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1910.146 Permit-required confined spaces.

(b) Definitions

Attendant means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

Confined spaces means a space that:

- (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
- (3) Is not designed for continuous employee occupancy.

Permit-required confined space (permit space) means a confined space that has one or more of the following characteristics:

- (1) Contains or has a potential to contain a hazardous atmosphere;
- (2) Contains a material that has the potential for engulfing an entrant;
- (3) Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- (4) Contains any other recognized serious safety or health hazard.

(d) Permit-required confined space program.

Under the permit-required confined space program required by paragraph (c)(4) of this section, the employer shall:

(4) Provide the following equipment (specified in paragraphs (d)(4)(i) through (d)(4)(ix) of this section) at no cost to employees, maintain that equipment properly, and ensure that employees use that equipment properly;

(iii) Communications equipment necessary for compliance with paragraphs (h)(3) and (i)(5) of this section.

(viii) Rescue and emergency equipment needed to comply with paragraph (d)(9) of this section, except to the extent that the equipment is provided for rescue services.

\*\*\*\*\* indicates that non-relevant sections have been omitted

3 (7) If multiple spaces are to be monitored by a single attendant, include in the permit program the means and procedures to enable the attendant to respond to an emergency affecting one or more of the permit spaces being monitored without distraction from the attendant's responsibilities under paragraph (i) of this section.

4 (9) Develop and implement procedure for summoning rescue and emergency services, for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and for preventing unauthorized personnel from attempting a rescue;

(e) Permit system

(5) The entry supervisor shall terminate entry and cancel the entry permit when;

5 (ii) A condition that is not allowed under the entry permit arises in or near the permit space.

(f) Entry permit.

1 The entry permit that documents compliance with this section and authorizes entry to a permit space shall identify;

8 (12) The communication procedures used by authorized entrants and attendants to maintain contact during the entry;

4 (13) Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be provided for compliance with this section.

(h) Duties of authorized entrants.

4 (2) Properly use equipment as required by paragraph (d)(4) of this section;

1 (3) 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 space as required by paragraph (i)(6) of this section;

(4) Alert the attendant whenever:

2& (i) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or

4 (ii) The entrant detects a prohibited condition; and

(5) Exit from the permit space as quickly as possible whenever;

7 (i) An order to evacuate is given by the attendant or the entry supervisor.

(i) Duties of attendants

2 (2) Is aware of possible behavioral effects of hazard exposures in authorized entrants.

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1 (5) Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space under paragraph (i)(6) of this section;

5 (6) Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions;

2 (ii) If the attendant detects the behavioral effects of hazard exposure in an authorized entrant;

5 (iii) If the attendant detects a situation outside the space that could endanger the authorized entrants;

4 (7) Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards;

(8) Takes the following actions when unauthorized persons approach or enter a permit space while entry is underway;

6 (i) Warn the unauthorized persons that they must stay away from the permit space;

(ii) Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and

(iii) Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space;

8 (10) Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants;

1(j) Duties of entry supervisors. The employer shall ensure that each entry supervisor;

4 (2) Verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;

4 (4) Verifies that rescue services are available and that the means for summoning them are operable.

# " COMPLIANCE "

of the CON-SPACE COMMUNICATIONS INC. Confined Space Intercom

with Dept. of Labor OSHA 29 CFR Part 1910.146 dated January 14, 1993, Rules & Regulations for Permit-Required Confined Spaces paragraphs (d) through (k) as they relate to communication and rescue alert between the entrant and the attendant.

OSHA 29 CFR Part 1910.146 is a comprehensive document outlining a series of regulations for the protection of people who work in Permit Required Confined Spaces.

This document deals with the basic safety of Confined Space entrants. It is the result of years of statistical information gathered by OSHA showing the danger involved in Confined Space activity for both entrants and rescuers. Many of you reading this have already taken great strides towards compliance in many areas of your business. CON-SPACE would like to show you that our family of Confined Space Communication and Alarm Systems were designed as a practical method of complying with the entrant/attendant communication and alarm requirements.

On the reverse is a copy of the parts of paragraphs b,d,e,f,h,i,&j of 29 CFR 1910.146 which are concerned with entrant/attendant communication and rescue alert. Key sections of these paragraphs are underlined and numbered and you are invited to judge for yourself that CON-SPACE equipment complies with the requirements. The numbered paragraphs on this page refer to those on the reverse.

1. The CSI-2000 & CSI-1000 are a full duplex hardwired communication systems capable of handling up to 14 entrants. The systems are battery powered and give a 12-hour warning of battery replacement. A specially designed cable allows safe communication to a distance of 1500' and is coated with thermo-plastic rubber that is impervious to a wide range of acid, alkalis and corrosive fluids such as Skydrol. Entrant can communicate under all conditions even when wearing a face mask. The system is designed and approved for Intrinsic Safe operation.
2. Having full duplex voice communication will allow attendant to easily and instantaneously detect behavioral changes in the entrant. Lack of response from the entrant or his cry for help plus anything in between can only be detected by the use of continuous two way communication.

Conversely, an entrant can immediately inform his/her attendant in the same way if a symptom of exposure to a hazard is felt during an entry.

3. The CSI-2000 System is capable of allowing one attendant to monitor up to seven entrants with a single Command Module. A second Command Module can be connected to the first if necessary, doubling the system's capacity.

In the event of an emergency, the attendant can calmly order the evacuation of all spaces not affected and alert a rescue crew while staying in continuous contact with the troubled entrant.

4. The CON-SPACE CSI-2140 Alarm Module in conjunction with the CSI-2000 System allows the entrant to initiate a two stage alarm from inside the Space by depressing his/her Personal Alarm Button (PAB). Each entrant accessory is equipped with a PAB.

Stage 1 alarm can be heard within a 10 - 15' radius of the module and lasts for 7 seconds or until reset by the attendant. If not reset the Stage 2 alarm automatically trips. This is a loud siren designed to alert a rescue team.

The CSI-2140 Alarm module allows both the entrant and the attendant to set off a "rescue alert". This alarm can be both audio and visual.

The CSI-1100 Module alarm is integral to the unit and is initiated immediately by the entrant depressing the PAB.

5. Attendant (or entry supervisor acting as attendant) must maintain full peripheral vision to comply with these regulations. Maintaining continuous contact with entrants, using full duplex open communication equipment will remove the need for "visual contact" and allow compliance. While wearing a headset connected to the communication system, an attendant can hear the activity inside the space and use his/her eyes for visual surveillance of activity outside the space to detect situations that could endanger entrants.

6. An attendant called on to comply with this regulation must first detect unauthorized persons around the space. When using the communication system, this can be accomplished without affecting the safety of entrants (see 5 above). Also when warning unauthorized persons to stay away, the attendant can maintain full contact with entrants on a continuous basis.

7. Full duplex voice communication is the most effective, efficient and safe method of transmitting and receiving an order to evacuate a space.

8. The attendant is restricted to perform only duties that do not interfere with his/her primary task of monitoring and protecting authorized entrants. Use of a CSI-2000 or CSI-1000 Systems for continuous monitoring of entrants gives the attendant freedom to move around the proximity of the space and perform minor tasks without affecting the entry in any way. This freedom of movement offered by the CON-SPACE system and accompanying activity will keep the attendant fully alert by removing the negative aspects of continued physical inactivity.

## IN ADDITION

Appendix D-1B of CFR 29 1910.146 is a suggested Pre-entry checklist for a Confined Space Entry Permit. Listed under 2. Equipment: is "Powered Communications" and the last item on the list calls for all electric equipment listed to be Intrinsically Safe Approved. Class 1 Div. 1 Group D. The CSI-2000 and CSI-1000 are a "Powered Communications" System and is Intrinsically Safe Approved by Factory Mutual for Class I, II and III; Div I; Groups A,B,C,D,E,F&G

