their hazards.

The classifications of confined spaces (See also Appendix A: Definitions) are:

Confined space, non-permit required

A space that meets the following criteria:

- Does not contain actual hazards or potential hazards capable of causing death or serious physical harm.
- Has limited or restricted means for entry or exit. For example, tanks, vessels, storage bins, vaults, pits, and excavations are spaces that may have limited means of entry.
- Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- Is not designed for continuous employee occupancy.

Permit required confined space

A space that meets all of the criteria for a confined space, and also has one or more of the following characteristics:

- Contains a material that has the potential to engulf an entrant
- Contains any other recognized serious safety or health hazard.
- Contains or has the potential to contain a hazardous atmosphere
- 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

Anyone suspecting that a space meets the definition of a permit-required confined space may not enter the space until it is evaluated. Complete the Confined Space Evaluation Form and submit it to EHS

Posting

All permit-required confined spaces at ASU must be labeled with a sign as designated below. Departments managing the spaces are responsible for posting these signs. If a department cannot label a space, it must consult with EHS about an alternative method of preventing entry into the space.

Permit system

Preparation

Prior to permit-required confined space entry, a written ASU Confined Space Pre-Entry Checklist and Confined Space Permit must be completed in full. The Permit form must include details of the planned entry and can be used as a checklist for the job, along with forms for lockout/tagout and hot work procedures, if applicable. Additional requirements may apply to permit-required spaces based on entry air testing results. A final authorization signature is required by the entry supervisor for permit-required confined spaces. If the area is a non-permitted space, and no atmospheric hazards are introduced, work may proceed without a permit or notification.

Issue and use

Confined space entry work must not deviate from the requirements of the permit, including the time required to complete the assignment. Entry must not be longer than one work shift. During entry, permits must be posted at or near the entry location or by equally effective means. It is the responsibility of the entry supervisor to see that permits are posted.

Conclusion of operations and cancellation of a permit

The authorized entry supervisor is responsible for terminating the entry and canceling the permit upon the conclusion of the entry operations (see Duties). The entry supervisor is also required to terminate entry and cancel the permit when a condition exists that is not acceptable by the permit. Entry must not exceed the expiration date and time posted on the entry permit. The entry supervisor must cancel the permit upon conclusion of entry operations. The permit will be kept on file in the department for at least one year, or at least 30 years if the permit includes air monitoring data and a copy is sent to EHS.

Reclassification of permit space

Permit-required confined spaces may be reclassified as non-permit spaces. Reclassification occurs when physical hazards and potential hazards are removed. Examples include, but are not limited to ventilation fan plenum spaces, some crawl spaces, vaults and interstitial spaces. Neutralization of dangerous moving parts, by lockout, for example, may allow reclassification to non-permit status. The space must be treated as a permit-required confined space until hazards have been eliminated if entry to a space is required to remove hazards. Controlling atmospheric hazards with forced air ventilation does not eliminate the hazards.

Reclassification of a Permit Space to a Non-Permit Space must be documented. For permanently reclassifying a space, the Confined Space Evaluation form or equivalent may be used, noting the date, location of the space and signature of person making the determination. For temporary reclassification, see Entry Without Permit.

Reevaluation of non-permit space
A non-permit space must be reclassified as a permit-required confined space when changes in the use or configuration increase the hazards to entrants. Employees must exit the non-permit space if hazards develop. The space must then be treated as a permit-required confined space.

Permit-required entry

Confined Spaces that contain known or potential safety and health hazards to entrants require a permit and an entry procedure prior to entry. These areas are permit-required confined spaces (See Appendix: Definitions). Entry is allowed only for trained and authorized individuals. The ASU Confined Space Entry Permit contains all requirements for entry into the space.

Acceptable entry conditions
There are conditions that must be eliminated before entry, because of the hazards that exist within permit-required confined spaces. Precautionary steps such as energy isolation, ventilation, and atmospheric testing are required prior to entry. Acceptable entry conditions for specific spaces are contained in the Entry Permit.

Controlling physical hazards
Many potential and actual hazards exist in ASU confined spaces. For example, mechanical spaces may have electrical, mechanical, heat, fall, entrapment and other hazards. Best efforts must be made to identify and eliminate hazards prior to entry using existing drawings and historical information. However, entrants must be vigilant as hazards may become evident during entry and must be addressed. The work plan must address all hazards and control methods. Fall hazards must be addressed prior to entry. Hazardous energy sources must be isolated prior to entry following the ASU Lockout/Tagout Program.

Introducing hazards
The use of chemicals, painting, cleaning, grinding, sanding, or hot work all create atmospheric hazards that can cause injury or illness without adequate ventilation or other controls. Hot work (welding, cutting, grinding, brazing, etc.) in a confined space must be authorized in writing prior to entry with an ASU Hot Work Permit. If hot work releases toxic gases or fumes special ventilation and air testing is required.

Oxygen-deficient atmospheres
The earth's atmosphere is composed of approximately 21% oxygen and 79% nitrogen. An atmosphere containing less than 19.5% oxygen shall be considered

oxygen-deficient. The oxygen level inside a confined space may be decreased as a result of either consumption or displacement.

Flammable atmospheres
A flammable atmosphere is generally the result of flammable gases, vapors and dust mixed in certain concentrations with air, or an oxygen-enriched atmosphere, specifically if the oxygen concentration is greater than 23.5%. An oxygen-enriched atmosphere will cause flammable materials such as clothing and hair to burn violently when ignited.

Toxic atmospheres
Toxic atmospheres may be present within a confined space as the result of one or more of the following:

- A product is stored in a confined space, it can be absorbed by the walls and give off toxic vapors when removed or when cleaning the residual material. The toxic vapors can remain in the atmosphere due to poor ventilation.
- Toxic vapors produced by processes near the confined space may enter and accumulate in the confined space, e.g., if the confined space is lower than the adjacent area and the vapor is heavier than air, it may settle into the confined space.
- Work conducted in a confined space can generate toxic atmospheres, including welding or brazing with metals capable of producing toxic vapors, painting, scraping and sanding. Many of the solvents used for cleaning or degreasing produce highly toxic vapors.

Mechanical and physical hazards
Mechanical and physical hazards may include rotating or moving mechanical parts or energy sources that can create hazards within a confined space. All rotating or moving equipment such as pumps, process lines and electrical sources within a confined space must be identified. Physical factors such as heat, cold, noise, vibration and fatigue can contribute to accidents. These factors must be evaluated for all confined spaces.

Excavations could present the possibility of engulfment. Employees shall be protected from cave-ins by sloping, trenching or shoring systems when the depth of the excavation is more than four feet, in accordance with 29 CFR § 1926.652.

Hot work requirements
Hot work or HW operations may create hazardous conditions and fire danger. To adequately address hazards all personnel involved in HW operations must follow the ASU Welding, Burning, and Cutting Program. This will help ensure compliance with applicable codes and regulations, including 29 CFR § 1910.252-255 and promote a safe environment. It is the responsibility of the welders, cutters, and their supervisors to ensure the following fire protection and prevention procedures are applied to all HW operations.

Air monitoring
Requirements of entry are listed on the Entry Permit. Monitoring of hazardous conditions is required prior to receiving entry authorization. Ongoing monitoring will be continuous and monitoring results will be periodically recorded on the permit. Monitor at several elevations as stratification may cause a hazardous atmosphere to be present at different levels. The same applies to any reentry of the space after a planned break. Only personnel trained in the proper use of monitoring equipment are authorized to perform required air monitoring.

The air should be tested at several levels in the space since gases may settle into layers. Continuous air monitoring should be done if the atmosphere can change, such as during welding, painting, descaling, cleaning with chemicals or working in sewers. Continuous air monitoring is required or all entries, verifying readings at regular intervals. It is recommended that a secondary monitor be worn by the entrant as an added precaution.

The table below provides the regulatory limit and alarm set points for oxygen and some specific air contaminants. If a space potentially contains air contaminants not listed below, EHS must be consulted to determine the regulatory limit and alarm set points.

Potentially Hazardous atmosphere	Regulatory limit [1]	Low alarm levels	High alarm levels
Oxygen (O2)	19.5 – 23.5 %	19.5%	23%
Lower Flammable Limit (LFL/LEL)	<10 of LFL/LEL %	10 %	20 %
Carbon Monoxide (CO)	<50 ppm [2]	25 ppm	100 ppm
Hydrogen Sulfide (H2S)	< 10 ppm	10 ppm	15 ppm
Other air contaminants	Consult with EHS for appropriate limits and alarm levels.		

Notes:
1. As assigned by the OSHA 1910.
2. **ppm** = parts per million.

If oxygen concentrations fluctuate beyond alarm levels, entrants must leave the space and conditions evaluated further in consultation with EHS, prior to re-entry.

General ventilation
If a confined space contains an atmosphere that is oxygen deficient, flammable, contaminated with a hazardous gas, chemical or material, or considered immediately dangerous to life or health, or IDLH, the area will require purging before employees can enter. Continual forced ventilation may be necessary to keep areas safe. It is advisable if any of these conditions exist to contact EHS to review the measurements and the planned corrective measures before proceeding

The minimum length of time needed to ventilate a space before it is considered safe to enter must be calculated as given below. A volume of clean air equal to at least five times the volume of the space is blown into the space to purge the atmosphere.

The following parameters must be known:

- Ventilation device flow rate (CFM or cubic feet/min.).
- Volume of space (cubic feet).

To determine the minimum time the ventilator should operate before testing the air prior to entry, divide the volume of the space by the flow rate of the blower. Multiply that by the number of air changes required.

$$\frac{\text{Volume of space } \_\_\_\_\_ \text{ Cubic feet } X \text{ 20 air changes/ hour}}{\text{60 minutes/hour}} = \_\_\_\_\_ \text{ CFM}$$

$$\frac{\text{Volume of space } \_\_\_\_\_ \text{ Cubic feet } X \text{ 20 air changes/ hour}}{\text{Ventilation device flow rate } \_\_\_\_\_ \text{ CFM}} = \_\_\_\_\_ \text{ min}$$

Continue to ventilate the space at a rate of 20 air changes per hour as long as necessary.

Local Exhaust

Local exhaust is ideal for flammable and toxic materials that are produced at a single point, or for hazards that are introduced into the space, such as in welding, hot work, and painting. Air contaminants are captured close to the source of contamination and removed from the space. The local exhaust system should be evaluated to ensure the system has been designed for the removal of the contaminants. Specific recommendations based on best practices include:

- The capture velocity at the task that requires local exhaust ventilation should be at least 100 feet per minute (fpm).
- The exhaust duct should not be more than 1.5 duct diameters in distance away from the work.
- The exhaust duct should be placed so it does not draw contaminants across the worker's breathing zone.

Local exhaust is not ideal when the contamination is widely spread around the space. Exhaust air must be discharged away from the space without creating a hazardous environment. Local exhaust does not replace general ventilation. General ventilation and local exhaust can be used at the same time.

Purging

Purging is the use of air, steam or an inert gas to displace air within the confined space and achieve safe atmospheric levels in the space. Purging can eliminate atmospheric hazards for the entry if there is no potential for the formation of an atmospheric hazard during the entry.

"Inerting" is a special form of purging that involves purging oxygen from a confined space using an inert gas, such as nitrogen, carbon dioxide or argon, to remove the hazard of fire or explosion. Since purging with an inert gas creates a hazardous atmosphere, it is not allowed without prior approval from EHS and management. When an inert gas is used to displace flammable vapors in a space, it needs to be introduced and maintained until flammable vapor concentration has been reduced to a safe level. Fresh air is then introduced to displace the remaining flammable vapors and increase the oxygen content to normal ambient fresh air levels. See the NFPA 350 Guide for Safe Confined Space Entry and Work for detailed guidance.

Barriers
Barriers must be placed around permit-required confined spaces when conditions may cause injury. Conditions include:

- Objects or personnel falling into the space.
- Unauthorized entry.
- Vehicular hazards around the space.

Attendants
There must be at least one attendant present outside the space for the duration of the work being performed in the permit-required confined space (See Duties). Attendants must not monitor more than one operation at any given time.

Concluding operations
When scheduled work operations in a permit-required confined space have concluded:

1. Entrants will exit the space.
2. The area will be closed off.
3. The Permit will be canceled by the entry supervisor.

Confined space non-permit required entry

Confined spaces that do not contain known hazards have reduced requirements for entry. Spaces classified as non-permit do not involve hazards considered serious. non-permit spaces do not require a written permit or attendant for entry. Non-permit spaces do not require any special testing or training.

Classifying a confined space as a non-permit space by hazard elimination
A confined space may be classified temporarily (no longer than a single shift) as a non-permit confined space for as long as the hazards remain eliminated. The following conditions must be met:

- Documentation using the form ASU Certificate of Confined Space Hazard Elimination is required to certify how the hazards were eliminated from the space, including the date, location, and signature of the person making the

determination. Certification is to be posted at the space entrance and available to each entrant, or their authorized representative.

- The confined space does not contain an actual or potentially hazardous atmosphere.
- The confined space does not contain hazards capable of causing death or serious physical harm, such as engulfment in solid or liquid material, electrical shock or moving parts.
  The space must be treated as a permit-required confined space until the hazards have been eliminated if entry is needed to remove hazards.

Equipment

Equipment required during entry operations is listed on the permit and may include:

- Air testing and monitoring equipment, including functional alarms.
- Barriers and shields.
- Communications equipment.
- Fall Protection
- Ingress and egress equipment. Also, may include ladders.
- Lighting equipment.
- Personal Protective Equipment, or PPE, examples:
  - Gloves.
  - Hard hat.
  - Harness and lanyards.
  - Respiratory equipment.
  - Safety glasses.

- Rescue and emergency equipment.
- Ventilation equipment.
- Any other equipment necessary for safe entry and rescue. For example, lock-out/tag-out, fall protection, etc.

Entry equipment will be maintained by their respective departments. Only trained and authorized employees are to use the equipment.

Respiratory protection requires enrollment in ASU Respiratory Protection Program. This protection may be required if an airborne hazard is present when certain work is done inside a confined space, such as welding or painting. Surgical masks or dust masks do not provide adequate protection. Program enrollment includes medical evaluation, training and fit testing for an appropriate respirator. Contact EHS 480-964-1823 for information.

Fall Protection
Fall protection needs must be determined in planning for an entry. Fall protection is required for fall hazards of four feet or more. Any time the entrance cover or access door is opened for preliminary inspection, conducting air monitoring, ventilating the

space with blowers and ducting or other activity, fall protection may be required for the person doing the work near a fall hazard. This may include setting up guardrails around the entry or using a personal fall restraint or arrest system tied to an anchor. Even in an alternative entry, fall protection may be required. Rescue-type equipment, i.e., tripod system, may be used to provide an anchor to address fall protection needs for entrants, such as backup fall protection required when entering a space by a fixed ladder that is greater than 24 feet long.

Training

ASU employees working with confined spaces must receive training before they are first assigned to duties in all confined spaces. EHS will provide training to ASU employees working as attendants, authorized entrants, and entry supervisors for the safe performance of assigned duties in confined space areas. Trainees must demonstrate proficiency in the tasks required before the training is complete.

Topics covered by the training include:

- Air monitoring.
- Communication.
- Confined space entry hazards.
- Confined space regulations and definitions.
- Emergency procedures and rescue services.
- Entry and exit procedures.
- Identification of potential hazards, e.g., chemical or physical.
- Introducing hazards, e.g., hot work, painting, etc.
- Permits.
- Respirators and PPE.
- Roles and responsibilities for confined space entry.
- Safety equipment use.
- Ventilation and purging.

Frequency
Affected employees must receive training before the first assignment of work in confined spaces. Employees receive annual refresher training and additional training anytime there is a change in assignment, operation, or procedures.

Documentation
All confined space training will be documented with the date of training and a listing of trainees.

Duties

There are three different active roles in the performance of permitted confined space entry operations:

- Attendants.

- Entrants.
- Entry supervisors.

Entrants
Entrants are employees authorized to enter a permit-required confined space. Entrants must:

- Communicate with the attendant, as necessary, alerting them of hazards.
- Exit from the permit space whenever there is an order to evacuate, a hazard is recognized or an evacuation alarm is activated.
- Know the hazards that they may encounter during entry.
- Properly use equipment described under the section “Equipment”.

Attendants
Attendants are employees stationed outside of a permit-required confined space to monitor entrant activity and perform duties listed on the permit. Attendants must:

- Communicate with entrants to relay information and monitor the status of the entrants.
- Keep an accurate count of the number of entrants in the permit space.
- Keep unauthorized employees away from the space.
- Know the behavioral effects of hazard exposure in authorized entrants.
- Know the hazards that may be encountered during entry.
- Monitor the work area for hazardous conditions.
- Order the evacuation of the entrants from the space if a hazardous condition is encountered inside or outside the confined space.
- Perform no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.
- Perform non-entry rescues if feasible and safe.
- Remain outside the space during operations until relieved, continuously monitoring the entrants’ condition.
- Summon rescue and emergency services.

Entry Supervisors
Entry supervisors authorize and supervise entry operations. An entry supervisor who authorizes entry may delegate supervisory responsibilities during entry to another employee authorized as a supervisor. Entry supervisors may also simultaneously serve as attendants. Entry Supervisors must:

- Assure that entrants and attendants are trained prior to entry.
- Cancel the permit at the conclusion of the entry.
- Determine that entry operations and conditions remain consistent with the terms of the permit.
- Determine that area conditions meet the requirements of the permit before entry.
- Provide necessary equipment, hazardous material information and ensure rescue services are in place.

- Recognize the potential hazards during entry, including signs and symptoms of exposure.
- Remove unauthorized individuals from the area during entry operations.

Contractors

Outside contractors must be informed of the following:

- Location of any permit-required confined spaces in their work area.
- Hazards or potential hazards of the spaces in the area or the reason it is a permit-required confined space.
- Precautions and procedures ASU have implemented for protecting employees who may enter or otherwise interact with the permit-required confined space.

If contractors are working in ASU confined spaces, those spaces must be identified in the ASU contracting documents. The contractor to ASU has the responsibility to inform sub-contractors or other entities needing entry of any hazards, ensure they are trained to enter and monitor the entry. If an ASU employee works in or near the space, coordinated entry operations are necessary. A copy of the contractor's permit and ASU permit must be completed and posted before entry in such cases.

Emergency procedures and rescue services

An emergency is an event in or near the permit space that could endanger entrants. The availability of adequate rescue and emergency services must be ensured when planning any entry. Not all local fire and emergency resources can provide effective responses to confined space emergencies where ASU facilities exist. ASU departments must plan their entry and communicate with the local fire department or rescue service prior to entry to determine available rescue resources and seek alternatives when local resources are insufficient. This information is documented on the permit.

The local fire departments will provide confined space emergency rescue services at ASU facilities in Phoenix, Tempe, Mesa and Gilbert. The following requirements must be met:

- The fire department must evaluate the entry conditions and space to determine if their rescue service is within the scope of what is needed for safe rescue from the space. Complicated entries, such as restricted entry hatches, deep entries, etc., will require advance planning.
- The responsible person for the entry must determine if the resources of the fire department are adequate for the entry being performed.

Prior to entry, determine the methods, equipment and personnel needed to effectively and safely extract entrants. Some conditions that may warrant having an on-site rescue resource during entry include:

- Entries into spaces fully or partially submerged in water requiring special equipment for access.
- Entries into spaces where traditional retrieval equipment is not practical.
- Entries into spaces where the atmosphere cannot be made safe without the use of supplied air respiratory equipment.
- Spaces with openings not large enough to allow entry by personnel with typical rescue gear (SCBA, etc.).

Evacuation and rescue procedures

1. The attendant will notify all Entrants to evacuate.
2. The attendant will contact the local fire department at 911 if applicable. Tell them it is a **Confined Space Emergency** and give detailed information.
3. The attendant will execute any "non-entry" rescue procedures appropriate to the situation.
4. Rescues involving confined space entry will not be performed by ASU employees.
5. The entry supervisor will immediately cancel the entry permit.

Supervisor and attendant responsibilities

- Forward information on any chemicals involved in exposures to the emergency responders or the emergency department treating exposed victims.
- Keep unauthorized personnel out of the area.
- Provide rescue service with any observations or information about the emergency.
- Provide the entry permit to rescue service personnel.
- Provide the rescue service with information on the work being done.

Accident/incident reporting

- Call 911 for any emergencies regarding confined space. Emergencies must be reported to the Environmental Health and Safety Department directly by calling 480-965-1823 or through the ASU Police Department, using either the emergency number 911 or non-emergency number 480-965-3456.
- For all incidents and near misses, the involved person or supervisor completes and submits the ASU Employee and Non-Employee Incident report form within 24 hours; 8 hours if serious injury or hospitalization.r providing first aid and summon rescue and emergency services.

Reviews

Post-entry review

EHS and the department will review specific entry operations under the following circumstances:

- A change in the use or configuration of a permit space.
- A condition prohibited by the permit occurs during entry.

- An injury or near-miss occurs during entry.
- Complaints of the effectiveness of entry procedures.
- Detection of hazards not addressed on a permit.
- Unauthorized entry.

Subsequent entries will not be authorized until the review is completed with all necessary revisions made.

Program review
The Permit-Required Confined Space program must be reviewed when there is any reason to believe the entry program may not protect employees, and it must be revised before allowing subsequent entries.

Permits must be reviewed within one year of the date of cancellation of the permit to evaluate the program and the protection provided to employees entering confined spaces. EHS and the department may perform a single annual review meeting covering all entries performed during a 12-month period. The program must be updated as necessary.

Resources

Certificate of Confined Space Hazard Elimination

Confined Entry Permit

Confined Space Pre-entry Checklist

Guidance for Temporary Reclassifying Permit-required Confined Spaces

Permit-required Confined Space Decision Flowchart

Appendix

Definitions

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

Attendant
An individual stationed outside the permit space who monitors the authorized entrants and who performs all attendants' duties assigned in the permit space program.

Blanking or blinding
The absolute closure of a pipe, line or duct by the fastening of a solid plate 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
A space that meets all the following criteria:

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

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

Engulfment
The surrounding capture of a person by a liquid or finely divided solid substance that can be inhaled 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.

Entrant
An employee who is authorized to enter a permit space.

Entry
Action by which a person passes through an opening into a permit-required confined space and includes work activities in that space. Entry occurs as soon as any part of the entrant's body breaks the plane of the opening into the space.

Entry permit
The written or printed document provided by ASU allowing and controlling entry into a permit space.

Entry supervisor
The person (such as the supervisor, foreman, or crew chief) responsible for:

- Authorizing entry and overseeing entry operations.
- Determining if acceptable entry conditions are present at a permit space where entry is planned.
- Terminating entry as required by this section.

Hazardous atmosphere
An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness from one or more of the following:

- Airborne combustible dust at a concentration that meets or exceeds its LEL;
- Atmospheric concentration of any substance which may exceed a permissible exposure limit.
- Atmospheric oxygen concentration below 19.5 % or above 23.5 %;
- Flammable gas, vapor or mist in excess of 10 % of its lower explosive limit.

Immediately dangerous to life or health or IDLH
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 permitted space.

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, including hydraulic or electric; or blocking or disconnecting all mechanical linkages.

Non-permit confined space
A confined space that does not contain actual hazards or potential hazards capable of causing death or serious physical harm.

Permit-required confined space, permit space
A confined space that has one or more of the following characteristics:

- Contains a material that has the potential to engulf an entrant
- Contains any other recognized serious safety or health hazard.
- Contains or has the potential to contain a hazardous atmosphere

- 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

Retrieval system
Equipment used for non-entry rescue of persons from a permit space, such as a retrieval line, full-body harness, wristlets and a lifting device or anchor.