Permit-Required Confined Space Program

Purpose and Background

Historical accident data indicates that there have been many injuries and fatalities due to lack of sufficient oxygen, toxic or explosive atmospheres, engulfment, and mechanical and electrical hazards encountered in confined spaces. This program shall apply to all University employees who may work in or be in direct communication with an employee working in a confined space.

Scope

The IUPUI Department of Environmental Health and Safety (EHS) has developed this program to protect employees and ensure effective implementation, operation and recordkeeping of the University permit-required confined space program in compliance with OSHA regulation 29 CFR 1910.146 (effective April 15, 1993 and revised February 1, 1999).

This policy applies to the requirements for practices and procedures to protect employees from the hazards of entry into a permit-required confined space. IUPUI employees may be required to enter potentially hazardous enclosed spaces. Confined spaces may have atmospheric conditions and/or physical hazards present and include: manholes, wet-wells, vaults, tanks, boilers, pits, sumps, and sanitary and storm sewers. Toxic and/or flammable gases and vapors may accumulate in these locations as a result of insufficient ventilation and deficient oxygen levels may be present as a result of corrosion and/or organic debris digestion. In addition, limited access to these locations complicates the retrieval of anyone incapacitated.

Policy

This policy has the following objectives:
1. Prevent injuries to employees that enter a permit-required confined space;
2. Ensuring that the University is in compliance with OSHA 29CFR 1910.146;
3. Ensuring that employees have the proper equipment, tools and training necessary to enter a permit-required confined space; and
4. Correctly identifying spaces that meet the confined space requirements.

Authority and Responsibility

The Department of Environmental Health and Safety has overall responsibility for the establishment and implementation of this program. Specific responsibility are as follows:

EHS shall be responsible for:
1. Developing the written Confined Space Program and revising the program as necessary;
2. Aiding in the training program for all personnel who enter confined spaces;
3. Approving all monitoring equipment, safety equipment, training programs and materials for safe work operations;
4. Assisting in identifying confined spaces on IUPUI campus;
5. Aiding in inspecting permit-required confined space locations for determination of hazards;
6. Providing periodic calibration of confined space entry monitoring equipment; and
7. Reviewing completed permits.
The Departments shall be responsible for:

1. Identifying confined space(s) encountered by his/her employees, submit a list of the confined spaces identified to EHS, and post or distribute the list to affected employees; The list shall include:
   a. Location;
   b. Physical dimensions and construction;
   c. Reason for employee entry;
   d. Potential hazards;
   e. Frequency of entry; and
   f. Duration of entry.

2. Reporting potential permit spaces to EHS;

3. Updating the confined space list whenever there are changes affecting work conditions or whenever new confined spaces are identified and submitting the changes to EHS;

4. Contact EHS to evaluate any confined space that is encountered but not on the confined space list;

5. Providing necessary PPE to employees;

6. Contacting EHS, when necessary, for assistance in identifying or characterizing confined spaces;

7. Assuring affected employees receive training appropriate for their confined space duties;

8. Ensuring that procedures and entry permits are accurately completed and reviewed. Maintain appropriate employee training and confined space entry permit records. Completed permits shall be maintained for a period of at least 1 year from the date of termination. Training records shall be maintained for at least 1 year from the date of an affected employee’s termination;

9. Taking appropriate disciplinary action whenever an employee fails to follow safety precautions outlined in this program;

10. Conducting briefing and de-briefing with any contracting company on the confined space they are hired to work in;

11. Ensuring that confined space entry equipment is properly maintained and stored; and

12. Ensuring that all entry permits are completed and signed upon termination of entry and that a copy is submitted to EHS.

The Employees shall be responsible for:

1. Notifying the supervisor of any confined space encountered not currently on the confined space list;

2. Notifying the supervisor whenever work operations may require a hot work permit or work operations may result in chemical exposure or generation of hazardous atmosphere and address appropriately;

3. Attending confined space training;

4. Reporting to the supervisor jobs requiring entry into permit entry confined spaces; and

5. Complying with duties assigned to them when working as entrants and attendants of permit-required confined spaces.

Contractors or other non-university employees shall be responsible for:

1. Developing and implementing a confined space program for their employees who work on IUPUI property and will enter an identified permit-required confined space. This program must meet OSHA regulations and include issuance of entry permits and required training.
General Requirements

A “Confined Space” is 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 of entry or exit; and
3. Is not designed for continuous employee occupancy.

An area will meet the definition of a confined space if it meets all three of the elements above.

Typical confined spaces include, but are not limited to:

- Storage Tanks
- Pipelines
- Lift Stations
- Tunnels
- Waste Water Tanks
- Air Handling Units
- Catch Basins
- Sewers
- Boilers
- Underground Retention Basins
- Manholes
- Valve pits
- Furnaces
- Process Vessels

A “Permit-Required Confined Space” is 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 (Other hazards could indicate radiation, noise, electricity, and moving parts of machinery).

An area will be a permit-required confined space if it meets the definition of a confined space and has at least one of the four characteristics named above.

A “Non-Permit Confined Space” is a confined space that does not contain a hazardous atmosphere; has natural or mechanical ventilation to ensure the atmosphere remains respirable; and does not contain any other hazards. (Examples could be vented vaults, motor control cabinets, and dropped ceilings).

Hazard Identification
The employer shall evaluate the workplace to determine if any spaces are permit-required confined spaces.

NOTE: Proper application of the decision flow chart in Appendix A would facilitate compliance with this requirement. Each permit space shall be evaluated to determine the potential hazards that may be present.

Permit System
A written permit system shall be utilized for entry into a permit-required confined space. Refer to Appendix B for the written permit.
Employee notification
Signs shall be posted where feasible near permit spaces to inform employees. The signs shall read DANGER – Permit-Required Confined Space, Do Not Enter or using other similar language that satisfies the requirement.

Prevention of Unauthorized entry
Unauthorized entry into permit spaces shall be prevented. Prevention measurements include training, signs and security measures. Any employee working in or around confined spaces shall attend confined space awareness training.

Employee Training
Only trained attendants, authorized entrants and personnel authorizing or in charge of entry, shall work in and around a permit space. Training shall meet standards established by EHS.

Equipment
Including, testing, monitoring, communication and personal protective equipment, shall be provided, maintained and properly used. A checklist of appropriate equipment can be found in Appendix C.

Rescue
Rescue procedures and equipment shall be in place prior to entry into a permit space. The use of retrieval equipment shall be required where there exists a potential for an IDLH atmosphere, engulfment, or vertical entries.

Alternate procedure entry
A confined space may be entered without a permit when certain conditions exist. If using the alternate procedure entry, the space must be evaluated for hazards and potential hazards by a competent person and the procedures outlined in Appendix D must be followed. Refer to Appendix D for further instructions.

Forced air ventilation
Anytime continuous forced air ventilation is used, the specific directions outlined in Appendix E must be followed.

Reclassification from a non-permit required space to a permit-required confined space
When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, EHS shall re-evaluate the space and, if necessary, reclassify it as a permit-required confined space.

Reclassification from a permit-required confined space to a non-permit required space
A space classified as a permit-required confined space might be reclassified as a non-permit confined space. Criteria that allows for the reclassification of a confined space are outlined in Appendix F.

Contractor Entry
When IUPUI arranges to have employees of a contractor company perform work that involves permit space entry the initiating department shall:

- Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this program;
- Apprise the contractor of the elements, including the hazards identified and the University’s experience with the space that make the space in question a permit space;
• Apprise the contractor of any precautions or procedures the University has implemented for the protection of employees in or near permit spaces where contractor personnel will be working;
• Coordinate entry operations with the contractor, when both University personnel and contractor personnel will be working in or near permit spaces. When employees of more than one employer are working simultaneously as authorized entrants in a permit space, the entry operations of one employer shall not endanger the employees of any other employer; and
• Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations and complete a debriefing form that shall be given to the initiating department. The initiating department shall forward the form to EHS.

**Contractor Requirements**

In addition to complying with the permit space requirements that apply to all university employees, each contractor who is retained to perform permit space entry operations shall:

• Obtain any available information regarding the permit space hazards and entry operations from the supervising department;
• Coordinate entry operations with the initiating department when both University personnel and contractor personnel will be working in or near permit spaces, as required by this program; and
• Inform the initiating department of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry.

**Permit-Required Confined Space Entry Program**

All permit required confined spaces shall have assessments conducted and a completed permit entry form every time the space is entered. The following must be conducted before any employee enters the confined space:

1. Implementation of the measures necessary to prevent unauthorized entry;
2. Identify and evaluate the hazards of the permit spaces before any employees enters them;
3. Develop and implement the means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to, the following:
   • Specifying acceptable entry conditions;
   • Make monitoring and testing information available to any employees who may work in or around the permit space;
   • Isolation of the permit space;
   • Purging, inerting, flushing, or ventilating the permit space as to eliminate or control atmospheric hazards;
   • Provisions for pedestrian, vehicle or other barriers as necessary to protect entrant from external hazards; and
   • Verification that conditions in the permit space is acceptable for entry throughout the duration of an authorized entry.

Detailed procedures for permit-required confined space entry are available in Appendix G.

The University shall provide the safety equipment at no cost to employees using them. A list of the necessary safety equipment is located in Appendix H.

**Evaluation of the permit space conditions must be performed anytime entry operations are conducted.**
Entry Permit System

Entry Permit Requirements
The entry permit that documents compliance with this program and authorizes entry to a permit space is located in Appendix B. The entry permit shall be completed by the outside attendant prior to entry into the space.

Before entry is authorized, the following shall be completed and documented on the entry permit form: (See Appendix B)

- Hazard determination measures shall be documented by preparing the entry permit and referring to Appendix J for safe atmospheric working conditions;
- The entry supervisor identified on the permit shall sign the entry permit to authorize entry; and
- The entry permit shall be made available at the time of entry by posting it at the entry portal or by any other equally effective means to confirm that pre-entry preparations have been completed.

The entry supervisor shall terminate entry and cancel the entry permit when:

- The entry operation covered by the entry permit has been completed; or
- A condition that is not allowed under the entry permit arises in or near the permit space.

The initiating department shall retain each canceled entry permit for at least 1 year to facilitate the review of the permit required confined space program. Any problems encountered during an entry operation shall be noted on the permit so that appropriate revisions to the permit space program can be made.

Duties and Training of Confined Space Personnel

Training shall be provided to all employees whose work requires them to enter any location defined as a permit required confined space. The training shall allow the employees to acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned to them. Training shall be provided to each affected employee:

- Before the employee is first assigned duties under this program;
- Before there is a change in assigned duties;
- Whenever there is a change in permit space operations that presents a hazard about which an employee has not been previously trained;
- Whenever management has reason to believe either that there are deviations from permit space entry procedures or that there are inadequacies in the employee’s knowledge or use of these procedures; and
- The training shall establish employee proficiency in the duties required by this program and shall include new or revised procedures, as necessary, for compliance with this program. EHS shall certify that the training has been accomplished. The certification shall contain each employee’s name, the signatures of the trainers, and the dates of training.

There are 3 basic roles in a permit-required confined space entry operation: entrant, attendant, and entry supervisor. The following identifies each role:

Duties of Attendants
1. Know the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure;
2. Be aware of possible behavioral effects of hazardous exposure in authorized entrants. Monitor the entrants behavior and watch for signs of fatigue, dizziness, etc.;
3. Maintain a continuous accurate count of authorized entrants in the permit space and ensure that the means used to identify authorized entrants accurately identifies who is in the permit space;
4. Remain outside the permit space during entry operations until relieved by another authorized attendant;
5. Maintain constant contact with the authorized entrants to monitor entrant status and to alert entrants to evacuate the space;
6. Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space. Stop the work and order the authorized entrants to evacuate the permit space immediately under any of the following conditions:
   - A change in the atmospheric monitoring is noticed. Contact EHS for assistance for assistance;
   - If the attendant detects a prohibited condition;
   - If the attendant detects the behavioral effects of hazards exposure in an authorized entrant;
   - If the attendant detects a situation outside the space that could endanger the authorized entrants; or
   - If the attendant cannot effectively and safely perform all the duties required under this section.
7. Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards;
8. Stop the work and have all entrants evacuate the space if an emergency occurs, and call 911 for assistance;
9. Take the following actions when unauthorized persons approach or enter a permit space while entry is underway:
   - Warn unauthorized persons that they must stay away from the permit space;
   - Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and
   - Inform the authorized entrants and entry supervisor if unauthorized persons have entered the permit space.
10. Perform non-entry rescue as specified by the rescue procedure; and
11. Perform no duties that might interfere with the attendants’ primary duty to monitor and protect the authorized entrants.

**Duties of Authorized Entrants**

1. Perform only the work specified on the entry permit. If conditions arise that require additional work to be performed, contact EHS to do additional testing;
2. Know the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure. Remain alert to any hazardous change in the atmospheric conditions of the space;
3. Remain aware of their physical senses, headaches, fatigue, etc.;
4. Use equipment properly in accordance with training received;
5. Maintain constant contact with the attendant through visual, radio or other means. This is to enable the attendant to monitor entrant status and to enable the attendant to alert the entrants of the need to evacuate the space as required;
6. Alert the attendant whenever:
The entrant recognizes any warning signs or symptoms of exposure to a dangerous situation; or
• The entrant detects a prohibited condition;

7. Exit from the space as quickly as possible whenever:
• An order to evacuate is given by the attendant or the entry supervisor;
• The entrant recognizes any warning sign or symptom of exposure to a dangerous situation;
• The entrant detects a prohibited condition; or
• An evacuation alarm is activated.

**Duties of the Entry Supervisor**

1. Know the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure;
2. Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
3. Terminate the entry and cancel the permit as required when:
   • The entry operation covered by the entry permit has been completed; or
   • A condition that is not allowed under the entry permit arises in or near the permit space;
4. Verify that rescue services are available and that the means for summoning them are operable;
5. Remove unauthorized individuals who enter or who attempt to enter the permit space during entry operations; and
6. Determine, whenever responsibility for a permit space entry operation is transferred to a different entry supervisor and at intervals dictated by the hazards and operations performed within the space that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

**Rescue and Emergency Services**

An entrant's evacuation from a Confined Space, or self rescue, shall take place when any of the following conditions occur:

• An attendant observes a potential problem that can affect the entrants, such as failure of a ventilation blower;
• Activation of an alarm that signal a hazardous change in atmospheric conditions; and/or
• Entrants believe they are in danger because they experience signs and symptoms of a hazard in the space.

In the event that an entrant becomes unconscious, attendants shall not attempt to enter the space to perform rescue. Rescue services that can be performed safely from outside of the confined space (e.g. hoisting a harnessed entrant) shall be undertaken. Other entrants in the space shall immediately exit the space and only provide such assistance as will not endanger themselves.

The attendant shall immediately contact IUPUI Public Safety Dispatch to summons the Indianapolis Fire Department (IFD) by one of the following:
• Calling 9-1-1 from a campus phone;
• Calling police dispatch at 274-7911 from a cell phone; or
• Radio for help.

Inform them that this is a confined space rescue and explain all of all hazards that may be present during the rescue. This information shall be communicated to IFD.

At off campus locations, the attendant must call local fire and rescue services directly by calling 9-1-1 from a cell phone. The telephone number must be in the attendant's possession prior to any entry. In no case shall the attendant be required to relay emergency information through a third party unless the third party location is fully staffed during the entire entry.

Emergency rescue services will be provided for all confined space emergencies by the IFD Confined Space Rescue Team, or local fire and rescue services at off campus locations. Local fire and rescue services shall provide their own equipment and training in accordance with federal and state regulations.