United Tribes Technical College

Confined Space Program

**Confined Space Entry Program**

**I. INTRODUCTION**

This document is a campus-wide Confined Space Entry Program for the United Tribes Technical College. Its purpose is to ensure personnel / entrant safety and prevent personal injury from work in confined spaces.

The program establishes departmental responsibilities, contains guidelines to assist the departments in implementing these responsibilities, and addresses the training requirements.

**II. ROLES AND RESPONSIBILITIES**

* **Safety & Security Department** is responsible for assuring that a confined space entry program is established on campus that provides maximum employee protection and complies with local safety and health regulations. In doing so Safety & Security Department produces and maintains program documentation including a written program, establishes program standards, advises departments on compliance and provides employee training. Safety & Security Department will also audit departments for compliance with the program during its routine inspections. The Safety & Security Department will work with departments to fully implement the program for the confined spaces they manage.

#### Departments are responsible for implementing the confined space entry program for their employees who enter or assist those who enter confined spaces. Supervisors must ensure that the procedures are followed whenever employees enter a confined space.

* **Personnel** (any authorized entrant) entering spaces are required to be trained, follow prescribed safety practices and procedures and use appropriate personal protective equipment when entering a confined space.

**III. CONFINED SPACE EVALUATION**

**IDENTIFICATION, CLASSIFICATION, AND INVENTORY**

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

The classifications of confined spaces are:

 CONFINED SPACE (NON-PERMIT REQUIRED)

A space that meets the following criteria:

• 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, storage bins, vaults, pits, and excavations are spaces that may have limited means of entry); and

• Is not designed for continuous employee occupancy.

* Does not contain actual hazards or potential hazards capable of causing death or serious physical harm

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 or has the 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.

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 The Safety & Security Department at Jheavyrunner@uttc.edu for evaluation.

**POSTING**

All Permit-Required Confined Spaces at United Tribes Technical College must be labeled with a sign. The Safety & Security Department is responsible for posting these signs. If The Safety & Security Department cannot label a space, it must determine an alternative method of preventing entry into the space.

**IV. PERMIT SYSTEM**

**PREPARATION**

Prior to Permit-Required Confined Space entry, a written Confined Space Entry 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 upon 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-Permit" space, and no atmospheric hazards are introduced, work may proceed without a permit or notification.

**ISSUE / 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 / CANCELLATION OF PERMIT**

Upon conclusion of the entry operations, the authorized Entry Supervisor is responsible for terminating the entry and canceling the Permit. 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. Upon conclusion of entry operations, the Entry Supervisor must cancel the Permit. The permit will be kept on file in The Safety & Security Department for at least one year, or at least 30 years if the permit includes air monitoring data, and a copy sent to EH&S.

**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. If entry to a space is required to remove hazards, the space must be treated as a permit-required confined space until hazards have been eliminated. 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.

**REEVALUATION OF NON-PERMIT SPACE**

When changes in the use or configuration of a Non-Permit Space increase the hazards to entrants, the space must be reclassified as a Permit-Required Confined Space. If employees are in a Non-Permit Space and hazards develop, they must exit the space. The space must then be treated as a Permit-Required Confined Space.

**V. 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. Entry is allowed only for trained and authorized individuals.

**ACCEPTABLE ENTRY CONDITIONS**

Because of the hazards that exist within Permit-Required Confined Spaces, there are conditions that must be eliminated before entry. 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 United Tribes Technical College 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 using a written fall protection plan. Hazardous energy sources must be isolated prior to entry following the United Tribes Technical College Lockout/Tagout Program.

**INTRODUCING HAZARDS**

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 a United Tribes Technical College Hot Work Permit. If hot work releases toxic gases or fumes special ventilation and air testing is required.

**AIR MONITORING**

Requirements of entry are listed on the Entry Permit. Monitoring of hazardous conditions is required prior to receiving entry authorization. Ongoing monitoring may be periodic or continuous as required by 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.

For entry or reentry, the following levels for oxygen and for air contaminants must be present:

|  |  |  |  |
| --- | --- | --- | --- |
| Hazard | Regulatory Limit 1 | Low Alarm Levels 2 | High Alarm Levels 3 |
| Oxygen (O2) | 19.5 – 23.5 % | 20.6 – 21.5 % | 20.4 – 21.7 % |
| Lower Explosive Limit (LEL) | <10 % | 2 % | 4 % |
| Carbon Monoxide (CO) | <35 ppm 4 | 15 ppm | 25 ppm |
| Hydrogen Sulfide (H2S) | < 10 ppm | 3 ppm | 5 ppm |

If oxygen concentrations fluctuate beyond alarm levels, conditions should be evaluated further in consultation with The Safety & Security Department. Atmospheres above 50% LEL must NOT be ventilated due to explosion hazard. CALL 911 IMMEDIATELY and then contact The Safety & Security Department.

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 recommended for all entries, verifying readings every 10 minutes. A secondary monitor may be worn by the entrant as an added precaution.

**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 (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 The Safety & Security Department 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 20 times the volume of the space is blown into the space to purge the atmosphere. This is based on the OSHA recommendation of 20 air changes per hour. The following parameters must be known:

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

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.



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

**BARRIERS**

Barriers must be placed around Permit Required Confined Spaces when conditions may cause injury. Conditions include:

* Unauthorized entry
* Objects or personnel falling into the space
* 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. 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 cancelled.

**VI. ENTRY WITHOUT PERMIT**

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.

**CLASSIFY CONFINED SPACE AS NON-PERMIT SPACE BY HAZARD ELIMINATION**

A confined space may be classified temporarily (no longer than 8 hours) as a non-permit confined space for as long as the hazards remain eliminated. The following conditions must be met:

* The confined space does not contain an actual or potential 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.
* If entry is needed to remove hazards, the space must be treated as a Permit-Required Confined Space until hazards have been eliminated.
* Documentation using the form United Tribes Technical College Certificate of Confined Space Hazard Elimination is required to certify how the hazards were eliminated from the space, including date, location and signature of person making the determination. Certification is to be posted at space entrance and available to each entrant, or their authorized representative.

**VII. EQUIPMENT**

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

• Air testing and monitoring equipment

• Ventilation equipment

• Communications equipment

• Personal Protective Equipment (PPE)

• Lighting equipment

• Barriers and shields

• Ingress and egress equipment (Ladders)

• Rescue and emergency equipment

• Any other equipment necessary for safe entry and rescue (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 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. A medical evaluation, training and fit testing is required for use of an appropriate respirator. Contact the Safety & Security Department Director at 701-221-1300 for information.

**VIII. TRAINING**

Employees working with Permit-Required Confined Spaces must receive training before they are first assigned to duties in Permit Spaces. The Safety & Security Department will provide training to employees working as attendants, authorized entrants, and entry supervisors for safe performance of assigned duties in confined space areas. Trainees must demonstrate proficiency of the tasks required before the training is complete. Training is not required of employees entering Non-Permit areas.

Topics covered by the training include:

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

**FREQUENCY**

Affected employees must receive training before the first assignment of work in permit required confined spaces. Employees receive periodic 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.

**IX. DUTIES**

There are three different active roles in the performance of permitted confined space entry operations: Entrants, Attendants, and Entry Supervisors.

**ENTRANTS**

Entrants are employees authorized to enter a Permit-Required Confined Space. Entrants must:

* Know the hazards that they may encounter during entry.

• Properly use equipment.

• Communicate with the attendant as necessary alerting them of hazards.

• Exit from permit space whenever there is an order to evacuate, a hazard is recognized, or an evacuation alarm is activated.

**ATTENDANTS**

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

* Know the hazards that may be encountered during entry.

• Know the behavioral effects of hazard exposure in authorized entrants.

• Keep an accurate count of the number of entrants in the permit space.

* Remain outside the space during operations until relieved, continuously monitoring entrant’s condition.

• Monitor the work area for hazardous conditions.

• Summon rescue and emergency services.

• Communicate with entrants to relay information and monitor the status of the entrants.

• Order the evacuation of the entrants from the space if a hazardous condition is encountered inside or outside the confined space.

• Keep unauthorized employees away from the 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.

**ENTRY SUPERVISORS**

Entry Supervisors authorize and supervise entry operations. An Entry Supervisor that 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:

• Recognize the potential hazards during entry, including signs and symptoms of exposure.

• Determine, before entry, that area conditions meet the requirements of the permit.

• Provide necessary equipment, hazardous material information, and assuring rescue services are in place.

• Assure that entrants and attendants are trained prior to entry.

• Determine that entry operations and conditions remain consistent with the terms of the permit.

• Remove unauthorized individuals from the area during entry operations.

• Cancel the permit at the conclusion of the entry.

**X. OUTSIDE CONTRACTORS**

Outside contractors must be informed of the following:

* Presence of a confined space that requires a permit for entry
* Hazards of the space
* UTTC’s experience with the space
* Precautions and procedures UTTC has implemented for protecting employees in or around the space

If contractors are working in UTTC confined spaces, those spaces must be identified in the UTTC contracting documents. The contractor to UW 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 a UTTC employee works in or near the space, coordinated entry operations are necessary. In such cases, a copy of the contractor's permit or a UTTC permit must be obtained before entry.

**XI. EMERGENCY PROCEDURES AND RESCUE SERVICES**

An emergency is an event in or near the Permit Space that could endanger entrants. When planning any entry, the availability of adequate rescue and emergency services must be ensured. The Safety & Security Department 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 Bismarck Rural Fire Department will provide confined space emergency rescue services at UTTC facilities. The following requirements must be met:

* Responsible person for the entry must determine if the resources of the Bismarck Rural Fire Department are adequate for the entry being performed.
* The Bismarck Rural 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.

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 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.)
* Entries into spaces fully or partially submerged in water requiring special equipment for access

**EVACUATION AND RESCUE PROCEDURES**

1. Attendant will notify all Entrants to evacuate.

2. Attendant will contact the Bismarck Rural Fire Department (if applicable) at 911. Tell them it is a “Confined Space Emergency” and give detailed information.

1. Attendant will execute any "non-entry" rescue procedures appropriate to the situation.
2. Rescue involving confined space entry will not be performed by UTTC employees.

5. The Entry Supervisor will immediately cancel the Entry Permit.

**SUPERVISOR AND ATTENDANT RESPONSIBILITIES**

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

**accident/incident Reporting**

For all incidents and near misses, the Safety & Security Department completes and submits an incident report.

**XII.** **EMPLOYEE RIGHTS**

The confined space regulations give affected employees, contractors and their authorized representatives the right to:

* Participate in the development and implementation of all aspects of the permit space program
* Review all supporting and determination data required
* Observe pre-entry testing of the internal atmosphere and any periodic testing that is required
* Review the certification that the space is safe to enter and that all pre-entry measures have been taken
* Review the employer documentation that all hazards in a permit space have been eliminated
* Request reevaluation of a permit space if the employee believes that the evaluation of that space may not have been adequate
* Review immediately the results of any testing conducted in accordance with the regulations
* Review the completed Permit

**XIII. REVIEWS**

**POST-ENTRY REVIEW**

The Safety & Security Department will review specific entry operations under the following circumstances:

* Unauthorized entry
* Detection of hazards not addressed on a permit
* A condition prohibited by the permit occurs during entry
* An injury or near-miss occurs during entry
* A change in the use or configuration of a Permit Space
* Complaints of the effectiveness of entry procedures

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. The Safety & Security Department may perform a single annual review meeting covering all entries performed during a 12-month period. The program must be updated as necessary.

**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 the following criteria:

• 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, storage bins, vaults, pits, and excavations are spaces that may have limited means of entry); and

• Is not designed for continuous employee occupancy.

EMERGENCY

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

ENGULFMENT

The surrounding capture of a person by a liquid or finely divided (flowable) 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

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 UW allowing and controlling entry into a permit space.

ENTRY SUPERVISOR

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

* determining if acceptable entry conditions are present at a permit space where entry is planned
* authorizing entry and overseeing entry operations
* 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:

• Flammable gas, vapor, or mist in excess of 10 percent of its lower explosive limit (LEL);

• Airborne combustible dust at a concentration that meets or exceeds its LEL;

• Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

• Atmospheric concentration of any substance for which may exceed a permissible exposure limit.

IMMEDIATELY DANGEROUS TO LIFE OR HEALTH (IDLH)

Any condition that poses an immediately or delayed threat to life or what would cause irreversible adverse health effects or that would interfere with an individual’s ability to escape unaided from a permit 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 or has the 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.

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.

## References

[OSHA Quick Card: Permit-Required Confined Spaces in General Industry](https://www.osha.gov/Publications/3214-10N-05-english-06-27-2007.html) - Assists with quickly remembering the most important CS safety issues