

CONFINED SPACE ENTRY PROGRAM

POLICY STATEMENT

All Colorado State University Facilities Management employees are **prohibited** from entering any Class A or B confined space. Only those employees who have been properly trained as outlined in this policy and equipped, at a minimum, in accordance with OSHA regulations will be allowed to enter a Class C confined space. **WARNING: This program prohibits entry into Class A or B space (as defined within this policy) until it has been mitigated to a Class C space.**

All visitors to Colorado State University facilities and job sites will comply with this program or be denied access to these areas.

This policy will be reviewed and updated on a yearly basis.

DEFINITION OF A CONFINED SPACE

A space large enough and so configured that an employee can bodily enter and perform assigned work and has the following characteristics:

- A. limited means for entry and exit;
- B. non-existent or inadequate ventilation of the space, allowing for the potential accumulation of toxic air contaminants, flammable or explosive agents, and/or depletion of oxygen; and
- C. not intended for continuous worker occupancy.

Included in this program is a list of currently known confined spaces. It will be updated periodically as the inventory is completed. It is not all-inclusive. If in doubt, do not enter a space until it is monitored and a determination has been made as to its classification.

Examples of confined spaces: Boilers, degreasers, drop inlets, furnaces, manholes, pipelines, pits, pumping stations, sewers, septic tanks, silos, storage tanks, tanks, tunnels with limited entry, utility vaults, vats, wells, or similar types of enclosures. See maps following page 15 in Manual.

PURPOSE

The purpose of the Confined Space Entry Program is to prevent accidents and injuries by training and equipping employees who might be required to enter approved Class C confined spaces. This program is designed to help eliminate or control the hazards associated with entering, working within, and exiting confined spaces.

DEFINITIONS

Attendant. A designated person who will remain outside the confined space and maintain constant communication with all confined space entrants. This person will have completed all confined space training requirements.

Atmospheric Testing Equipment. Equipment used to monitor levels of oxygen, flammable and combustible gases, and toxic gases prior to and during entry into confined space.

Body Harness. A harness made with adjustable leg and shoulder straps and a D-ring in the back for attaching a lifeline.

Confined Space. See definition on page 1 of this policy.

The Confined Space Classification Table. Appendix B (page 11) explains the different levels (A, B, C) of confined spaces.

Lower Flammable Limit (LFL). The minimum concentration of a combustible gas or vapor in air, which will ignite if an ignition source, is present.

Lifeline. The retrieval line attached to the worker in a confined space.

Lifestation (Pump station). Lifts sewer water from a gravity collection area into a re-pumping station or waste-water facility.

Manlift. A portable tripod to which a lifeline used in raising, lowering, and positioning the worker in a confined space is attached.

Personal Protective Equipment (PPE). Any piece of equipment worn by an employee to protect them from injury or illness.

Self-Contained Breathing Apparatus (SCBA). Is a device, which allows one to carry one's own supply of clean air.

Qualified Person. A person who has been trained in confined space entry and has demonstrated the ability to:

- ◆ recognize confined spaces and determine the class (A, B, C) based on atmospheric test results.
- ◆ anticipate, recognize, and evaluate exposure and physical hazards an employee might encounter in the confined space.
- ◆ execute pre-entry, entry, work, and if necessary rescue procedures
- ◆ operate Atmospheric Testing Equipment
- ◆ issue and sign the entry permit and keep appropriate records.

CONFINED SPACE ENTRY PROCEDURES

No confined space atmosphere is assumed safe. Always regard confined spaces as dangerous and abide by the procedures outlined below. **ABSOLUTELY NO DEVIATIONS FROM THESE PROCEDURES WILL BE ALLOWED.**

Pre-Entry Procedures:

1. Before entering any confined space, the following steps must be completed.
 - a. Sign and/or cone the work area.
 - b. Remind the work crew of the 20 ft. no-smoking rule.
 - c. A "Qualified Person" must take atmospheric readings and determine what class (A, B, C) confined space it is. **Only Class C confined spaces are to be entered. DO NOT ENTER CLASS A OR CLASS B SPACES.**
 - d. The "Qualified Person" in charge will next determine what PPE is necessary for the team and what equipment is needed to achieve Class C levels. Example: If a Class B site is encountered, powered ventilators might be used to improve air quality to bring it to the required Class C level. Any time equipment is used to change the level of hazard, that equipment must remain in operation as long as work is being performed at the site. If for some reason the equipment fails or is turned off, the entrants will immediately evacuate the confined space.

Once a Class A or B space has been mitigated to a Class C space, all measures required to maintain the space at a Class C level shall continue in operation while the space is occupied.

2. Ventilation

- a. Carefully remove or open lids, covers, doors, and/or hatches to allow for natural ventilation. Be cautious to not create a spark. If within 15 minutes the confined space is not at Class C level, use a power ventilator and retest the air as before in pre-entry. Use a sampling port if available.
- b. Unacceptable levels of oxygen (less than 19.5% or greater than or 21.4%), combustible gases (greater than 10% of LFL), toxic gases (10 ppm or more hydrogen sulfide).
- c. If a suspected hazardous chemical spill occurs, evacuate the area, call the "Qualified Person" in charge, and start the procedure from the beginning.
- d. The "Qualified Person" in charge will ensure all members of the entry crew have completed the Facilities Management Confined Space Entry Program.
- e. When the confined space has been determined to be at the approved Class C level, all necessary PPE is in place, and the qualified work crew has been assembled and briefed, then the "Qualified Person" in charge will fill out the confined space ENTRY PERMIT according to the following procedure:
 - 1) Record date and time.
 - 2) Record the location of the job (job site).
 - 3) Record the reason for entry.
 - 4) Record the atmospheric readings and tester's name.
 - 5) Record the names of all entrants.
 - 6) Record possible work hazards.
 - 7) Record the required PPE.
 - 8) Record the signature of "Qualified Person".

See the **CONFINED SPACE ENTRY PERMIT** in Appendix C (page 12)

3. Entry Procedures

- a. Enter the confined space only after the ENTRY PERMIT has been completed, signed by a "Qualified Person", and posted at the area of entry.
- b. Make sure an attendant is outside the confined space to operate any equipment that is required, and is equipped with a radio for emergency communication.
- c. At no time shall an employee be left unattended while they are in the confined space.
- d. If a gas monitor is part of the required PPE, it will be on at all times. If the alarm sounds, evacuate the confined space immediately.
- e. Exit the confined space if feeling dizzy, light headed or sick, or if instructed by the attendant.
- f. Maintain constant communication with the attendant. If this is not possible, leave the confined space until communication is regained.
- g. Never enter a confined space over four feet (4') deep without a ladder.
- h. If permanent steps are located in the confined space, check their stability before putting entire body weight on them.
- i. Put on body harness and attach to lifeline.
- j. Stay alert to hazards during the work period. **DON'T TAKE SAFETY FOR GRANTED.**
- k. EXCEPTIONS to the body harness and lifeline:
 - 1) Pump stations, with ventilation fans in operation and steam distribution walk tunnels that have acceptable atmospheric levels, do not require the body harness and lifeline for entry.
 - 2) If "Qualified Person" determines and documents that this level of PPE is not required.

4. Concluding Entry

Cancelled permits shall be kept by the department for a period of at least one year after each entry.

Using the cancelled permit, the department's Confined Space Entry Program shall be reviewed at least annually. Reviews may become necessary by the department for reasons stated in Training Program for Confined Space Entry in Appendix A (page 5), such as: any 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 complaints about the effectiveness of the program.

Emergency Rescue Procedures

In the event an employee is injured, disabled, and needs help in the confined space, the following emergency rescue procedures should be followed:

1. **DO NOT ENTER THE CONFINED SPACE** to attempt rescue. Assume the environment has changed from a Class C to a Class A or B.
2. Immediately notify the **base radio dispatcher**. The base radio dispatcher will immediately notify emergency rescue personnel.
3. If entry equipment allows, begin lifting the worker out of the confined space with the lifeline. Use the lifeline to guide the employee away from obstacles. Speed is important; however, make every attempt not to "catch" the employee on any obstacles. If two (2) persons are outside the confined space, one person will operate the lifeline while the other person guides the worker out with the lifeline. If the employee cannot be pulled out, **do not** enter the confined space to retrieve the employee. Wait for emergency rescue personnel.
4. Never enter a confined space without a self-contained breathing unit on, when a rescue is in progress.
5. Once the injured worker has reached the top of the confined space, move the worker away from the confined space, and allow emergency trained personnel to begin CPR, first aid, etc.
6. In cases of emergency rescue, director of Facilities Management or his/her designee must be notified. Additionally, notify Environmental Health Services safety official, and other proper authorities.

Personal Protective Equipment

1. All employees participating in a confined space activity will be required to take a class on Personal Protective Equipment (PPE).
2. This class will include the following subjects:
 - a. Head protection.
 - b. Eye protection.
 - c. Hand protection.
 - d. Foot protection.
 - e. Protective clothing.
 - f. Respiratory protection.
 - g. Hearing protection.
 - h. Lifelines and harnesses.

Training Responsibilities

No employee is allowed to enter confined spaces prior to completion of the Confined Space Training Program. Appendix A contains a suggested training program.

APPENDIX A

TRAINING PROGRAM FOR CONFINED SPACE ENTRY

INTRODUCTION

Confined spaces are a common part of many work places. They may be found in just about any occupation. Every year people die in confined spaces mainly due to hazardous atmospheres such as inadequate oxygen and flammable or toxic gases. **MORE THAN 60% OF THE DEATHS IN CONFINED SPACES OCCUR DURING RESCUE ATTEMPTS AMONG WOULD-BE RESCUERS.** The confined space entry-training program will educate and train designated Facilities employees in all areas of confined space entry. Employees will be taught the definition and classes of confined spaces, how to calibrate and use atmospheric testing equipment, how to use entry equipment, and what procedures to follow during pre-entry, entry, and rescue operations.

FILM OR VIDEO

A film or video will be used to give a brief introduction to confined spaces – the associated hazards and proper entry procedures.

FILM OR VIDEO REVIEW

“What is a confined space?” A confined space refers to a space which has limited openings for entry and exit, unfavorable natural ventilation which could contain or produce dangerous air contaminants, and is not intended for continuous worker occupancy. Examples of confined spaces may include manholes, pits, trenches and excavations, tanks, or similar types of enclosures. The film or video explains what confined space is. The training program covers in detail how confined spaces affect Facilities Management employees and the correct procedures to use in dealing with these areas. After recognizing a confined space, the first step in dealing with a confined space is to begin pre-entry procedures.

PRE-ENTRY

Most confined space fatalities are the result of hazardous atmospheres. This is due to the design of the confined spaces. The confined space is designed to provide an atmosphere in which to process or store chemicals. The air may not move freely in and out of these spaces. Organic substances may begin to decompose in these areas.

There may not be enough oxygen inside the confined space to support life, or the air could be so oxygen-rich that it is likely to increase the chances of fire or explosion, if a source of ignition is present. The three (3) types of hazardous atmospheres are:

1. Oxygen-deficient/ -enriched
2. Flammable
3. Toxic

Oxygen-deficient atmospheres occur when the level of oxygen in the air falls below 19.5%. Normally there is about 21% oxygen in the air we breathe. Safe oxygen levels range from 19.5% to 21.4%. Below 19.5%, body function may diminish or result in headaches, drowsiness, and an increase in breathing and heart rate. Unconsciousness and death can occur if the body does not receive enough oxygen. Oxygen-deficiency may occur when oxygen is consumed (such as from a fire or corrosion) or when oxygen is displaced by other gases (such as nitrogen or methane).

Oxygen-enriched atmospheres occur when the level of oxygen in the air rises above 21.4%. Oxygen above the normal level increases the flammability range of combustible gases or material and causes them to burn violently.

Flammable atmospheres may occur when vapors from solvents, petroleum products, or other combustible materials accumulate in the air. Because of the enclosed area, they may be easily ignited by sparks, cigarettes, or even static electricity. This may result in sudden flames or an explosion with little or no warning. To prevent the possibility of a fire or explosion in a confined space, only approved tools and equipment should be used. These include, but are not limited to items that are grounded, explosion proof, non-sparking, low voltage, and battery or pneumatically powered. If the work being performed might create an ignition source (such as welding), a fire extinguisher should be readily available.

Toxic atmospheres like flammable ones, can be caused by the generation of vapors from solvents, chemicals, or chemical processes. Some toxic atmospheres, such as carbon monoxide, are odorless, colorless and tasteless, and thus have no warning properties. Other toxic atmospheres may have a noticeable smell similar to rotten eggs or that of hydrogen sulfide. Many toxic atmospheres cause rapid dizziness, which might prevent someone from getting out of the area in time.

To prevent incidents related to a hazardous atmosphere, it is important that the confined space be tested prior to entry. Discuss these specific procedures for pre-entry:

1. Proper use and operation of the gas monitor. Refer to gas monitor manufacturer's operating instructions. Cover instructions step by step.
2. Proper calibration techniques of the gas monitor (calibrate it before testing the confined space). Refer to gas monitor manufacturer's instructions. Cover instructions step by step.

NOTE: It is extremely important that each person in the class be tested on calibration of the equipment since the entry decision hinges on accurate equipment calibration.

3. Proper completion of the confined space entry permit. Pass out a blank Confined Space Entry Permit to each person in the training class. Discuss the permit in detail; line by line. A sample of the Confined Space Entry Permit is included in this **Appendix C (page 12)**. The "Qualified Person" completes the Confined Space Entry Permit in the following order:
 - a. Record the date.
 - b. Record the location (job site).
 - c. Record the reason for entry.
 - d. Record the person's name taking the atmospheric readings.
 - e. Test the confined space atmosphere for oxygen deficiency, combustible gases, and toxic gases, using the following steps:
 - 1) Calibrate gas detectors per factory recommendations.
 - 2) Lower the gas detector probe into the confined space and take readings at the top, middle, and approximately six inches (6") above the bottom of the confined space. Repeat the process at the middle and top as the probe is removed.
 - 3) Record readings.
 - f.
 - 1) Indicate possible work hazards that may exist or be created. Are any corrosives in the confined space? Corrosives are irritants, such as chlorine or battery acid that may cause severe irritation or destruction of tissue if allowed to come in contact with skin, eyes, or lungs. If corrosives are present, mark the appropriate box.
 - 2) Are toxic materials present in the confined space? Toxic agents are poisons such as hydrogen sulfide that, if swallowed, inhaled, or absorbed through the skin, may cause injury or disease, and even death.

- 3) Are flammables present in the confined space? Flammables are liquids and gases that burn readily, such as gasoline.
 - 4) Another possible work hazard is slippery surfaces. If surfaces are wet or slippery, check yes. If not, check no.
 - 5) Will welding occur in the confined space?
 - 6) If any other possible work hazards exist in the confined space, list them.
- g. Indicate safety equipment required for entry. If ventilation requires a power ventilator, check "yes". If not, mark "no". Is head protection required? If there is any danger from falling objects, either from within the confined space or through the entryway, head protection must be worn. List any other protection that may be needed.
 - h. List team members.
 - i. Sign the permit authorizing the entry, if conditions are acceptable for entry.
 - j. Record the date authorized.

REMINDER: If the confined space is vacated for any period of time (for example, a lunch break), a new entry permit must be completed.

If the pre-entry procedures have been accomplished and the entry permit has been signed, the confined space may be entered using entry procedures. Do not enter a confined space if any test reveals unacceptable levels of oxygen, combustible gases or toxic gases as indicated in the Confined Space Classification Table (Appendix B, page 11). Also if, for any reason, presence of a hazardous chemical in the confined space is suspected, do not enter. Immediately notify the supervisor. The confined space may need to be ventilated before entry. If so, ventilate the confined space using the following procedure:

- 1) Manholes – Ventilate by moving one or two manhole lids on each side of the work area for a minimum of fifteen (15) minutes. If natural ventilation is inadequate, a power ventilator should be used. Ventilation (whether natural or powered) should be continued as long as work is being performed.
- 2) Lift Stations – Operate ventilating fans fifteen (15) minutes prior to entering any confined space, and continue ventilation as long as work is being performed.
- 2) Tanks – Open all doorways, hatches, and openings to allow for natural ventilation. If natural ventilation is not adequate, a power ventilator should be used.

ENTRY

Before entering any confined space, the following equipment must be assembled and ready for use at the work site:

- ♦ Entry ready permit.
- ♦ Gas monitoring equipment.
- ♦ Body harness, where required by entry permit.
- ♦ Lifeline, where required by entry permit.
- ♦ Necessary equipment for a vertical lift of unconscious or disabled employee, where required by entry permit.
- ♦ Any personal protective equipment that may be required by the entry permit.
- ♦ Safety cones.
- ♦ Powered ventilator, where required by permit.

Ask for a volunteer. Have the volunteer put on a safety harness and the gas monitor equipment. Demonstrate how to adjust each for the best comfort.

The confined space is ready for entry. Providing all pre-entry procedures are successfully accomplished, workers may continue entry with the following entry procedures:

Manhole Entry Procedures

- A. Put on body harness and attach it to lifeline.
- B. Check manhole entry steps by hitting each one before putting weight on it.
- C. If a manhole does not have steps, use a ladder that reaches to the bottom.
- D. Take the gas monitor into the manhole.
- E. If the gas monitor alarm sounds, climb out of the manhole immediately.
- F. If the gas monitor alarm does not sound, atmospheric levels are acceptable. Proceed to work, following ALL safety procedures.

Pump Station

- A. If the pump station is equipped with ventilation fans and readings are acceptable, a body harness and lifeline are not required for entry.
- B. If the pump station is not equipped with ventilation fan and gas readings are acceptable, put on body harness and attach it to the lifeline when entering.
- C. Take the gas monitor into the pump station.
- D. If the gas monitor alarm sounds, leave the pumpstation immediately.
- E. If the gas monitor alarm does not sound, atmospheric levels are acceptable. Proceed to work, following all safety procedures.

Steam Distribution Walk Tunnels

Steam distribution walk tunnels normally have adequate ventilation to allow entry and work; however, the following shall be used as entry requirements:

- A. Entry permits will be issued through the Heating Plant.
- B. A gas monitor must be taken into the tunnel. If the gas monitor alarm sounds, get out immediately through the nearest exit.
- C. Review a map at the Heating Plant to become familiar with the location of exit manholes and building exits from the tunnel area in which the work is being performed.
- D. Pick up the 800 MZ radio at the Heating Plant and ensure there is constant communication with the designated Heating Plant person.
- E. Communicate immediately with the Heating Plant person any hazards that may develop and any emergency exits required.

All Other Confined Space Entry

- A. All persons entering the confined space will wear a full body harness with the lifeline attached to the manlift.
- B. Use the ladder or other safe means to enter or exit confined spaces exceeding four (4) feet in depth.
- C. Upon entering, take the gas monitor along. If the gas monitor alarm sounds, evacuate immediately.
- D. If the gas monitor does not sound, atmosphere levels are acceptable. Proceed to work, following all safety procedures.

HAZARDS IN THE CONFINED SPACE

Mechanical/Electrical Hazards:

Mechanical and electrical systems, which are unnecessary and irrelevant to the work being performed in the confined space, should be de-energized and tagged out in accordance with OSHA regulations (Standard 1910.147). This will isolate the area from mechanical and electrical dangers and protect against the accidental start-up of equipment. Electrical hazards can be further reduced by the use of equipment that is grounded, low voltage, and battery- or pneumatically-operated. All lighting units, extension cords, and other wiring in enclosed areas must be connected to outlets, which have approved ground-fault circuit interrupters.

Other Hazards

There are several other dangers involving confined spaces. These include noise, heat, lighting, and poor communication.

Noise can be a problem since sounds echo or reverberate in the enclosed space. Hearing protection should always be readily available and worn if noise levels become too high.

Heat stress can develop in a confined space due to high temperatures and limited air movement. This can lead to exhaustion, dizziness, and other problems. Heat stress can be prevented by adequate ventilation and by drinking plenty of water to replenish body fluids lost by perspiration. Rest periods may need to be established if conditions warrant.

Lighting in confined spaces usually needs to be provided by the use of explosion-proof and low voltage or battery-operated equipment. This will help reduce both electrical hazards and ignition sources.

Communication between workers in a confined space can be difficult due to noise or inadequate lighting. Communication between workers in a confined space and those on the outside is essential to ensure safety of the workers inside. Contact (verbal or visual) between the workers and those outside must be maintained at all times.

EMERGENCY RESCUE PROCEDURES

In the event a worker is injured, disabled, and needs help in the confined space, the following emergency rescue procedure must be followed:

1. DO NOT ENTER THE CONFINED SPACE to attempt rescue. Assume the environment has changed from Class C level to Class A or B.
2. Immediately notify the **base radio**. The base radio dispatcher will immediately notify emergency rescue personnel.
3. If entry equipment allows, begin lifting the worker out of the confined space with the lifeline. Use the lifeline to guide the worker away from obstacles. Speed is important; however, make every attempt not to “catch” the worker on any obstacle, thus making retrieval difficult. If two (2) persons are outside the space, one will operate the lifeline while the other person guides the injured worker out with the lifeline. If the worker cannot be pulled out, **do not** enter the confined space to retrieve him/her. Wait for emergency rescue personnel.
4. Never enter a confined space without a self-contained breathing unit when a rescue is in progress.

5. Once the worker has reached the top of the confined space, move the worker away from the confined space and allow emergency-trained personnel previously called to begin CPR, first aid, etc.
6. In the case of death, Facilities Management Director or his/her designee must be notified. Additionally, notify Environmental Health Services Safety official and other proper authorities as required.

ENTRY REVIEWS

Reviews will be conducted when:

- ♦ The department believes measures taken under this program are not adequate to protect the worker.
- ♦ Revision is necessary to correct differences found to exist before subsequent entries are authorized.
- ♦ The program has been in effect for one year, and annually thereafter.

The annual review shall be initiated by the Department Head or his/her designated representative and shall include review of all completed/cancelled permits.

Examples of other reasons to review the program annually:

- ♦ Unauthorized entry into a designated confined space.
- ♦ Detection of a hazard not covered by the entry permit.
- ♦ Detection of a hazard prohibited by the entry permit.
- ♦ Occurrence of an injury or near miss during entry.
- ♦ Reconfiguration of a designated confined space.
- ♦ Employee complaints about effectiveness of the program.

SUMMARY

It is the responsibility of each employee to work safely. A key question to remember while working in confined spaces is, "What must I do to prevent myself from being injured and from injuring others?" If this question is remembered and answered, and the following safety points are observed, the confined space will be a safe place to work.

Safety Points

- ♦ Hazards are not always recognizable upon entering a confined space.
- ♦ Before entering a confined space always obtain and complete an entry permit.
- ♦ Never smoke within twenty (20) feet of a confined space entrance.
- ♦ Be sure the gas monitor alarm is on at all times while working in a confined space.
- ♦ Exit the confined space if the gas monitor alarm sounds or when starting to feel dizzy, light headed, or sick.
- ♦ Stay alert at all times. **DON'T TAKE SAFETY FOR GRANTED.**
- ♦ Concentrate on the job being done at all times.

APPENDIX B

CONFINED SPACE CLASSIFICATION TABLE

PARAMETERS	CLASS A	CLASS B	CLASS C
Characteristics	Immediately dangerous to life. Rescue procedures require entry of more than one individual fully equipped with life support equipment. Maintenance of communication requires an additional standby person stationed within the confined space.	Dangerous, but not immediately life-threatening. Rescue procedures require the entry of no more than one individual fully equipped with life-support equipment. Indirect, visual, or auditory communication with workers.	Potential hazard. Requires no modification of work procedures. Standard rescue procedures. Direct communication with workers from outside the confined space.
Oxygen	16% or less, or greater than 25%	16.1% to 19%, or 21.5% to 25%	19.5% to 21.4%
Flammability Characteristics	20% or greater of LFL (Lower Flammable Limit)	10% to 19% LFL (Lower Flammable Limit)	10% LFL or less (Lower Flammable Limit)
Toxicity	Immediately dangerous to life or health (IDLH)	Greater than contamination level listed in OSHA Standard 1910 Sub Part Z, but less than IDLH level.	Less than contamination level listed in OSHA Standard 1910 Sub Part Z. For example: Carbon Monoxide level – 35 PPM, Hydrogen Sulfide level- 10 PPM.

Facilities Management employees will enter only Class C confined spaces.

APPENDIX C

CONFINED SPACE ENTRY PERMIT

DESIGNATED SUPERVISOR: _____ DATE: _____

LOCATION & DESCRIPTION
of confined space: _____

PURPOSE of entry: _____

TIME OF ENTRY: _____ EXPIRATION of permit: _____

PERSON in charge of work: _____

EMPLOYEES entering or on site: 1. _____ 2. _____

3. _____ 4. _____

SPECIAL REQUIREMENTS Lock out/De-energize Lines Broken/Capped or Blanked Purge/Flush & Vent Ventilation Secure Area Breathing Apparatus Resuscitator/Inhaler Other (Explain) HAZARD(S) caused by work:	YES	NO	Escape Harness Tripod Unit Lifelines Fire Extinguishers Lighting Protective Clothing Respirator Attendant First Aid/CPR Provider	YES	NO
MONITORING REQUIRED % Oxygen (19.5% to 21.4%) Flammable/explosive LEL Hydrogen Sulfide 0PPM Methane Chlorine Carbon Monoxide Others:	YES	NO	INSTRUMENT(S) USED/SERIAL #	YES	NO

CONFINED SPACE READINGS

TOP	MIDDLE	BOTTOM

Permit must be on job site until work is complete. Original copy to be kept on file with designator supervisor. Copy to Environmental Health Services.

Authorized Signature

Date: _____

APPENDIX D

SAFE ENTRY CHECKLIST

Use the following checklist to evaluate the confined space

DO NOT ENTER A CONFINED SPACE UNTIL ALL THE QUESTIONS BELOW HAVE BEEN CONSIDERED AND IT HAS BEEN DETERMINED THAT THE SPACE IS SAFE TO ENTER.

YES **NO**

_____ _____ Is entry necessary?

TESTING

_____ _____ Are the instruments used in atmospheric testing properly calibrated?

_____ _____ Was the atmosphere in the confined space tested?

_____ _____ Was the oxygen level at least 19.5% and not more than 21.4%?

_____ _____ Were toxic, flammable, or oxygen-displacing gases or vapors present?

- Hydrogen Sulfide
- Carbon Monoxide
- Methane
- Carbon Dioxide
- Other (list) _____

MONITORING

_____ _____ Will the atmosphere in the space be monitored while work is going on?

_____ _____ Continuously?

_____ _____ Periodically? (If yes, give interval: _____)

REMEMBER: ATMOSPHERIC CHANGES OCCUR DUE TO THE WORK PROCEDURE OR TO THE PRODUCT STORED. THE ATMOSPHERE MAY BE SAFE WHEN ENTERED, BUT CAN CHANGE VERY QUICKLY.

CLEANING

_____ _____ Has the space been cleaned before entry?

_____ _____ Was the space steamed?

_____ _____ If so, was it allowed to cool?

_____ _____ Has the space been ventilated before entry?

SAFETY ENTRY CHECKLIST (cont.)

YES **NO**

- ____ ____ Will ventilation be continued during entry?
- ____ ____ Is the air intake for the ventilation system located in an area that is free of combustible dusts, vapors, and toxic substances?
- ____ ____ If atmosphere was found unacceptable and then ventilated, was it retested before entry?

ISOLATION

- ____ ____ Has the space been isolated from other systems?
- ____ ____ Has electrical equipment been locked out?
- ____ ____ Have disconnects been used where possible?
- ____ ____ Has mechanical equipment been blocked, choked, and disengaged where necessary?
- ____ ____ Have lines under pressure been blanked and bled?

CLOTHING/EQUIPMENT

- ____ ____ Is special clothing required (boots, chemical suits, glasses, etc.)?
If so, specify _____
- ____ ____ Is special equipment required (e.g., rescue equipment, communications equipment, etc.)?
If so, specify _____
- ____ ____ Are special tools required (e.g., spark-proof)?
If so, specify _____

RESPIRATOR PROTECTION

- ____ ____ Are MSHA/NIOSH approved respirators of the type required available at the work site?
- ____ ____ Is respirator protection required (e.g., air-purifying, supplied air, self-contained breathing apparatus, etc.)?
If so, specify _____
- ____ ____ Is the entrance accessible with a respirator on? (If unknown, find out before entering)

SAFETY ENTRY CHECKLIST (cont.)

YES **NO**

TRAINING

_____ _____ Have all employees covered by this permit been training in proper use of a respirator, first-aid/CPR, confined space entry procedures, emergency rescue procedures?

STANDBY/RESCUE

_____ _____ Will there be a standby person on the outside in constant visual or auditory communication with the person on the inside?

_____ _____ Will the standby person be able to see and/or hear the person inside at all times?

_____ _____ Has the standby person(s) been trained in rescue procedure?

_____ _____ Will safety lines and harnesses be required to remove a person?

_____ _____ Are company rescue procedures available to be followed in the event of an emergency?

PERMIT

_____ _____ (The permit is an authorization in writing that states that the space has been tested by a qualified person; the space is safe for entry; what precautions, equipment, etc. are required; and what work is to be done.

_____ _____ Has a confined space entry permit been issued?

_____ _____ Does the permit include a list of emergency telephone numbers?

For further information on confined spaces, occupational hazards, safe work practices, and other topics, which would affect individual well-being, write to:

**PUBLICATIONS DISSEMINATION
National Institute for Occupational Safety & Health
Robert A. Taft Laboratories
4676 Columbia Parkway
Cincinnati, OH 45226**