

OFFICE OF ENVIRONMENTAL HEALTH AND SAFETY

STANDARD OPERATING PROCEDURE

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SUBJECT: Confined Space

I. PURPOSE

As part of routine maintenance activities many employees of The Ohio State University (OSU) and OSU contractors are required to enter potentially hazardous enclosed spaces. Confined spaces may have atmospheric conditions and/or physical hazards present which could lead to injury or death.

This Standard Operating Procedure (SOP) has been developed by OSU's Office of Environmental Health and Safety (EHS) in accordance with the Occupational Safety and Health Administration (OSHA) regulation (Permit-required Confined Spaces - 29 CFR 1910.146) and provides the minimum requirements for safe entry into these locations.

II. PROCEDURES

OSU employees whose work requires them to enter a confined space must notify their supervisor prior to entry. The following outlines the processes for entry into a confined space:

1. Determine if the planned work will require employees to enter a permit-required or non-permit-required confined space by consulting the Master List of Confined Spaces maintained by EHS. Also, consult OSU's Confined Space Program for definitions, requirements, and questions about confined spaces.
2. Should work require entry into a permit-required confined space, contact EHS and inform him/her of the confined space work operations and request a Confined Space Entry Permit.
3. Designate the appropriate trained personnel who will be involved in the work operations. Review entry requirements with entrants and attendants.
4. Gather the equipment as specified on the permit for the type of work to be performed.
5. Ensure all preparatory measures listed on the permit are completed. These include (but are not limited to):
 - Safe atmosphere monitoring
 - Lockout/Tagout and/or deactivation
 - Hot work permit
 - Explosion proof lighting and/or communications devices
 - Personal Protective Equipment (PPE).

6. Obtain permit authorization from EHS and proceed with entry operations.

Contractors will coordinate confined space entry through the Facilities, Operations and Development (FOD) project manager. The FOD project manager will assist with entry in accordance with OSU's Confined Space Entry Program.

III. HAZARD ANALYSIS

Usually, confined space incidents are caused by multiple factors. However, there are two primary categories of hazards: atmospheric and physical. It is critical to identify all the hazards in a space and determine how they can impact the health and safety of workers who enter this space.

Atmospheric Hazards: A hazardous atmosphere is any atmosphere that may incapacitate, injure, or impair an employee's self-rescue or lead to acute illness or death to workers and rescuers who enter confined spaces.

Atmospheric monitoring is necessary whenever:

- A safe atmosphere cannot be ensured.
- An existing hazardous atmosphere cannot be removed.
- The confined space cannot be physically isolated from the penetration of hazardous materials.
- There is reason to suspect the development of a hazardous atmosphere during work activity.

In addition, atmospheric testing of confined spaces must follow the order listed below:

1. Oxygen is tested first because most combustible gas and toxic atmosphere meters are oxygen-dependent and will not provide reliable readings when used in oxygen-deficient atmospheres. In addition, both oxygen-deficient and oxygen enriched atmospheres are extremely hazardous to workers' health and safety.
2. Combustible gases and vapors are tested next because the threat of fire and explosion is both more immediate and more life-threatening, in most cases, than exposure to toxic gases and vapors.
3. Toxic atmospheres are tested last.

Do not go inside the confined space to do the initial air sampling. To the extent feasible, pre-entry testing should be conducted with equipment that allows air to be tested remotely. If entry into the space is required to obtain further verification of acceptable entry conditions, entry is performed in accordance with a permit-required confined space program.

Physical Hazards: Moving equipment or parts and energized or pressurized systems can be dangerous. Examples include shafts, couplings, gears, belts, conveyors, mixers, rotors, and compressing devices.

Extreme care must be taken in order to avoid entrapment or engulfment hazards. Examples of entrapment hazards include inwardly converging walls or floors that slope downward and taper to a smaller cross-section (such as air plenums). Examples of engulfment hazards include accidental dumping of a product on a worker, a worker walking on granular material that could conceal an underlying void.

Consideration must also be given to thermal conditions (extreme heat or cold) in proximity to the confined space. An example of a thermal condition is an employee engaged in heavy work while wearing PPE during summer months. This thermal condition could lead to heat stress.

Sounds generated by tools or heavy machinery can be magnified inside a confined space. Over time, excessive noise may impair a workers hearing. Noise may also impede verbal communications between attendants and entrants.

Other physical hazards include slips/trips/falls, electrical shock, poor lighting, obstructions, and/or falling objects.

IV. QUALITY ASSURANCE

Confined space awareness training shall be provided for OSU employees not required to enter permit required confined spaces as a part of their job duties, but who work in proximity to these areas. Awareness training shall consist of:

- Understanding what constitutes a confined space.
- Identifying potential hazards requiring permit entry procedures.

Confined space entry training shall be provided for employees required, in the course of completing their job duties, to enter any location defined as a permit entry required confined space. 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 the supervising department 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.

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. The certification shall be available for inspection.