

**University of Illinois at Urbana-Champaign
Facilities & Services
Division of Safety and Compliance**

Facilities & Services Confined Space Entry Program

Reviewed 2015

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I. PURPOSE

Facilities & Services (F&S) at the University of Illinois at Urbana-Champaign (UIUC), through the Division of Safety and Compliance (S&C), has established this Confined Space Entry Program to protect the health of F&S employees and to assure compliance with State and Federal occupational safety and health standards, particularly the Confined Space Entry Standard of the Occupational Safety and Health Administration (OSHA) located in 29CFR 1910.146 and enforced at the UIUC by the Illinois Department of Labor. See UIUC Confined Space Entry Program for definitions of terms.

II. SCOPE

The provisions of the Confined Space Entry Program shall apply to all F&S employees who have to enter a Confined Space. Examples of Confined Spaces include, but are not limited to the following: Storage tanks, furnaces, boilers, pits, ducts, sewers, manure pits, hoppers, silos, large pipelines, vaults, dikes and open surface tanks.

III. RESPONSIBILITIES

Entry Supervisor: The Entry Supervisor shall be assigned by the Shop Foreman and shall have the training and experience necessary to:

- A. Know and understand all provisions of this Confined Space Entry Program and the UIUC Confined Space Entry Program;
- B. Know the hazards that may be present or exist during entry, including information on the routes of potential exposure (i.e. inhalation, skin contact, etc); signs or symptoms, and consequences of the exposure;
- C. Verify that the appropriate entries have been made on the permit, that all tests specified on the permit have been completed, and that all equipment required on the permit has been provided and is being used;
- D. Terminate operations and cancel the permit;
- E. Verify that the rescue services are available and that the means of summoning them are operable;
- F. Prevent unauthorized individuals from attempting to enter the permit space during entry operations;
- G. Determine that entry operations remain consistent with the terms of the permit and that acceptable entry conditions are maintained; and
- H. Provide all canceled permits to the Confined Space Competent Person for filing purposes.

The Entry Supervisor must be present at the entry site during the following times:

- A. To sign the permit and initiate the entry;
- B. At least every two hours to verify that entry operations are consistent with the terms of the permit and that acceptable entry conditions are maintained;
- C. Prior to re-entry following a scheduled break lasting 30 minutes or more;
- D. As requested by the attendant to deal with unauthorized individuals;
- E. When a condition not listed on the permit arises (this requires close out of existing permit, re-evaluation of the space, a new permit with control/elimination measures for the new condition); and
- F. During any evacuation or other emergency.

Authorized Entrants: Authorized Entrants shall be assigned by the Shop Foreman and shall have the training and experience necessary to:

- A. Know and understand all provisions of this Confined Space Entry Program and the UIUC Confined Space Entry Program;
- B. Request a Confined Space Entry Permit from the Supervisor for entry and/or work to be performed in permit required confined spaces;
- C. Implement the precautions identified on the Confined Space Entry Permit prior to entry.
- D. Obtain the approval of the Supervisor prior to entry;
- E. Know the hazards that may be present or exist during entry, including: Information on the routes of potential exposure (e.g., inhalation, skin contact, etc), signs or symptoms, and the consequences of the exposure;
- F. Properly use all the required equipment;
- G. Properly wear chest or full-body harnesses, and in certain circumstances, wristlets, as retrieval equipment;
- H. Alert the Attendant whenever you recognize any warning sign or symptom of exposure to a dangerous situation or detect a condition that is not allowed by the permit;
- I. Evacuate the permit space as quickly as possible if:
 - a. An order to evacuate is given by the Attendant or the Supervisor;
 - b. The Entrant recognizes any warning sign or symptom of exposure to a dangerous situation;
 - c. The Entrant detects a condition that is not allowed by the permit; or
 - d. An evacuation alarm is activated; and
- J. Return the confined space entry permit to the Supervisor when the work is completed.

Attendants: Attendants shall be assigned by the Shop Foreman and shall have the training and experience necessary to:

- A. Know and understand all provisions of this Confined Space Entry Program and the UIUC Confined Space Entry Program;
- B. Know the hazards that may be present or exist during entry, including information on the routes of exposure (i.e. inhalation, skin contact, etc.), signs or symptoms, and consequences of the exposure;
- C. Be aware of the possible behavioral effects of hazard exposure in authorized entrants;
- D. Monitor and maintain the safety of the Authorized Entrants inside the confined space at all times;
- E. Continuously maintain an accurate count of the Authorized Entrants in the permit space;
- F. Remain outside the permit space during operations until relieved by another Attendant. If relieved by another Attendant, provide a complete status of conditions and personnel in the confined space;
- G. Post the permit on or near the confined space and assure that the conditions stipulated on the permit are being met. Warn unauthorized persons to stay away from the space;
- H. Know how and where to activate the rescue service requirements;
- I. Communicate with Authorized Entrants as necessary to monitor the entrant status and to alert entrants of the need to evacuate the space;
- J. Order the evacuation of the confined space if:
 1. A condition which is not allowed on the permit is observed;
 2. The Authorized Entrant exhibits behavior effects indicative of hazard exposure;
 3. A situation outside the space is detected which could endanger those who are working inside the space;
 4. An uncontrolled hazard is detected inside the space; or
 5. The Attendant can not effectively and safely perform all of the required duties;
- K. Render any medical aid that can be done safely;

- L. An attendant should never enter a confined space in an emergency unless they are equipped and trained with suitable emergency equipment and back up personnel; and
- M. Perform no duties that might interfere with the primary duty to monitor and protect the Authorized Entrants.

(Note: Passing tools to Authorized Entrants and monitoring the atmosphere of the permit space are permitted provided the Attendant does not break the plane of an opening into a confined space.)

Confined Space Competent Person: The Confined Space Competent Person for F&S is a Safety Officer who is located in the Division of Safety and Compliance. The Confined Space Competent Person shall have all of the training and experience necessary to:

- A. Understand the requirements of this Confined Space Entry Program, the UIUC Confined Space Entry Program, and applicable OSHA regulations;
- B. Create, maintain, revise, implement, and enforce this Confined Space Entry Program;
- C. Attend training, as needed, to enforce the requirements of this Confined Space Entry Program;
- D. Identify personnel who require confined space entry training;
- E. Train or arrange training for all affected personnel on the requirements of this Confined Space Entry Program;
- F. Coordinate training for supervisors, attendants, and entrants in accordance with the requirements outlined in **Section XI Training Requirements**;
- G. Ensure that the requirements of this Confined Space Entry Program are followed; and
- H. Maintain a training record for all employees that have been trained in the components of this Confined Space Entry Program.

IV. SPACE EVALUATION

Identification and Classification

Each space that has not been previously classified or may changes have been made to the space that could alter the classification shall be evaluated by an Entry Supervisor using the Procedures for Atmospheric Testing (Appendix A) and the Space Evaluation Form (Appendix B). Once the Entry Supervisor has completed the Space Evaluation Form, it shall be given to the Confined Space Competent Person for review and approval. The Confined Space Competent Person shall maintain a copy of the Space Evaluation Form and log the information into an electronic database. Based on the Space Evaluation Form, each space shall be classified as:

- Non-Permit Required Confined Space (see Section V);
- Permit Required Confined Space (see Section VI);
- Alternate Entry Procedures Confined Space (see Section VII); or
- Special Procedures Space (see Section VIII).

Signage

Once a space has been evaluated and classification has been approved, a sign shall be placed on each Permit Required Confined Space and Alternate Entry Procedures Confined Space and the space shall be secured from unauthorized entry. The sign shall state "DANGER - PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" or similar language in the vicinity of the space or by some other effective means to prevent unauthorized entry.

Reclassification of Permit Space

A Permit Required Confined Space and Alternate Entry Procedures Confined Space may be reclassified as a Non-Permit Required Confined Space if the space:

- Possesses no actual or potential atmospheric hazards and all other hazards can be eliminated without entry in to the space; or
- Previous testing and inspection of the permit space demonstrates that all hazards within have been eliminated.
- Meets and continues to meet the requirements identified in Section II and IV of the Non-Permit Entry Reclassification Form located in Appendix C.

Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards.

In order to reclassify a permit space an Entry Supervisor must fill out the Non-Permit Entry Reclassification Form and submit it to the Confined Space Competent Person for approval. The completed Non-Permit Entry Reclassification Form must be maintained on file for review by potential entrants. Signage shall be removed from the space upon approval of the Non-Permit Reclassification Form.

V. NON-PERMIT REQUIRED CONFINED SPACES

A Non-Permit Required Confined Space is a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm. Non-Permit Required Confined Spaces do not require written permits, attendants, special testing, or special training for entry. Entrants are required to verify that there are no changes in condition within the space that have created or have the potential to create a hazard.

VI. PERMIT REQUIRED CONFINED SPACES

Permit Required Confined Spaces have known or potential hazards. An Entry Permit is required for entry into Permit Required Confined Spaces. Additional requirements for entry into a Permit Required Confined Space are detailed below.

Acceptable Entry Conditions

Known or potential hazards must be eliminated or controlled prior to entry through the use of engineering, controls, administrative controls and/or personal protective equipment. Additional details of acceptable entry conditions are included on the Entry Permit located in Appendix D. Methods for adequately controlling and/or eliminating hazards follow:

- Isolation – The process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages. Additional information can be found in the F&S Lock-out/Tag-out Procedures for Isolating Machines from Energy Sources.
- Flushing and Inerting – In confined spaces with atmospheres that are flammable or have atmosphere that are immediately dangerous to life and health (IDLH), elimination of the hazardous atmosphere is

required. This can be done through flushing with forced air or inerting with a noncombustible gas such as nitrogen. Note that inerting may result in an oxygen-deficient atmosphere.

- **Verification Monitoring** – Monitoring of the atmosphere must be conducted prior to entry. Constituents must be monitored in accordance with Procedures for Atmospheric Testing located in Appendix A. Acceptable constituent levels are listed on the Entry Permit (Appendix D). Periodic air monitoring throughout entry is required, although continuous monitoring is recommended. Monitoring results are to be recorded on the Entry Permit at least every hour or more often if conditions warrant by either the Attendant or Entry Supervisor and verified by the Entry Supervisor at least every two hours. Continuous monitoring is required when isolation of the space is infeasible. See for Atmospheric Testing located in Appendix A for more details.

Permitting System

Confined Space Entry Permits (Appendix D) must be filled out prior to each entry into a permit required confined space. A new permit is required for each new work shift.

Preparation

Prior to entry into a permit required confined space, an Entry Permit must be completely filled out, signed by an authorized Entry Supervisor, and posted at the entry to the confined space.

Issue/Use

Work conducted in a permit required confined space shall not deviate from the requirements identified on the Entry Permit including work activities to be conducted, time to conduct work, and equipment to be used.

Concluding Operations/Canceling Permits

Once entry operations are complete all entrants must evacuate the space, the space must be closed/sealed up to pre-entry conditions, and the Entry Supervisor must cancel the permit. Entry must not exceed the expiration date and time indicated on the Entry Permit. Cancellation of the Entry Permit by the Entry Supervisor is also required when activities or situations arise that are not allowed by the Entry Permit.

The canceled Entry Permit shall be given to the Confined Space Competent Person for review. Canceled Entry Permits shall be maintained by the Confined Space Competent Person for a minimum of one year.

Disclosure

Each Authorized Entrant and/or their authorized representative must have the opportunity to observe the completed permit, pre-entry monitoring or testing of the permit space prior to entry, and subsequent monitoring or testing of the permit space. The permit space must also be reevaluated in the presence of the Authorized Entrant or their authorized representative upon their request.

Coordination with Contractors

Contractors are responsible for identifying, evaluating, and classifying spaces that their employees will enter. All available information will be provided by F&S to contractors about spaces to be entered. Contractors shall not reclassify a permit space to non-permit space without a written justification and concurrence by S&C or applicable departmental safety personnel. Contractors must have and implement their own Confined Space Program and provide their own equipment. Contractors must debrief their F&S contact about hazards identified during their evaluations, methods of control and/or elimination of hazards, and any issues encountered during entry.

If F&S personnel will be working in the same space as contractor personnel, then each group will conduct work in accordance with their own Confined Space Entry Programs. F&S and the contractor must each provide an Entry Supervisor.

A single Attendant from either group is acceptable as long as both Entry Supervisors agree on the duties of the Attendant and proper communication is maintained between the Attendant and Entrants. This information must be documented on both Entry Permits. Only one group will need to conduct pre-entry air monitoring and other hazard control/elimination activities as long as both Entry Supervisors agree with the results and that the requirements of both Entry Permits are satisfied.

Barriers

Barriers must be used during permit required confined space entry to prevent unauthorized entrance and protect personnel participating in the entry from external hazards such as overhead hazards and vehicular traffic.

Attendants

At least one Attendant must be present for each permit required confined space entry to verify that conditions in the permit space are continuously acceptable for entry throughout the duration of the authorized entry. The Attendant can monitor more than one ingress/egress point as long as they are able to adequately perform their duties. Monitoring of multiple spaces by a single attendant is prohibited.

Entry Supervisor

Each entry requires an Entry Supervisor who is responsible for determining hazards, hazard mitigation actions, signing the permit to initiate the entry, and canceling the entry. The Entry Supervisor may also serve as either an entrant or attendant.

VII. ALTERNATE ENTRY PROCEDURES

Alternate Procedures may be used for entering a confined space if it can be demonstrated that the only hazard faced by employees entering the space is an actual or potential atmospheric hazard that can be controlled using continuous forced air ventilation.

Once a space has been identified and approved as an Alternate Entry Procedures space using the Space Evaluation Form (Appendix B), the Alternate Entry Procedures form (Appendix E) shall be utilized to document the appropriate mitigating measures that must be taken to eliminate non-atmospheric hazards. Pre-entry and periodic air monitoring must be conducted and documented during each Alternate Entry Procedures entry and the F&S Safety Officer must verify that the space still meets all of the conditions for an Alternate Entry Procedures space.

If hazards are introduced into the space as part of the entry, the space shall be evaluated considering these hazards. If the introduced hazards can not be controlled using continuous forced air ventilation the space shall be considered a permit required confined space. See Section VI for requirement for PERMIT REQUIRED CONFINED SPACES.

Once non-atmospheric hazards have been eliminated and atmospheric hazards are controlled, Alternate Entry Procedure spaces do not require the use of the Entry Permit or Attendant. Training is still required for personnel participating in entry into Alternate Entry Procedure spaces.

VIII. SPECIAL PROCEDURES

Special Procedures spaces are spaces that are unique and do not necessarily fall into one of the other three categories of confined spaces and following typical procedures for Permit Required Confined Spaces or Alternate Entry Procedures would be more hazardous to the Entrants. Special Procedures will be written on an as needed basis, providing detailed information for safe entry into a specific space.

Sewers contain unique hazards and are among the permit spaces that Special Procedures will need to be written. Appendix F Special Considerations for Sewer Entry contains information that should be reviewed and used in the production of the Special Procedure.

IX. EQUIPMENT

Equipment required during a permitted entry must be listed on the permit and may include:

- A. Atmospheric testing and monitoring equipment;
- B. Forced air ventilation equipment;
- C. Communications equipment;
- D. Lighting equipment needed to enable employees to work safely within the permit space and exit said space quickly in the event of an emergency;
- E. Barriers and shields necessary to prevent pedestrian and vehicular access;
- F. Ladders;
- G. Rescue equipment such as fall arrest systems and retrieval devices as required in **Section X RESCUE AND EMERGENCY PROCEDURES**; and
- H. Miscellaneous personal protective equipment (PPE) such as eye protection, foot protection, head protection, etc. as necessary to work safely within the confined space.

Personnel must be trained on the proper use of the equipment and equipment must be inspected prior to each use. Atmospheric Monitoring equipment can be checked out from the Electricians Shop. If the atmosphere needs to be tested for constituents other than carbon monoxide, oxygen, hydrogen sulfide, and lower flammability limit please contact S&C at 265-9828 for assistance. The rest of the equipment can be checked out from the Tool Room. Most PPE can be obtained from Campus Stores or ordered through one of the F&S preferred vendors for safety equipment and supplies.

X. RESCUE AND EMERGENCY PROCEDURES

The UIUC Emergency Rescue Services are the Champaign and Urbana Fire Departments depending upon your location on campus. The appropriate fire department must be contacted prior to entry into a permit space. The Urbana Fire Department non-emergency phone is 384-3420 and the Champaign Fire Department non-emergency phone is 403-7200.

Emergency Evacuation Procedures

In the event of an emergency, the Attendant will notify the Entrants of the need to evacuate. The Attendant will also notify the Entry Supervisor and, if necessary, the UIUC Emergency Response Service by calling **911**. The Entry Supervisor will cancel the entry permit. If re-entry is to be performed, a new permit must be used.

See the Section below on **Rescue Procedures** if Entrants are unable to evacuate the space on their own.

Rescue Procedures

If a rescue is required:

- The Attendant must immediately contact the UIUC Emergency Response Service by calling **911**;
- The Attendant will attempt to evacuate the Entrant(s) using non-entry retrieval methods;
- The Attendant will provide the UIUC Emergency Response Service with the number and location of the Entrants in the space, the reason emergency rescue is required, the hazards associated with the space, and provide them with the permit to review; and
- All personnel will follow the instructions of the UIUC Emergency Response Service commander upon their arrival.

XI. TRAINING REQUIREMENTS

All F&S personnel who are involved in entry into Permit Required Confined Spaces, Alternate Entry Procedures spaces, and Special Procedure spaces must attend confined space training provided by S&C. F&S personnel who will act as an Entry Supervisor must attend additional S&C-approved confined space training. Personnel entering Non-Permit Required Confined Spaces are not required to attend training.

Training Frequency

F&S personnel are required to attend training prior to their first work assignment associated with a confined space. Additional training is required when there is a change in assignment, operation, procedures, or the Entry Supervisor and/or Confined Space Competent Person determine additional training is required for safe operations.

Documentation

F&S personnel attending the confined space training provided by S&C will be required to sign-in with their name, signature, and badge number. Personnel attending the additional training through an outside consultant must provide a copy of the attendance sheet or completion certificate to S&C. Sign-in sheets and certificates will be scanned for electronic filing. Training information will be stored in the S&C training database.

XII. CONFINED SPACE PROGRAM REVIEW

The Confined Space Competent Person shall review the F&S Confined Space Program at least annually and revise as needed. The review shall include canceled permits, this Program document, and input from F&S personnel involved in confined space entry. Additional reviews may be warranted based on unauthorized entries, violations of Entry Permit requirements, failure to identify and isolate/eliminate hazards prior to entry, and complaints that the requirements of this Program document including attached forms and procedures are inadequate.