

5. Confined Spaces Program

WAC 296-62-141

1.0 Introduction

The purpose of the confined space program at Pacific Lutheran University (PLU) is to establish procedures to ensure that all confined spaces are identified on the campus and that employees are aware of and practice proper procedures for entry into these potentially hazardous spaces. The procedures in this program apply to any space or area at PLU that is by definition a confined space. A **Confined space** means a space that 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, and 3) is not designed for continuous employee occupancy. These spaces may include, but are not limited to, utility vaults, tunnels, attics, boilers, vessels, ducts, tanks, sewers, pipelines, silos, storage bins, hoppers and pits. See Appendix 4-A for a list of *identified* PLU confined spaces.

2.0 Policy

Pacific Lutheran University employees will be trained to enter permit-required spaces that can be reclassified to enable the use of alternate entry procedures. Employees are not currently trained, nor are their effective procedures or equipment in place, to permit entry into confined spaces that require full permit procedures to be used.

All employees will be made aware of the provisions of this program as those provisions apply to the employee's respective role. The types of employees covered by this program include, but are not limited to maintenance employees, TV/radio and, telecommunications technicians and supervisors.

2.1 Compliance

All employees are required to comply with this program. Because of the potentially deadly nature of hazards in confined spaces, strict disciplinary procedures will be followed for employees violating these rules. Please refer to the corrective action policy in the personnel manual.

3.0 Responsibilities

3.1 Environmental Health & Safety Manager Responsibilities

The University Environmental Health & Safety Manager is responsible for ensuring that employee training and retraining programs on this procedure are available for all affected employees.

3.2 Supervisor Responsibilities

- The supervisor is responsible for ensuring that affected employees get trained by working with the Environmental Health & Safety Manager.
- Each supervisor will assure that the testing and safety equipment required for compliance with the procedures are accessible to all affected employees as needed.

- Each supervisor of affected employees is responsible for effectively enforcing compliance with these confined space procedures in their department. This includes the use of corrective disciplinary action when necessary for violations of procedures.

3.3 Employee Responsibilities

- All affected employees are expected to comply with the confined spaces procedures in this program.
- All affected employees are expected to use the testing and safety equipment required by the procedures and provided by the university.
- Employees should consult with their supervisor or the Environmental Health & Safety Manager whenever there are any questions regarding their personal protection during maintenance, service, or routine operations in confined spaces.
- Employees should report new data, problems or changes to a confined space to the Environmental Health & Safety Manager and their supervisor.

3.4 Entrant Duties

- Know the hazards that may be faced during entry.
- Know how to properly use the safety and monitoring equipment required for the job.
- Exit from the space immediately when the entrant detects signs and symptoms of exposure, a prohibited condition, or an evacuation alarm is activated.
- Arrange for a buddy to check on you periodically when using alternate entry procedures.

4.0 Training Requirements

All employees who must enter confined spaces will be trained in this program before the employee is assigned confined space responsibilities. It is the supervisor's responsibility to arrange training for the employee. The Environmental Health and Safety Manager may be of assistance.

Training records containing the employee's name, date of training, signature of trainers, and identity of trainer must be retained by the supervisor and submitted to the Environmental Health & Safety Manager.

4.1 Initial Training

Employee training will include

- Identification and location of known permit required confined spaces on campus.
- Identification of known or potential hazards in confined spaces.
- Use of testing procedures for confined spaces.
- Use of testing equipment.
- Introduction of entry procedures and forms.

4.2 Retraining

Retraining for permit required spaces will be provided bi-annually. Otherwise training will be provided when there is a change in job assignments, a change in machine, equipment or a

process that present a new hazard, a change in entry procedures, or when periodic inspection reveals that there are deviations in employee knowledge of the procedures.

5.0 Contractors

The PLU Project Manager will notify outside contractors, who have employees engaged in activities that may require entry into confined spaces, of PLU's confined spaces policy and procedures. This notification will be provided to the contract in writing

The Project Manager will identify all known confined spaces to the contractor. The contractor will supply his or her own equipment and employee training for confined spaces entry. All contractors must, at minimum, abide by the University's confined spaces procedures as a condition of their contract; failure to comply with these procedures will result in the cancellation of any service contract and expulsion of the contractor from the PLU campus.

Contractors must coordinate entry with employees who will also be working in the space. Contractors who are entering Pacific Lutheran University confined spaces must have a confined space entry trained person from the department who "owns" the space sign on their permit or alternate entry worksheet to acknowledge that we know of their entry.

Contractors must report problems or changes to a confined space to the project manager who will convey those changes to the Environmental Health & Safety Manager.

6.0 Confined Space Procedures

6.1 Identification of Confined Spaces

The types of confined spaces on the PLU campus are listed in Appendix A. This list includes the risks associated with the space and entry procedures required for the space. Signs will be posted at the entrance to the spaces identified in the confined space list.

Evaluation of potential confined spaces on the PLU campus will be done on a continuous basis. As new confined spaces become known or as hazards are eliminated or identified in existing spaces, Appendix A will be adjusted accordingly by the Environmental Health & Safety Manager. Employees who are aware of such changes shall notify the Environmental Health & Safety Manager.

6.2 Entry Procedures

Procedures for entry into each type of confined space are listed in Appendix A. These procedures must be followed exactly before entry into confined spaces is allowed.

Entry will be coordinated among the entrants, if more than one type of activity is occurring at the same time within a single space.

6.3 Permit-Required Confined Space Procedures

Permit-required confined space (permit space) means a confined space that has one or more of the following characteristics: 1) contains or has a potential to contain a hazardous atmosphere; 2) contains a material that has the potential for engulfing an entrant; 3) has an

internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or 4) contains any other recognized serious safety or health hazard.

A Non-permit confined space means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Entry into permit-required spaces will require an entry permit. *Pacific Lutheran University employees are not trained or authorized to enter permit-required spaces using full entry permit procedures.* You must hire a contractor to do this work or eliminate the hazard that prevents the space from being reclassified as an alternate entry space.

6.4 Alternate Entry Procedures

Permit-required confined spaces that have hazards that can be controlled from the outside leaving only an actual or potential atmospheric hazard may be entered under alternate entry procedures. Employees may enter the space by reclassifying it at the time of entry using the following procedure. The space is continuously ventilated while the entrant is inside. Entrants must exit the space should any of the gas readings demonstrate an unsafe atmosphere or the space cannot be continuously ventilated.

- Obtain a copy of the Certificate of Temporary Reclassification Worksheet in Appendix B and the Alternate Entry Procedure Worksheet in Appendix C.
- Get the help of another confined space entry trained employee.
- Control hazards by completing lock out tag out procedures from outside the space.
- Identify and control other hazards by using appropriate control methods from outside the space.
 - Cool to ambient temperature
 - Stabilize loose materials or enter when empty
 - Use fall protection harness or guardrail
 - Use buddy system
 - Use ladder
- ***If hazards cannot be controlled from outside the space, you may not reclassify the space and you may not enter it.***
- Fill out and sign the Certificate of Temporary Reclassification Worksheet.
- Document the following activities using the Alternate Entry Procedure Worksheet.
 - Conduct fresh air and bump test on 4-gas monitor.
 - Establish safe conditions for removing the cover of the confined space.
 - Use monitoring equipment to test for oxygen, flammable gases, carbon monoxide and hydrogen sulfide around the cover of the space.
 - Monitor for the above parameters at four-foot depth intervals before removing cover, when possible. Be sure to wait the amount of time for the reading to register correctly on the instrument that you are using.
 - If readings are within acceptable levels, continue entry procedure. If not, abort entry and contact the Environmental Health & Safety Manager or a confined space entry trained supervisor to evaluate the cause of the abnormal levels.
- Remove cover. (If you were unable to monitor within the space before removing cover, this is the time to do it.)
- Install air ventilation system.

- Install guardrails and toe boards to prevent items and people from falling into space.
- Ensure monitor is still on and attach to your body.
- Enter space and complete work.
- Leave space when conditions change that creates a hazardous environment. Contact the Environmental Health & Safety Manager or a confined space entry trained supervisor.
- Submit both the Certificate of Temporary Reclassification Worksheet and the Alternate Entry Procedure Worksheet to the Environmental Health and Safety Manager after work is complete.
- Relative to the hazards of the confined space, make arrangements to be checked on periodically by another confined space entry trained person while you are in the confined space.

6.5 Lockout/Tagout Procedures

All Lockout/Tagout procedures for permit-required spaces will follow PLU's Lockout/Tagout program.

6.6 Equipment Use

Ventilation: Blowers may be used to adequately remove any hazardous atmospheres from the permit-required spaces. Spaces must be monitored before and during entry and must be within acceptable limits before entry is permitted.

Personal Protective Equipment (PPE): Appropriate personal protective equipment will be used to enter any permit-required space as outlined in the procedures for that space. All PPE must be readily available to the employee and regularly inspected before each use.

6.7 Testing and Monitoring Spaces:

Spaces will be monitored for oxygen level, flammable gases, and toxic gases (carbon monoxide and hydrogen sulfide before and during entry.

6.8 Emergency Procedures

If someone becomes trapped or disabled in a confined space, call 911 for help from Central Pierce Fire and Rescue Technical Response Team.

7.0 Review

This program will be updated as new spaces or conditions are identified and procedures developed.

Appendix A. PLU Confined Spaces

Type of Confined Space	Risks	Entry Protocol
Attic Crawl Space – No motorized equipment	Fall Hazard (in some areas)	Permit Required Confined Space unless Fall Hazard can be controlled from the outside. If fall hazard can be controlled from the outside, then Alternate Entry Confined Space
Attic Crawl Space –Motorized equipment present	Atmospheric Hazard Fall Hazard	Alternate Entry Confined Space
Boiler Firebox	Atmosphere – oxygen deficiency and toxic gases Temperature (heat)	Alternate Entry Confined Space
Condensate Tank Pit	Temperature (heat)	Alternate Entry Confined Space
Drop-Off-Box	Loose materials	Enter when empty. Otherwise Permit Required Confined Space
Grease Interceptor	Atmosphere – oxygen deficiency	Permit Required Confined Space
HVAC Plenums		No special protocols
Manhole	Atmosphere – oxygen deficiency and toxic gases	Alternate Entry Confined Space
Pipe Chase		No special protocols
Radio shack		No special protocols
Stage Crawl Space	Loose materials	Enter when empty. Otherwise Permit Required Confined Space
Steam Chase	Temperature (heat)	Alternate Entry Confined Space (Permit Required Space when heat can not be controlled)
Trash Compactor	Atmosphere – oxygen	Alternate Entry Confined

Type of Confined Space	Risks	Entry Protocol
	deficiency and toxic gases	Space
Vault	Atmosphere – oxygen deficiency and toxic gases	Alternate Entry Confined Space
Wellhead	Atmosphere – oxygen deficiency and toxic gases	Alternate Entry Confined Space

Appendix B. Certificate Of Temporary Reclassification

This certificate must be completed before each time that a permit-required confined space is entered. If an entry is needed to eliminate or verify the elimination of a hazard, then full Permit-Required Confined Space (PRCS) entry procedures are required.

Permit Space Location (or number):

Purpose of entry:

Date of entry: _____ Start time: _____ End time: _____

Describe lockout procedure used:

Describe other control methods used (specify):

ENTRY IS ALLOWED ONLY WHEN ALL NECESSARY CONTROL MEASURES ARE STILL IN PLACE. THIS IS A PERMIT-REQUIRED CONFINED SPACE WHENEVER IT'S NOT FULLY LOCKED OUT.

I have received general Confined Space training and specific training for proper reclassification procedures for this Permit-Required Confined Space. I understand the lockout procedures and any other necessary control conditions for this space and certify that they have been fulfilled.

Entrant signature: _____

I have received general Confined Space training and specific training for proper reclassification procedures for this Permit-Required Confined Space. I understand the lockout procedures and any other necessary conditions for this space and certify that they have been fulfilled.

Signature of another confined space entry trained employee

IF HAZARDS ARISE DURING ENTRY, EMPLOYEE(S) MUST EXIT THE SPACE AND HAVE IT RE-EVALUATED BY THE ENVIRONMENTAL HEALTH & SAFETY MANAGER OR THE CONFINED SPACE ENTRY TRAINED SUPERVISOR.

IMMEDIATELY REPORT ANY UNUSUAL OCCURRENCES AND MAKE ANY SUGGESTIONS REGARDING POSSIBLE SAFETY PROBLEMS RELATED TO ENTERING THIS SPACE TO THE ENVIRONMENTAL HEALTH & SAFETY MANAGER.

Appendix C. Alternate Entry Procedure Worksheet

This worksheet is to be used to certify that the hazards have been eliminated and the permit-required confined space is safe for entry while continuous forced-air ventilation is used to control the actual or potential hazardous atmosphere. If an entry is needed to eliminate or verify the elimination of a hazard, then a full Permit-Required Confined Space (PRCS) program is required.

Permit Space Location (or number):

Date of entry: _____ Start time: _____ End time: _____

Direct-reading instrument carried by employee in space ____ Date of calibration

Instrument Mfr, model, serial#

Fresh air test on direct reading instrument complete Yes No

Bump test on direct reading instrument complete Yes No

Verify the following:

Safe conditions established for entrance cover removal and entry (measure levels at 4-foot intervals).

Gas	At Opening	4 foot	8 foot	12 foot
CO	reading	reading	reading	reading
H ₂ S	reading	reading	reading	reading
Oxygen	reading	reading	reading	reading
LEL	reading	reading	reading	reading

Opening guarded against people and objects falling

Periodic tests made while employee is in the space

Reading (write time in top row):

Substance	Acceptable Level	time	time	time	time
Oxygen	19.5% - 23.5%	reading	reading	reading	reading
Explosive gas/vapor	<10% LEL	reading	reading	reading	reading
Carbon monoxide	<35 ppm	reading	reading	reading	reading
Hydrogen sulfide	<10 ppm	reading	reading	reading	reading

NOTE: Even if initial atmospheric conditions are acceptable, forced-air ventilation must be continuously provided during the entire time employee(s) are in the space.

I have received general Confined Space training and specific training for proper Alternate Entry Procedures for this Permit-Required Confined Space. I understand the necessary conditions and procedures for this space and certify that they have been fulfilled.

Signature of entrant _____

Appendix D. Confined Space Entry Permit

Job Location: _____ Date & Time Issued: _____ / _____

Equipment to be worked on: _____ Date & Time Expires: _____ / _____

Purpose of Entry: _____

Description of Hazards: _____

Entry Supervisor: _____

Number of Entrants assigned: _____ Names of Entrants: _____

Name of attendant: _____

Pre-Entry Checklist:

Lockout/Tagout	NA	YES	NO
Mechanical	()	()	()
Electrical	()	()	()
Pipes	()	()	()

Atmospheric Check after Isolation and Ventilation:

Oxygen _____ % > 19.5% and < 23.5%
Explosive _____ LFL < 10%
Toxic _____ ppm
Time: _____ a.m./p.m.

Hourly Atmospheric Check Performed by: _____

Hour 1	_____	Hour 2	_____	Hour 3	_____	Hour 4	_____
Oxygen:	_____	Oxygen:	_____	Oxygen:	_____	Oxygen:	_____
Explosive	_____	Explosive:	_____	Explosive	_____	Explosive:	_____
Toxic	_____	Toxic:	_____	Toxic:	_____	Toxic:	_____
H Sulfide:	_____	H Sulfide:	_____	H Sulfide:	_____	H Sulfide:	_____

Hour 5	_____	Hour 6	_____	Hour 7	_____	Hour 8	_____
Oxygen:	_____	Oxygen:	_____	Oxygen:	_____	Oxygen:	_____
Explosive:	_____	Explosive:	_____	Explosive:	_____	Explosive:	_____

Toxic: _____	Toxic: _____	Toxic: _____	Toxic: _____
H Sulfide: _____	H Sulfide _____	H Sulfide: _____	H Sulfide: _____
Safety Equipment Needed:	NA	YES	NO
Oxygen Monitor	()	()	()
Direct Reading Gas Monitor	()	()	()
Toxicity Meter	()	()	()
Safety Harness and Lifeline	()	()	()
Hoisting Equipment	()	()	()
Communications (radio, etc.)	()	()	()
Respirator or SCBA	()	()	()
Protective Clothing	()	()	()

Will there be hot work operations in the confined space? Yes () No ()

How will hot work hazards be controlled? _____

Communication Procedures: _____

Rescue Procedures: _____

We have reviewed the work authorized by this permit and the information contained here. Written instructions and safety procedures have been received and are understood.

Entry cannot be approved if any squares are marked in the "NO" column.

Permit requested by: _____

Approved by: _____

Print Name _____ Signature _____

Pacific Lutheran University Confined Space Trained Supervisor signature acknowledging
Contractor work in confined spaces
