HUMBOLDT STATE UNIVERSITY

Confined Space Program

(A Component of the Facilities Management Injury & Illness Prevention Program)

Adopted: 23 March 2016

FACILITIES MANAGEMENT CONFINED SPACE PROGRAM

ATTACHMENTS

- Hazard Identification Form (Attachment A)
- Potential Confined Space Evaluation Form (Attachment B)
- Confined Space Entry Permit (Attachment C)
- Confined Space Non-Permit Required Entry Plan (Attachment D)

Introduction

It is the policy of Facilities Management to provide its employees with a safe and healthful workplace. The following comprises a Facilities Management-specific Confined Space Program as a compliment to its adopted Injury & Illness Protection Plan. The following Confined Space Program is in compliance with the University-wide Program but also more specific to the day-to-day operational activities of Facilities Management. All Facilities Management employees are required to ensure standard operating procedures associated with this Program are followed. Definitions not specifically outlined herein are included at the end of this document.

Purpose & Description

The purpose of the Confined Space Program is establish, implement, and maintain an effective program so as to fully comply with OSHA regulations as outlined in CCR Title 8 § 5156-5158 while ensuring personnel work safely in and around *confined spaces*.

A **Confined Space** is defined as a space with **all three of these** characteristics:

1. It is large enough and so configured that a person can bodily enter and perform assigned work; **and**
2. It has limited or restricted means for entry or exit; **and**
3. It is not designed for continuous human occupancy.

A confined space is classified, depending on the type of hazards present, as either:

- **Permit-Required Confined Space (PRCS)** which is defined as a confined space having **one or more** of the following characteristics:
    - Contains or has a potential to contain a hazardous atmosphere. o Contains a material that has the potential for engulfing an entrant.
    - Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section.
    - Contains any other recognized serious safety or health hazard.
- **Non-Permit-Required Confined Space (NPRCS)** which is defined as a confined space that does not contain or have the potential to contain any atmospheric or other hazard capable of causing death or physical harm. A NPRCS may become a Permit-Required Confined Space if hazardous materials are brought into the space or if hazardous activities are conducted in the space.

Spaces classified as a PRCS may pose the potential for

- A *hazardous atmosphere*
- *Oxygen-deficient atmosphere*

- *Engulfment*
- Proximity to electrical equipment, which poses a risk for electric shock
- Proximity to a mechanical device with exposed moving parts, which poses a risk for injury
- Due to the small size of the work area, all confined spaces pose a risk for such injuries as bumps, scrapes, and lacerations

Certain types of hazards pose more than one type risk. For example, the presence of gasoline vapor poses two types of risk because it is both flammable and toxic.

Confined space program requirements include training that supports accurate identification and mitigation of hazards posed by both the confined space and the work that will be performed in it. Every entry must be documented. The required form or permit provides guidance and serves to keep the confined space inventory up to date.

Confined space program requirements apply to any person who is involved in the *entry* of a confined space on University property whether it be owned or leased.

Roles & Responsibilities

There are a variety of roles personnel must perform as part of a successful confined space program. The roles and their corresponding responsibilities are defined below. Roles will be assigned to specific individuals depending upon the responsibility and assignment associated with managing, supervising or conducting work in association with this program.

Confined Space Program Manager

The Facilities Management Confined Space Program Manager maintains authority, as delegated by Risk Management, and is responsible for implementing and ensuring the following:

- Develops program requirements and training
- Approve/certifies confined space entry supervisors as designated by Facilities Management
- Works collaboratively with confined space entry supervisors to survey and profile confined spaces to determine classification (NPRCS or PRCS), hazards, and controls
- Advises confined space entry supervisors on procedures and protocols to ensure compliance with current adopted policies and procedures.
- Maintains the confined space inventory in conjunction with Risk Management.
- Provides completed forms and closed permits to Risk Management who retains such for one year, except those used by subcontractors.
- Reviews, in conjunction with Risk Management, closed permits and other forms at least annually to identify any program deficiencies.
- Conducts, in conjunction with Risk Management and the Facilities Management leadership team, an annual review of the program and updates, as needed.
- Reviews subcontractor programs to ensure their programs are OSHA or Cal/OSHA compliant.
- Ensure confined spaces are properly posted. Reports deficiencies to Facilities Management and works collaboratively with Facilities Management to ensure signage is properly updated.
- Develop an appropriate maintenance schedule for each piece of equipment specifically associated with confined space entries and ensures such is properly utilized (i.e., air monitors, full body harnesses, lifelines, tripods, hoists, respirators, and any other types of personal protective equipment, etc.,)

Facilities Management- Managers & Unit Leaders

Facilities Management Managers and Unit Leaders maintain authority, as delegated by the Associate Vice President, Facilities Management, and are responsible for implementing and ensuring the following:

- Designates Confined Space Supervisors and communicates such designation to the Facilities Management Confined Space Program Manager.
- Ensures appropriate training in confined space operations and use of corresponding equipment is completed as required for those employees under a Facilities Management Manager or Unit Leader's supervision.
- Ensures provision of required equipment for confined space operations and that such is utilized by personnel as required.
- Reports any changes in the confined space profile to the Confined Space Program Manager.
- Forwards all completed and closed plans and permits to the Confined Space Program Manager.

Confined Space Entry Supervisors

Confined Space Entry Supervisors are responsible for determining if acceptable entry conditions are present for entry, for authorizing entry, overseeing entry operations, and closing any permit-required confined space operations. These individuals maintain authority, as delegated by the Facilities Management Manager/Unit Leader, and are responsible for implementing and ensuring the following:

- Ensures all required training is completed and current for:
- confined space operations for role as assigned; and
- corresponding procedures including proper operation of equipment and protocols.
- For all NPRCS, reviews the entry form and confirms absence of potentially hazardous conditions.
- Profiles newly discovered or created confined spaces. Consults with and reports such to the Confined Space Program Manager and Facilities Management Manager/Unit Leader as needed to finalize profile determination.
- Oversees all PRCS entries as follows:
- Identifies hazards which may occur during a specific entry including potential signs, symptoms, and consequences of a potential exposure.
- Verifies all specified tests, procedures and equipment conducted or in place before certifying pre-entry and allowing entry.
- Verifies non-entry rescue procedures are in place prior to entry.
- Ensures atmospheric test equipment is adequate for the anticipated hazards and has been properly calibrated.
- Remains outside the space throughout the confined space operation unless relieved by another Confined Space Entry Supervisor.
- Terminates the entry and permit when confined space operations covered by the permit have been completed or a condition not allowed under the permit arises in or near the confined space.
- Prevents unauthorized individuals from entering the confined space during operations.
- Determines, whenever responsibility for a permitted confined space entry operation is transferred and the work 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.

- Debrief entrants and attendants following operations.
- Forward all closed permits and corresponding completed forms to the responsible Facilities Management Manager or Unit Leader

Confined Space Operations Attendants

Confined Space Operations Attendants are those individuals designated to remain outside the confined space to monitor conditions for any health or safety impacts and perform duties specified on the Plan or Permit. These individuals maintain authority, as delegated by the Facilities Management Manager/Unit Leader, and are responsible for implementing and ensuring the following:

- Ensures all required training is completed and current for:
- confined space operations for role as assigned; and
- corresponding procedures including proper operation of equipment and protocols.
- Understanding hazards which may be encountered during the confined space operation, including behavioral/physiological symptoms and health effects should overexposure occur.
- Monitors activities inside and outside the confined space operations area to determine entrance safety.
- Maintains an accurate account of entrants in the PRCS operations area.
- Maintains communication with entrants to monitor work activities and sound an alert if evacuation becomes necessary.
- Remains outside the confined space during operations unless relieved by another Confined Space Operations Attendant.
- Does not perform other activities which may interfere with the primary job of monitoring safety and condition of entrants currently in the confined space.
- Performs non-entry rescue, if necessary.
- Forwards completed confined space entry forms to the responsible Confined Space Entry Supervisor.

Confined Space Operation Entrants

Confined Space Operation Entrants are those individuals determined to be physically capable of performing work in a confined space and who have the appropriate training for such. These individuals maintain authority, as delegated by the Facilities Management Manager/Unit Leader, and are responsible for implementing and ensuring the following:

- Ensures all required training is completed and current for:
- confined space operations for role as assigned; and
- corresponding procedures including proper operation of equipment and protocols.
- Understands the hazards which may be encountered during the confined space operations, as well as symptoms and health effects if overexposure occurs.
- Properly operates any equipment required for the safety of the entry operation.
- Actively maintains communication with the Confined Space Operation Attendant.
- Notify the Confined Space Operations Attendant of any indication of a dangerous situation or *prohibited condition* and exits the confined space immediately.

- Exits the confined space as quickly as possible as instructed by the Confined Space Operations Attendant or the Confined Space Entry Supervisor. • Forwards completed forms to the responsible Confined Space Operations Attendant.

Facilities Management Managers/Unit Leaders/Project Managers

Facilities Management Managers/Unit Leaders, and Project Managers must make information in the Confined Space Inventory available to all Contractors, Subcontractors and Service Providers. Said outside providers shall be responsible for conducting their own confined space entry operation based on their organization's adopted safety program, ensuring that said program meets or exceeds University requirements.

Confined Space Inventory

Inventory Maintenance

The Confined Space Program Manager, in conjunction and collaboration with Risk Management, is responsible to maintain the University's Confined Space Inventory, which includes all identified confined spaces including their specific profile and known hazards and also provides the basis for entry method selection. Confined spaces named in the inventory shall be properly signed as defined in Table 1.

All profiles include the following information:

- Building, Room and/or Other Appropriate Location Information utilizing Data from FacilitiesLink
- University Entity Responsible for Maintenance of the Location
- Dimensional Criteria
- Description of the Space
- Description of the Space's Hazards and Controls
- Confined Space Classification (PRCS or NPRCS)

The Confined Space Program Manager must keep the inventory current by reviewing forms and permits for all confined space entries, evaluating new or created spaces, and auditing the inventory regularly.

Newly Identified Confined Spaces

Upon creation or discovery of a new or suspected confined space:

- The employee discovering a new potential Confined Space shall submit a Hazard Identification form (Attachment A) to their Supervisor. The Supervisor shall be responsible to submit the form to their Facilities Management Manager.
- Upon notification, the Facilities Management Manager shall be responsible to submit a work order and coordinate evaluation with the Confined Space Program Manager using the Potential Confined Space Evaluation Form (Attachment B).
- In collaboration with Facilities Management and Risk Management, the Confined Space Program Manager shall evaluate the confined space and, if determined to be a confined

space, ensures such is added to the confined space inventory and is updated in University space and facility management systems.

- The Confined Space Program Manager shall ensure the confined space is identified with signage, as outlined in Table 1, appropriate to the space classification.

Confined Space Entry Operations

Purpose

The purpose of these procedures is to ensure that entry into any confined space is planned and documented as required in order to identify and control hazards. The procedure contained herein covers entry method selection, planning, and documentation of entry into confined spaces of both classifications (PRCS, NPRCS). These procedures apply to all personnel associated with a confined space entry or assigned a specific role associated with such.

Entry Procedure

Requirements for entering a confined space depend on the hazards present as determined by information in the confined space inventory, by the work required in such space and by observation of the conditions associated with such.

All entries must be reviewed and confirmed as described below and stated in the *permit*. To ensure entry conditions are acceptable, permits are good for one day only. For work lasting more than one day, a separate permit is required. Any individual may terminate an entry and initiate a new evaluation for potential hazards if work operations or conditions change that increase a hazard or if new hazards are identified.

The two-person rule applies to all confined space entries; that is, every confined space entry requires the presence of at least two qualified persons.

Permit Required Confined Space Entry

A Permit-Required Confined Space (PRCS) entry applies when hazards are judged to be present. Entry into the PRCS must follow the established entry procedures as discussed herein and be controlled by a University-issued Confined Space Entry Permit (Attachment C) or equivalent Contractor/Service Provider permit as reviewed and approved by the University. All entries are administered by the Confined Space Program Manager in conjunction with the Confined Space Entry Supervisor. The applicable permit requires that all hazards are listed and specifies the required controls to mitigate or eliminate each hazard.

Non-Permit Required Confined Space Entry

Non-Permit Required Confined Space (NPRCS) entry applies when no hazards are present. This is established by completion of the Confined Space Non-Permit Required Entry Plan (Attachment B), which requires a Confined Space Entry Supervisor or the Confined Space Program Manager confirm no hazards exist and none will be introduced during operations.

Entry Method Selection

There are two possible methods of confined space entry; non-permit required and permit required. The required method depends on the confined space classification (NPRCS or PRCS), identified hazards listed in the confined space inventory, and hazards introduced by the work to be completed. Each type of entry requires a permit or a plan dependent upon the operations and space involved. Permits and plans are developed as described below.

Step	Person	Action
1.	Confined Space Entry • Supervisor/ Entrant/ Attendant or Work • involving Contractors or Service Providers	If the confined space is identified with a posting, use identifying information to check the confined space inventory for profile information. If the space is listed in the inventory but not posted, contact the Confined Space Program Manager to request posting of such. If the work space is not posted and not listed in the inventory, it shall be considered a potential new confined space. Contact the Confined Space Program Manager.
2.	Confined Space Entry Supervisor	• Determines or confirms applicable entry method and whether a permit or plan is required. Submits such documents to the Confined Space Program Manager for review and approval prior to operations being undertaken.
3.	Confined Space Program Manager	• Updates the confined space inventory when new confined spaces or hazards are reported and confirmed to exist. • Ensures identifying information is available at the confined space location. • Reviews and approves plans and issues permits where applicable.

Entry Procedure for Permit-Required Confined Space (PRCS)

Step	Person	Action
Planning		
1.	Confined Space Entry Supervisor	• Determines if non-entry rescue can be performed and that such does not pose a risk per regulations. This shall entail conducting a hazardous analysis of the retrieval mechanism to be utilized under this permit and for this space. If non-entry rescue cannot be achieved, entry is prohibited and the Confined Space Program Manager is contacted for further advice.
2.	Confined Space Entry Supervisor	• If entry is allowed, determines control measures for hazards associated with the confined space entry.
3.	Confined Space Entry Supervisor	• Verifies all required equipment, attendants, documentation and entrants are available.
Pre-Entry		
4.	Confined Space Entry Supervisor	• Documents the pre-entry process based on the Confined Space Entry Permit or equivalent Contractor/Service Provider HSU-approved permit

5.	Confined Space Entry Supervisor	• Ensures the confined space's atmosphere is ventilated as necessary and tested prior to entry using properly calibrated monitoring equipment. (For assistance with obtaining monitoring equipment, contact the Confined Space Program Manager.) • Results for the following must be recorded on the permit: • Oxygen • Flammability (percent of lower explosive limit) • Hydrogen sulfide • Carbon monoxide • Any other suspected or known atmospheric hazard • If at any time the oxygen concentration falls below 19.5 percent, the cause of the deficiency must be determined and controls must be in place before entry is allowed. If entry is necessary to correct the deficiency, self-contained breathing apparatus must be worn. *Note: The entrant has the right to witness atmospheric testing.*
6.	Confined Space Entry Supervisor	• Secures the work site as appropriate. • Installs barriers and/or controls vehicular and pedestrian traffic as needed. • Posts warning signs and any required permit(s) at the work location. • Takes measures to prevent hazards near the confined space.
7.	Confined Space Entry Supervisor	• Conducts pre-entry briefing for all personnel involved in the entry that includes at minimum the following topics: • Work to be performed • Anticipated hazards, including signs, symptoms and consequences of exposure • Hazard control measures • Prohibited conditions as specified in the permit • Non-entry rescue procedures which generally involve using a full-body harness with a retrieval line attached to a mechanical device or fixed point.
8.	Confined Space Entry Supervisor	• Verifies all control measures, procedures, and equipment specified by the permit are in place. • Verifies entry conditions are acceptable. • Notifies UPD and the Arcata Fire Department prior to start of operations. • Establishes the non-entry rescue plan.
9.	Confined Space Entry Supervisor	• Signs the pre-entry certification section of the permit.
Entry		
10.	Confined Space Operation Entrant	• Enters the permit-required confined space only if: • Listed on the permit

		• Entry conditions are acceptable • All control measures and specified non-entry rescue provisions are implemented
11.	Confined Space Entry Supervisor	• Verifies acceptable entry conditions are maintained and entry operations remain consistent with terms of the permit and the hazards associated with the planned work.
12.	Confined Space Operation Attendant	• Maintains communication with confined space operation entrant(s) and performs no other duties which may interfere with his or her ability to observe and protect the confined space operation entrant(s). • Controls entry by remaining at the site and maintaining an accurate accounting of confined space operation entrants as listed on the permit. • Does not become a confined space operation entrant unless he or she is listed on the permit as a potential confined space operation entrant and has been properly replaced by a qualified confined space entry attendant.
13.	Confined Space • Operation Entrant •	Maintains communication with the confined space operation attendant. Maintains readiness to exit if ordered by the confined space operation attendant.
14.	Confined Space Operation Attendant	• Orders confined space operation entrant(s) to evacuate the space if one or more of the following occurs: • Detects a prohibited condition • Observes any behavioral effects of exposure to any hazard • Identifies a situation that may endanger the confined space operation entrant(s) • Becomes unable to effectively and safely perform all required duties
Post-Entry		
15.	Confined Space • Entry Supervisor •	Conducts a post-entry debriefing with all confined space operation entrants and attendants. Notify UPD and Arcata Fire Department when operations are complete.
16.	Confined Space Entry Supervisor	• Closes the permit by signing the permit closure section as warranted: • At the completion of the job • At the end of the work shift • When a change occurs in work conditions or methods that requires additional controls • When a changes occurs that affects acceptable entry conditions • If the permit is closed due to a new hazardous condition, a new permit is required.
17.	Confined Space Entry Supervisor	• Forwards the permit to the Confined Space Program Manager
18.	Confined Space Program Manager	• Reviews and files the permit. • Updates the confined space inventory if necessary. • Maintains records of all permits for at least one year from date of entry.

Entry Procedure for Non-Permit Required Confined Space (NPRCS)

Step	Person	Action
1.	Confined Space Operation Entrant and/or Attendant	• Completes Confined Space Non-Permit Required Entry Plan (Attachment B) or equivalent subcontractor's HSU-approved form to establish that the confined space still qualifies as non-permit required and that no hazardous work[1] will be performed.
2.	Confined Space Entry Supervisor	• Before any confined space work begins, confirms NPRCS entry conditions by signing the Confined Space Non-Permit Required Entry Plan or determines that another entry method applies.

3.	Confined Space Operation Entrant and/or Attendant	• Takes precautions, as necessary, to conduct operations safely. • Installs vehicular and pedestrian traffic controls as needed. • Posts warning signs and any required permit at the work location. • Takes measures to prevent hazards near the confined space. • Properly utilizes required personal protective equipment or other safety equipment required to conduct operations safely.
4.	Confined Space Operation Entrant and/or Attendant	• Performs authorized work. • It is recommended that one person remain outside the confined space throughout operations. • If a hazardous condition is encountered, evacuates immediately and reports such to their immediate supervisor or manager.
5.	Confined Space Entry Supervisor	• Once operations are complete, signs the Confined Space Non-Permit Required Entry Plan and forwards such to the Confined Space Program Manager.
6.	Confined Space • Program Manager	Reviews and files the Plan. • Updates the confined space inventory if necessary. • Maintains records of all Plans for at least one year from date of entry.

[1] Hazardous work includes painting, cleaning with acids or solvents, welding, brazing, torch cutting, sanding with power tools, sandblasting, breaking utility lines, using cryogenic gases, conducting work that involves reduction-oxidation reactions, or operating valves capable of releasing material, such as water or gas, in a quantity sufficient to engulf a person or cause a hazardous atmosphere. A signed and approved *hot work* permit is required for any spark or flame-producing activities to be done in the space. Proper lock out/tag out procedures must be in place where applicable, and must be performed by authorized persons properly trained.

Rescue

All permit-required entries must have a non-entry rescue plan and retrieval system in place prior to entry. The University does not maintain an active confined space entry rescue team. As such, entry rescue by campus personnel is not authorized. Arcata Fire Department is the designated rescue team and must be notified, along with the University's Police Department, prior to entry to coordinate the need for a potential rescue. The Arcata Fire Department and the University Police Department must also be contacted when operations are complete or at the end of each shift and no rescue was needed. When entry rescue is required, the following actions will be taken:

1. Call 911 or the University Police Department (826-5555) to convey the need for a confined space entry rescue team and details regarding the location and situation. The University Police Department will contact Arcata Fire Department or other Humboldt county confined space entry rescue team for assistance.
2. Attempt to perform non-entry rescue per non-entry rescue plan.
3. Notify the Manager/Unit Leader responsible for personnel involved in the confined space entry.
    a. The Manager shall notify the Associate Vice President- Facilities Management and Risk Management & Safety Services immediately.
4. Prevent entry into the confined space unless by authorized confined space entry rescue team members.

Preventing Unauthorized Entry

The Confined Space Program Manager is responsible to post identifying signage at the entrance of each confined space as specified in Table 1.

Additional safety and security measures can also be taken to prevent entry. The following are examples of such measures:

- Engineering controls such as o Locking or bolting the entrance.
  - o Making access to the entrance difficult without the use of tools, heavy equipment, or several workers. o Welding the entrance shut.
- Administrative controls such as ensuring personnel are trained to recognize hazards or PRCS conditions

Personnel

All confined space entries must follow the two-person rule and be carried out by qualified persons as follows:

- All PRCS entries must be supervised by a Confined Space Entry Supervisor and carried out by workers who are current in the training required at the confined space operation attendant or entrant level.
- For NPRCS entries, the minimum qualification is that both workers are current in the training required at the confined space operation attendant or entrant level.

Equipment

Equipment used for confined space entry (i.e., *air monitor*s, full body harnesses, lifelines, tripods, hoists, respirators, and any other types of personal protective equipment, etc.,) must be properly maintained and inspected. The Confined Space Program Manager shall be responsible to develop an appropriate maintenance schedule for each equipment type and ensure such is properly implemented.

Recordkeeping

The Confined Space Program Manager will compile all closed Confined Space Entry Permits and all completed Confined Space Non-Permit Required Entry Plans and retain such for a minimum of one year. Contractors and service providers are responsible for maintenance of their own records.

Training

Confined Space Entry Supervisors

To become eligible to be a Confined Space Entry Supervisor the following courses must be successfully completed with designated courses repeated annually to maintain eligibility:

- Initial Confined Space Supervisor course (offered through North Coast Safety Consortium)
- Annual Refresher SkillPort course(s)

Confined Space Operation Attendants & Entrants

To become eligible to be a Confined Space Operation Attendant and/or Entrant, the following courses must be successfully completed with designated courses repeated annually to maintain eligibility:

- Initial Confined Space Attendant/Entrant course (offered through North Coast Safety Consortium)
- Annual Refresher SkillPort course(s)

Confined Space Entry Supervisors are responsible to ensure any personnel assigned such work are eligible to perform such.

Posting Requirements

Facilities Management is responsible to ensure confined spaces it is responsible for maintaining are properly posted. The Confined Space Program Manager is responsible to ensure such and signage shall be appropriate to the space's classification: Permit-Required Confined Space (PRCS) or Non-Permit Required Confined Space (NPRCS). Requirements and recommendations are listed in Table 1.

Table 1: Confined Space Posting Requirements and Recommendations

Sample Permit Required Signage

Sample Non-Permit Required Signage

Signage Requirements & Recommendations

It is required that signage includes a warning in standard safety signage colors (i.e., DANGER in red and white on a black background).

It is also required that signage include information regarding entry requirements (i.e., permit required or plan required) based on the space classification only. It should be noted that planned operations may dictate override the classification.

It is required the signage must be placed on or near the confined space entrance and be clearly visible and no smaller than 3.5" by 5". Signage must also designate the confined space inventory number assigned to such.

It is recommended the designated confined space inventory number is also included on signage either on, adjacent to or above signage.

Definitions

Acceptable entry condition. Condition that must exist in a permit space to ensure that work can be conducted safely within the space

Air monitoring. The process by which the atmospheric hazards that may confront entrants of a permit space are identified and evaluated

Engulfment. The surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be inhaled to cause death by filling or plugging of the respiratory system or than can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry (into a confined space). When any part of a person's body passes through the plane of the opening of the space.

Entry permit. The document that specifies authorized personnel, required equipment, and air monitoring data for entry into a permit-required confined space

Forced air ventilation. Introduction of air into a confined space before and during entry. Certain circumstances may require local exhaust ventilation to remove contaminants from the space generated at a point source, such as removing fumes from welding in a confined space.

Hazardous atmosphere -or- Potentially hazardous atmosphere. An atmosphere that has the potential to cause death, incapacitation, impairment of ability for self-rescue, acute illness, delayed illness, or effects that can result in injury.

Hot work. Any work that involves burning, welding, riveting, or similar fire-producing operations, as well as work which produces a source of ignition, such as drilling, abrasive blasting, and space heating.

Non-entry rescue. Rescue/retrieval of an entrant from a confined space that is achieved without entry into the space by rescuers. This involves the use of equipment such as a retrieval line, a fullbody harness, and a lifting device or anchor (usually a tripod with mechanical advantage winch).

Oxygen concentration. Normal ambient air contains 20.9 percent oxygen by volume. Deviations – both below this concentration, called deficiency, and above it, called enrichment – constitute a hazard to worker safety. Deviating oxygen conditions include:

- *Oxygen-deficient atmosphere.* Atmosphere in which the oxygen by volume is below 19.5 percent.
- *Oxygen deficiency.* Any measured oxygen concentration less than what is present in normal ambient air. It can be due to the intrusion of an unknown material that dilutes or displaces the available oxygen or by the presence of an oxygen-consuming process such as oxidation

(rust), chemical reactions (including combustion), absorption (on wet activated carbon), or biological action.

- *Oxygen enrichment.* Any measured oxygen concentration greater than what is present in normal ambient air. If the concentration exceeds 20.9 percent, check for an oxygen source inside the confined space such as a leaking welding hose or a chemical reaction.
- *Oxygen-rich atmosphere.* An oxygen concentration in the space of greater than 23.5

percent oxygen by volume.

Prohibited condition. Any condition in permit-required confined space not allowed by the permit governing such operations during the period when the entry is authorized.

Retrieval system. Used to conduct non-entry rescue of persons from confined spaces. This system includes mechanical retrieval or extraction devices (i.e., a rated tripod, davit, or other anchorage plus winch) and full body harness. Wristlets may be used to aid in a difficult extraction but should not be used to support a person's weight.