
SUBJECT: Confined Space Entry

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EFFECTIVE DATE: December 26, 2003

SUPERCEDES: May 1994

DESCRIPTION

This procedure describes the necessary steps to ensure that employees safely enter only confined spaces classified as 'non-permit confined space.'

DEFINITIONS

Confined Space: A special configuration that could result in any of the following:

1. A dangerous air contamination, oxygen deficiency, or oxygen enrichment may exist or develop.
2. The emergency removal of a suddenly disabled person is difficult due to the location, number, or size of the access opening(s)
3. The risk of engulfment exists or could develop

NOTE: Common confined spaces include tanks, boilers, pits, and vaults.

Confined Space Entry: An action resulting in any part of the worker's face breaking the plane of any opening of the confined space, and includes any ensuing work activities inside the confined space.

Dangerous Air Contamination: An atmosphere presenting a threat of death, acute injury, illness, or disablement due to the presence of flammable, explosive, toxic, or otherwise injurious or incapacitating substances.

Engulfment: The surrounding and capture of a person by finely divided particulate matter or a liquid.

Locked Out (Zero Mechanical State): The process of ensuring that valves, switches, etc., are secured with an individual lock to prevent unauthorized start-up.

Lower Explosive Level (LEL): The concentration of a gas or vapor in air above which an explosion may occur in the presence of an ignition source.

Multi-Gas Monitor: A device that monitors concentrations of oxygen, combustible gases, carbon monoxide, and hydrogen sulfide in air.

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Oxygen Deficiency: An atmosphere containing oxygen at a concentration of less than 19.5 percent by volume.

Oxygen Enrichment: An atmosphere containing oxygen at a concentration of more than 23 percent by volume.

Parts Per Million (PPM): Parts of a contaminant per million parts of air by volume.

Unsafe Atmosphere: An atmosphere with an oxygen deficiency or a dangerous air contamination.

Ventilation System: Motor driven fan and flexible duct designed to changing the atmosphere of a confined space.

Zero Mechanical State: The process of ensuring that any equipment power source (electrical, pressurized fluid, mechanical) is secured in as safe a position as possible to prevent movement and possible subsequent employee injury.

PROCEDURES

Step	Action Responsibility	Responsibility
1.	Identify all confined spaces and classify as permit or non-permit required.	Supervisor/Safety Director
2.	Ensure that Admin. employees do not enter permit required confined spaces and that permit required confined spaces are labeled 'Permit Required Confined Space.'	Supervisor/Safety Director/Employee
3.	Provide training to all employees who may either be required to enter a confined space or to assist in confined space entry.	Supervisor/Safety Director
4.	Ensure that all necessary equipment is available and properly maintained.	Supervisor/Employee
5.	Ensure that the multi-gas monitor is properly calibrated. The monitor shall be calibrated (using currently dated calibration gases) within a month prior to use. The results of this testing shall be recorded on a calibration log.	Safety Director

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Step	Action Responsibility	Responsibility
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| 6. | Ensure that the following entry procedures are followed: | Supervisor/Employee |
| | a. All drive mechanisms and equipment shall be placed and secured in a zero mechanical state. | |
| | b. Confined space covers shall be removed and replaced using tools designed for that purpose. Smoking and open flames are not permitted within 20 feet of the confined space opening. | |
| | c. When removing or replacing confined space covers, care shall be exercised by workers to use good body mechanics and have adequate equipment and help to prevent muscle strain. (When opening such covers in the presence of snow or ice, the immediate area is salted or sanded to provide safe footing. A flame shall not used to melt ice around a confined space cover.) | |
| | d. The atmosphere in the confined space shall be tested for the presence of oxygen (must be between 19.5 and 23 percent); carbon monoxide (must be below 35ppm); hydrogen sulfide (must be below 10ppm); and combustibles (must be below 10 percent of the LEL of methane). | |

IMPORTANT: If the atmospheric test indicates conditions outside the above parameters, the space shall not be entered. However, the space may be ventilated and retested. The entry procedure may be resumed after the atmosphere is determined to be safe by the Supervisor and/or Safety Director and with continuous ventilation and monitoring.

Step	Action Responsibility	Responsibility
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- e. All confined spaces shall be ventilated before entry with a mechanical blower. The blower shall be located to assure that engine exhaust gases are not blown into the confined space. A quantity of air equal to five times the volume of the confined space shall be added to the confined space prior to entry. During entry, the ventilation rate shall be a minimum of 200 cfm per worker inside. In confined spaces larger than 2,000 cubic feet, the ventilation rate shall change the air in the confined space six times per hour. [For example, if the volume of the confined space is 1,000 cubic feet, the amount of ventilation initially supplied to the space would be 5,000 cubic feet of air or if the ventilator capacity is 800 cfm, it would need to operate for seven minutes (5,000 divided by 800) and then be operated during entry.]

- f. Proper personal protective equipment is provided and used by employees who will enter the space.

NOTE: Personal protective equipment may include eye, hearing, foot, and fall protection. Respiratory protection may not be used to enter a space with an unsafe atmosphere.

- g. All tools and materials are handed down or lowered by hand lines.
- h. Only approved grounded wiring, extension cords, and electrical apparatus provided with a Ground Fault Circuit Interrupter are used in confined spaces when the atmosphere is below 10% of the Lower Explosive Limit (LEL).

NOTE: Only approved intrinsically safe electrical wiring and equipment may be used in or within 20 feet of confined spaces when the atmosphere is unknown or above 10 percent of the LEL.

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Step	Action Responsibility	Responsibility
7.	Ensure that provisions are made to ensure continuous ventilation and periodic atmospheric monitoring while the confined space is occupied.	Supervisor/Employee
8.	Immediately exit the confined space whenever continuous atmospheric monitoring of the occupied confined space identifies a hazardous condition.	Employee
9.	Administration employees shall not attempt a rescue of a downed individual in a confined space wherein there may be a hazardous environment. They shall call the local fire department at 9-911, give an exact location and describe what has happened, and then assist then assist in showing the rescue squad the location of the confined space involved.	Supervisor/Employee

AUTHORITY

Minnesota Rules 5205.1000

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