

Confined Space Entry Program
California State University Bakersfield
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INTRODUCTION

Over 2 million workers enter confined spaces every year. According to accident reports, thirty-nine of those workers die and approximately 5,900 are injured in confined spaces accidents. Most fatalities and injuries occur because employees are unaware of the dangers in confined spaces and are not properly equipped to handle hazardous situations. This program provides procedures for safe entry into confined spaces.

The California Occupational Health and Safety Administration requires employers to provide written procedures for safe entry into and work within confined spaces (8 CCR 5156-5159). Federal regulations contain similar provisions (29 CFR 1910.146). No person shall enter a confined space until an entry hazard evaluation and/or permit has been completed. General and permit entry requirements must be strictly observed at all times during confined space entries.

SCOPE AND APPLICATION

Confined spaces include all areas that:

- a) Are large enough to enter bodily, but have limited or restricted means for entry or exit;
- b) Are not designated for continuous human occupancy; and/or
- c) Contain physical or atmospheric hazards.

Confined spaces may be sewers, pipelines, tanks, boiler compartments, ducts, vaults, pits or bins which could lack oxygen or have dangerous air contamination and be of such configuration that it would be difficult to remove a disabled person. This program applies to all CSUB and contract employees conducting work in confined spaces on the University campus.

DEFINITIONS

Acceptable Entry Conditions

The conditions that must exist to allow entry and to ensure that employees can safely work within a permit-required confined space.

Attendant

An individual stationed outside a confined space who monitors the safety of authorized entrants.

Entrant

An employee who is authorized to enter a confined space.

Entry Permit

A confined space evaluation / entry permit (copy attached) is used for identifying hazards and planning a safe entry into a confined space. An entry supervisor must complete the evaluation/permit prior to authorizing entry into a permit-required confined space.

Entry Supervisor

The entry supervisor determines if acceptable entry conditions are present, authorizes and supervises the entry, and terminates entry operations. An entry supervisor also may serve as an attendant or entrant, as long as that person is trained and equipped as required for each role he or she fills. The duties of the entry supervisor may be passed from one qualified individual to another during the course of an entry operation.

Hazardous Atmosphere

A hazardous atmosphere may expose employees to a risk of death, impaired ability to escape unaided, or physical injury. Hazardous atmospheres are caused by one or more of the following:

- a) Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);
- b) Airborne combustible dust at a concentration that meets or exceeds its LFL (approximated as a condition in which the dust obscures vision at a distance of five feet or less);
- c) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent by volume;
- d) An atmospheric concentration of any substance which could result in employee exposure in excess of permissible exposure limits; and
- e) Any other atmospheric condition that poses an immediate or delayed danger to life or health or that may impair an individual's ability to escape unaided from a confined space.

Isolation

Workers in confined spaces must be protected against the release of hazardous energy and materials into the space by such means as: blanking and bleeding hydraulic and pneumatic lines; misaligning or removing sections of lines, pipes or ducts; locking out all sources of energy; and disconnecting belt or chain drives and all mechanical linkages.

Permit Required Confined Space (Permit Space)

A permit required confined space has one or more of the following characteristics:

- a) Contains or has a potential to contain a hazardous atmosphere;
- b) Contains a material that has the potential for engulfing an entrant;
- c) Has an internal configuration such that an entrant could be trapped by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section ; or
- d) Contains other serious safety or health hazards.

RESPONSIBILITIES

Departmental managers are responsible for:

- a) Providing training, prior to assigning employees work within confined spaces, which includes evaluation of confined space hazards, recognition of the symptoms of hazardous exposures, use of protective equipment, and implementation of emergency procedures;
- b) Providing refresher training yearly or whenever confined space operational procedures change; and
- c) Maintaining training certificates which include the name of each employee who has been trained, the level of training, the date of training and the signature of the trainer.

Departmental supervisors are responsible for:

- a) Ensuring that only trained employees participate in confined space evaluations and entries;
- b) Ensuring that safety procedures are followed;
- c) Ensuring that a qualified entry supervisor is in charge of all permit-required confined space entries;
- d) Identifying locations which fit the definition of a confined space and reporting these to EH&S;
- e) Posting signs on confined spaces located in their work areas;
- f) Providing and maintaining all equipment required to work in and ventilate a confined space; and
- g) Retaining copies of confined space entry evaluations & permits for at least one year.

Environmental Health & Safety (EH&S) staff are responsible for:

- a) Establishing and updating written procedures for conducting confined space operations;
- b) Assisting with the identification and posting of confined spaces;
- c) Coordinating training;
- d) Maintaining and calibrating air monitoring equipment and making it available for use by qualified persons; and
- e) Providing copies of the CSUB Confined Space Program to contractors upon request.

Procurement Services staff are responsible for:

- a) Ensuring that contract specifications for all maintenance and construction projects include confined spaces notifications (attached).

Public Safety Staff are responsible for:

- a) Checking out the air monitoring equipment only to authorized confined space entry supervisors.
- b) Monitoring radio transmissions during confined space entry operations.

Contractors are responsible for:

- a) Notifying EH&S (ext. 2066) if their work will involve entry into known confined spaces;
- b) Providing their employees with all necessary confined space safety equipment; and
- c) Assuring compliance with the OSHA confined space regulations.

Confined space entry supervisors are responsible for:

- a) Completing a hazard evaluation and determining if a confined space entry will require a permit;
- b) Developing a space isolation plan for each permit required-entry;
- c) Eliminating all hazards prior to entering a non-permit required space;
- d) Supplying entrants and attendants with necessary personal protective equipment;
- e) Verifying that all confined space team members are adequately trained in the use of personal protective equipment;
- f) Documenting that all tests have been conducted and that all procedures and equipment are in place before endorsing the permit and allowing entry to begin;
- g) Arranging rescue services and verifying that the means for summoning them are operable;
- h) Informing all entrants and attendants of the hazards that may be faced during entry, including the types, signs or symptoms and consequences of possible exposure;
- i) Ensuring that entry operations remain consistent with terms of the permit;
- j) Terminating entries and canceling permits if acceptable entry conditions cannot be maintained; and
- k) Removing unauthorized individuals who enter or who attempt to enter the permit space during entry operations.

Confined space entrants are responsible for:

- a) Contacting an entry supervisor prior to entering a confined space;
- b) Adhering to established procedures and the conditions of the permit;
- c) Using equipment properly;
- d) Communicating with the attendant regularly;
- e) Alerting the attendant and evacuating the space if any warning sign of a dangerous situation is recognized, an air monitor alarm sounds or a prohibited condition is detected; and
- f) Exiting the space immediately if an order to evacuate is given by the attendant or the entry supervisor.

Confined space attendants are responsible for:

- a) Adhering to established procedures and the conditions of the permit;
- b) Using equipment properly;
- c) Maintaining an accurate count of authorized entrants in the permit space;

- d) Remaining outside the permit space continuously during entry operations until relieved by another attendant;
- e) Performing no duty that may interfere with the primary duty to monitor and protect the entrants;
- f) Communicating with entrants as necessary to monitor their physical safety;
- g) Monitoring activities inside and outside the space to determine if it is safe for entrants to remain in the space;
- h) Ordering evacuation of the space if a prohibited condition is detected, if behavioral effects of hazardous exposure are noticed in any entrant, if a situation outside the space could endanger entrants, or if the attendant cannot effectively and safely perform all of the duties required; and
- i) Summoning emergency rescue and/or medical services as soon as it is known that an entrant needs assistance.

CONFINED SPACE EVALUATION PROCEDURES

A list of known confined spaces is attached. Confined spaces labeled "Danger - Confined Space - Authorized Personnel Only" must be evaluated prior to each entry to determine if a permit will be required. Spaces labeled "Danger - Permit Required Confined Space - Do Not Enter" require a permit for every entry. Only individuals who have completed confined space training should participate in hazard evaluation of confined spaces. Contact a trained entry supervisor for assistance with a pre-entry hazard evaluation.

Before entering ANY confined space:

- a. Survey the space and surrounding area for potential hazards without making entry;
- b. Complete sections A & B of the confined space evaluation/entry permit;
- c. Remotely monitor the outside, top, middle and bottom the space for oxygen deficiency/enrichment, carbon monoxide, hydrogen sulfide and flammable gas; and
- d. Record the pre-entry air monitoring results on section D of the confined space evaluation / entry permit.

Use the attached decision logic diagrams (1 and 2) to help determine requirements. If hazards can be eliminated prior to entry, place a check in the "permit not required" portion of Section A and sign section F of the confined space evaluation / entry permit. If atmospheric hazards, potential for engulfment, sloping surfaces, the need for hot work or any other hazards cannot be eliminated, do not enter the space.

GENERAL ENTRY REQUIREMENTS

Confined spaces may be entered without a permit only after a confined space entry supervisor has completed a hazard evaluation and determined that the space is safe to enter. Any space designated permit required on the CSUB list may not be entered without a full permit. The following rules apply to all confined space entries.

Isolate the space from sources of hazardous energy using locks and tags.

Provide adequate ventilation and illumination.

Provide exhaust ventilation if combustion driven equipment is to be used.

Make certain that vehicle and/or equipment exhaust does not drift into the space.

Guard openings to prevent accidental falls by persons or objects into the space.

Continuous air monitoring must be conducted for the duration of the entry.

Workers must immediately evacuate the space if the air monitor sounds an alarm.

Never take compressed gas cylinders (except breathing air) into a confined space.

Portable electric tools, equipment and lighting must be equipped with ground fault interrupters.

Ladders must be adequately secured or of a permanent type.

PERMIT ENTRY REQUIREMENTS

An entry supervisor must perform the hazard evaluation and complete the full permit prior to any entry into a permit required confined space. A signed permit authorizes entry only under the defined conditions for the purpose and duration stated. The completed permit must be made available to all permit space entrants at the site. The general confined space entry requirements apply to permit-required entries. In addition, the following rules must also be observed in permit-required spaces.

The duration of the permit should not exceed the time required to accomplish the task or a maximum of 24 hours.

All ignition sources should be at least 20 feet away from the entry to a confined space that may contain a flammable atmosphere.

An attendant, outside the confined space, must maintain communication with the entrants for the duration of the entry. Person to person voice communication may only be used if a line of sight can be maintained.

A body harness and/or a safety belt with D rings on the back must be attached to a life line retrieval system and worn at all times during a permit required entries that involve non-atmospheric hazards. Safety lines must be 1/2" in diameter and have a test strength of 2000 pounds.

Only explosion proof lighting should be used if there is any chance of encountering a flammable atmosphere.

Life jackets should be worn if workers are exposed to falls into any liquid over four feet in depth.

Emergency communication equipment must be provided. Notify CSUB Public Safety of permit entry operations, so that they are prepared to expedite emergency response if necessary.

Continuous forced air ventilation must be provided for hot work, chemical use or to eliminate other hazardous atmospheric conditions.

HOT WORK

Hot work includes riveting, welding, cutting, burning, soldering and heating processes.

An entry supervisor must provide written authorization to perform any operations capable of providing a source of ignition. A permit is required when hot work must be performed inside a confined space.

ENTRY UNDER HAZARDOUS CONDITIONS

If air monitoring demonstrates that a hazardous atmosphere persists, prescribed emergency rescue provisions cannot be implemented, or hot work must be performed in an area where flammable gases/dusts may be present, a qualified contractor must be hired to perform the entry. EH&S staff should be notified of any unusual, previously unidentified or particularly hazardous conditions existing within confined spaces.

EMERGENCY PROCEDURES

60% of fatalities in confined space occur during unsuccessful rescue attempts!

Specific rescue procedures shall be developed for each permit required entry. Notify CSUB Public Safety of the location and nature of permit entries, so that they are prepared to expedite an emergency response if necessary. If an employee becomes disabled in a confined space:

- a) Have another individual radio or call Public Safety at 911 or 2111. Tell the operator to call Bakersfield Fire Department immediately and to request assistance with a confined space rescue;
- b) Attempt rescue by retracting life lines;
- c) Provide mechanical ventilation from the exterior of the space while waiting for assistance; and
- d) Never enter a confined space to attempt a rescue unless trained to do so and the atmosphere inside the space is **KNOWN** to be safe via constant air monitoring.