I. Purpose

To protect employees, students, visitors, and contractors from potential safety hazards encountered during entry into confined spaces and provide procedures for identification, evaluation and safe entry.

II. Scope

Establish procedures for entry into confined spaces, as defined in Section III, for all employees, students, visitors, and contractors on all university owned or leased property.

III. Definitions

A. **Attendant** – any authorized personnel stationed outside a permit required confined space that monitors the authorized entrants and who performs attendant's duties as listed in section V.B.2.b.viii.

B. **Authorized Personnel** – an individual who has received confined space training and can perform duties as an entrant, entry supervisor, attendant, and qualified person as listed in section V.B.2.

C. **Confined Space** - any space that is large enough, and so configured, that an employee can bodily enter and perform assigned work, has limited or restricted means for entry or exit, and is not designed for continuous employee occupancy. Confined spaces include, but are not limited to, storage tanks, pits, vats, vessels, sewer manholes, electrical manholes, vaults, pump or lift stations, septic tanks, boilers, ventilation and exhaust ducts, trenches, water tower, elevator shafts and excavations.

D. **Entrant** - any authorized personnel who enters a confined space.

E. **Entry Supervisor** – any authorized personnel responsible for determining if acceptable entry conditions are present in a permit required confined space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this policy. Also performs additional duties as listed in section V.B.2.c.

F. **Non-permit Required Confined Space** - a confined space that does not contain, or have the potential to contain, any hazard capable of causing death or serious physical harm.

G. **OSHA Permissible Exposure Limit (PEL)** – The legal limit for exposure to a chemical substance or physical agent. For chemicals, it is usually expressed in parts per million (ppm) or milligrams per cubic meter (mg/m3). PEL's are established by the Occupational Safety and Health Administration (OSHA) as a time-weighted average (TWA), Short Term Exposure Limit (STEL), or Ceiling Limit (CL).
H. Permit Required Confined Space - a confined space that has one or more of the following characteristics:

1. Contains or has the potential to contain a hazardous atmosphere (see section VI);
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;
4. Contains any other recognized serious safety or health hazard (such as noise, electrical, radiation, or exposed moving parts of machinery).

I. Qualified Person – any authorized personnel who are trained to recognize and evaluate the anticipated hazard(s) of the confined space and who shall be capable of specifying necessary control measures to assure worker safety.

J. Retrieval System - the equipment used for non-entry rescue of persons from permit spaces, and includes retrieval lines, chest or full body harness, and a lifting device or anchor. A retrieval line is primarily of use in vertical confined spaces, and shall not be used in confined spaces consisting of horizontal tunnels or spaces where obstructions could increase the hazard to the entrant during emergency non-entry removal.

IV. Responsibilities

A. Employees, Students, Contractors, and/or Visitors

1. Do not enter any confined space without prior approval from their supervisor, project manager, or in the case of students or visitors from Environmental Health and Safety.
2. If entry into confined spaces is required complete all the training requirements to become an authorized personnel and follow all entry procedures listed in this policy.
3. Contractors must ensure their confined space entry program meets or exceeds the requirements of 29 CFR 1910.146 and all their employees and sub-contractors have reviewed the Wright State University Contractor Environmental Health and Safety Guidelines.
4. Contractors must receive prior approval from their university project manager before entering into any confined space.
5. Notify EHS when processes, materials, equipment changes, or building renovations are made that affect confined spaces.

B. Managers and/or Supervisors

1. Identify all employees or contractors requiring entry into confined spaces.
2. Communicate the Confined Space Policy requirements and the locations of all know confined spaces to all contractors prior to any work being performed.
3. Ensure all personnel who will be entering confined spaces receive confined space training as listed in section VII prior to entering into a confined space and annually thereafter.
4. Ensure all entry into confined spaces by their employees is performed following the procedures listed in the policy.
5. Notify EHS when processes, materials, equipment changes, or building renovations are made that affect confined spaces.
C. Project Managers

1. Communicate the Confined Space Policy requirements and the locations of all known confined spaces to all contractors prior to any work being performed.

D. Environmental Health and Safety (EHS)

1. Identify, with the assistance of affected departments, the location of confined spaces and maintain an inventory of all identified locations.
2. Label all confined spaces with appropriate signage as described in section V.A.2.
3. Develop, review, and revise as necessary the Confined Space Policy.
4. Evaluate hazards and provide assessments of the risk of entering confined spaces and determine which confined spaces will be posted as permit required confined spaces.
5. Provide training as listed in section VII.
6. Issue, or provide guidance to the issuer, all confined space entry permits and maintain copies of all permits issued.
7. Maintain and calibrate confined space entry monitoring equipment.
8. Provide approval process for any student or visitor requiring entry into any confined space.

E. Authorized Personnel

1. As a qualified person be able to perform duties as an entrant, entry supervisor, and/or attendant as described in section V.B.2.
2. Obtain training as listed in section VII prior to entering into a confined space for the first time and annually thereafter.
3. Ensure full compliance with the permit system, permit procedures, and permit conditions.
4. Immediately evacuate any confined space upon notification from the entry supervisor, attendant, or emergency personnel when suspected hazards have been noted, or a toxic reaction is observed in a worker.

V. Procedures

A. Confined Space Identification

1. All known confined spaces are evaluated for potential hazards and a list of locations is maintained by EHS and is available on the EHS website. The list designates which confined spaces are permit-required and which are not. The entry procedure for the different designations are listed in section V.B.

   NOTE: This list is not necessarily inclusive of all confined spaces covered by this policy. It is up to the individual entering the space to determine if the space is considered a confined space (see confined space definition in section III). Any new confined spaces identified must be reported to EHS.

2. All confined spaces are required to be labeled depending on their designation as permit required or non-permit required. The labels shall read as follows:
Permit-Required Confined Space:

DANGER
PERMIT-REQUIRED CONFINED SPACE
DO NOT ENTER
Contact EHS 937.775.2215
For Emergency – WSUPD 937.775.2111

Non-Permit Required Confined Space:

DANGER
CONFINED SPACE
NOTIFY YOUR SUPERVISOR PRIOR TO ENTRY
For Emergency – WSUPD 937.775.2111

B. Confined Space Entry

1. Non-Permit Required Confined Space

   a) Entry is not permitted into any confined space unless the entrant has been trained as listed in section VII.
   b) Notification to one’s supervisor, project manager, or EHS is required prior to entry into a non-permit required confined space.
   c) Non-permit required confined spaces have been designated as such because under normal conditions no hazards exist that require special precautions for entry. An evaluation must be made to ensure normal conditions exist at the time of entry.
   d) Individuals must discuss with their supervisor, project manager, or EHS the work scheduled to be performed in the confined space to ensure the work does not create a hazard that would designate the space a permit required confined space. Examples of such work include painting, welding, or use of chemical products for repair. If additional hazards are identified then follow the procedures listed for Permit Required Confined Space Entry (section V.B.2).
   e) Any additional precautions listed on the confined space inventory found on EHS’s website must be considered and addressed prior to entry.
   f) Following the verification that no additional hazards exist, and addressing any additional concerns listed on the inventory, the non-permit required confined space can be entered and the work performed. Different work, not previously discussed and approved by the entrant and their supervisor, project manager, or EHS, may not be performed without first being evaluated if the work will create additional hazards.
2. Permit Required Confined Space Entry

a) General

i) Entry is not permitted into any confined space unless the entrant has been trained as listed in section VII.

ii) Notification to one’s supervisor or project manager, AND EHS is required prior to entry into a permit required confined space.

iii) Permit required confined spaces have been designated as such because under normal conditions hazards exist that require special precautions for entry.

iv) Individuals must discuss with their supervisor, project manager, and EHS the work scheduled to be performed in the confined space to ensure the work does not create additional hazards. Examples of such work include painting, welding, or use of chemical products for repair.

b) Entry Precautions

i) 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.

ii) 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.

iii) 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.

iv) 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.

v) 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.

vi) 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
vii) 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.

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

i) Remain in constant communication with the entrants, with the use of 2-way radios if necessary.

ii) 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.

iii) Warn unauthorized persons not to enter the confined space.

iv) Initiate the rescue operations established for the confined space entry when conditions warrant rescue.

ix) 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 would increase the overall risk of entry or would not 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:

1) A permit space has obstructions or turns that would prevent pull on the retrieval line from being transmitted to the entrant.

2) A permit space from which an employee being rescued with the retrieval system has projections which would injure the employee if forcefully contacted.

3) 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.

x) Plans for emergency rescue must be established prior to entry. In many cases Fairborn Fire Department (FFD) may be able to serve in this role. Pre-entry communication and confirmation with FFD must be made prior to entry. If FFD 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 FFD for rescue services can be found on the EHS website (see section VIII.C).

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

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

xiii) 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.

c) Entry Permits and Entry Supervisor

i) After notification, EHS shall issue a permit prior to entry. For after hours, or when EHS is not on-site, contact police dispatch at 937.775.2111. 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.

ii) 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:

   i) Identify on the permit the Space ID (if known), the location of the confined space, the purpose of the entry, and the date and time of the entry and the expiration date and time.

   ii) If it is determined no entry permit is required mark the permit as “Reclassified Space”. If a permit is required mark as “Permit Required”.

   iii) Complete the “Requirements Completed” checklist after consideration of all conditions listed in section V.B.2.b.

   iv) Complete the “Observable Serious Safety/Health Hazards” based on his/her assessment of the confined space and the work to be done.

   v) 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.

   vi) 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.**

   vii) List the names of the entrants, the attendant, and any standby personnel (i.e., rescue) on the entry permit.

   viii) Verify that rescue services are available and the means for summoning rescue services are operable.

   iv) 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.

iii) 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.

iv) The permit shall be available at the work site outside the confined space.
v) All confined space entry permits shall be forwarded to EHS after work is complete.

VI. Regulatory Limits

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

1. Oxygen levels < 19.5% or >23.5%
2. Flammable gas, vapor, or mist > 10% of its lower explosive limit (LEL)
3. Airborne combustible dust at a concentration in which the dust obscures vision at a distance of 5 feet or less.
4. Any toxic or hazardous substance found at levels exceeding its OSHA Permissible Exposure Limit (PEL).
5. Carbon Monoxide levels > 35 ppm
6. Hydrogen Sulfide levels > 10 ppm
7. Any atmospheric condition that is immediately dangerous to life and health.
8. 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

A. All personnel involved in confined space work shall receive authorized personnel training. The training shall consist of a review of the Confined Space Entry procedures listed in section V.B. and additional information consisting of:

1. The conditions or work practices that may produce a hazard in a non-permit confined space that may require that the space be reevaluated by the entry supervisor prior to entry.
2. Hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of exposure.
3. Hazard recognition and use of atmospheric testing devices.
4. The use of personal protective equipment including, but not limited to, rescue harnesses and respiratory protection.
5. Emergency and non-entry rescue methods, and procedures for calling rescue services.

B. Training shall be prior to assigned duties in confined spaces and annually thereafter. Employees may be retrained if confined space entry procedures are revised, or deficiencies are noted during EHS or supervisor audits.

C. Training records shall be maintained by EHS. These records shall include the date(s) of the training program, the instructor(s) of the training program, a copy of the written material presented, and the names of the employee(s) to whom the training was given.

VIII. References

A. 29 CFR 1910.146 - Permit-Required Confined Spaces

C.  http://www.wright.edu/administration/ehs/safety/ConfinedSpaces.html

IX. Forms

A.  http://www.wright.edu/administration/ehs/safety/documents/ConSpacePermit.pdf

X. Approval

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