

BGSU

Bowling Green State University

Permit-Required Confined Space Program

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Introduction

Forward

In 1970, the United States Congress established the right of workers to "safe and healthful working conditions" through the Occupational Safety and Health Act. This act created the Occupational Safety and Health Administration (OSHA). House Bill 308 incorporates by reference all federal OSHA standards found in the Code of Federal Regulations (CFR), Title 29 Parts 1910, 1926 and 1928 as Ohio Public Employment Risk Reduction Standards. All adopted Ohio Public Employment Risk Reduction Standards are found in Chapter 4167 of the Ohio Revised Code and the Ohio Administrative Code.

This program has been established by Bowling Green State University to comply with OSHA's Permit-Required Confined Spaces Standard, 29 CFR 1910.146.

Objective

The objective of this program is to set forth safety requirements and procedures for entry and operations within permit-required confined spaces (PRCS) to protect those working inside these spaces as well as bystanders of the campus community who may be operating in close proximity to these spaces.

Applicability

This program applies to all BGSU PRCSs, BGSU employees who are authorized through their department to work in these spaces and have been properly trained to do so, and contractors who have been hired by BGSU to conduct work in these spaces.

Program Enforcement

BGSU employees and contractors are required to comply with all aspects of this program where applicable. A violation of a University employee's responsibility must be reported to the employee's supervisor for appropriate action. A violation of a contractor's responsibility must be reported to the appropriate BGSU Project Manager for action.

Responsibilities

The first three positions listed are those of the PRCS entry team. These individuals play a vital and direct role in the safety and success of entry operations.

Entrant

An Entrant is an employee who is authorized by BGSU to enter a PRCS and is responsible for:

- Knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Properly using equipment as required by this program.
- Communicating with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space.

- Alerting the attendant whenever they recognize any warning signs or symptoms of exposure to a dangerous situation or detect a prohibited condition.
- Exiting from the permit space as quickly as possible whenever:
 - An order to evacuate is given by the attendant or the entry supervisor
 - The entrant recognizes any warning signs or symptoms of exposure to a dangerous situation
 - The entrant detects a prohibited condition
 - An evacuation alarm is activated

Attendant

An Attendant is an individual stationed outside one or more permit spaces who monitors the authorized entrant(s). At least one attendant shall be posted outside of a PRCs at all times while entry operations are taking place and is responsible for:

- Knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Being aware of possible behavioral effects of hazardous exposures to authorized entrants.
- Continuously maintaining an accurate count of authorized entrants in the permit space and ensuring that the means used to identify authorized entrants accurately identifies who is in the permit space.
- Remaining outside the permit space during entry operations until relieved by another attendant.
- Communicating with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space.
- Monitoring activities inside and outside the space to determine if it is safe for entrants to remain in the space and evacuating authorized entrants from the space under any of the following conditions:
 - If the attendant detects a prohibited condition
 - If the attendant detects the behavioral effects of hazard exposure in an authorized entrant
 - If the attendant detects a situation outside the space that could endanger the authorized entrants
 - If the attendant cannot effectively and safely perform all their required duties
- Summoning rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.
- Taking the following actions when unauthorized persons approach or enter a permit space while entry is underway:
 - Warning the unauthorized persons that they must stay away from the permit space.

- Advising the unauthorized persons they must exit immediately if they have entered the permit space.
- Informing the authorized entrants and the Entry Supervisor if unauthorized persons have entered the permit space.
- Performing non-entry rescue as specified in this program, if applicable.
- Performing no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

Entry Supervisor

An Entry Supervisor is a person responsible for determining if acceptable entry conditions are present, authorizing entry, overseeing entry operations, and terminating entry as required by this program. More specifically, this position is responsible for:

- Knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
- Verifying, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- Terminating the entry and canceling the permit as required when:
 - The entry operations covered by the entry permit have been completed; or
 - A condition that is not allowed under the entry permit arises in or near the permit space.
- Determining, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.
- Calling the Bowling Green Fire Division (BGFDD) prior to entering a PRCS to inform them of the location, nature of work, and approximately how long the work will take.

This concludes the PRCS entry team members. Below are others who may play a direct and/or supporting role in the safety and success of entry operations within PRCSs. Their duties include, at a minimum, the following:

Sr. Industrial Hygienist, Environmental Health and Safety (EHS) Department

- Ensuring workspaces are evaluated for confined spaces, assessing the hazards within those spaces, and determining if they meet the definition of permit-required.
- Reevaluating spaces when notified that there have been changes in the use or configuration, new hazards introduced, etc. and if necessary, reclassifying the space accordingly.
- Ensuring all forms of recordkeeping and employee training are met per this program.

- Reviewing the Permit-Required Confined Space Program and any cancelled permits at least annually for any needed changes to further protect those involved in confined space entry operations.
- Performing monthly calibrations of 4-gas air monitoring equipment designated for entry operations as required by this program.
- Performing or delegating any other duties that arise and have not already been assigned.

Project Managers

When Bowling Green State University (host employer) arranges to have employees of another employer (contractor) perform work that involves permit space entry, the BGSU Project Manager or their designee is responsible for:

- Informing the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of 29 CFR 1910.146.
- Apprising the contractor of the elements, including the hazards identified and BGSU's experience with the space, that make the space in question a permit space.
- Apprising the contractor of any precautions or procedures that Bowling Green State University has implemented for the protection of employees in or near permit spaces where contractor personnel will be working.
- Coordinating entry operations with the contractor when both BGSU employees and contractor personnel will be working in or near permit spaces. This coordination will involve the development of procedures so that employees of one employer do not endanger employees of another employer.
- Debriefing the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

Contractors

In addition to complying with permit space requirements, each contractor who is retained to perform permit space entry operations is responsible for:

- Obtaining any available information regarding permit space hazards and entry operations from BGSU.
- Coordinating entry operations with BGSU, when BGSU and contractor personnel will be working in or near permit spaces together.
- Informing BGSU of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.

General Information

A confined space is a space that is:

- Large enough and so configured that an employee can bodily enter and perform assigned work; and
- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, pits, etc.); and
- Not designed for continuous employee occupancy.

Spaces must exhibit **ALL** three of the characteristics above to be considered a confined space. Once a space is classified as a confined space, it must be further assessed to determine if it meets the definition of permit-required. A PRCS 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; or
- Contains any other recognized serious safety or health hazard.

Making the determinations above are simplified in a decision flow chart contained in Appendix A. Entry into PRCSs require special procedures to protect the safety and health of entrants as well as pedestrians and others who may be operating near these spaces while work is being performed within. These procedures are explained further along in this program.

If a confined space is classified as non-permit, it means that when the space was assessed, it did not meet the definition of a PRCS. This assessment is limited in scope in that it did not take into consideration any work that might be conducted in the space. It is simply a review of the space under normal or standard conditions. Welding, cutting, brazing, using chemical products, etc. in the space introduces hazards that wouldn't normally be there and could change the designation of the space to permit-required for the duration of a task. Even with PRCSs, additional hazards introduced into the spaces while completing tasks need to be accounted for and controlled throughout the entry operations.

Tunnels

Entry into the University Tunnel System for the purposes of routine inspection and project design does **NOT** constitute entry into a PRCS. With this said, the entry procedure below has been established to enhance the safety of and provide some surveillance over the entrant(s) due to the configuration and complexity of this space:

1. Identify the work to be performed.
2. Evaluate all hazards.
3. Identify and implement any hazard controls that can be completed from outside of the space. Verify that the controls were effective.
4. Assemble all necessary equipment and personnel to perform the entry.
5. Verify that communication methods are functional.
6. Perform a bump test on each air monitor to be used (see Appendix B for the specific procedure). No pre-entry air monitoring is required, however, one entrant shall have a fully functional, running, 4-gas air monitor on them during the entry, which should be clipped to their shirt as close to the breathing zone as possible, not to exceed 9 inches. A monitor shall be used until the work is completed and all entrants have exited the space. If multiple entrants are present and they will be working in different sections of the space, each entrant or group shall have a fully functional, running, 4-gas air monitor on them.

7. Report to the Campus Operations Help Desk (419-372-2251) that entry into the tunnels is taking place, provide location, and approximately how long the job will take to complete. If after hours, report this information to the BGSU Police by calling their non-emergency number (419-372-2346).
8. Implement any remaining hazard controls and verification inside the space before performing any work.
9. Complete work.
10. Exit tunnels.
11. Report to the Campus Operations Help Desk or BGSU Police (whichever one was contacted in #6 above) that entry into the tunnels has been terminated. **NOTE:** If the Campus Operations Help Desk or BGSU Police has not heard back from the entrant within the amount of time specified for the work, they are required to call the entrant. If they are unable to get a hold of the entrant, they are to summon rescue services immediately, which is the Bowling Green Fire Division (419-372-3106).

Unclassified Spaces

If an employee needs to enter a space that they feel meets the definition of a confined space but the space is not represented on BGSU's master list of spaces, no entry shall take place until the space and the hazards within are assessed. Contact the Sr. Industrial Hygienist, EHS, for this assessment.

Campus Communication

The EHS department retains a master spreadsheet of campus confined spaces, whether they are permit-required or not, if a permit space can be reclassified (explained below), and potential hazards and chemicals found in the spaces at the time of the assessment. BGSU employees who are most likely to enter these spaces are the maintenance and trades staff in the department of Campus Operations. Because of this, a copy has been provided to that department and has been uploaded to their departmental SharePoint site for employee access. If employees are unsure of how to access this information, they should consult their supervisor.

In addition to this, a general overview of the campus PRCS locations is discussed during employee training. Finally, a few select PRCSs may be labeled on campus where it makes sense based on the use, location, reasons for entry, and employees engaged in the entry operations. That labeling will read "Danger--Permit-Required Confined Space, Do Not Enter" or have similar language.

BGSU Permit Required Confined Spaces

A confined space has been classified as permit-required because a hazardous condition has been identified within the space. Following the procedures below is critical in the protection of everyone involved in the entry operations, especially the entrant. This is not a time to guess. If anyone on the entry team is unsure of the hazards or proper control methods, they should consult their supervisor. Environmental Health and Safety is also available to assist. If neither are available, no entry will take place until all questions have been addressed and the entire entry team is confident with the entry procedures and hazard controls.

Equipment

The following equipment must be provided at no cost to employees, be maintained according to the manufacturer's instructions and used properly. Equipment on this list, specific to confined space entry operations, shall only be used by employees who are trained on this program and in the proper use of that equipment.

- Testing and monitoring equipment to measure atmospheric conditions in and around confined spaces. Ensure the monthly calibration of these units is up to date by locating the EHS issued hand-written sticker on the side of the unit or by watching the startup screens upon powering the unit on.
- Ventilating equipment needed to obtain acceptable entry conditions.
- Communications equipment necessary to enable the authorized entrant(s) and attendant(s) to maintain constant communication and to enable an attendant to summon rescue services without leaving his/her post.
- Personal protective equipment, provided by the affected employee's department, when engineering and work practice controls do not adequately protect employees.
- Lighting equipment needed to enable employees to see well enough to work safely and to exit the space quickly in an emergency. This equipment may need to be intrinsically safe depending on space conditions and the work to be performed within the space.
- Pedestrian, vehicle, or other barriers/shields as necessary to protect entrants from external hazards.
- Approved equipment, such as ladders, needed for safe ingress and egress by authorized entrants.
- Approved self-rescue, non-entry rescue, or other applicable emergency equipment.
- Any other equipment necessary for safe entry into and rescue from permit spaces. This may include explosion-proof and non-sparking tools where applicable.

Hot Work

If welding, cutting, or brazing in a confined space, a hot work permit will need to be obtained (this is in addition to the entry permit) and the following precautions followed per BGSU's Hot Work Program:

- To prevent accidental contact, arc welding is to be suspended for any substantial period of time, such as during lunch or overnight. All electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine disconnected from the power source.
- In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the gas supply to the torch positively shut off at some point outside of the confined space area whenever the torch is not to be used for a substantial period of time, such as during a lunch hour or overnight. Where practical, the torch and hose shall also be removed from the confined space.
- When welding or cutting is being performed in any confined space, the gas cylinders and welding machines shall be left outside of the space. Before operations begin, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.

***Please consult BGSU's Hot Work Program for additional information.**

Specific Entry Procedures

Use of a permit is required. It serves as a reminder of the procedural steps below and as a way to document that important safety measures have been taken. See Appendix C for this form.

1. Identify the work to be performed.
2. Evaluate hazards.
3. Identify hazard control methods.
4. Assemble all necessary equipment and personnel to perform the entry.
5. Inspect all equipment to ensure it is in good working order, especially the means that will be used to summon rescue services.
6. Implement hazard controls and verification of those controls for any hazards that can be controlled without having to enter the space.
7. Perform a bump test on each air monitor to be used (see Appendix B for the specific procedure).
8. Begin pre-entry air monitoring (more specifics on how to do this below). This will determine if it is acceptable to enter the space and will establish a baseline to compare monitoring that is conducted in the space while work is being performed to ensure that a hazardous atmosphere has not been created.
9. Entry Supervisor calls the BGSU to inform them of the location, nature of work, and approximately how long it will take to complete the work. NOTE: The BGSU may respond by saying no staff are available for rescue at that point in time. If this occurs, entry operations will not take place until notified that staff are available for rescue.
10. Entry Supervisor completes and signs the permit and reviews the hazards and controls with the entire entry team.
11. Post permit and attendant at the entry point.
12. Set up the mechanical retrieval device directly over the entry point whenever possible for vertical entries. In doing this, ensure the unit is balanced and stable to prevent tipping. It is important that this is set up in a way that does not create a hazard in itself. The entrant is required to wear a full body harness. For a vertical entry, the rescue line from the mechanical retrieval device is required to be attached to the D-ring on the back of the harness. For horizontal entries, a mechanical retrieval device typically cannot be used. Instead, a rescue rope is required to be attached to the D-ring on the harness and the other end attached to a fixed point outside of the space. BGSU does not own any rescue rope because entry into

these types of permit spaces is extremely rare. Contact EHS if this type of entry is required so it can be coordinated with the BGF and their equipment.

13. Entrants inspect all personal protective equipment to ensure it is in good working order and don it.
14. Entrants can enter the space at this point as long as they are not exposed to the risk of death, incapacitation, or impairment of ability to self-rescue. Note: At a minimum, one entrant shall have a fully functional, running, 4-gas air monitor on them during the entry, which should be clipped to their shirt as close to the breathing zone as possible, not to exceed 9 inches. A monitor shall be used until the work is completed and all entrants have exited the space. If multiple entrants are present and they will be working in different sections of the space, each entrant or group shall have a fully functional, running, 4-gas air monitor on them.
15. Verify that communication methods are functional between the entrants and attendant.
16. Implement remaining hazard controls and verification if needed.
17. Complete work.
18. Exit space.
19. Entry Supervisor will review entry with entire entry team and note any abnormalities that arose during the entry.
20. Entry Supervisor cancels permit. A copy of the cancelled permit shall be submitted to the EHS department.
21. Clean up work area and return all equipment to proper location.

Supporting Procedural Information

1. At least two employees are required at all times to perform PRCS entries: one employee to enter the space (Entrant) and one employee to remain outside the space to perform monitoring and oversight activities of the entrant (Attendant). An Entry Supervisor has duties under this program as well but is not required to be present during the entry. The Attendant can also be the Entry Supervisor as long as all duties of both positions can safely and effectively be performed.
2. BGSU owns one set of non-entry rescue equipment for vertical entries, so only one entry of this type can occur at a time. It is rare that the University would need to perform horizontal PRCS entries. If this is needed, it should be planned in advance with input from the BGF. Special equipment and procedures may be needed.
3. The duration of the entry cannot exceed the time required to complete the task identified on the permit.
4. The Entry Supervisor shall be notified if any problems are encountered during an entry operation and the problem(s) shall be noted on the permit, along with any corrective measures.

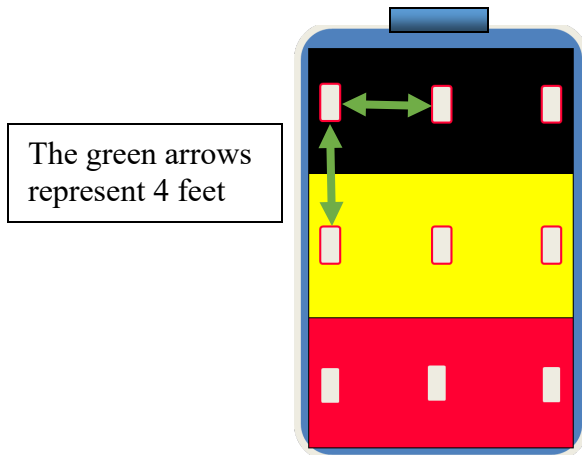
Atmospheric Testing Procedures

When:

1. Pre-Entry – Before space is entered; and
2. Periodic – Throughout the duration of work inside the space; best practice is to record air monitoring results every 15 minutes on the permit; for lengthy tasks that will take most of the work shift to complete, the readings should be checked every 15 minutes, however, the results only need to be recorded every 2 hours

How:

No matter how a PRCS is entered, the atmospheric envelope should be tested every 4 feet in the direction of travel and to each side. To illustrate how this would be completed, below is an example of a vertical decent space (most common type of setup on campus) where each box represents a suggested measuring point. If a space is fairly narrow, one measurement in the center, middle, and bottom of the space may be sufficient. This is where one may need to exercise some judgment. Some gases are lighter than air, some are heavier, and some mix evenly with air. Therefore, it is important to always test the different layers and areas of a space.



Alarms (MSA Altair 4X gas monitor):

Contaminant	Low Alarm	High Alarm
Oxygen (O2)	19.5%	23.0%
Lower Explosive Limit (COMB/EX)	10%	20%
Carbon Monoxide (CO)	25 PPM	50 PPM
Hydrogen Sulfide (H2S)	10 PPM	15 PPM

Acceptable entry levels and required response actions for other reported levels:

Oxygen

Other than 20.8%	No entry. If already in space, evacuate and determine cause of discrepancy. Ventilate the space as necessary.
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Lower Explosive Limit

Greater than 5%	No entry. If already in space, evacuate and determine cause of discrepancy. Ventilate the space as necessary.
2% - 5%	Acceptable for entry. Document air monitoring results at 5 minute increments.
Less than 2%	Acceptable for entry. Document air monitoring results at 15 minute increments.

Carbon Monoxide

Greater than 6 PPM	No entry. If already in space, evacuate and determine cause of discrepancy. Ventilate the space as necessary.
3 - 6 PPM	Acceptable for entry. Document air monitoring results at 5 minute increments.
Less than 3 PPM	Acceptable for entry. Document air monitoring results at 15 minute increments.

Hydrogen Sulfide

Greater than 5 PPM	No entry. If already in space, evacuate and determine cause of discrepancy. Ventilate the space as necessary.
2 – 5 PPM	Acceptable for entry. Document air monitoring results at 5 minute increments.
Less than 2 PPM	Acceptable for entry. Document air monitoring results at 15 minute increments.

Other Contaminants

Greater than 50% of TLV/PEL	No entry. If already in space, evacuate and determine cause of discrepancy. Ventilate the space as necessary.
25% - 50% of TLV/PEL	Acceptable for entry. Document air monitoring results at 5 minute increments.
Less than 25% of TLV/PEL	Acceptable for entry. Document air monitoring results at 15 minute increments.

NOTE: If other contaminants are expected, an air monitor that can detect and measure that contaminant may need to be purchased or rented to ensure safe levels throughout the work. Contact EHS for assistance.

Reclassifying PRCs

PRCs that pose no actual or potential atmospheric hazards may be temporarily reclassified as non-permit as long as the non-atmospheric hazards remain eliminated. If the space must be entered to eliminate the non-atmospheric hazards, the entry must be conducted under full permit provisions until these hazards are eliminated. NOTE: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazard. For the most part, the spaces at BGSU that this option is available for, are those where the hazards are mechanical and electrical in nature that can be eliminated through lockout/tagout. As with any lockout/tagout procedure, one must verify that the equipment has been effectively de-energized before work takes place. See BGSU's Lockout/Tagout program for more information.

PRCs that can be temporarily reclassified are designated as such on BGSU's master list of spaces. Please note that if one chooses this route, they must document the basis for determining that all hazards in the permit space have been eliminated, the date, space location, and signature of the person making the determination (use Appendix D to document this information). This completed form must be made available to each employee entering the space. If hazards arise within the space while entry operations are taking place, all entrants shall exit the space immediately. The space shall then be reevaluated to determine whether it must be reclassified as a permit space.

Access Restrictions

Effective measures shall be taken to prevent unauthorized employees and the general public from entering permit spaces. One or more of the following methods will accomplish this: 1) affixing placards, signs, stickers, or other identification at the entrance of PRCs, 2) a physical means (e.g. wall or floor plating secured with screws or bolts), 3) training, etc.

Emergency Response

The Bowling Green Fire Division (BGFDF) has been designated as the entry rescue team for BGSU pursuant to section (k)(1) of OSHA's Permit-Required Confined Space standard. Under no circumstances will anyone other than the BGFDF enter a PRCS to perform rescue operations. Management at BGSU's Firelands campus in Huron, Ohio has opted to not enter PRCSs, so a rescue team has not been identified for that location.

If any problems occur during work operations (i.e. the entrant exhibits any unusual behavior, becomes unconscious, contact cannot be established between the attendant and entrant, etc.), the attendant will immediately contact BGSU Police (this is achieved by dialing 419-372-2346 on a cell phone or 2-2346 or 911 using a campus phone), whom will dispatch the BGFDF. The attendant shall remain in contact with BGSU Police until help arrives. Please note that calling 911 from a cell phone will put the individual in touch with the Wood County Sheriff's Office who will transfer the call to BGSU's Police department. This route will add extra steps and result in additional response time.

Rescue Service Requirements

BGSU is required to provide the BGFDF with the following:

- Knowledge of locations and access to all permit spaces from which rescue may be necessary, so that appropriate rescue plans and practice rescue operations can be developed.
- Information regarding the hazards the rescue workers may confront when called on to perform rescue operations at BGSU.
- Information regarding hazardous substances to which an entrant could be exposed to. To help facilitate this, applicable safety data sheets shall be kept at the space with the permit. These copies may be taken by the responders to be given to the treating medical facility.

BGSU will host a simulated rescue training session with the BGFDF every calendar year in which they will remove dummies, manikins, or actual persons from a BGSU confined space. Careful consideration will be made to identify a different space or entry point each year to increase familiarization of all spaces across campus.

Non-Entry Rescue Requirements

To facilitate non-entry rescue, retrieval systems or other methods shall be used whenever an authorized entrant enters a permit space, unless it would increase the overall risk of entry or would not contribute to the rescue of the entrant.

Retrieval systems shall meet the following requirements:

- Each authorized entrant shall use a chest or full body harness, with a retrieval line attached to the D-ring in the center of the entrant's back. If keeping the retrieval line attached creates a greater hazard (i.e. when traveling over and under piping or obstructions where snagging or entanglement could occur), the retrieval line should still be lowered into the space where the entrant can reach it to hook onto in the event of an emergency.
- The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet deep.

Employee Information and Training

The Sr. Industrial Hygienist will ensure all those involved in confined space entry and/or work have been trained. Job titles identified for this training are maintenance repair workers, plumbers, boiler operators, safety & health inspectors, air quality technicians, electricians, stationary engineers, and their supervisors. The training will establish employee proficiency in the duties required by this program and introduce new or revised procedures, as necessary, for compliance with this program. All training records will be kept on file in the EHS department and each affected employee will be trained at the following frequencies:

- Before the employee is first assigned duties under this program (initial training)
- Every 3 years following initial training (periodic training)
- Before there is a change in assigned duties
- Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained
- Whenever there are deviations from the permit space entry procedures required by this program, or there are inadequacies in the employee's knowledge or use of these procedures

Program Evaluation

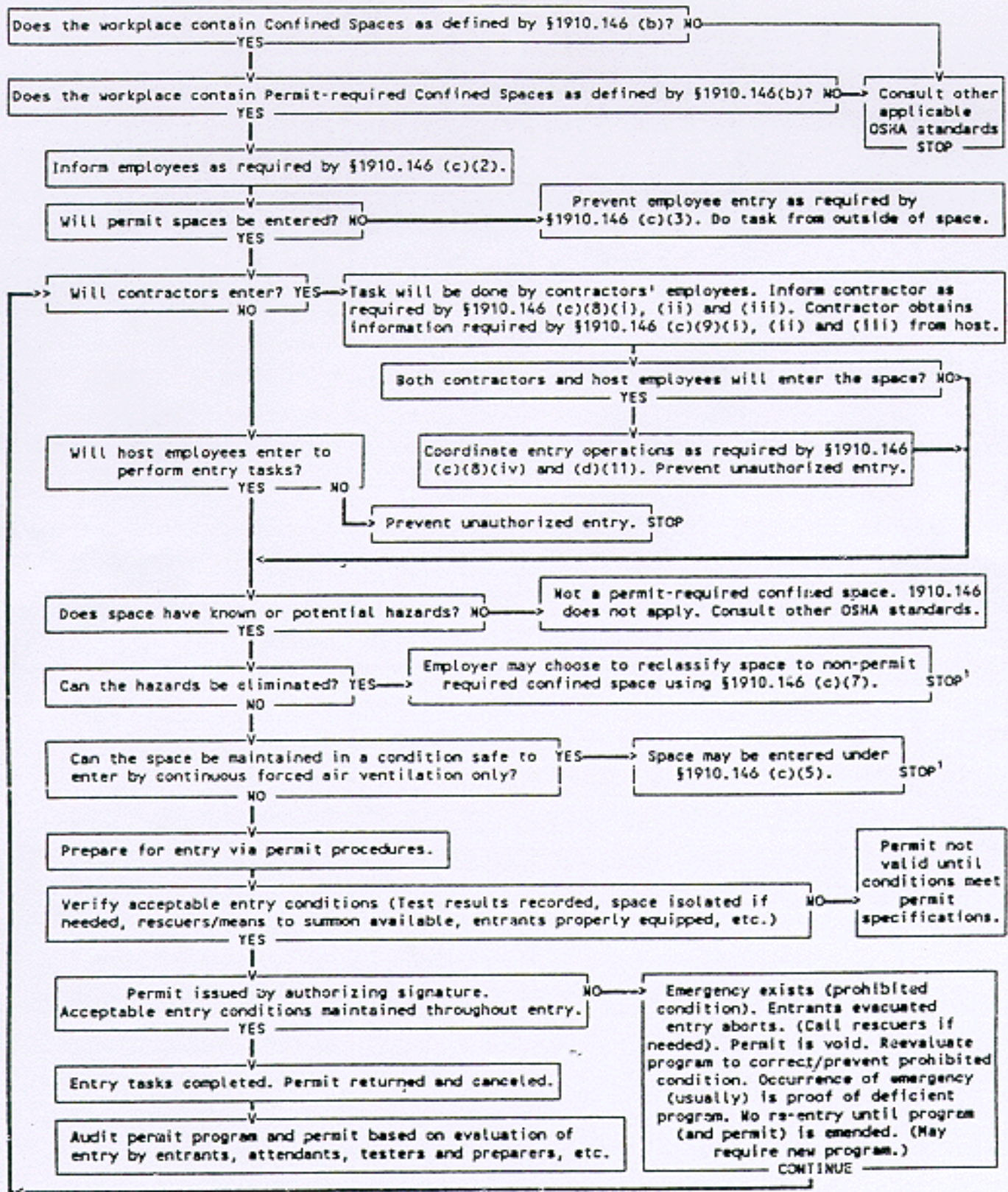
The Sr. Industrial Hygienist shall review the Permit-Required Confined Space Program and any cancelled permits at least annually to ensure employees participating in entry operations are adequately protected from permit space hazards. Any revisions shall take place before subsequent entries are authorized. If no entries are made during a 12- month period, no review is required. Submit all requests for changes to the program to the Sr. Industrial Hygienist, EHS department, for approval.

The following circumstances shall warrant a review of the program at any time:

- An unauthorized entry of a permit space;
- The detection of a permit space hazard not covered by the permit;
- The detection of a condition prohibited by the permit;
- The occurrence of an injury or near-miss during entry;
- A change in the use or configuration of a permit space; and
- Employee concerns regarding the effectiveness of the program.

Appendix A - Permit-Required Confined Space Decision Flow Chart

APPENDIX A TO §1910.146—PERMIT-REQUIRED CONFINED SPACE DECISION FLOW CHART



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

Appendix B – Air Monitor Bump Test Procedure

⚠ WARNING

Perform a Bump Test before each day's use to verify proper instrument operation. Failure to perform this test can result in serious personal injury or death.

This test quickly confirms that the gas sensors are functioning. Perform a full calibration periodically to ensure accuracy and immediately if the instrument fails the Bump Test. The Bump Test can be performed using the procedure below or automatically using the Galaxy Test Stand.

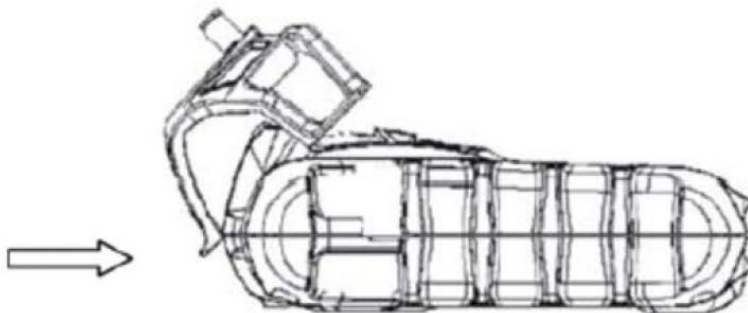
Step 1

From the normal measure screen, press the ▼ button to display "BUMP TEST?".

Step 2

Attach the calibration cap to the instrument.

- Insert tab on calibration cap into slot on instrument.
- Press calibration cap as shown until it seats onto instrument.



- Press both side tabs down onto instrument until they snap in.



- Ensure that the calibration cap is properly seated.
- Connect one end of the tubing to the calibration cap.
- Connect other end of tubing to the cylinder regulator (supplied in the calibration kit).

Step 3

Press the ϕ button to start the bump test then open the valve on the regulator. The hourglass will flash and the sensors will respond to the gas.



After the BUMP TEST completes, the instrument momentarily displays “BUMP PASS” or “BUMP ERROR” along with the label of any sensor that failed before returning to Measure mode. If the instrument fails the BUMP TEST, contact Environmental Health and Safety immediately (372-2171) and take instrument out of service. The instrument cannot be used until Environmental Health and Safety has the instrument fixed and deems it is safe for use.



- The \checkmark symbol will be displayed in the Measure mode for 24 hours after a successful Bump Test.

Appendix C - Permit-Required Confined Space Entry Permit

Date & Time of Entry:				Date & Time Cancelled:				
<i>*Completed permit must be posted at point of entry.*</i>			Authorized Duration of Entry Operations (hours):					
Space to be entered:		Location/Department:		Purpose of Entry:				
Permit Space Hazards: (check all that apply)								
<input type="checkbox"/> Oxygen deficiency (less than 19.5%)		<input type="checkbox"/> Oxygen enrichment (greater than 23.5%)		<input type="checkbox"/> Electrical shock				
<input type="checkbox"/> Flammable gases/vapors (greater than 5% LEL/LFL)		<input type="checkbox"/> Airborne combustible dust (less than 5ft visibility)		<input type="checkbox"/> Material harmful to skin (specify):				
<input type="checkbox"/> Engulfment (could flow over and enclose entrant, i.e. water)		<input type="checkbox"/> Toxic gases/vapors (greater than 50% of TLV/PEL – specify): _____						
<input type="checkbox"/> Mechanical hazards (specify): _____				<input type="checkbox"/> Other (specify): _____				
Preparation for Entry: (check after completed)								
<input type="checkbox"/> Notified affected department(s) of service interruption				<input type="checkbox"/> Notified BGFD of location, nature of work, and approximate duration of project (419-372-3106)				
Methods for Controlling Space Hazards: (check all that apply)								
<input type="checkbox"/> Lockout/Tagout		<input type="checkbox"/> Blank/Blind		<input type="checkbox"/> Purge/Clean				
<input type="checkbox"/> Ventilation		<input type="checkbox"/> Pedestrian Barriers		<input type="checkbox"/> Other (specify): _____				
Personnel Awareness: Pre-entry briefing on specific hazards and control methods (check after completed)								
<input type="checkbox"/> Notified all affected employees				<input type="checkbox"/> Notified all affected contractors				
<input type="checkbox"/> Other (specify): _____								
Additional Permits: Check if required (must be attached) <input type="checkbox"/> Hot Work <input type="checkbox"/> Other (specify): _____								
Atmospheric Testing: (Results must be recorded initially and then every 15 minutes thereafter. Additional permit pages can be attached for additional documented readings.)								
Sampling Equipment Type:		Serial Number:		Date Calibrated:				
Time:								
Oxygen (O ₂) Level = 20.8%								
Lower Explosive Limit < 5%								
Carbon Monoxide (CO) < 6 PPM								
Hydrogen Sulfide (H ₂ S) < 5 PPM								
Other (specify):								
Testers Initials:								
Equipment Required for Entry and Work: (specify)								
Special Personal Protective Equipment:				Lighting Equipment:				
Rescue Equipment:				Other:				
Means of Communication for Entrants and Attendants: (Circle all that apply)				Verbal Hand Signals Radio/Nextel (check battery/working order) Other				
Authorized Entrants		(Print Name)		(Print Name)		(Print Name)		
		(Signature)		(Signature)		(Signature)		
Authorized Attendants		(Print Name)		(Print Name)		(Print Name)		
		(Signature)		(Signature)		(Signature)		
Authorized Entry Supervisor (MUST BE A TRAINED SUPERVISOR)								
I certify that all required precautions have been taken and necessary equipment is provided for safe entry and work in this confined space.								
Print Name:		Signature:		Date:				

Revision Date: May 2020

Appendix D – Reclassifying PRCs

TEMPORARY RECLASSIFICATION OF A PERMIT-REQUIRED CONFINED SPACE TO NON-PERMIT

DO NOT USE FOR SPACES WITH ACTUAL OR POTENTIAL HAZARDOUS ATMOSPHERES

Instructions: Completing this form is required for temporary reclassification of a permit-required confined space. It serves as a place for the employee to document known hazards and their efforts in controlling those hazards. For additional guidance, see Page 2 of this form.

Specific location (room number, building, address, etc.)	Date, Time Valid (<8 hrs)
Specific tasks to be performed in the space	
Hazard(s) identified (Electrical, mechanical, etc)	
Methods used to eliminate hazards (lockout/tagout, sufficient cool down time, etc)	
Were methods used to eliminate hazards effective?	
Signature + printed name of <u>confined space competent and authorized</u> employee	
<hr style="border: 0; border-top: 1px solid black; margin: 0;"/>	

For questions, contact Environmental Health and Safety at (419) 372-2171 or envhs@bgsu.edu.

NOTE(s): This document must be made available to each employee who enters the space. If hazards arise within a permit space that has been declassified to a non-permit space, each employee in the space shall exit the space. The space shall then be reevaluated to determine whether it must be reclassified as a permit space.

Guidance for Temporarily Reclassifying Permit-Required Confined Spaces

Before attempting to reclassify a permit-required confined space, ensure the following:

- There is no actual or potential hazardous atmosphere in the confined space. Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards.
- All hazards must remain eliminated throughout the duration of entry operations.
- If someone must enter the space to eliminate hazards, the space must be treated as a permit-required confined space until all hazards have been eliminated and verified.

Reclassification examples:

Hazard	Elimination (Can reclassify)	Control (Cannot reclassify)
Inwardly converging walls, sloped floor, or internal configuration that could trap entrants	Use of secure temporary floor that is designed to carry the anticipated load of entrants, equipment, and rescuers	Use of harness and lifeline
Heat stress	Sufficient cool-down time allowed before entering space	Use of ventilation, frequent breaks, or personal protective equipment
Electrical or mechanical hazards	Lockout/Tagout of energy sources and verification prior to entry	Simply powering off equipment
Engulfment hazards	Draining space and ensuring measures are put in place to prevent additional material from entering	Fully draining the space and not ensuring measures are in place to prevent additional material from entering