043. CONFINED SPACE ENTRY REQUIREMENTS

01. Scope
This section contains requirements for practices and procedures to protect employees from those hazards dealing with entry into and work within confined spaces. Nothing in this standard shall be construed to prohibit better or otherwise safer conditions than specified herein. (7-1-00)

02. Definitions
For other definitions of terms used in this section, see sub-section 010 of this standard. (7-1-97)

a. Acceptable entry conditions are conditions that must exist in a confined space to allow safe entry and to ensure that employees can safely work in a confined space. (7-1-97)

b. Attendant is an individual stationed outside the confined space who is trained as required by this section and who monitors the authorized entrants inside the confined space. (7-1-97)

c. Authorized entrant is an employee who is authorized by the employer to enter a confined space. (7-1-97)

d. Blanking or Blinding means the absolute closure of a pipe, line, or duct by the fastening of a solid plate that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate. (7-1-97)
e. Confined Space is a space that is large enough and so configured that an employee can bodily enter and perform work; and has limited or restricted means for entry or exit; and is not designated for continuous employee occupancy and has one or more of the following hazards or potential hazards: contains or has the potential to contain a hazardous atmosphere; contains a material with the potential for engulfment; has an internal configuration such that an employee could be trapped or asphyxiated by inwardly converging walls, or a floor that slopes downward and tapers to a smaller cross section; or contains any other recognized safety or health hazard. (7-1-97)

f. Double Block and Bleed is the closure of a line, duct, or pipe by closing and locking or tagging two (2) in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves. (7-1-97)

g. Emergency is when any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the confined space that could endanger entrants. (7-1-97)

h. Engulfment is the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force to cause death by strangulation, constricting, or crushing. (7-1-97)

i. Entry is the action by which a person passes through an opening into a confined space. Entry includes the ensuing work activities in the confined space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of the opening into the confined space. (7-1-97)

j. Entry supervisor is the person (such as the employer, foreman, or crew-chief) responsible for determining if acceptable entry conditions are present at a confined space where entry is planned, for authorizing entry, overseeing entry operations, and for terminating entry as required by this section. (7-1-00)

k. Inerting is the displacement of the atmosphere in a confined space by a noncombustible gas to such an extent that the resulting atmosphere is noncombustible. (7-1-97)

l. Isolation is the process by which a confined space is removed from service and completely protected against the release of energy and material into the confined space by such means as; blanking or blinding, mis-aligning or removing sections of lines, pipes, or ducts; double lock and bleed system; lock or tag out of all sources of energy; or blocking or disconnecting all mechanical linkages. (7-1-97)

m. Line Breaking is the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury. (7-1-97)
n. Oxygen Deficient Atmosphere is an atmosphere containing less than nineteen point five (19.5) percent oxygen by volume. (7-1-97)

o. Oxygen Enriched Atmosphere is an atmosphere containing more than twenty-three point five (23.5) percent oxygen by volume. (7-1-97)

p. Rescue Service are the personnel designated to rescue employees from a confined space. (7-1-97)

q. Retrieval System is the equipment including a retrieval line, chest or full-body harness, wristlets, and if appropriate a lifting device or anchor for use in a non-entry rescue of persons from a confined space. (7-1-97)

r. Testing is the process by which the hazards that may confront entrants in a confined space are identified and evaluated. Testing includes specifying the tests that are to be performed in the confined space. (7-1-97)

03. General Requirements: (7-1-97)

a. The employer shall evaluate the workplace to identify any confined spaces. (7-1-97)

b. The employer shall develop a written confined space program. (7-1-03)

c. The employer shall develop standardized checklists for each of his known confined spaces. Before any entry into a not previously identified confined space is allowed that space shall be evaluated and checklists developed. (7-1-03)

d. The employer shall inform exposed employees, by posting danger signs or by any other equally effective means of the existence and location of and danger posed by the confined space(s). (7-1-97)

e. If employees are not to enter the confined space, the employer shall take effective measures to prevent employees from entering the confined space. (7-1-97)

f. If employees are to enter the confined space the employer shall develop a written confined space program with standardized checklists. The written program shall be available for inspection by employees and their authorized representatives. (7-1-97)

g. When there are changes in the use or configuration of a confined space that might increase or decrease the hazards to the entrants, the employer shall reevaluate that space and update the written confined space program/checklists as necessary. (7-1-97)

h. When an employer (host employer) arranges to have employees of another employer (contractor) perform work that involves confined space entry, the host employer shall: inform the contractor that the workplace contained confined space(s); apprise the contractor of the elements, including the hazards identified and the host employer's experience with the confined space;
apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near the confined spaces where contractor personnel will be working; and coordinate operations with the contractor, when both host and employer and contractor personnel will be working in or near confined spaces. (7-1-97)

04. Development and Implementation: (7-1-97)

a. The employer shall develop and implement the means, procedures, and practices necessary for safe confined space entry operations, including, but not limited to, the following: specifying acceptable entry conditions; isolating the confined space; purging, inerting, flushing, or ventilating the confined space as necessary to eliminate or control atmospheric hazards; and verifying that conditions in the confined space are acceptable for entry throughout the duration of an authorized entry. (7-1-97)

b. The employer shall provide the following equipment (at no cost to the employees), (maintain that equipment properly, and ensure that employees use the equipment properly): testing and monitoring equipment; ventilating equipment needed to obtain acceptable entry conditions; communications equipment; personal protective equipment insofar as feasible engineering and work practice controls do not adequately protect employees; lighting equipment needed to enable employees to see well enough to work safely and to exit the confined space quickly in an emergency; barriers and shields; equipment such as ladders, needed for safe ingress and egress by entrants; rescue and emergency equipment, except to the extent that the equipment is provided by rescue services; and any other equipment necessary for safe entry into and rescue from a confined space. (7-1-97)

c. The employer shall have confined space conditions evaluated when entry operations are conducted: conditions in the confined space shall be tested to determine if acceptable entry conditions exist before entry is authorized to begin, except that, if isolation of the space is infeasible because the space is large or is part of a continuous system (such as a sewer), pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the areas where entrants are working; test or monitor the confined space as necessary to determine if acceptable entry conditions are being maintained during the course of entry operations; and when testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, and then for toxic gases and vapors with a calibrated direct-reading instrument. (7-1-00)

d. When entrance covers are removed, the opening shall be guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space. (7-1-00)

e. The employer shall provide at least one (1) attendant outside the confined space into which entry is authorized and for the duration of the entry operations. (7-1-97)

f. If multiple confined spaces are to be monitored by a single attendant, include in the written program the means and procedures to enable the attendant to respond to an emergency affecting
one (1) or more of the confined spaces being monitored without distraction from the attendant's responsibilities. (7-1-97)

g. Designate the persons who are to have an active roles in confined space operations, identify the duties and responsibilities of these of each such employee, and provide each such employee with the training required for the duty. (7-1-97)

h. Develop and implement procedures for summoning rescue and emergency services, for rescuing entrants from confined spaces, for providing necessary emergency services to rescued employees, and from preventing unauthorized personnel from attempting a rescue. (7-1-97)

i. Develop and implement procedures to coordinate confined space entry operations when employees of more than one (1) employer are working simultaneously are authorized entrants in a confined space, so that employees of one (1) employer do not endanger the employees of any other employer. (7-1-97)

j. Review confined space entry procedures when the employer or employees have reason to believe that the measures in the confined space program may not protect employees and revise the program to correct deficiencies found to exist before subsequent confined space entries are authorized. (7-1-97)

05. Training: (7-1-97)

a. The employer shall provide training so that all employees whose work involves confined spaces acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned relative to confined spaces. (7-1-97)

b. Training shall be provided to each effected employee: before the employee is first assigned to duties involving confined spaces; before there is a change in assigned duties; whenever there is a change in confined space operations that presents a hazard about which an employee has not previously been trained; whenever there is reason to believe that there are deviations from the entry procedures or there are inadequacies in the use of the procedures. (7-1-97)

c. The training shall establish employee proficiency in the duties assigned relative to confined space operations and shall introduce new or revised procedures as necessary for compliance with this section. (7-1-97)

06. Duties of Entrants: (7-1-97)

a. The entrant shall know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure. (7-1-97)

b. The entrant shall ensure that all required equipment is available and used. (7-1-97)

c. Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the confined space. (7-1-97)
d. Alert the attendant whenever: the entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or the entrant detects a dangerous condition. (7-1-97)

e. Exit from the confined space as quickly as possible whenever: an order to evacuate is given by the attendant or supervisor; the entrant recognizes any warning sign or symptom of exposure to a dangerous situation; or the entrant detects a prohibited condition. (7-1-97)

07. Duties of Attendants: (7-1-97)

a. The attendant shall know the hazards that may be faced during confined space entry, including information on the mode, signs or symptoms, and consequences of exposure. (7-1-97)

b. The attendant shall be aware of the possible behavioral effects of hazard exposure in entrants. (7-1-97)

c. The attendant shall continuously maintain an accurate count of entrants in the confined space. (7-1-97)

d. The attendant shall remain outside the confined space during confined space operations until relieved by another attendant. (7-1-97)

e. The attendant shall maintain communications with entrants to monitor entrant status and to alert entrants of the need to evacuate the confined space. (7-1-97)

f. The attendant shall monitor activities in side and outside the confined space to determine if it is safe for the entrants to remain in the space and orders the entrants to evacuate the confined space immediately under any of the following conditions: if the attendant detects a prohibited condition; if the attendant detects the behavioral effects of hazard exposure; if the attendant detects a situation outside the confined space that could endanger the entrants; or if the attendant cannot effectively and safely perform all the required duties. (7-1-97)

g. The attendant shall summon rescue and other emergency services as soon as it is determined that entrants may need assistance to escape from the confined space. (7-1-97)

h. The attendant shall take the following actions when unauthorized persons approach or enter a confined space during confined space operations: warn the unauthorized persons that they must stay away from the confined space; advise the unauthorized persons that they must exit immediately if they have entered the confined space; and inform the authorized entrants and the supervisor that unauthorized persons have entered the confined space. (7-1-97)

i. The attendant may perform non-entry rescues as specified by the employer's rescue procedure if trained to do so. (7-1-97)

j. The attendant shall not perform any other duties that might interfere with the attendant's primary duty to monitor and protect the entrants. (7-1-97)
08. **Duties of Supervisors**: (7-1-97)

a. The supervisor shall know the hazards that may be faced during confined space entry, including information on the mode, signs or symptoms, and consequences of the exposure. (7-1-97)

b. The supervisor shall verify that all required tests have been performed, that all procedures have been followed, and that required equipment is available and used before allowing entry into confined spaces. (7-1-97)

c. The supervisor shall verify that rescue services are available and that the means for summoning them are available. (7-1-97)

d. The supervisor shall remove unauthorized individuals who enter or attempt to enter the confined space during confined space operations. (7-1-97)

e. The supervisor shall ensure that confined space entry operations remain consistent with the employer's program and that acceptable entry conditions are maintained. (7-1-97)

09. **Rescue and Emergency Services**: (7-1-97)

a. The employer shall ensure that each member of the employer's rescue service is provided with, and is trained to use properly, the personal protective equipment and rescue equipment necessary for making rescues from confined spaces. (7-1-97)

b. Each member of the employer's rescue service shall receive the training required for entrants in sub-section 043.05 of this standard. (7-1-00)

c. When an employer (host employer) arranges to have persons other than the host employer's employees perform confined space rescue, the host employer shall: evaluate a prospective rescuer's ability to respond to a rescue summons in a timely manner, considering the hazard(s) identified; evaluate a prospective rescue service's ability, in terms of proficiency with rescue related tasks and equipment, to function appropriately while rescuing entrants from the particular confined space; inform the rescue service of the hazards they may confront when called on to perform rescue at the host employer's facility, and provide the rescue service with access to all confined spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations. (7-1-97)

d. Each member of the rescue service shall practice making confined space rescues at least once every twelve (12) months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual or representative confined spaces. (7-1-97)

e. Each member of the rescue service shall be trained in basic first-aid and in cardiopulmonary resuscitation (CPR). (7-1-97)
f. To facilitate non-entry, retrieval systems or methods shall be used whenever an entrant enters a confined space, unless the retrieval equipment would increase the overall risk of confined space entry or would not contribute to the rescue of the entrant. (7-1-97)

g. Retrieval systems shall meet the following requirements: each entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near the shoulder level, or above the entrant's head, (wristlets may be used in lieu of the chest or full body harness if the employer can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative); The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the confined space in such a manner that rescue can begin as soon as the attendant becomes aware that rescue is necessary; a mechanical device shall be available to retrieve personnel from vertical type confined spaces more than five (5) feet deep. (7-1-97)

h. If an injured entrant is exposed to a substance for which a Material Safety Data Sheet (MSDS) or other similar written information is required to be kept at the work-site, that MSDS or other similar written information shall be made available to the medical facility treating the exposed entrant. (7-1-97)