

**WICHITA STATE UNIVERSITY
CONFINED SPACE ENTRY PROGRAM**

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CONFINED SPACE ENTRY PROGRAM

I. INTRODUCTION

The Occupational Safety and Health Administration has established a specific rule regarding confined spaces found at 29 CFR 1910.146, Permit-Required Confined Spaces. This program has been developed in accordance with this standard.

II. SCOPE

This confined space entry program is designed to reduce the possibility of worker injury and/or damage to the Wichita State University (WSU) and all ancillary campus locations, and property resulting from accidents associated with confined space work. No WSU employee shall perform work in permit-required confined spaces without prior approval of the Environmental Health and Safety (EHS) department.

III. DEFINITIONS

- A. Attendant: An employee designated to remain outside the permit space who monitors the authorized entrants and performs all attendant's duties assigned in this program.
- B. Atmospheric Testing Equipment: Equipment used to monitor levels of oxygen, flammable, combustible and toxic gases prior to and periodically during work in a confined space.
- C. Authorized Entrant: A person who is approved or assigned by the department head in charge of the entry to perform a specific duty or duties.
- D. Authorizing Supervisor: A person who is in charge of a confined space entry onsite with knowledge of the process, hazards, and entry procedures.
- E. Confined Space: 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 (for example, tanks, vessels, silos, storage bins, vaults, and pits are spaces that may have limited means of entry); and
 - 3. is not designed for continuous employee occupancy.
- F. Confined Space with No Entry Allowed: A confined space that, due to limitations (equipment and/or rescue capabilities), no WSU employee is allowed entry into these spaces.

If entry into one of these spaces is required for maintenance or repair activities, a competent contractor experienced in confined space entry shall be used to perform such activities.

- G. 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 to the confined space.
- H. Entry: The action by which a person passes through an opening into a permit required confined space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the confined space.
- I. Entry Permit: The written or printed document provided by entry supervisor that must be completed before entry into a permit required confined space.
- J. Hazardous Atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness from one or more of the following causes:
 - 1. flammable gas, vapor or mist in excess of 10 percent of its lower flammable limit (LFL);
 - 2. airborne combustible dust at a concentration that meets or exceeds its LFL;
 - 3. atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
 - 4. atmosphere concentration of any substance for which a dose or a permissible exposure limit (PEL) is published in Subpart G, of OSHA Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances and that could result in employee exposure in excess of either; and
 - 5. any other atmospheric condition that is immediately dangerous to life or health.
- K. Hot Work: Any work involving burning, welding or similar fire producing operations or operations that produce a source of ignition, such as grinding, drilling, or heating.
- L. Hot Work Permit: WSU's written authorization to perform operations capable of providing a source of ignition in a confined space.
- M. Immediately Dangerous to Life or Health (IDLH): Any condition that poses an immediate or delayed threat to life or would cause irreversible adverse health effects or interfere with an

individual's ability to escape unaided from a permit space.

- N. Lower Explosive Limit (LEL): Minimum concentration of a flammable gas or vapor in air which will ignite if an ignition source is present.
- O. Lifeline: Line attached to the employee in a confined space to remove him or her if unconscious or disabled.
- P. Non-Permit-Required Confined Space: 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.
- Q. Oxygen Deficient Atmosphere: An atmosphere that contains less than 19.5 percent oxygen by volume.
- R. Oxygen Enriched Atmosphere: An atmosphere that contains more than 23.5 percent oxygen by volume.
- S. Permit-Required Confined Space: A 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.
- T. Personal Protective Equipment (PPE): Equipment to protect eyes, face, head, and extremities, safety glasses, hard-hats, respirators, gloves, and protective clothing.
- U. Permissible Exposure Limit (PEL): Concentration of a substance to which an individual may be exposed repeatedly without adverse effect.
- V. Power Ventilator: Explosion proof electrically powered fan and duct system which supplies fresh air into a confined space, and lowers the concentration of hazardous gases and vapors.
- W. Retrieval line: A line or rope secured at one end to the worker by chest-waist or full- body harness, and with its other end secured to either a lifting (or other retrieval) device, or to an

anchor point located outside the entry.

IV. NON-PERMIT-REQUIRED CONFINED SPACES

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 may be considered a non-permit-required confined space. Procedures for such spaces are as follows:

- A. Before entry into any confined space, the authorizing supervisor must follow the pre-entry checklist provided on page 14, Blank Permits.
- B. Before each entry into any confined space, atmospheric testing utilizing direct-reading instruments must be performed to verify that the space meets the conditions of not requiring a permit. If all conditions in the air monitoring section of the pre-entry checklist indicate “yes” answers, and the space does not meet the definition of a permit-required confined space, no written permit is required.

V. PERMIT-REQUIRED CONFINED SPACE SYSTEM

- A. No WSU employee shall perform work in permit-required confined spaces without prior approval of the EHS.
- B. A written permit system has been established which provides for the proper preparation, issuance, and implementation of entry permits.
- C. A list of known permit-required confined spaces will be developed as spaces are identified.
- D. No entry into a permit-required confined space will be allowed without a permit. This permit is designed to assure that employees identify conditions that could endanger confined space entrants and attendants. Employees and supervisors are required to contact the EHS for permits when needed.
- E. All permits must be retained for at least one year after the entry permit has been canceled.

VI. RESPONSIBILITIES

- A. The Environmental Health and Safety Office (EHS) is responsible for:
 - 1. conducting initial air monitoring in the event of a confined space entry.
 - 2. conducting awareness level training for employees who may encounter a confined space during the performance of their daily duties,

3. conducting detailed training for authorized entrants into a permit required spaces,
4. conducting detailed training for approved attendants in the proper operation of air testing equipment,
5. assisting supervisors in identifying confined spaces on WSU campus,
6. providing, maintaining and calibrating the air testing equipment used during confined space entry, and

B. Supervisors are responsible for:

1. identifying confined spaces on the WSU campus and reporting those identified spaces to the EHS,
2. ensuring that all employees required to perform any confined space entry procedure have received the appropriate level of training,
3. obtaining and completing the appropriate permit-required confined space entry permit,
4. providing necessary personal protective equipment to employees,
5. ensuring that all employees perform their assigned duties as outlined in this program, and
6. taking appropriate disciplinary action whenever an employee under his or her direction fails to follow safety precautions outlined in this program.

C. Authorizing Supervisors are responsible for:

1. evaluating the hazards which may be faced during permit-required confined space entry;
2. verifying that all employees have been trained on safe entry procedures and proper use of entry and personal protective equipment;
3. completing and signing a new entry permit before each entry into a permit-required confined space and communicating the contents of the permit to all parties involved;
4. determining that the necessary procedures, practices, and equipment for safe entry are in effect before allowing entry (see Section VII., Entry Preparation Procedures for Permit-Required Confined Spaces);

5. periodically determining whether entry operations remain consistent with the terms of the permit-required confined space entry permit, and that acceptable entry conditions are present;
 6. canceling the entry authorization and terminating entry whenever acceptable conditions are not present;
 7. taking necessary actions when terminating an entry operation, such as closing off a permit space and canceling the permit, once the work authorized by the permit has been completed; and
 8. taking appropriate measures to remove unauthorized personnel who are in or near entry permit spaces.
- D. Authorized entrants are responsible for:
1. knowing the hazards that may be faced during entry to a permit-required confined space;
 2. recognizing the signs and symptoms of exposure to a hazard;
 3. understanding the consequences of exposure to a hazard;
 4. maintaining contact with the attendant;
 5. notifying the attendant when the entrants self-initiate evacuation of a permit space;
 6. using entry and personal protective equipment properly; and
 7. exiting the permit space immediately when:
 - a. the attendant orders evacuation,
 - b. an automatic alarm is activated, or
 - c. the authorized entrants perceive that they are in danger.
- E. Attendants are responsible for:
1. remaining outside the permit space at all times during entry operations;
 2. continuously maintaining an accurate count of all persons in the space;
 3. recognizing potential permit space hazards;
 4. monitoring activities inside and outside the permit space to determine whether it is safe for entrants to remain in the space;

5. maintaining effective and continuous contact with authorized entrants during entry;
6. ordering authorized entrants to evacuate the permit space immediately when:
 - a. a condition is observed which is not allowed in the entry permit,
 - b. behavioral effects or symptoms of hazard exposure are detected,
 - c. a situation inside or outside the space is detected which could endanger the entrants,
 - d. the attendant must leave the workstation;
7. warning unauthorized persons to remain away from the space;
8. requesting the unauthorized persons to exit immediately if they have entered the permit space;
9. informing the authorized entrants and entry supervisor if unauthorized persons have entered the permit space;
10. summoning rescue and other emergency services as soon as the attendant determines that escape is required from the space;
11. not entering the permit space to attempt rescue of entrants; and

VII. ENTRY PREPARATION PROCEDURES FOR PERMIT-REQUIRED CONFINED SPACES

- A. Before each entry into a permit-required confined space, a new entry permit must be completed by the authorizing supervisor.
- B. The authorizing supervisor is responsible for communicating the contents of the permit to all parties involved.
- C. All items on the permit must be checked and completed before any person is allowed to enter a permit space.
- D. The legible name and signature of the authorizing supervisor must be on the permit before the entry begins. By signing this form, the authorizing supervisor must verify that all actions and conditions necessary for safe entry have been performed.
- E. The authorizing supervisor must revoke the permit when conditions or work activity are different than those specified on the permit which could introduce a new hazard to the permit space. The EHS must be contacted to develop a new permit.

- F. An attendant is required for each entry and shall be located outside the entry space at all times. The permit must remain in the possession of the attendant at all times while entry activities are underway.
- G. Atmospheric testing utilizing direct-reading instruments must be performed by the EHS before entry into a permit-required confined space.
 - 1. Initial monitoring of the atmosphere inside the permit-required confined space shall be conducted from a safe distance outside the space by a trained EHS employee using air-sampling instruments that have been properly calibrated.
 - 2. Monitoring shall occur simultaneously or in the following sequence: oxygen, flammability, carbon monoxide, other toxic gases.
 - 3. If the permit required confined space is vacated for any significant period of time, the atmosphere of the permit required confined space shall be retested before re-entry is permitted.
- H. The atmosphere of the confined space shall be considered unacceptable for entry whenever the following conditions are noted:
 - 1. the atmospheric oxygen concentration is below 19.5 percent or above 23.5 percent,
 - 2. a flammable gas, vapor, or mist is present in a concentration in excess of 10 percent of its Lower Explosive Limit (LEL) or Lower Flammability Limit (LFL),
 - 3. airborne combustible dusts are present at a concentration that obscures vision at a distance of 5 feet or less,
 - 4. atmospheric concentrations of other substances for which a permissible exposure Limit (PEL) is published by OSHA or a threshold limit value (TLV) is published by the American Conference of Governmental Industrial Hygienists (ACGIH) are above these recognized exposure limits, or
 - 5. any atmospheric condition recognized as immediately dangerous to life or health exists.
- I. Whenever atmospheric testing of the confined space indicates unacceptable conditions for entry, controls such as providing additional ventilation shall be implemented to modify the

atmospheric conditions to acceptable levels or appropriate personal protective equipment will be utilized. These procedures will be performed under the direction of the EHS.

- J. All energy sources and pipelines, which enter the workspace, will be locked out.
- K. Any temporary lighting or portable power tool to be used in a permit-required confined space where there is a potentially explosive atmosphere shall be explosion proof.
- L. Any temporary lighting or portable power tool to be used in a permit- required confined space where there is a potential of electrical shock shall be battery operated or served through a ground fault circuit interrupter.
- M. Rescue provisions and a system of effective and continuous communication between the attendant and the authorized entrants must be established prior to entry
- N. Personal protective equipment that will be required for entry will be determined by the supervisor with the advice of the EHS. This may include respirators, coveralls, gloves, head protection, foot protection, safety glasses and/or hearing protection. This information will appear on the permit.
- O. Any employee required to wear respiratory equipment must receive additional training on respirator use, a fit test on the respirator to be used, and a physical examination to ensure that the employee is capable of wearing the respirator without undue physical distress.
- P. Upon completion of the entry permit, and after all entrants have exited the permit space, the authorizing supervisor signing the permit must cancel the permit.

VIII. TRAINING

- A. Training is required for permit-required confined space entry to ensure that attendants, authorized entrants, and supervisors can work safely in and around the permit space. Training should be provided to each affected employee before the employee is first assigned duties in a confined space area. The EHS will coordinate this training which shall include as a minimum:
 - 1. duties and responsibilities of each participant in entry procedures,
 - 2. hazard recognition of all hazards which may be faced during entry,
 - 3. how to recognize the signs and symptoms of exposure to a hazard,

4. the potential consequences of exposure to a hazard,
 5. proper communication procedures,
 6. procedures for evacuation of a permit space,
 7. proper use and limitations of protective equipment, and
 8. proper procedures for rescue.
- B. Awareness training will be provided for shop and other personnel on general procedures for recognizing confined spaces, limitations on entering, and procedures for entry into non-permit-required confined spaces.
- C. Training shall be reinforced at least annually through additional training sessions.

IX. EQUIPMENT

- A. Supervisors must provide, ensure maintenance of, and ensure the proper use of the equipment necessary for safe entry, including rescue, atmosphere monitoring equipment, communication equipment, and personal protective equipment.
- B. The EHS will provide instruction on the proper use of atmospheric testing and monitoring equipment.
- C. Any use of hot work equipment during confined space entry must comply with the WSU Hot Work Permitting Program.

X. RESCUE PROCEDURES

- A. Wichita State University will rely on the city of Wichita Fire Department in the event of an emergency.

XI. CONTRACTORS

- A. Permit-required confined space entry involving outside contractors shall be pre-planned and coordinated by the contractor's job site supervisor, WSU Project Manager and EHS. The Contractors shall:
1. work to their approved confined space entry program.
 2. ensure employees are trained.
 3. designate entry supervisors.
 4. ensure all equipment is inspected and calibrated.

5. enforce program compliance.
6. notify WSU EHS of any discovered or created confined spaces.

XII. PROGRAM REVIEW

- A. The EHS Department shall review this plan tri-annually to verify compliance with all current requirements.
- B. WSU Confined Spaces shall be reviewed and tested every 5 years to verify status as permit required of non-permit required confined space.

CONFINED SPACE ENTRY PERMIT

A. Confined Space Location _____ Purpose of Entry _____

Dept. Entering _____ Date _____ Time: _____ Entry _____

Building & Description of Space _____ Exit _____

B. Potential Hazards (check all that apply)	C. Monitoring Record
--	-----------------------------

<input type="checkbox"/>	Oxygen (O ₂) deficiency	<19.5%
<input type="checkbox"/>	Oxygen enrichment	>23.5%
<input type="checkbox"/>	Combustible vapors	>10% of LEL
<input type="checkbox"/>	Carbon Monoxide (CO)	>25ppm
<input type="checkbox"/>	Hydrogen Sulfide (H ₂ S)	>10ppm
<input type="checkbox"/>	Electrical shock	
<input type="checkbox"/>	Hot work	
<input type="checkbox"/>	Engulfment/Drowning	
<input type="checkbox"/>	Moving mechanical equipment	
<input type="checkbox"/>	Heat stress	
<input type="checkbox"/>	Biohazards	
<input type="checkbox"/>	Chemical Contact	

Time*	%O ₂	% LEL	CO (ppm)	H ₂ S (ppm)	Initials

*Monitor top, middle, and bottom of space for each

Monitoring Equipment _____

Calibration Date _____

D. Safety Equipment Checklist	E. Hazard Control Checklist
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G. Authorization For Entry

I certify that all precautions have been taken as required by the WSU Confined Space Entry Program for safe entry and work in this confined space.

All hazards listed above have been removed and space has been declassified to "non-permit"

All hazards except potential atmospheric hazards have been removed, ventilation and monitoring is in place for "alternate procedures entry"

Permitted confined space, all precautions apply

Entry Supervisor: (signature) _____ Date: _____

CONFINED SPACE ENTRY PERMIT AND CHECKLIST

Pre-Entry Checklist

Date: _____ Time: _____

Location and Description of Confined Space: _____

Purpose of Entry: _____

ISOLATION CHECKLIST	Yes	No	N/A	Time	Inspected by:
Electrical					
Pumps off and locked out					
Lines disconnected, blinded or blocked					
Valves shut and locked/tagged out					

VENTILATION CHECKLIST	Yes	No	N/A	Time On	Inspected by:
Mechanical					
Natural ventilation only					

AIR MONITORING	Time	Result	Within Safe Parameters		Signature
			Yes	NO	
Oxygen					
Flammable gases (LEL)					
Carbon monoxide					
Instrument calibration					

Warning: If any "No" block is checked or air quality is not within safe parameters, entry is not permitted. Contact EHS before entering the space.

Authorizing Supervisor's signature: _____

Authorizing EHS signature: _____

PERMIT REQUIRED CONFINED SPACE ENTRY PERMIT AND CHECKLIST

Entry Checklist

Date: _____ Time: _____

Location and Description of Confined Space: _____

Purpose of Entry: _____

Entrant(s): _____

Attendant(s): _____

Action	Check	Initial
Notify Environmental Health and Safety Office 3 days in advance of project		
Are all employees involved properly trained?		
Has area been ventilated for at least 10 minutes prior to entry		
Assign one person to carry monitoring device for oxygen, LEL an carbon monoxide		

Warning: There can be no hazardous atmospheres within the confined space whenever a employee is inside. If a hazardous atmosphere is detected while in the workspace, each employee must leave the confined space immediately.

Authorizing Supervisor Signature: _____

Completion of Project Date: _____ Time: _____

Supervisor Signature of Permit Cancellation: _____

PERMIT REQUIRED CONFINED SPACE ENTRY PERMIT AND CHECKLIST

Attendant Checklist

Date: _____

Time: _____

Location and Description of Confined Space: _____

ENTRANT(S)	Time		Initials
	In	Out	

ATTENDANT AIR MONITORING	Oxygen	Flammable Gases (LEL)	Carbon Monoxide	Initials
Time:				
Time:				
Time:				
Time:				
Time:				
Time:				
Time:				
Time:				

Warning: There can be no hazardous atmospheres within the confined space whenever an employee is inside. If a hazardous atmosphere is detected while in the workspace, each employee must leave the confined space immediately.

Attendant(s) Signature: _____

