

P-7

Confined Space Entry

I. Scope

This program shall apply to all DGS employees and to contractors during entry into Permit and Non permit confined spaces. These mandatory procedures prescribe the minimum criteria for preventing employee exposures to hazardous conditions when entering and working within any confined space. Additional requirements may be designated for confined space entry by the Department of General Services prior to permitting entry.

An assessment and classification has been performed for all identified confined spaces and is in Appendix A.

II. References

A OSHA 29 CFR 1910.146- Permit Required Confined Spaces

B. Federal Register 58 FR4462

C. American National Standards Institute (ANSI), "Safety Requirements for Working in Tanks and Other Confined Spaces", ANSI Z117.1-1989.

D. National Institute for Occupational Safety and Health (NIOSH), Criteria Document, "A Guide to Safety in Confined Spaces", July, 1987

III. Definitions

Acceptable Atmospheres: - Acceptable environmental conditions within confined spaces in which uncontrolled hazardous atmospheres are not present.

Acceptable Entry Conditions: - Conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit required confined space entry can safely enter into and work within the space.

Attendant: - An employee assigned as a standby person who is trained in non-entry emergency rescue and stationed outside one or more permit required confined space to communicate, observe and assist those inside.

Authorized Entrant: - An employee authorized by the shop supervisor to enter a permit required confined space to perform a specific type of duty(ies) and has received the necessary confined space entry training.

Blanking or Blinding: - Absolute closure of a pipe, line or duct, by fastening across its bore a solid plate or cap that completely covers the bore, extends at least to the outer edge of the flange, and can withstand maximum upstream pressure.

Class II Chest Harness: - A chest-waist harness used for side entry into confined spaces where only a limited fall hazard exists and where personnel retrieval may be necessary.

Class III Full-Body Harness: - A full-body harness used for top entry into confined spaces where a vertical free fall hazard exists and where personnel retrieval may be necessary.

Permit Required Confined Space (PRCS): - A space has **all** of the following characteristics:

1. Large enough and so configured that an employee can bodily enter and perform assigned work;
2. Has limited or restricted means for entry or exit;
3. Is not designed for continuous employee occupancy;
4. And there is a reasonable risk of exposure to: serious hazards, entrapment, asphyxiating atmospheres and/or the moving parts of machinery.

Confined Space Entry Permit: - Is a permit form authorizing entry and work in a confined space; which states the type of work, air test results, entry requirements, and protective measures. This document is signed by an Entry Supervisor and is required to be posted at the entrance of the space during such work.

Contaminant: - Any organic or inorganic substance, dust, fume, mist, vapor, or gas, the presence of which in air can be harmful or hazardous to human beings.

Double Block and Bleed: - Closure of a line, duct or pipe by closing and locking or tagging a drain or vent which is open to the atmosphere in the line between two locked-closed valves.

DGS Safety Coordinator: - Chief of the Fire, Safety and Environmental Section.

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, capturing, or both, of a person by a finely divided particulate matter or liquid that can be aspirated 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.

Entry: - Ingress by persons into a confined space which occurs upon breaking the plane of the confined space portal with any part of the entrant's body; and all periods of time in which the confined space is occupied.

Entry Supervisor: - The person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required.

Hazardous Atmosphere: - Hazardous atmosphere poses risk of death, incapacitation, or impairment of self-rescue ability, injury or illness from:

1. Flammable gas, vapor, or mist >10% LEL
2. Combustible dusts exceeding its LEL (obscures vision at distance of 5 feet)
3. Oxygen below 19.5% or above 23.5%
4. Chemical/physical hazards exceeding Permissible Exposure Limits
5. IDLH (Immediately Dangerous to Life or Health) atmospheres

Hoisting Device: - A person-rated hoist, winch, or similar mechanical device of specific design to permit an employee to safely enter and/or be removed through a top-opening of a confined space.

Hot Work: - Work involving welding, burning, open flame, sparks or temperatures that could ignite combustible materials.

Fire Safety Permit: - A written authorization issued for hot work operations.

Immediately Dangerous to Life or Health (IDLH): - Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space. Values established by NIOSH.

Inerting: - Displacing an atmosphere with a non-reactive gas (e.g., nitrogen or carbon dioxide) so that the resulting atmosphere is noncombustible.

Isolation: - A process of removing a confined space from service and preventing release of engulfing substances, or hazardous substances or energy. Isolation includes:

1. Disconnection, removal or misalignment of lines;
2. Blanking or blinding at flanges;
3. Double block and bleed with valves;
4. Electrical lockout and tagout or disconnection; and
5. Mechanical lockout and tag out or disconnection.

Lockout/Tagout: - Placement of a lock/tag on the energy-generating device to isolate and prevent operation of the device.

Lower Explosive Limit (LEL): - The minimum concentration of gas, vapor, or dust in air that can ignite in the presence of an ignition source.

Non-Permit Required Confined Space (NPRCS): - A space meeting the following specifications:

1. Is large enough and so configured that an employee can bodily enter and perform assigned work;
2. Has limited or restricted means for entry or exit;
3. Is not designed for continuous employee occupancy;
4. There are no atmospheric or physical hazards to be reasonably expected to be present in the space.

Oxygen Deficiency: - Any atmosphere containing less than 19.5 percent oxygen by volume

Oxygen Enriched Atmosphere: - An atmosphere containing more than 23.5 percent oxygen by volume

Permissible Exposure Limit (PEL): - OSHA has published permissible exposure limits concerning various toxic and hazardous chemical substances and physical agents to which employees may be exposed during the course of employment without developing any adverse health effects.

Permit-Required Confined Space (PRCS): - A space that meets all the requirements of a confined space AND that potentially has ANY one or more of the following characteristics:

1. Contains or has a potential to contain a hazardous atmosphere
2. Contains a material with the potential for engulfment of an entrant
3. Has internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or a floor which slopes downward and tapers to a smaller cross-section
4. Contains any other recognized serious safety or health hazard

Retrieval Systems: - Equipment used for non-entry rescue of persons from confined spaces consisting of the following items:

1. Cable, line, or rope of at least 1/2 inch diameter and capable of withstanding 2000-pounds test. The line shall be equipped with fittings for attachment to a safety harness and shall be of a length that permits attachment to a hoisting device, or to an anchor point located outside the entry portal to the confined space;
2. A hoisting device, winch, or similar mechanical device of specific design for use to permit an employee to safely enter and/or be removed through a top-opening of a confined space; and
3. Class II Chest Harness used for side entry into confined spaces where only a limited fall hazard exists and where personnel retrieval may be necessary; or
4. Class III Full-Body Harness used for top entry into confined spaces where a vertical free fall hazard exists and where personnel retrieval may be necessary.
5. Wristlets & Anklets may be utilized where it is determined by the entry supervisor that the use of a harness would create an additional hazard to the entrant due to space configuration.

Retrieval Line: - A cable, line, or a rope of at least 1/2 inch diameter and capable of withstanding 2000-pounds test. The line shall be equipped with fittings for attachment to a safety harness and shall be of a length that permits attachment to a hoisting device, or to an anchor point located outside the entry portal to the confined space.

Threshold Limit Value(TLV): - The American Conference of Governmental Industrial Hygienists has established recommended threshold limit values (TLVs) concerning chemical substances and physical agents to which employees may be exposed during the course of employment. TLVs shall be used as guidelines only, and shall be considered as one of many contributing factors in evaluating the overall degree of hazard for confined space work.

IV. Guidance/ Program

A. PROGRAM RESPONSIBILITIES

1. Bureau Director or Regional Manager has the responsibility to:

- a. Support and ensure that all elements of procedure are implemented completely for the protection of all employees.
- b. In areas **outside of the Harrisburg area**, make the final determination if DGS employees will be permitted to enter all confined spaces and clearly institute mechanism to adequately enforce.
- c. Ensure that the overall program effectiveness is evaluated annually.

2. The Safety Coordinator has the responsibility for:

- a. Reviewing the confined space program on annual basis
- b. Overseeing the space identification/classification process.
- c. In areas in and around the **Harrisburg area**:
 - Make the final approval on the confined space permit to allow DGS employees or DGS Contracted employees to enter permit required confined spaces.
 - Conduct confined space assessment for all new or significantly modified spaces.
 - Coordinating emergency response activities per this program.
 - Issuing Fire Safety Permits pending appropriate approvals (in accordance with Fire Safety Permit Procedure).
 - Coordinating with contractors to ensure proper procedures are being followed per this program.
- d. Establishing a mechanism to ensure the confined space program elements are being performed, including:
 - Coordination of entrant, attendant, supervisor required training.
 - All pre-entry conditions are met entry permits reviewed prior to entry.
 - No unauthorized employee will enter or be exposed to a PRCS.
 - The confined space entry permit is completed and maintained at the worksite during confined space entry operations

3. Managers have the responsibility to:

- a. Ensure Supervisors are performing their responsibilities defined in this procedure.
- b. Notify the Safety Coordinator of any employee concerns and/or exposure potentials that they have identified in their areas.
- c. Notify the Safety Coordinator of any significant equipment modification/upgrade/addition that can be expected to create a new PRCs or substantially modify an existing confined space.
- d. Assist the Safety coordinator in coordinating confined space training for affected employees in their department.
- e. Outside the Harrisburg area:
 - i. Determine is a confined space assessment necessary for all new or significantly modified spaces.
 - ii. Coordinating emergency response activities per this program.
 - iii. Issuing Fire Safety/hot work Permits.
 - iv. Coordinating with contractors to ensure proper procedures are being followed per this program.

4. Authorized Attendant responsibilities include, but are not limited to, the following:

- a. When required, complete the Confined space entry permit and submit it to the entry supervisor.
- b. Know the hazards, including information on the mode of exposure (e.g., inhalation or dermal absorption), signs or symptoms, and consequences of the exposure;
- c. Be aware of possible behavioral effects in entrants due to exposure;
- d. Know the number and identity of entrants in the space at all times;
- e. Remain outside the space until relieved by another attendant;
- f. Maintain communication with entrants throughout the entry.
- g. Maintain some form of communication to emergency response personnel
- h. Monitor activities inside and outside space to determine whether it is safe for entrants to remain in the space;
- i. When required, perform air monitoring and surveillance of the confined space prior to and during entry into a confined space;
- j. Evacuate the space if:
 1. detect a prohibited condition
 2. detect behavioral effects in entrants due to hazard exposure
 3. detect a situation outside the space which could endanger entrants
 4. cannot adequately perform these duties;
- k. Summon rescue/emergency services if entrants may need assistance to escape;
- l. While entry is underway:
 - warn unauthorized persons to stay away from space;
 - advise them to exit immediately if they have entered the permit space;

- Inform entrants and entry supervisor if unauthorized persons have entered the space;
- m. Perform non-entry rescues as specified by rescue procedure.
- n. Perform no duties that may interfere with the primary duty of monitoring and/or protecting authorized entrants; and
- o. Never enter a permit space to attempt a rescue.

5. Entry Supervisor shall:

- a. Know the hazards, including information on the mode of exposure (e.g., inhalation or dermal absorption), signs or symptoms, and consequences of the exposure;
- b. For Non permit confined spaces ensure that there are at least two employees assigned to the task with a reliable form of communication.
- c. Verify appropriate entries have been made on entry permit, all tests have been conducted, all pre-entry conditions have been met and all procedures/equipment specified by permit are in place before endorsing permit and authorizing entry;
- d. In the **Harrisburg area**:
 - Send the permit to the Safety Coordinator for final approval
 - post a confined space entry permit
- e. In **areas outside the Harrisburg** area:
 - Issue and post the confined space permit
 - Verify the availability and means of summoning rescue/emergency services;
- f. If appropriate, terminate entry, cancel permit and notify the DGS Fire Safety and Environmental office when tasks are completed or when a condition not allowed by the permit arises;
- g. Remove unauthorized individuals who enter or attempt to enter the space; and determine,
- h. Whenever responsibility for entry is transferred, that operations remain consistent with the terms of the permit and acceptable entry conditions are maintained.

6. Authorized Entrant shall:

- a. Know confined space hazards, including information on the mode of exposure (e.g., inhalation or dermal absorption), signs or symptoms, and consequences of the exposure;
- b. Use appropriate personal protective equipment properly (e.g., face and eye protection, and other forms of barrier protection such as gloves, aprons, and coveralls);
- c. Maintain communication (e.g., telephone, radio, visual observation) with Attendants to enable the Attendant to monitor the Authorized Entrant's status as well as to alert the Authorized Entrant to evacuate;

- d. Alert the attendant whenever a warning sign or symptom of exposure to a dangerous situation exists or a prohibited condition is detected; and
- e. Exit from confined space as soon as possible when ordered by an authorized attendant/entry supervisor, when the authorized entrant recognizes the warning signs or symptoms of exposure exists, when a prohibited condition exist, or when an automatic alarm is activated.

7. Employees have the responsibility to:

- a. Notify his/her supervisor immediately of any adverse or unanticipated reactions/incidents occurring during or after entering a confined space.
- b. Notify his/her supervisor if he/she has ANY safety concerns or notice any unsecured confined spaces.
- c. Not enter any confined space unless authorized and performed per the procedures outlined in this program

B. GENERAL PROGRAM MANAGEMENT

This section describes the main elements of the Commonwealth of Pennsylvania Department of General Services confined space program.

1. Confined Space Hazard Identification

The DGS Safety Coordinator shall identify all potential confined spaces and classify each as either "non-permit required" or "permit-required". These spaces are listed in Appendix B . A re-evaluation is required for any new potential confined space introduced into the agency or when a significant change in a characteristic(s) of an existing space occurs

Two simple tests are used to determine if a PRCS exists:

a. The first test verifies if the space is a confined space.

For an enclosure to be considered a confined space, it must meet the definition of a confined space as outlined in the definition section of this procedure.

Clarification: If access is any more difficult than walking through an ordinary door or walking up an ordinary flight of stairs, it is to be considered limited.

b. The second test determines the type of confined space it is.

Permit required confined spaces are confined spaces that are hazardous to enter unless special precautions are taken. To be a PRCS, the space must possess any ONE of the following characteristics:

- actually, or potentially, contain a hazardous atmosphere such as oxygen deficiency or enrichment, flammable gases or vapors, or toxic air contaminants at levels exceeding OSHA established permissible exposure limits (PEL). [i.e., afterburners/thermal oxidizers, RTOs, solvent recovery adsorber beds, ductwork, sewers]
- poses a potential for engulfment by liquids or finely divided solids, that can surround an entrant or be aspirated into the lungs.
- has inwardly converging walls that taper to a smaller cross-sectional area that could trap an entrant (i.e., cone-shaped hoppers, bins or tanks, cyclones).
- presents any other serious health or safety hazard such as unguarded mechanical equipment, energized conductors, temperature extremes or hazardous radiation. (i.e. press ovens)

Non-permit required confined spaces are those that don't present any of the above mentioned hazards that could cause death or serious harm. [i.e. drop ceilings, mechanical cabinets, telephone equipment closets and some building crawl spaces]

2. Confined Space Labeling and Site Security

When possible, signs or labels identifying each space as either "non-permit required" or "permit required" per the assessment above shall be permanently affixed outside of each opening leading to the space. When possible, Sign wording shall comply with OSHA 1910.146(c)(2). Additionally, each entry port or access to a confined space shall be secured such as to prevent unauthorized access.

NOTE:

There are many confined spaces by their nature can not be practically labeled (i.e. man holes, elevator pits...) it will be the manager/supervisors responsibility to know the definitions of "confined space" and to take the appropriate steps to protect their employees.

3. Confined Space Entry Procedures

a. Non-Permit Confined Space (NPRCS) Entry Procedure

The following requirements and procedures apply to entry into a designated NPRCS :

- Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed;
- When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space;
- The entry supervisor will coordinate any joint NPRCS entries made with outside contractors to ensure this procedure is understood and followed by all involved parties.
- If deemed necessary by the manager/supervisor air sampling equipment can be obtained from the DGS Fire Safety and Environmental section or DGS High voltage supervisor for the following conditions:
 - oxygen content;
 - flammable gases and vapors; and
 - potential toxic air contaminants.
- The determinations and data required above are made available to each employee who enters the confined space;
- There may be no Hazardous Atmosphere in the confined space whenever any employee is inside;
- Any personal protective equipment deemed necessary shall be available and utilized by entrant(s).
- When appropriate, continuous forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the confined space and shall continue until all employees have left the confined space;

- The air supply for the forced air ventilation shall be from a clean source and shall not increase the hazards;
- Where initial air testing is required due to the potential for a hazardous environment, the atmosphere shall be monitored continuously to ensure that the continuous forced air ventilation is preventing the accumulation of a Hazardous Atmosphere.
- If a Hazardous Atmosphere is detected during entry:
 - each employee shall leave the confined space immediately;
 - the confined space shall be evaluated to determine how the Hazardous Atmosphere developed; and
 - measures shall be taken to eliminate the Hazardous Atmosphere before any subsequent entry takes place;
- Training shall be provided as outlined in Section VI- Training of this program.

b. Permit Required Confined Space (PRCS) Entry Procedure

• **Pre-Entry**

The following procedures shall be performed to verify that acceptable entry conditions exist before a Confined Space Entry Permit will be completed and entry into a PRCS will be permitted:

- A safety meeting will be conducted with employees involved in the entry to review:
 - the elements of the permit
 - job specific information regarding the nature of the work to be performed,
 - the potential hazards associated (including atmospheric conditions),
 - the correct use of required personal protective equipment and monitoring equipment, and
 - emergency procedures shall be reviewed;
- Ensure a sign is posted at the entrance to a permit-required confined space containing the following language:

DANGER
PERMIT-REQUIRED CONFINED SPACE
AUTHORIZED ENTRANTS ONLY

- All individuals who are to enter the confined space shall be currently qualified for confined space entry and respiratory protection (NOTE: Employees who are not currently qualified shall not be permitted to conduct confined space entry activities);
- All pipe and lines shall be cleaned out and locked-out prior to entry.
- All electrical and mechanical equipment shall be disconnected and/or de-energized and locked/tagged out; power supplies to pumps are to be shut-off and the controls locked in the "OFF" position by means of

padlocks; the Entry Supervisor will retain positive control of all padlock keys; each electrical panel is to be tagged/labeled to indicate the reason why the panels are locked out.

- Air monitoring will be conducted prior to and continuously throughout the entry; the atmosphere shall be checked in an area that would represent the breathing zones of the employees while performing work inside confined space; measurements shall be taken and recorded for the following:
 - oxygen content (Note: no entry shall be made if the oxygen concentration is less than 19.5% without approved supplied air respirators; no entry shall be made if the oxygen content is greater than 23.5% by volume);
 - flammability level (Note: no entry shall be made if the level is greater than 10% of the LEL); and
 - other air contaminants (Note: no entry shall be made if the level(s) is above IDLH; air contaminants above PELs but below IDLH will require use of respiratory protection for entry).
- The Entry Supervisor shall be notified before entry into Hazardous Atmospheres to review confined space procedures;
- The entrance to the confined space shall be maintained free of obstructions, debris and/or other conditions that prevent ready entry into and exit from the confined space;
- Confined spaces with both side and top openings shall be entered from side openings when practical;
- At least one attendant shall be stationed at the entrance to the confined space. (Note: The Attendant(s) shall have some means to summon medical or other emergency assistance without leaving the confined space entrance);
- A minimum of one additional employee, who may have other assigned duties, must be immediately available within sight or call of the attendant to help in case of an emergency. This additional employee must also be trained as an authorized attendant.
- Communication shall be maintained between the Attendant and Authorized Entrants in the confined space; radio or retrieval line signals must be used when Authorized Entrants are out of sight of the Attendant; affected employees shall be trained in the use of the communication system which shall be tested before each use;
- When entering confined spaces which previously contained flammable or combustible materials, the following ADDITIONAL requirements shall apply (reference Procedure HS250- Hot Work):
 - no hot work or ignition sources shall be allowed in or adjacent to the confined space; (**If hot work must be performed, contact Safety Coordinator for further guidelines)
 - all electrical equipment, including lighting, shall be explosionproof and safe for use in Class I, Agency I atmospheres;

- all monitoring equipment shall be intrinsically safe for use in Class I, Agency I atmospheres;
- ground fault circuit interrupters shall be used as appropriate; and
- non-sparking tools shall be used;
- The availability of a rescue team shall be verified as able to respond within a five minute response time or must be stationed on site;
- Isolation of a confined space shall be performed to prevent the release of hazardous substances or energy into the space and prevent unauthorized entry;
 - spaces containing flammable, toxic, corrosive, irritating or engulfing liquids or solids must be emptied, flushed or otherwise purged from the space whenever possible;
 - pipes or hoses conveying flammable, toxic, incapacitating or engulfing substances must be disconnected, blanked, or double blocked and bled;
 - mechanical or electrical equipment that could force substances into a confined space or injure workers in the space if energized must be disconnected or de-energized and locked/tagged out;
 - appropriate warning signs and barriers shall be posted at the entrances to confined spaces to protect employees. Signs and barriers shall be removed only after the operation is completed and the confined space is secured.
- If ventilation is required during confined space work in order to minimize concentrations of air contaminants and to maintain the oxygen content at safe levels in the confined space; the following ADDITIONAL considerations shall be made:
 - confined spaces shall be ventilated prior to entry and during occupancy;
 - whenever a ventilation system is employed, the system shall be evaluated before and during each work shift to ensure that it is functioning properly and that acceptable atmospheres are maintained;
 - the physical properties of the contaminants within the confined space and the configuration of the confined space shall be considered in determining the ventilation technique to be employed;
 - only explosion proof air movers shall be used to ventilate confined spaces;
 - whenever possible, air movers shall be used with ducting to increase the efficiency of the ventilation system in the confined space and to prevent recirculation of contaminated air due to ventilation "short circuiting;" and
 - when ventilating confined spaces previously containing flammable or combustible products, ventilation equipment shall be bonded or grounded to prevent the build-up and release of static electricity.

- Monitoring for oxygen content, flammable gases or vapors and potential toxic contaminants shall be performed continuously and documented periodically on the entry permit to ensure that changes in atmospheric conditions are identified and workers are adequately protected. Air monitoring instruments that shall be used include combustible gas indicators, oxygen indicators, colorimetric gas detector tubes, organic vapor analyzers, and other direct reading air contaminant measuring devices.
- When preparing to enter a permit-required confined space, the following air testing requirements shall apply:
 - a person with adequate knowledge and training shall perform appropriate confined space testing instruments shall be calibrated and maintained according to manufacturer requirements;
 - initial air testing of the confined space shall be made from outside of the confined space. Initial testing of the confined space shall be completed with mechanical ventilation equipment off so that "worst case" conditions can be assessed;
 - all air testing results shall be recorded on the entry permit; and
 - if the configuration of the confined space prevents initial testing from outside, entry shall not be made until authorization is obtained from the Entry Supervisor.
- In addition to atmospheric testing, positive steps shall be taken to ensure that employees are protected from physical hazards in the permit-required confined space, which include, but are not limited to, the following:
 - discharge of steam, high-pressure air, water or oil into the confined space, or failure of confined space structural support members;
 - falling objects;
 - openings and elevated work areas from which persons may fall;
 - hoses, pipes, tools, or equipment posing trip and fall hazards;
 - wet or oily surfaces posing slip hazards;
 - inadequate lighting;
 - insufficient or faulty personal protective equipment;
 - insufficient or faulty equipment or tools;
 - noise in excess of permissible levels;
 - temperature extremes that could cause heat or cold stress; and
 - electrical shock due to faulty wiring or improper grounding procedures (GFCI protected circuits must be used when electrical equipment is used in a potentially wet environment or outside)
- Selection and use of personal protective and safety equipment shall be determined by Entry Supervisor; selection of such equipment is based on the following conditions:

- specific work activities of personnel inside the confined space;
- type of chemical residues inside the confined space;
- actual or potential for development of dangerous air contamination and/or oxygen deficiency; and
- potential physical hazards associated with the confined space;
- The personal protective and safety equipment that may be required include:
 - eye and face protection - safety glasses, chemical goggles, face shields or full face respirators;
 - head protection - hard-hats;
 - body protection - chemical resistant coveralls, suits, and aprons;
 - foot protection - steel-toe boots and boot covers;
 - respiratory protection - air-purifying respirators, supplied air-line respirators, escape packs, and self-contained breathing apparatus;
 - hearing protection - ear plugs and ear muffs;
 - retrieval devices - Class II chest harness and Class III full-body harness, wristlets, retrieval line, hoisting device (man-rated top entry extraction winch or hoist);
 - fall protection - chest harness, full-body harness and lanyard;
 - warning devices - barricades, signs, caution tape and cones; and
 - other equipment - first aid kit, eye wash, emergency shower, fire extinguisher, lighting equipment, and ladders.

c. PRCS Entry Permit System

- The PRCS entry permit authorizes the entry into a confined space with a Hazardous Atmosphere and documents compliance with applicable regulations. A PRCS permit (Appendix B) must be completed prior to entry into any identified PRCS. The permit shall identify the following items:
 - tester's initials or signature;
 - the confined space to be entered;
 - the purpose of the entry;
 - the date and authorized duration of the entry permit;
 - the Authorized Entrants within the confined space, by name, roster, or other such tracking system, so that the Attendant knows exactly who is within the confined space during the entire duration of the permit;
 - name(s) of Attendant(s);
 - name(s) of Entry Supervisor(s), with a space for the signature or initials of the Entry Supervisor who originally authorized the entry;

- the hazards of the confined space to be entered;
 - the measures used to isolate the confined space and eliminate or control permit space hazards before entry (e.g. lockout/tagging of equipment, procedures for purging, inerting, ventilating, and flushing permit spaces, etc.);
 - acceptable entry conditions;
 - results of initial and periodic testing accompanied by the names or initials of the testers, and time that tests were performed;
 - the rescue and emergency services that can be summoned and the equipment to use and numbers to call;
 - the communication system used to maintain contact between Authorized Entrants and Attendants during an entry operation;
 - equipment including personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment to be provided;
 - any other information necessary to ensure the safety of employees; and
 - any additional permits which have been issued for the confined space, such as hot work permits.
- The Entry Supervisor shall sign the permit and:
 - in the Harrisburg area:
 - forward the permit it to the DGS Fire Safety and Environmental section for finale approval.
 - the DGS Fire Safety and Environmental section will review the permit notify the appropriate emergency response personnel and return the permit to the entry supervisor to be posted thus allowing the entry operation to begin.
 - For areas outside of Harrisburg:
 - The permit will be forwarded to the regional manager.
 - the regional manager will review the permit, sign it and return the permit to the entry supervisor to be posted thus allowing the entry operation to begin.
- The permit shall be posted at the entry portal, or otherwise available for inspection by all Authorized Entrants, so that they may confirm all pre-entry preparations have been made.
 - The duration of the permit shall not exceed the time required to complete the job or task specified on the permit.
 - The Entry Supervisor shall terminate the entry and cancel the entry permit if the operations covered by the entry permit have been completed or a condition not allowed under the entry permit arises in or near the confined space.

- The Entry Supervisor shall sign-off to cancel an entry permit only after it is confirmed that the space has been properly secured and covered so as to prevent unauthorized access.

C. Rescue Operations

Appropriately trained Department of General Services' employees may perform non-entry rescues. Retrieval systems shall be used to facilitate non-entry rescues whenever an authorized entrant enters a PRCS, unless the retrieval system increases the overall risk of entry.

All rescues requiring entry into the space will be performed by a qualified outside service, in most cases it will be the local Fire department. Rescue personnel must be trained in accordance with section (k) of the confined space standard. The Department of General Services has contracted with Harrisburg Fire Department to perform all such rescue tasks within the Harrisburg areas. If confined space entry is required in regional area contact the DGS Safety coordinator. Procedures shall be developed and implemented for summoning rescue and emergency services, for rescuing entrants from permit spaces, for providing emergency services to rescue employees, and for preventing unauthorized personnel from attempting a rescue.

{NOTE: internal entry rescue is not permitted}

V. Training

A. Initial

Internal initial training is dependent upon the type(s) of confined space entries permitted by the agency in the program (see guidance/program- Agency Entry Status) and shall be performed prior to permitting or authorizing the employee to enter a confined space. As the Department of General Services has elected to , the following training applies to our employees: *{select and insert the training section below that corresponds with the entry status selected by the agency. NOTE: The remaining sections may be deleted from this section.}*

1. Confined space awareness training is required for Commonwealth of Pennsylvania employees who are not permitted to enter any confined space, including those employees in agencies where confined space entry is permitted, but they are not authorized to enter. Initial training is required and shall include the following elements:
 - a. The hazards associated with confined spaces
 - b. The identification and classification of existing confined spaces
 - c. Clarification of no entry policy
 - d. The characteristics of NPRCS and PRCS and their labeling requirements.
2. Confined space training is required for employees who are not authorized to enter any PRCS, but may enter non-permit required confined spaces (NPRCS) or spaces declassified to NPRCS. Initial training shall include the following elements:
 - a. Clarification of agency NO ENTRY policy regarding PRCS
 - b. The hazards associated with confined spaces
 - c. The characteristics of NPRCS and PRCS
 - e. The identification and classification of confined spaces
 - f. Labeling requirements
 - g. Methods for declassifying PRCS to NPRCS
 - h. Responsibilities and duties of personnel
 - i. Air monitoring/testing equipment use
 - j. PPE selection, use and requirements
 - k. Ventilation
 - l. Review of Agency confined space written program
 - m. General contractor requirements
 - n. The OSHA confined space standard
3. Full confined space program training is required for employees authorized to perform all PRCS and NPRCS entries. Initial shall include the following elements:
 - a. All training topics required in option 2 above PLUS
 - b. Respiratory protection (if applicable)

- c. Permit entry procedures
- d. Designation and certifications of entrants, attendants, entry supervisor, and rescue team
- e. Emergency egress and rescue procedures (including annual simulated non-entry rescue operations)

B. Refresher

Internal refresher training is dependent upon the type(s) of confined space entries permitted by the agency in the program (see guidance/program- Agency Entry Status) and shall be performed as outlined above. As the Department of General Services has elected to **Permit authorized Commonwealth of Pennsylvania employees to enter PRCS and NPRCS or spaces declassified as such**, the following refresher training applies to our employees:

1. Refresher training required where identified as appropriate following the annual review of program, after occurrence of non-compliance with any of the listed training elements, or every three (3) years, whichever comes first.
2. Refresher training must be conducted as applicable based on annual review of program, contractor permits and NPRCS declassification forms or every three (3) years, whichever comes first.
3. Refresher training is required on an annual basis and shall be comprehensive. Refresher training must include simulated practice non-entry rescue.

VI. Testing/Monitoring

A. Environmental

Not applicable

B. Health and Safety

1. Employee Medical

Individual OSHA expanded health standards (29 CFR 1910.1001 – 1910.1200) require employee medical evaluation/ testing at specified action/ permissible levels. In cases where entry involves a health hazard with an expanded standard, the specific OSHA standard shall be referenced and all applicable medical requirements followed based on the exposure levels.

Additionally, in cases where respiratory protection is required or provided for use during entry or rescue operations, the medical requirements of 29 CFR 1910.134- Respiratory Protection shall be followed. (reference HS#350- Respiratory Protection).

2. Equipment/Sampling

The confined space monitor shall be calibrated according to manufacturer's directions on a monthly basis and prior to each use. Monitoring of a space shall be conducted continuously throughout the entire entry for any PRCS and spaces declassified from PRCS to NPRCS where a hazardous atmosphere may occur.

In order for a space to be declassified from PRCS to NPRCS, the only hazard present may be atmospheric which is controlled through the use of forced ventilation alone and a written certified declassification permit must be completed. [see Guidance/Program, Entry Procedures- NPRCS Entry Procedure]. Results should be recorded and retained with permit or declassification document. (see Section VIII- Recordkeeping/ Documentation)

Air testing shall be conducted using a properly maintained confined space monitor capable of monitoring (at a minimum) oxygen, LEL and carbon monoxide (CO) simultaneously plus any additional toxin known to be present in potentially hazardous concentrations.

Testing requirements are as follows (in the order listed):

a. TEST Permissible Level for entry

-
- % oxygen between 19.5% and 23.5%
 - % LEL less than 10% of LEL for flammable present (10% of LEL for toluene= 1,200 ppm)
 - CO less than 50 ppm (unless proper respiratory protection provided)

- Hydrogen sulfide less than 10 ppm
- Any other identified potentially hazardous chemical must be measured in addition to the above and levels maintained below the established OSHA PEL and STEL through continuous forced ventilation. Documentation: Documented site evaluation and classification for each confined space present within a agency shall be maintained for the duration of occupancy or until permanently removed from service.

VII. Contractors

- A. Contractors used by the Commonwealth of Pennsylvania to enter confined spaces, shall be informed in advance of potential hazards associated with the confined space if known. Contractors shall have and follow a written PRCS program and utilize their own entry permit. Both the contractor program & entry permit must be at least as stringent as those required by this procedure.
- B. The contractor's entry permit shall be reviewed prior to entry into a PRCS to ensure that it is acceptable to the Commonwealth of Pennsylvania. The Commonwealth of Pennsylvania shall also have the authority to review the contractor's atmospheric testing results prior to and during entry.
- C. The Commonwealth of Pennsylvania and the contractor shall establish, prior to permit-required confined space operations, who will serve as the rescue responder in an emergency and what system will be used to notify the responder that an emergency exists.

Plans will be developed and implemented to coordinate entry operations when employees of more than one contracted employer are working simultaneously as authorized entrants in a permit-required confined space.

VII. Recordkeeping/Documentation

The following records will be maintained:

- A. Documented site evaluation and classification for each confined space present within an agency shall be maintained for the duration of occupancy or until permanently removed from service.
- B. Contractor confined space entry permits, training records and air monitoring data shall be retained by the contractor and the Commonwealth of Pennsylvania safety coordinator for a minimum of one year.
- C. Employee training records and certifications shall be retained in the employee's training file for the duration of employment in position requiring such training.
- D. Records of all declassification documents and all PRCS permits, including all supporting air monitoring results, shall be retained and maintained with the safety coordinator for a period of one year from the date of entry.
- E. Documentation of annual review of all declassification documents and PRCS permits (both Commonwealth of Pennsylvania and contractor) to determine continued

- program/permit effectiveness is required and shall be maintained for a period of three years from the date of the review.
- F. Documentation of confined space monitor, rescue equipment, rescue and PPE inspection (monthly and prior to each use) and maintenance (per mfr. recommendations) shall be retained for a minimum of three years.
 - G. Documentation of confined space monitor calibration (required monthly and prior to each use) should be maintained with the safety coordinator for a minimum of three years.
 - H. Documentation of any agreement(s) made with outside rescue services to act as rescue team for confined space entries. [Note: documentation must include initial assessment performed by the Commonwealth of Pennsylvania (Appendix C) and the most recent Off-Site Rescue Performance Evaluation (Appendix D)]

APPENDIX A



Appendix A. Confined Space Identification and Classification Form

Description/Name of Space _____

Location of Space _____

A. Confined Space Determination:

Yes

No

A confined space means a space that: (1) is large enough and so configured that an employee can bodily enter and perform assigned work; and, (2) has limited or restricted means for entry/exit (for example: tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and, (3) is not designed for continuous employee occupancy.

This space meets all three of the above criteria.

Note: A "NO" answer means that this is not a confined space. Go no further. A "YES" answer means that this is a confined space; proceed with the next section.

B. Identification of Potential Hazards:

1. Potential for Hazardous atmosphere?

⇒ Oxygen deficiency (less than 19.5%)

⇒ Oxygen enrichment (greater than 23.5%)

⇒ Flammable gas or vapor (greater than 10% LEL or LFL)

⇒ Airborne combustible dust (dust explosion hazard)

⇒ Toxic contaminant (greater than PEL/TLV for anychemical present)

2. Engulfment by liquid or finely divided, flowable solid substance that can be aspirated to cause death by filling or plugging the respiratory system, or that can surround and effectively capture a person or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.?

3. Entrapment and/or constriction of torso (asphyxiation hazard) by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section?

4. Hazardous energy (mechanical, electrical, thermal, chemical, pneumatic, etc)?

5. Significant fall hazard (slippery surfaces, 10 foot or more drop/fall potential, etc.)?

C. Classification of Confined Space:

Non-permit Confined Space. (Section A is answered YES. Section B has all NO answers.) The Permit Required Confined Space Standard has no further application. Follow the Non-Permit Required Confined Space Procedures found In the Commonwealth of Pennsylvania Confined Space Procedure (HS200).

Permit-Required Confined Space. (Section A is answered YES. Section B has one or more YES answers.) The Permit-Required Confined Space Standard (1910.146) and the Commonwealth of Pennsylvania Confined Space Procedure (HS200) requirements must be met.

Assessment and classification performed by:

(print name)

(signature)

(date)

Reviewed and approved by: _____

(print name)

(signature)

Appendix B: Sample DGS Permit

This form must be filled out by the Entry Supervisor 24 hours in advance of entry into the permitted space. The Entry Supervisor must be able to confirm that all employees are properly trained and will be provided with safety controls to safely enter the Permit Required Confined Space without injury. If there are any questions on the permit or questions about Confined Space entry please contact The Office of Fire and Safety at (717)-772-4545

Building:(Click Here)	Floor: (Click Here)	Closest Room Number Or Description: (Click Here)	
Type of Work Being Performed: (Click Here)			
Entry Performed by: State employee <input type="checkbox"/> / Contracted employee <input type="checkbox"/>			
Date of Entry: (Click Here)	Entry Time: (Click Here)	Time Restriction: (Click Here)	Exit Time: (Click Here)
Building Manager: (Click Here)		Entry Supervisor:(Click Here)	
Confined Space Attendant: (Click Here)		Confined Space Entrant: (Click Here)	
Contact Information: (Click Here)			
Description of work being performed? (Click Here)			
Description of equipment brought into the space? (Click Here)			
Safety Controls Checklist:			
Potential Hazards Identified: Yes <input type="checkbox"/> No <input type="checkbox"/> Emergency Procedures Developed: Yes <input type="checkbox"/> No <input type="checkbox"/>			
Personal Protective Equipment used: Yes <input type="checkbox"/> No <input type="checkbox"/> Entrants and Attendants Trained: Yes <input type="checkbox"/> No <input type="checkbox"/>			
Isolation of Energized Equipment: Yes <input type="checkbox"/> No <input type="checkbox"/> Emergency Retrieval System in place: Yes <input type="checkbox"/> No <input type="checkbox"/>			
Direct Communication procedures established between supervisor/attendant/entrant: Yes <input type="checkbox"/> No <input type="checkbox"/>			
Entry Team Trained in the Hazards associated with the entry Yes <input type="checkbox"/> No <input type="checkbox"/>			
Entry Team Trained in Emergency Evacuation Procedures Yes <input type="checkbox"/> No <input type="checkbox"/>			
Confined Space Entry Equipment & Required PPE:			
Temporary Lighting: Yes <input type="checkbox"/> No <input type="checkbox"/>		Rescue Tripod with Lifeline: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Tripod with Mechanical Wench: Yes <input type="checkbox"/> No <input type="checkbox"/>		Direct/Radio Communications: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Class II Fall Prevention: Yes <input type="checkbox"/> No <input type="checkbox"/>		Class III full body fall prevention: Yes <input type="checkbox"/> No <input type="checkbox"/>	
General/Local Exhaust Ventilation: Yes <input type="checkbox"/> No <input type="checkbox"/>		Hard Hat/Bump Cap: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Self Contained Breathing Apparatus: Yes <input type="checkbox"/> No <input type="checkbox"/>		Laceration/chemical Resistant Gloves: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Safety Glasses/Goggles/Face Shield: Yes <input type="checkbox"/> No <input type="checkbox"/>		Hearing Protection: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Chemical Resistant Clothing: Yes <input type="checkbox"/> No <input type="checkbox"/>		Air Purified Respirator: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Initial Air Monitoring:			
Air Monitoring Required? Yes <input type="checkbox"/> No <input type="checkbox"/>			
Continuous Monitoring Required? Yes <input type="checkbox"/> No <input type="checkbox"/>			
Oxygen: (Click Here) % LEL (Click Here) % CO (Click Here) % H2S (Click Here) %			
Continuous Air Monitoring: Testing shall be documented every half an hour. If entry required more than four samples documented than this sheet must be expanded.			
Time: (Click Here) Oxygen: (Click Here) % LEL (Click Here) % CO (Click Here) % H2S (Click Here) %			
Time: (Click Here) Oxygen: (Click Here) % LEL (Click Here) % CO (Click Here) % H2S (Click Here) %			
Time: (Click Here) Oxygen: (Click Here) % LEL (Click Here) % CO (Click Here) % H2S (Click Here) %			
Time: (Click Here) Oxygen: (Click Here) % LEL (Click Here) % CO (Click Here) % H2S (Click Here) %			
De-energization Points and Lockout Tag out locations: If equipment must be shutdown and locked and tagged out than document the following information. (If more than 6 shutdown locations please add additional sections).			
1.Equipment: (Click Here) Energy: (Click Here) Location: (Click Here) Completely De-energized? Yes <input type="checkbox"/> No <input type="checkbox"/>	2.Equipment: (Click Here) Energy: (Click Here) Location: (Click Here) Completely De-energized? Yes <input type="checkbox"/> No <input type="checkbox"/>	3.Equipment: (Click Here) Energy: (Click Here) Location: (Click Here) Completely De-energized? Yes <input type="checkbox"/> No <input type="checkbox"/>	
4.Equipment: (Click Here) Energy: (Click Here) Location: (Click Here) Completely De-energized? Yes <input type="checkbox"/> No <input type="checkbox"/>	5.Equipment: (Click Here) Energy: (Click Here) Location: (Click Here) Completely De-energized? Yes <input type="checkbox"/> No <input type="checkbox"/>	6.Equipment: (Click Here) Energy: (Click Here) Location: (Click Here) Completely De-energized? Yes <input type="checkbox"/> No <input type="checkbox"/>	

Appendix C: Off-Site Rescue Initial Evaluation

Name of Rescue Service being evaluated: _____

1. Is the service willing to perform rescues at this facility?
Yes _____ No _____
2. How quickly can the rescue team or service get from its location to the permit spaces from which rescue may be necessary? _____
3. What is the availability of the rescue service? Is it unavailable at certain times of the day or in certain situations? _____
4. If the rescue service becomes unavailable while an entry is underway, does it have the capability of notifying the Agency so that the entry can be aborted immediately?
Yes _____ No _____
5. Does the rescue service meet all the requirements of paragraph (k)(2) of the standard? If not, has it developed a plan that will enable it to meet those requirements in the future? If so, how soon can the plan be implemented?
Yes _____ No _____

6. Is an adequate method for communications between the attendant, the Commonwealth of Pennsylvania and the prospective rescuer available so that a rescue request can be transmitted to the rescuer without delay? How soon after notification can a prospective rescuer dispatch a rescue team to the entry site?
Yes _____ No _____

7. If the Agency has spaces with a vertical entry over 5 feet in depth, can the prospective rescue service properly perform entry rescues? Does the service have the knowledge and equipment to perform rope work or elevated rescue, if needed?
Yes _____ No _____
8. Does the rescue service have the necessary skills in medical evaluation, patient packaging and emergency response?
Yes _____ No _____
9. Does the rescue service have the necessary equipment to perform rescues or must the equipment be provided by the Commonwealth of Pennsylvania?
Service _____ Commonwealth of Pennsylvania _____

Using the information obtained in this assessment, the {enter agency name} agency has elected to utilize the above named company for permit required confined space entry rescue operations.

Signature of Safety Coordinator

Date

Appendix D: Sample Off-Site Rescue Performance Evaluation

In accordance with the requirements of OSHA 29 CFR 1910.146 (k)(2) (iv), an annual performance evaluation is required. Please complete the following questions and return to the Commonwealth of Pennsylvania, {enter address}. Please send to the attention of the Safety Coordinator. Thank you for your cooperation.

Name of Rescue Service being evaluated: _____

Person Completing Evaluation: _____

1. Have all members of the service been trained as permit space entrants, at a minimum, including training in the potential hazards of all permit spaces, from which rescue may be needed?

Ye

No

s _____

2. Is every team member provided with, and properly trained in, the use and need for PPE, such as SCBA or fall arrest equipment, which may be required to perform permit space rescues in this facility?
 Yes____ No____

3. Is every team member properly trained to perform his/her functions and make rescues, and to use any rescue equipment, such as ropes and backboards, that may be needed in a rescue attempt?
 Yes____ No____

4. Are team members trained in the first aid and medical skills needed to treat victims overcome or injured by the types of hazards that may be encountered in the permit spaces at this facility?
 Yes____ No____

5. Do all team members perform their functions safely and efficiently?

Yes____ No____

6. If necessary, can the rescue service properly test the atmosphere to determine if it is IDLH?

Yes____ No____

7. Can the rescue personnel identify information pertinent to the rescue from entry permits, hot work permits, and MSDS's? Yes____ No____

8. If necessary, can the rescue service properly package and retrieve victims from a permit space that has a limited size opening(less than 24 inches in diameter), limited internal space, or internal obstacles or hazards? Yes____ No____

9. If necessary, can the rescue service safely perform an elevated (high angle) rescue?
Yes _____ No _____
10. Does the rescue service have a plan for each of the kinds of permit space rescue operations at this facility? Is the plan adequate for all types of rescue operations that may be needed at this facility?
Yes _____ No _____

According to OSHA 29 CFR 1910.146 (k)(2)(iv), the rescue service is required to practice a simulated rescue at least once every 12 months, provided that the service has not successfully performed a similar type permit space rescue within that time. Should you wish to schedule a time to perform a simulated confined space rescue on-site, please contact {enter name and telephone here}.

The information provided in this performance evaluation is truthful to the best of my knowledge.

Signature of evaluator

Date