

Confined Space



CONFINED SPACE ENTRY AND RESCUE

The OSHA standard on Permit-Required Confined Spaces ([29 CFR 1910.146](#)) requires employers to implement practices and procedures to protect employees from hazards associated with entry and work within permit required confined spaces.

UMCES CONFINED SPACE PROGRAM

Nationally, numerous injuries and deaths occur annually as a result of individuals entering a confined space and becoming trapped, suffocated or overcome by toxic fumes. As a result of this, the Occupational Safety and Health Administration (OSHA) issued regulations governing the procedures to be followed when dealing with a confined space with limited or no air exchange.

HPL has identified all confined spaces on campus. ("DANGER PERMIT REQUIRED CONFINED SPACE, DO NOT ENTER"). If you see a signed area ("DANGER PERMIT REQUIRED CONFINED SPACE, DO NOT ENTER") please do not enter. Anyone who wishes to enter one of these confined spaces must obtain permission from the Facilities Manager or the Environmental Safety Compliance Officer (ESCO).

WHAT IS A CONFINED SPACE?

A confined space

- IS LARGE ENOUGH FOR A BODY TO ENTER AND DO WORK
- HAS LIMITED OR RESTRICTED ENTRY OR EXIT
- IS NOT DESIGNED FOR CONTINUOUS EMPLOYEE OCCUPANCY

WHAT IS A PERMIT REQUIRED CONFINED SPACE?

- ALL OF THE ABOVE AND
- CONTAINS OR HAS THE POTENTIAL TO CONTAIN HAZARDOUS ATMOSPHERES
- 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 THAT SLOPES DOWNWARD AND TAPERS TO A SMALLER CROSS SECTIONAL AREA
- CONTAINS ANY OTHER RECOGNIZED SERIOUS SAFETY OF HEALTH HAZARDS



Program Responsibilities

Program Manager

Environmental Safety Compliance Officer (ESCO) is the Confined Space Program Manager and is ultimately responsible for

Confined Space Entry Safety in UMCES. The ESCO will evaluate the workplace to identify the confined spaces and will ensure that proper procedures are followed. Daily confined space operations will be the responsibility of the Entry Supervisor. The Entry Supervisor will establish procedures to be followed by the attendants and entrants entering a particular space, in accordance with this policy.

(ESCO)/Program Manager

(Entry Supervisor)

(Attendant/Entrant)

Program Manager (ESCO) has been designated as the confined space Program Manager. He/she is ultimately responsible for ensuring that the procedures set forth in this policy are followed by all members of the Confined Space Team. The Program Manager will also meet with all employees to review the confined space entry policy and procedures annually and will make any modifications as needed. In addition, if any near misses or accidents occur, the Program Manager will immediately review the program to determine if procedures were followed and to determine what if any changes in procedures are needed to prevent future incidents.

Entry Supervisor

The OSHA Confined Space Entry Standard requires the designation of one or more "Entry Supervisors". The Entry Supervisor is required to know the hazards of all spaces, and to review entry procedures into all confined spaces. In cases where a permit is required, the entry supervisor will be responsible for assigning adequate numbers of entrants and attendants and for filling out and signing the permit. The entry supervisor has full authority to stop entry operations or to cancel permits if a hazard should arise.

Authorized Attendants

The authorized attendant is responsible for monitoring the entrant's activities from outside the space. The attendant must stay outside the space during the entire entry and must continually air monitor the space unless the entrant is wearing the gas monitor inside the space. The attendant must maintain communication with the entrant(s) at all times using visual, verbal or radio contact. The attendant must be knowledgeable about the signs and symptoms of exposure to oxygen deficient and toxic environments that may occur in the space. The attendant has the authority to order the entrant out of the space should a hazardous condition arise and is responsible for non-entry rescue using the tripod, harness, winch system and fall protection system if required.

Authorized Entrants

The entrants will not enter a permit required confined space until a permit has been issued and signed by the entry supervisor. The entrant must wear the harness attached to the tripod, winch system whenever entering a confined space, and must never detach from the retrieval system. The entrant must be aware of the hazards of the space as well as the symptoms and consequences of exposure to toxic or hazardous atmospheres and wear the appropriate personal protective equipment listed on the permit or certification form. The entrant must maintain communication with the attendant at all times and must leave the space immediately when a gas monitor alarm goes off or when ordered by the attendant or entry supervisor to evacuate.

CONFINED SPACE ENTRY PERMITS:

CONFINED SPACE PRE-ENTRY CHECK LIST

Atmospheric Testing

The atmosphere in the confined space must be tested every four feet top to bottom and side to side in all directions with a calibrated four-gas monitor prior to entry. If levels are not within the given specifications then the supervisor should be contacted to make a determination on actions to be taken-including possibly requiring a full permit entry instead. If readings are within specifications, a blower used in the positive pressure mode must be used except where noted. Atmospheric testing with a gas monitor must be done continuously throughout the occupancy period. The entrant must be able to communicate with an entry supervisor or program manager during the entire entry. If at any time the gas monitor alarm goes off, the entrant must immediately leave the space.

NO ENTRY IF:

- Oxygen is lower than 19.5% or higher than 23.5% or,
- Hydrogen sulfide is greater than 10 ppm*,
- LEL is greater than 10%,
- Carbon Monoxide greater than 35 ppm

Full Permit Required Confined Space Entry

1. Obtain a confined space entry permit-from the Entry Supervisor. The signed permit is your authorization to evaluate the assigned confined space for entry for the purpose expressed by the Entry Supervisor and/or as described on the work order. The permit must be kept at the work site and be made available to entrants for the duration of the work being performed. The scope of the work performed cannot exceed that for which the permit was issued.)
2. Required Personnel - There must be two entrants and 2 attendants for each PERMIT REQUIRED confined space.
3. Communication - Attendants and entrants must remain in continuous contact with each other. If visual contact cannot be maintained, effective communication must be maintained by portable radios or some other reliable, pre-approved means. All attendants must have radio communication readily available for the purpose of summoning off-site emergency services. Note that intrinsically safe, or explosion-proof equipment must be used inside the confined space if the potential for an explosive atmosphere exists.
4. Non-Entry Rescue-All authorized entrants must wear a full body harness with attached lifeline, hardhat and safety shoes. Protective clothing, gloves and eyewear must be used if determined to be necessary to protect against specific, potential or existing hazards. All entrants must descend into a confined space while securely attached to a tripod/winch system, or other approved retrieval device. A secondary line for fall protection must be used if entrants are lowered into the space instead of climbing into the space on a ladder. Slack on the retrieval line must be avoided whenever entrants use a ladder or built-in rungs as the primary work platform. The retrieval system must be monitored by an attendant continuously throughout the occupancy period. Detachment from the mechanical retrieval system is prohibited. Attendants must

always be at the confined space site ready to retrieve entrants whenever a prohibited condition occurs (e.g., entrant exhibits behavioral changes, gas monitor alarms).

Personal Protective Equipment (PPE)

Entry into confined spaces may require the use of various types of personal protective equipment such as hardhats (for all permit entries), safety shoes, insulating or chemical protective gloves, eye protection and hearing protection. The Entry Supervisor will make the determination for the type of PPE required for a particular job. Entrants and attendants must wear the required PPE listed on the permit or certification. Note that only in unusual circumstances will respirators be required. If respirators are required, they must only be worn after training, fit testing and medical screening has occurred.

Lockout/Tag-out

If there is an electrical/hydraulic/mechanical/pneumatic/thermal/liquid energy source that an employee may be exposed to during servicing or maintenance of equipment in a confined space then it must be disabled or de-energized in accordance with the Lockout/Tag-out Policy/Procedure.

Welding/Cutting in Confined Spaces

All welding, torching, brazing and cutting operations carried on in confined spaces must be done with extreme caution.

Hot work Permit

All hot work requires written authorization from the Program Manager or Entry Supervisor to insure that precautions are taken to prevent fires and to protect workers. (See *Hot Work* permit).

1. Gas cylinders and welding machines must be safely secured outside the confined space in a vertical position.
2. Fuel gas and oxygen gas flows to the torch must be positively shut off at some point outside of the confined space when not in use for an extended period of time (e.g., lunch time).
3. Two types of ventilation are required-A portable, closed local exhaust ventilation system with freely moveable hood shall be used to control the accumulation of toxic materials or possible oxygen deficiency. This ventilation shall operate in the EXHAUST mode and shall be located as close as possible to the work being performed. NOTE: The exhaust hose for the welding must be located within inches of the work being performed in order to adequately exhaust the welding fumes. If the exhaust hose is placed more than one duct diameter away (i.e. for an 8 inch duct, more than 8 inches from the welding) then you are getting only 10 % of the exhaust volume. Placing the exhaust far away from the source will do nothing to control the fumes from welding.
4. Additional positive pressure ventilation (ventilation blowers) will also be provided as it normally would be in a permit required confined space entry to control potentially hazardous atmospheres.

Training Requirements

Responsible Person/ESCO will be responsible for ensuring that all Confined Space employees are trained to the level of competency required by their job assignment. Initially, all entrants, attendants and entry supervisors must successfully complete a basic training program. The training program must provide employees with the information and hands-on experience and skills necessary to safely perform their assigned confined space job duties. This training will be done by Maryland Fire and Rescue (MFRI)-or ESCO. The ESCO will train employees on the in-house equipment and policies and

procedures outlined in this policy. Employees will be given the opportunity to ask questions about the policy. Annually, entrants and attendants must be provided with and successfully participate in a refresher training program. This refresher training will be done by the ESCO or MFRI. A training certification form will be filled out for each employee who is trained.

Recordkeeping Requirements

Employee training records will be kept on file by the (Program Manager) for a period of three years. All written certifications and permits will be kept for a period of one year.

Contractors

Contractors hired will be given a copy of this procedure and are required to follow this confined space procedure in addition to all applicable OSHA Standards. All contractors will be informed of the hazards and potential hazards in the confined spaces they will be entering. If procedures are not being followed, employees and supervisors should immediately notify the contractor that proper procedures are not being followed and if the contractor does not immediately correct the situation, the Program Manager must be notified to stop all work.

This check list must be filled out whenever the job site meets the criteria of a confined space.

1. Did your survey of the surrounding area show it to be free of hazards such as drifting vapors from tanks, piping or sewers? Yes No
2. Does your knowledge of industrial or other discharges indicate this area is likely to remain free of dangerous air contaminants while occupied? Yes No
3. Are you certified in operation of the gas monitor to be used? Yes No
4. Has a gas monitor functional test (Bump Test) been performed this shift on the gas monitor to be used?
Yes No
5. Did you test the atmosphere of the confined space prior to entry? Yes No
6. Did the atmosphere check as acceptable (no alarms given)? Yes No
7. Will the atmosphere be continuously monitored while the space is occupied? Yes No

Dial **9-911** for personnel rescue by local fire departments in the event of an emergency.

Notice: If any of the above questions are answered "no" do not enter. Contact your immediate supervisor.

Job location_____

LEAD MAN signature_____Date_____

SPECIAL REQUIREMENTS FOR ENTRY

1. List all known or expected hazards in the confined space: _____

2. List all measures which will be used to control or eliminate all hazards or expected hazards: _____

3. Methods of communication between entrant/attendant/supervisor: _____

ADDITIONAL EQUIPMENT AND REQUIREMENTS

Lockout/Tag-out (Electrical/Mechanical)	Respiratory Protection
Secure area (Barricades, Tape, Etc.) PPE (List all)	Lifelines Respiratory
Secure area (Barricades, Tape, Etc.) PPE (List all) cont'd	Protective Clothing (hard hat, goggles, hearing protection, special boot special equipment, etc)
Lighting (GFCI's)	Escape Harness
Ventilation	Tools (hand operated, grounded or double insulated with GFCI's)
Line Broken-Capped or Blanked	Purge-Flush and Vent
Fire extinguisher	

For more information and/or suggestions contact the Environmental Safety Compliance Officer (ESCO) at 410-221-8441 or Email <mailto:umces-safety@umces.edu>