I. Purpose

This policy protects employees, students, visitors, and contractors from hazards when entering confined spaces. It provides procedures for identifying, evaluating, and safely entering confined spaces.

II. Scope

This policy applies to all Kansas State University employees, students, visitors, and contractors who enter confined spaces on university-owned or leased property.

III. Definitions

1) **Attendant –** A trained person stationed outside a confined space who monitors entrants, ensures safety, and who performs attendant's duties as listed in section V. 2. B. ii. 8.

2) **Authorized Personnel** – Individuals trained to perform confined space duties as entrants, supervisors, or attendants.

3) **Confined Space**- A space large enough for a person to enter, with limited access and not designed for continuous occupancy. Examples include tanks, manholes, pits, and tunnels.

4) **Entrant** – An authorized person who enters a confined space.

5) **Entry Supervisor –** A person responsible for ensuring safe entry conditions, overseeing operations, and terminating entry if needed. Also performs additional duties as listed in section V. 2. b. iii.

6) **Non-permit Required Confined Space** – A confined space without hazards that could cause series harm or death.

7) **Permit Required Confined Space –** A confined space with hazards such as toxic gases, risk of engulfment, or dangerous machinery.

8) **Qualified Person –** Someone trained to identify confined space hazards and implement safety controls.

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9) **Retrieval System –** Equipment used to rescue someone from a confined space, including harnesses, lifelines, and lifting devices.

IV. Responsibilities

1) Environmental Health and Safety (EHS)

a) Maintain and update Confined Space Policy.
b) Identify and label confined spaces.
c) Evaluate hazards and determine which spaces require entry permits.
d) Provide training as listed in section VII and maintain records.
e) Issue or guide the issuance of confined space entry permits.
f) Maintain and calibrate confined space entry monitoring equipment.
g) Provide approval process for any student or visitor requiring entry into any confined space.

2) Engineering and Construction Department/Office of Facilities Planning and Development

a) Notify EHS of changes affecting confined spaces.
b) Ensure all new or renovated confined spaces are identified to EHS prior to any construction or renovation beginning.
c) Ensure new or renovated construction minimizes confined space hazards.
d) Ensure all project managers inform contractors of the university's confined space procedures, locations of all known confined space locations, obtain and assess contracted service companies confined space procedures, ensure compliance with all university confined space policies.

3) Department Heads

a) Ensure compliance with this policy within their departments.
b) Assign and communicate responsibilities to managers and supervisors.

4) Managers and /or Supervisors

a) Identify all employees or contractors requiring confined space entry.
b) Ensure all personnel who will be entering confined spaces receive confined space training prior to entering and annually thereafter.
c) Oversee compliance with confined space entry procedures.
d) Notify EHS of changes affecting confined spaces.

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5) Authorized Personnel

a) As a qualified person follow the permit system and safety procedures as described in section V. 2. b.
b) Evacuate immediately if hazards arise.

6) Other Employees, Students, Contractors, and/or Visitors

a) Do not enter any confined space without prior authorization from their supervisor, project manager, or from EHS.
b) Complete training if entry is required and annually thereafter.

V. Procedures

1) Confined Space Identification

a) EHS maintains a list of all known confined spaces. However, this list is not necessarily inclusive of all confined spaces covered by this policy.
b) Individuals entering a space are responsible for determining if the space is considered a confined space (see confined space definition in section III).
c) Any new confined spaces identified must be reported to EHS.

d) All confined spaces are required to be labeled. Spaces are labeled as:

Permit-Required Confined Space:

DANGER
PERMIT-REQUIRED CONFINED SPACE
DO NOT ENTER
Contact EHS 785.532.5856
For Emergency – 911 or KSUPD 785-532-6412

Non-Permit Required Confined Space:

DANGER
CONFINED SPACE
NOTIFY YOUR SUPERVISOR PRIOR TO ENTRY
For Emergency – 911 or KSUPD 785.532.6412

2) Entry Procedures:

a) **Non-Permit Spaces:**

i) Trained personnel may enter after notifying a supervisor and confirming no new hazards exist.

b) **Permit-Required Spaces:**

i) Ensure training as listed in VII has been completed before entry.
ii) Notify a supervisor and EHS before entry.
iii) Remove entrance covers safely and guard openings.
iv) Lock out energy sources before entry.
v) Ventilate spaces with known or potential air hazards.
vi) Wear appropriate protective equipment
vii) Assign an attendant to monitor entry and initiative rescues if needed.
viii) Use retrieval systems unless they create additional hazards.
ix) Have an emergency rescue plan in place before entry.
x) Conduct atmospheric testing for oxygen levels, toxic gases, and flammable substances before and during entry.

c) **Confined Space Entry**

i) Entry Precautions

(1) Any condition making it unsafe to remove an entrance cover shall be eliminated before removing the cover. When entrance covers are removed, the opening shall be promptly and effectively guarded to prevent accidental fall into the opening and prevent objects from falling into the opening. The area must be secured to prevent the unauthorized entry of individuals into the confined space.
(2) Electrical, mechanical, hydraulic, pneumatic, chemical, thermal, electromagnetic, radioactive, kinetic (moving), potential (gravity), or other energy sources in the confined space shall be locked out at their source by each individual or group prior to entry. Individuals performing lockout must have received training and follow all procedures as required under the university Lockout Policy.
(3) Continuous forced mechanical ventilation shall be used in all permit-required confined spaces that contain a known or potential atmospheric hazard. If a hazardous atmosphere is detected (see section VI), individuals shall not enter the space until the hazardous atmosphere has been eliminated.

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(4) Mechanical ventilation must be used regardless of initial monitoring results if the potential for development of a hazardous atmosphere exists. The potential for a hazardous atmosphere to develop shall be determined by the Entry Supervisor in consultation with EHS if necessary. If a hazardous atmosphere is detected, employees shall not enter the space until the hazardous atmosphere has been eliminated by continuous forced air ventilation.

(5) The forced air shall be directed to the immediate vicinity where an employee is or shall be within the space. Ventilation shall continue until all employees have left the space. If mechanical ventilation should fail during entry operations, all employees shall immediately evacuate the space until ventilation is restored, and re-testing indicates acceptable entry conditions. The method and equipment selected shall depend on the size of the confined space and opening, the gases exhausted, and the source of make-up air. Ventilation systems used in flammable atmosphere shall be explosion-proof and appropriately rated for the hazard.

(6) Local exhaust ventilation shall be used during welding, cutting or other similar operations in confined spaces as necessary to remove harmful gases, smoke and fumes. The confined space shall be continuously ventilated if a toxic solvent is used in the space. <u>Oxygen shall never be used to ventilate a confined space.</u>

(7) Personal protective equipment adequate for the hazards identified shall be provided to, and worn by, all entrants. If respiratory protection is required all entrants must meet the requirements of the university's Respiratory Protection Policy.

(8) An attendant shall be assigned to remain outside the permit required confined space at all times during entry operations. The attendant shall:

   (a) Remain in constant communication with the entrants, with the use of 2-way radios if necessary.
   (b) Order the entrants to leave if a condition listed in section VI is observed; if behavioral effects from hazardous exposure is observed in an entrant; or, if a condition outside the confined space is detected that could endanger an entrant.
   (c) Warn unauthorized persons not to enter the confined space.
   (d) Initiate the rescue operations established for the confined space entry when conditions warrant rescue.

(9) Each individual entering a permit required confined space shall have a safety line attached to an approved body harness or other rescue retrieval system unless it increases the overall risk of entry or would not

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contribute to the rescue of the entrant. The other end of the line shall be secured to an anchor point or lifting device outside the entry portal. The anchor point shall not be secured to a motor vehicle in a manner that would pull the line out of the space if the vehicle moved. A retrieval line is not required if:

(a) A permit space has obstructions or turns that would prevent pull on the retrieval line from being transmitted to the entrant.
(b) A permit space from which an employee being rescued with the retrieval system has projections which would injure the employee if forcefully contacted.
(c) A permit space was entered by an entrant using an air supplied respirator, and retrieval lines, if used, could not be controlled so as to prevent an entanglement hazard.

(10) Plans for emergency rescue must be established prior to entry. In many cases Manhattan Fire Department (MFD) may be able to serve in this role. Pre-entry communication and confirmation with MFD must be made prior to entry. If MFD is unavailable to serve in this role then rescue and emergency services in compliance with 29 CFR 1910.146(k) must be established. Alternatives to MFD for rescue services can be found on the EHS website (see section VIII.C).

(11) A Hot Work permit, issued by KSU FM, shall be submitted separate from a confined space entry permit for any work qualifying for a hot work permit (i.e., welding, soldering, etc…)

(12) No smoking is permitted at any time during a confined space entry, or by anyone involved with the entry procedure.

(13) Prior to entry the internal atmosphere of the confined space shall be tested for oxygen concentration, combustible gases, and any known or suspected toxic substances with EHS's calibrated confined space entry monitoring equipment, or other properly calibrated direct read monitoring equipment, operated by EHS personnel or EHS approved personnel.

ii) **Entry Permits and Entry Supervisor**

(1) After notification, EHS shall issue a permit prior to entry. For after hours, or when EHS is not on-site, contact police dispatch at 785-532-6412. Dispatch shall forward the call to the EHS contact that is on-call. The EHS contact shall assist via the telephone with the completion and issuance of a permit. The Confined Space Entry Permit can be found on the EHS website (see section IX). For contractors, the permit shall be prepared by a qualified person, approved by the project manager and/or EHS, prior to

entry following the procedures of this policy or their Confined Space Entry Program in compliance with 29 CFR 1910.146.

(2) A qualified person shall be designated as the entry supervisor. Depending on the hazards of the confined space this person may also serve as an entrant or attendant and shall provide the necessary signatures on the entry permit. **No entry is permitted until the entry permit is complete.** The entry supervisor shall:

(a) Identify on the permit the Space ID (if known), the location of the confined space, the purpose of the entry, the date and time of the entry, and the expiration date and time.
(b) If it is determined no entry permit is required mark the permit as "Reclassified Space". If a permit is required mark as "Permit Required".
(c) Complete the "Requirements Completed" checklist after consideration of all conditions listed in section V. 2. b. ii.
(d) Complete the "Observable Serious Safety/Health Hazards" based on his/her assessment of the confined space and the work to be done.
(e) Complete the "Hazard Assessment" box based on the initial test of the atmosphere just prior to entry into the confined space. This assessment must be done within 15 minutes before entry.
(f) Ensure periodic atmospheric testing of the confined space is performed during entry operations. The results of this periodic testing shall be recorded on the entry permit. The potential for conditions to change can be used to determine the frequency of retesting but in no case shall the frequency be less than 20 minutes. **Continuous air monitoring shall be performed if the potential for a hazardous atmosphere exists, for example during entry into sewers or during welding operations. The device shall be equipped with an audible alarm.**
(g) List the names of the entrants, the attendant, and any standby personnel (i.e., rescue) on the entry permit.
(h) Verify that rescue services are available and the means for summoning rescue services are operable.
(i) Complete and sign Box 1, 2, and/or 3 on the entry permit as applicable. After the permit is completed and signed, entry into the confined space is allowed.

(3) The entry shall be terminated, and all entrants shall vacate the confined space if a potential hazardous situation occurs which exceeds the conditions authorized on the permit.

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(4) The permit shall be available at the work site outside the confined space.
(5) All confined space entry permits shall be forwarded to EHS after work is complete (Safety@ksu.edu).

VI. Regulatory Limits

1) Atmospheric conditions shall be considered unacceptable if determined to be hazardous based on the criteria below (29 CFR 1910.146):

a) Oxygen levels < 19.5% or >23.5%
b) Flammable gas, vapor, or mist > 10% of its lower explosive limit (LEL)
c) Airborne combustible dust at a concentration in which the dust obscures vision at a distance of 5 feet or less.
d) Any toxic or hazardous substance found at levels exceeding its OSHA Permissible Exposure Limit (PEL).
e) Carbon Monoxide levels > 35 ppm
f) Hydrogen Sulfide levels > 10 ppm
g) Any atmospheric condition that is immediately dangerous to life and health.
h) For substances which OSHA has not established a PEL, other sources of information, such as material safety data sheets or published references, shall be used to provide guidance in establishing acceptable atmospheric conditions.

VII. Training and Recordkeeping

1) Employees must complete confined space training before their first entry and receive annual refresher training.
   a. Training covers:
      i. Hazard recognition
      ii. Personal Protective Equipment
      iii. Rescue procedures
      iv. Atmospheric testing
2) EHS maintains training records, including dates, instructors, materials, and attendee list.

VIII. References

1) 29 CFR 1910.146 - Permit-Required Confined Spaces

IX. Forms

1) Confined Space form
2) Confined Space Signage

X. Questions

Direct questions to EHS by phone: 785-532-5856 or email: safety@ksu.edu

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XI. Version History

Version	Description of Change	Effective Date
1	Standardize format	10-16-2023
2	Minor editing fixes.	11-08-2024
3	Annual Review and changes.	03-19-2025