IUP Confined Space Plan & Procedure

INTRODUCTION

This procedure is designed to protect IUP employees from injury or death from accidents caused by entries into confined spaces. Periodically, confined spaces must be entered for inspection, cleaning and/or repair.

CONFINED SPACE DEFINITION: A confined space is any area not intended for continuous occupancy, has limited openings for entry and exit, unfavorable natural ventilation and has the potential for containing or accumulating a dangerous atmosphere or become oxygen deficient. Examples of confined space on IUP's campus include manholes, boilers, storage tanks and cooling towers.

The below safety steps must be completed before entry into a confined space can begin.

A. ***PREPARATION:***

The following six steps must be completed before a confined space is safe to enter:

1. Testing of the confined space atmosphere to determine condition of the air prior to ventilating.
2. Conditioning
3. Ventilating
4. Isolating
5. Immobilizing powered equipment
6. Testing of the confined space atmosphere

I. Conditioning the confined space: {boilers, storage tanks, some cooling towers}

1. Before entering the confined space, be sure all material has been drained or pumped out as completely as possible. If this is not possible, the supervisor shall consult with the facilities director and environmental health and safety to discuss alternatives.
2. When appropriate, flush the confined space with water or an appropriate cleaning solution followed by a final water flush.
3. If flammable or toxic gases are present, purge the confined space with air after washing.
4. Once the pressure in the confined space is at ambient pressure, the space is conditioned and can be opened. Manhole covers should be removed.

II. Ventilating the confined space:

1. Mechanical ventilation can now be started. This can be accomplished by introducing fresh air into the confined space with a blower.
2. Ventilation of the confined space must continue until all pockets of "dead air" which may contain flammable, toxic or inert gas have been eliminated and measurements with our 4 gas meters shows sufficient oxygen levels (above 19.5% but less than 23.5%) and that the atmosphere is free of any explosive or toxic gases (methane, carbon monoxide and hydrogen sulfide).
3. Only air shall be used for ventilation, never nitrogen or oxygen. Make sure intake for blower is not near any possible source of contaminant such as motor vehicles or exhaust from any source.

III. Isolating the confined space:

1. Isolate the confined space by blocking off all pipes through which potentially harmful materials can be introduced into the confined space. Include all liquid, gas or vapor lines as well as external sources of heat.
2. There are 2 general methods of isolation:
    a. The first is total mechanical which may include blanking off the line by using in-line or individual blinds, disconnecting pipes, and closing the open ends caps, plugs or blind flanges and removal of a section of pipe.
    b. The second is the double block and bleed method which can only be used on water or steam lines. Line valves are closed on either end and the 2 valves must be chained, locked, and tagged when in the closed position.
3. Where discharge lines from relief valves enter the confined space, they must be disconnected and temporarily vented to a safe location.

IV. Immobilizing power equipment:

Whenever a confined space is equipped with power driven internal equipment, this equipment must be immobilized before entry is allowed. This can be accomplished by:

1. Physically locking out by use of a padlock all electrical power at the breaker box in compliance with the electrical lockout procedure. Each employee required to enter the confined space must place their personal safety lock on the switch by means of multiple lock out device. Where it is not possible to lock-out due to age or design of equipment, all fuses and/or circuit breakers for that equipment must be removed to a safe place and the fuse box and switches tagged and signed by all employees required to enter the confined space.
2. Physically disconnecting mechanical drives or power trains. Before initiating this step, make sure all sources of power are turned off and cannot be energized accidentally. This method is only to be used when the electrical lockout procedure cannot be followed. If this method is used, appropriate **CAUTION** tags should be conspicuously displayed.

V. Testing the atmosphere of the confined space:

After all the previous preparations of the confined space have been completed, the confined space atmosphere must be tested for flammable vapors, carbon monoxide, oxygen levels and hydrogen sulfide using a four-gas meter.

1. These tests should be conducted at 15-minute intervals and results noted on the entry document. If at any time any reading is high (meters are equipped to alarm at potentially dangerous levels), all workers must exit the confined space and the space ventilated until readings return to safe levels.

B. ***SAFETY REQUIREMENTS FOR ENTRY***

This procedure requires that a safety observer be present with the appropriate personal protective equipment worn and necessary safety equipment readily available.

1) The duties of the safety observer are to:
    a) Ensure safety and retrieval equipment is set up and ready for use
    b) Keep continuous visual and voice contact with the people inside the confined space
    c) Assist in necessary equipment changes
    d) Protect entrant from external hazards
    e) Respond to any unusual behavior of the people inside the confined space
2) Any person entering the confined space must wear personal protective clothing and equipment that is appropriate for the work being performed and the condition of the confined space. Appropriate safety equipment may include a two-piece rainsuit, rubber gloves, rubber boots, face shields or hood, body harness with lifeline attached and a mechanical means of retrieval.

3) Appropriate two-way communication equipment that can summon emergency assistance shall be used at each entry. University Police shall be notified of each entry into the confined spaces and when exiting the space.
4) Use rubber covered, explosion proof extension cords and ground fault circuit interrupters with power tools.
5) Only electric lights of 12 volts or less or 110 volts with ground fault circuit interrupters may be used inside of confined spaces.
6) Area must be cordoned off so that no unauthorized individual may enter into the work area. Manholes and any pit must be covered or fenced off when leaving the area.
7) All other safety measures deemed necessary by the supervisor must be followed.

C. ***CONFINED SPACE ENTRY PERMIT***

NOTE: A CONFINED SPACE ENTRY PERMIT IS REQUIRED BEFORE ENTERING ANY CONFINED SPACE.

I. RESPONSIBILITIES:

Unit Supervisor:

a. After checking the job to see that all safety measures and all fire prevention precautions have been taken, the supervisor has the prime responsibility of completing the Confined Space Entry Permit, which he will sign.

a. The **entrants** performing the work shall handle the equipment safely and use it as to not endanger lives and property.

b. The **safety observer** will assist in preparing the area and remain in continuous contact with entrants.

c. *The entrants and safety observer will sign the permit certifying that they have been instructed in the proper confined space entry procedures.

II. Procedure

The employee in need of a confined space entry permit shall first contact the unit supervisor for permission to perform the work.

a. If it is necessary to burn or weld in the confined space to perform the work, extra work precautions must also be followed.

b. After receiving permission from the unit supervisor to proceed with the work, the safety observer and entrants will prepare the equipment and/or area for a confined space entry permit.

c. After completing the permit, the unit supervisor will review to ensure that all permit requirements have been satisfactorily completed. The safety observer and entrants will perform the atmosphere tests to rule out any explosive, flammable, oxygen deficient, or toxic atmospheres in the area.

d. After the inspection and atmosphere test, the unit supervisor shall certify that all of the safety precautions listed on the permit have been considered and will sign the permit in the space granting the permit.

D. ***EMERGENCY RESCUE PROCEDURE***

Emergency Rescue will be performed by the Indiana Fire and rescue squad. **The safety observer must not enter the confined space.** Use radio to notify campus police in the event of an emergency. *(See Confined Space Emergency Rescue Procedure)*

IUP CONFINED SPACE ENTRY PERMIT

Date and Time Issued:_____ Date and Time Expires:_____
Job Site/Space I.D.:_____ Job Supervisor:_____
Work to be Performed:_____
_____

Unit manager: _____
Unit supervisor: _____
Safety observer: _____

1. Atmospheric Checks: Time
   O2 _____%
   LEL _____%
   CO _____ppm
   H2S _____ppm

2. Tester's signature:_____

3. Source isolation (No entry):

	N/A	Yes	No
Pumps or lines blinded,	( )	( )	( )
Disconnected, or blocked	( )	( )	( )

4. Ventilation Modification:

	N/A	Yes	No
Mechanical	( )	( )	( )
Natural ventilation only	( )	( )	( )

5. Atmospheric check after Isolation and Ventilation:
   O2 _____%
   LEL _____%
   CO _____ppm
   H2S _____ppm
   Time
   Tester's signature:_____

6. Radio check time:_____
7. Rescue procedures: *See attached **Confined Space Rescue Procedures**

		Yes	No
8.	Supervisor, unit manager, safety observer and entrants successfully completed training?	( )	( )

		N/A	Yes	No
9.	Equipment:			

Direct reading gas monitor tested	( )	( )	( )
Safety Harness and lifelines for entry and standby persons	( )	( )	( )
Hoisting equipment	( )	( )	( )
Powered communications	( )	( )	( )
All electric equipment listed Class 1, Division 1, Group D and Non-Sparking tools	( )	( )	( )

10. Periodic atmospheric tests: *use attached chart

11. Special conditions:

We have reviewed the work authorized by this permit and the information contained herein. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit Prepared By: (Supervisor) _____

Approved By: (Unit Supervisor) _____

Reviewed By: (Safety observer) _____

(entrants) _____

(printed name) (signature)

This permit is to be kept at the job site. Return job site copies to Safety Office, Unit Supervisor and Unit Manager following job completion.

Emergency Medical Service	Safety Department	Campus Police
911	**357-5705**	**357-2141**

Periodic Atmospheric Tests. Job Site ID:__________________ Date:___________________

TIME	02	CO	LEL	H2S