

RESOLUTION NO. 417

RESOLUTION ADOPTING A CONFINED SPACES PROGRAM.

WHEREAS, the Town of Mount Carmel is responsible for providing a safe and healthful workplace for its employees; and

WHEREAS, the Occupational Safety and Health Administration (OSHA) requires the Town to develop and implement a written permit space entry program; and

WHEREAS, the Town of Mount Carmel has a number of employees who are required to enter spaces that are considered toxic, explosive or asphyxiative; and

WHEREAS, the Town of Mount Carmel is required to identify all permit-required spaces in their workplaces, prevent unauthorized entry into them, and protect authorized workers from hazards through a permit space entry program; and

WHEREAS, the Mount Carmel Safety Committee has recommended adopting the attached Confined Spaces Program; and

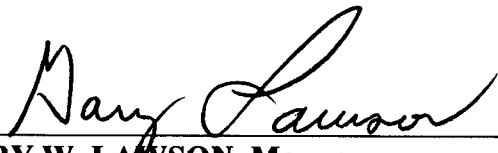
WHEREAS, to the extent that any other Resolution or Ordinance presently existing is conflicting in any way with the provisions the Confined Spaces Program, this Resolution supersedes any previously adopted policy; and

WHEREAS, the public health and welfare require it;

NOW, THEREFORE, BE IT RESOLVED that the attached, Exhibit A, the "Confined Spaces Program" is adopted by the Board of Mayor and Aldermen of the Town of Mount Carmel;

THIS Resolution shall become effective immediately, the public welfare demanding it.

A D O P T E D this the 27th day of January, 2009.



GARY W. LAWSON, Mayor

ATTEST:

Marian Sandidge
MARIAN SANDIDGE, Recorder



APPROVED AS TO FORM:

Joel May
LAW OFFICES OF MAY & COUP

FIRST READING	AYES	NAYS	OTHER
Alderman William Blakely	✓		
Alderman Richard Gabriel	✓		
Alderman Tresa Mawk	✓		
Alderman Kathy Roberts	✓		
Vice-Mayor Thomas Wheeler	✓		
Alderman Carl Wolfe	✓		
Mayor Gary Lawson	✓		
TOTALS	7	0	0

PASSED FIRST READING January 27, 2009

Town of Mount Carmel Confined Spaces Program

Introduction

The hazards that may be present in a confined space are not easily seen, smelled, heard or felt, but can represent deadly risks. The worker who enters confined spaces may be, or often is, exposed to multiple hazards due primarily to ignorance or negligence in the enforcement of safety regulations. This ignorance and neglect has led to countless deaths by asphyxiation, fire and/or explosion, and by fatal exposure to toxic materials.

A confined space is one in which dangerous air contamination may be generated and may not be removed by ventilation. When a person works in this type of environment, the chance always exists that a reduced oxygen level, or combustible or toxic gases may be present. Prevention of injuries to the life and health of workers requires that they be properly trained and well equipped to recognize, understand and control the hazards they could encounter. In the process of identifying a confined space, the supervisor in charge should always assume that a hazard is present.

This publication discusses those hazards, safe entry procedures and rescue. Its intent is educational, preventive and fulfills the requirements of the OSHA Confined Space Entry Written Control Plan, 29 CFR 1910.146. A copy of this standard is attached to the end of this document. A copy of this written program shall be available to any Town employee upon request. With these procedures, persons working in confined areas should always exit alive and unharmed.

Responsibilities:

Central Administration

1. Endorsement of the written plan.
2. Delegation of sufficient authority to the respective department heads involved to effectively implement the plan.
3. Appropriate the necessary resources required to effectively implement the plan.

Department heads - Employees who enter confined spaces

1. Appoint an individual(s) to serve as liaison with Safety Officer to perform the required monitoring and to issue entry permits.
2. Assure that the authorized individual(s) receive all the necessary training to effectively discharge their duties.
3. Assure that all individuals who enter confined spaces receive all required training.
4. Assure that all necessary equipment and supplies to effectively protect the health and safety of the workers is provided and maintained in a good state of repair.
5. Develop departmental policies that will assure that all confined space entries are performed in compliance with the Town written program and all applicable regulations.
6. Develop departmental policies that will assure that all required records are maintained and that copies are forwarded to the Department of Safety & Risk Management for central filing.
7. Each department head, or designated agent, shall be responsible for ensuring that the confined spaces under their control have been posted.

Department of Safety and Risk Management

1. Develop a written control plan and perform an annual review to determine necessary revisions.
2. Monitor the compliance of the respective departments with the plan and regulations to include compliance with training, monitoring, permitting, record keeping, etc.
3. Assure that a central file of all records required by the regulation is maintained.
4. Provide guidance and technical assistance to departments in the design and selection of appropriate engineering and work practice controls.
5. Provide guidance and technical assistance to departments in the selection of the most appropriate types and quantities of personal protective equipment.
6. Provide consultation to the departments to assist them in fulfilling their training program.
7. Serve as the Town liaison to the Systems Wide Safety Office.
8. Promote Town compliance with the OSHA Standard.
9. Provide a means in which employees can direct suggestions, complaints, and concerns regarding the Town Confined Space Entry Program.
10. Identify, log and classify confined spaces in the Town. This information shall be communicated to the rescue personnel.

Employee

1. Participate willingly in all training programs offered by the Town and learn as much as possible about the confined space entry protection procedure.
2. Abide by all work rules and apply to the fullest extent possible the safety and health precautions specified by the Town.
3. Report any problems that are observed, which could compromise health and safety, to the Town administration through the immediate supervisor.

Confined Space Hazards

Types of Confined Spaces

1. Those of such design that restrict the movement of air in such a manner that ventilation may be inadequate.
2. Enclosed areas with very limited openings for entry and exit. Examples of open - topped confined spaces are pits, degreasers and certain storage tanks. Gases that are heavier than air (such as butane and propane) can remain in low places of these type spaces where they are difficult to remove. Other hazards may also develop due to the nature of the work being involved or by a residue remaining in the space.
3. Confined spaces may contain an engulfment or entrapment hazard. See the definition section of this document for a more detailed explanation of these terms.

Confined spaces such as sewers or tanks usually have limited access and are considered the most hazardous. Gases, such as carbon dioxide and propane that are heavier than air, may lie in recessed areas for hours or even days. Because many of these gases are odorless, the hazard may be overlooked with fatal results. At the opposite end, gases, which are lighter than air, may be trapped at the top of a space where access is from the bottom.

Hazardous Atmospheres

Flammable Atmosphere

A flammable atmosphere generally arises from an enriched oxygen atmosphere, vaporization of a flammable liquid, chemical reaction, a by - product of work, heavy concentrations of combustible dust and even desorption (release of entrapped substances) of chemicals from inner linings of combined spaces.

An atmosphere becomes flammable when the ratio of oxygen to combustible material in the air is neither too rich nor too lean for combustion to occur. Combustible gases or vapors will accumulate when there is inadequate ventilation in areas such as a confined space. Flammable atmospheres may also be formed by chemical reaction. These occur when surfaces are initially exposed to the atmosphere, or when chemicals combine to form flammable gases.

Combustible dust concentrations are usually found during loading, unloading or conveying coal, grain, fertilizers or other combustible materials. The explosion from these concentrations occurs when high amounts of static electricity accumulates at low humidity readings and causes a spark which ignites the combustible mixtures present in the air. Also, desorption of chemicals from the inner linings of surfaces of a tank or vessel may produce a flammable mixture. An example of this can occur when propane is emptied from a tank. After the removal, the walls may desorb some remaining gas and create a flammable mixture.

Toxic Atmospheres

Toxic atmospheres can be created from almost any gas, vapor or airborne dust. Examples of the source of these substances include:

1. The manufacturing process itself.
2. The product being stored.
3. The operation being performed in the confined space (e.g. welding or brazing certain materials).
4. Leakage of lines within the space.
5. Leakage of substances into the space from the outside.

There are certain gases, which are prevalent in various vessels; one is carbon monoxide (CO). This odorless and colorless gas has approximately the same density as air and is formed from the incomplete combustion of such materials as wood, oil, gas, etc. It has poor warning signals as to its level of intoxication. Higher levels (more than 1,000 ppm) can occur without warning and are almost always fatal. Another prevalently released gas is hydrogen sulfide (H₂S). Hydrogen sulfide may be formed several ways, but the most common way is when hydrochloric acid is combined with iron sulfide, as in the cleaning of vessel walls. Another common source of hydrogen sulfide is microbial breakdown of organic material such as sewage, manure, garbage, etc.

Irritant (Corrosive) Atmospheres

Irritant or corrosive atmospheres can be divided into primary and secondary groups. Primary irritants exert no systemic toxic effects; the adverse effect exerted by them on the respiratory tract is direct irritation to the tissue. Examples of these are hydrochloric acid, sulfuric acid, and ammonia. A secondary irritant is one that produces toxic effects plus surface irritation. Examples of this type are benzene and carbon tetrachloride. Prolonged exposure at high levels of irritant atmospheres may produce a general weakening of the nerve endings in the upper respiratory tract. The danger in this is that the worker generally is not aware of the onset of distress.

Oxygen Deficient or Oxygen Enriched Atmospheres

An oxygen deficient atmosphere is caused when the oxygen level of an atmosphere depreciates below 19.5% by either consumption or displacement. The consumption of oxygen takes place during combustion of flammable substances, such as in welding. Oxygen may also be consumed during chemical reactions, such as the formation of iron oxide (rust). A second factor in an asphyxiating atmosphere is displacement by another gas. One such example of displacement is "inerting" a tank by placing nitrogen in it. The total displacement of oxygen will cause immediate collapse and death. Since these gases are colorless and odorless, they pose an immediate hazard unless ventilation and oxygen measurements are carried out. A confined space should never be purged with nitrogen or other gas used in welding as this could lead to an oxygen deficient atmosphere.

An oxygen-enriched atmosphere contains greater than 23.5% oxygen. The main hazard associated with an oxygen-enriched atmosphere is fire. Combustible materials burn much faster in the presence of an oxygen-enriched environment. Some materials that are generally not considered a fire hazard will burn rapidly when the oxygen concentration is

Increased. A contaminated atmosphere must never be purged with oxygen, as this would greatly increase the fire hazard in the space.

Definitions:

Acceptable Entry Condition:

the conditions that must exist in a permit space to allow employees involved with a permit - required confined space entry can safely enter and work within the confined space.

Attendant:

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

Confined Space:

a space that: (1) is large enough and so configured that an employee can bodily enter and perform assigned work; (2) has limited or restricted means of entry or exit; and (3) is not designed for continuous employee occupancy.

Engulfment:

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

Entrapment:

a condition where an uninjured person is unable to remove themselves, or any body part, from a confined space. Entrapment occurs as a result of the configuration of a confined space and is often associated with converging or convoluted surfaces.

Entry Permit:

the written or printed document that is provided by the employer to allow and control entry into a permit space.

Entry Supervisor:

the employer, foreman, or crew chief responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required.

Flammable or Explosive Limits:

when flammable vapors are mixed with air in the proper proportions, the mixture can be ignited. The range of concentrations over which the flash will occur is designated by the Lower Explosive Limit (LEL) and the Upper Explosive Limit (UEL). Flammable limits (explosive limits) are expressed as percent volume of vapor in air.

Hazardous Atmosphere:

an atmosphere that exposes employees to the risk of death, incapacitation, impairment of ability to self - rescue, injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist in excess of 10 percent of the lower flammable limit.
- Airborne combustible dust at a concentration that meets or exceeds the lower flammable limit.
- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.
- Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published. Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability or self - rescue, injury, or acute illness due to health effects is not covered by this provision.
- Any other atmospheric condition that is immediately dangerous to life or health.

Hot Work:

any work involving burning, welding, riveting, or similar fire producing operations, as well as work, which produces a source of ignition such as drilling or abrasive blasting.

Inerting:

displacement of an area's atmosphere by a non-reactive gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

Isolation:

the process whereby the confined space is removed from service and completely protected against an inadvertent release of material. Examples are: blanking off lines, lockout of electrical systems and disconnecting mechanical linkages.

Permissible Exposure Limit (PEL):

the maximum 8 hours weighted average of an airborne contaminant to which an employee may be exposed. At no time shall the exposure level exceed the ceiling concentration for the contaminants as listed in 29 CFR 1910 Subpart Z.

Permit - Required Confined Space:

a confined space permit that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere
- 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 which slopes downward and tapers to a smaller cross - section
- Contains any other recognized serious safety or health hazard.

Permit System:

the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

Purging:

the method by which gases, vapors, or other airborne impurities are displaced from a confined air.

Threshold Limit Value (TLV):

an occupational exposure guide published by the American Conference of Government Industrial Hygienist (ACGIH), extensively used to judge acceptable exposure levels to hazardous substances.

General Safety Hazards

1. Mechanical

If the activation of any electrical or mechanical equipment could cause injury to persons in a confined space, each piece of equipment shall be manually isolated and inactivated (locked out) before workers are allowed to enter a confined space. Also, there may be other hazards associated with confined spaces such as flammable vapors or gases in which special precautions must be taken. Preventing vapor leaks, flashbacks, and other hazards by closing valves is not sufficient. All pipes must be physically disconnected or isolation blanks bolted in place. Some tanks or vessels must also be blanked off and a blanket of inert gas placed within the tank to prevent a build - up of flammable vapors.

2. Communications for Permit - Required Confined Spaces

Communications between the worker and personnel outside is of the utmost importance. If a worker becomes unconscious or suddenly feels distressed, an injury may quickly become a fatality without proper communication. Communications should include visual monitoring at a minimum. Frequently, there are situations where visual monitoring is impossible and communication by means of a voice or alarm - activated type of communication system shall be necessary.

3. Entry and Exit

The extent of the time required to enter and exit is of major significance as a physical limitation and is directly related to the potential hazard of the confined space. The extent of precautions taken and the standby equipment needed to maintain a safe work area will be determined by the means of access and rescue. The following should be considered:

- Type of confined space to be entered.
- Access to the entrance.
- Number and size of openings.
- Barriers within the space.
- Occupancy load.
- Time required to exit confined space.

Training

Training of employees for entering and working in confined spaces is required because of the potential hazards. To insure worker safety, the training program must be especially designed for the type of problems encountered. Instructional areas to be covered in the training program are:

1. Potential dangers of confined space work.
2. Emergency exit procedures.
3. Use of respirators.
4. Lockout and Tagging procedures.
5. Fire Protection.
6. Communications.
7. Air Quality Monitoring.
8. Space Ventilation Procedures.
9. Permitting requirements training of employees must be done by a qualified person or someone knowledgeable in all relevant aspects of confined space entry procedures. The qualified person must be proficient in the following areas:
 - Types of confined spaces that employees will be entering.
 - Chemical and Physical Hazards.
 - Work practices and techniques.
 - Testing requirements, permissible exposure limits, etc.

- Safety equipment such as respirators, protective clothing and other protection such as helmets and shields.
- Rescue procedures.
- Knowledge of applicable Federal, State, and Local regulations.
- Evaluation and test methods.

The effectiveness of the training program can be determined by the qualified person to see if safe work practices are being followed and testing the employee for knowledge of the operations and hazards. Training shall be provided by the affected departments in conjunction with the Safety Committee or any other approved source.

Confined Space Identification and Warning

All confined spaces located in the Town shall be identified and posted with appropriate signs to discourage the entry of unauthorized individuals. Where possible they shall be secured to prevent unauthorized entry. The Department of Safety & Risk Management shall identify, classify, and log the location of confined spaces in the Town. A copy of the log shall be provided to the rescue service, and to departments in the Town that have employees who enter confined spaces. Contractors that enter confined spaces shall be provided with a list of the confined spaces in the building or areas in which they will be working. If a location is encountered in the Town that appears to meet the definition of a confined space, and it is not posted as such nor does it appear on the log, contact Safety & Risk Management.

Permit Retention and Record Keeping

All completed permits and pre - entry checklists shall be forwarded to Safety Committee Secretary. Individual departments should maintain a copy of these forms. The records kept by Safety Committee Secretary shall be retained for the time period specified below. The following records shall be maintained:

1. Training. Information to include the date, location, instructor, content of course, name and signature of trainee, etc. 3 - years.
2. Permits and pre-entry check lists. 3 - years.
3. Equipment calibration and maintenance log. 3 - years.
4. Confined space log. Indefinitely.
5. Equipment signout log. 1 - year.

Equipment

The Mount Carmel Wastewater Plant and Mount Carmel Fire Department will provide and maintain one GasTech gas detector for use by Town of Mount Carmel employees. Departments may wish to purchase their own gas detectors or may borrow the detectors from these Departments.

Contractors

Contractors who enter confined spaces in the Town shall be apprised of this written program and the entry procedure. The Town shall inform the contractor of hazards present in the space, the Town's experience, any precautions or procedures. When employees of the Town and the contractor enter a confined space together the entry shall be coordinated to minimize hazards to the employees.

Specific Procedures and Work Practices

The Confined Space Entry procedure does not cover all possible situation or conditions that could be encountered. Additional or different safety features or procedures may be necessary for specific operations.

Entering Confined Spaces

Application

This procedure must be followed when entering confined spaces such as manholes, pump stations basins, ductwork, vessels, etc. Its intent is to protect entering personnel against such hazards as oxygen deficiency, combustible gas and vapors, toxic gases and vapors, mechanical hazards, entrapment, etc.

Confined spaces may be closed on all sides, top and bottom, with entry provided through restricted openings, or may be open completely on one side, top or bottom. Entry is defined as breaking the plane of the confined space with any part of the body.

Permit - required confined spaces are of greater hazard than non - permit required confined space. The entry points to permit - required confined spaces are marked with red-stenciled signs stating: Danger - Permit - Required Confined Space, Do Not Enter. The entry points to non - permit required confined spaces are marked with yellow stenciled signs stating: Caution, Confined Space, Authorized Entry Only.

It is important to realize that a non-permit required confined space may require re-classification based on the type of work to be performed. For example, an underground vault may be classified as non-permit required, however, if an employee will be applying a solvent within this space it could be upgraded to permit - required.

Procedure

WARNING: SMOKING IS NOT PERMITTED IN A CONFINED SPACE OR NEAR THE ENTRANCE TO A CONFINED SPACE AT ANY TIME. THIS IS ESPECIALLY IMPORTANT WHEN THE SPACE IS BEING INITIALLY OPENED AND THE ATMOSPHERE TESTED.

WARNING: ALL ENERGY SOURCES MUST BE LOCKED OUT OR TAGGED OUT PRIOR TO ENTRY, UNLESS OTHERWISE APPROVED BY THE AUTHORIZED ENTRY SUPERVISOR.

- I. Prior to entering the confined space, the following minimum requirements must be observed:
 - a) No person may enter the confined space without specific training in confined space entry and approval of their supervisor;
 - b) Any conditions making it unsafe to remove an entrance opening cover shall be evaluated and the necessary precautions applied before the cover is removed;
 - c) When an entrance opening cover is removed, the opening will be promptly guarded by a railing, temporary cover or other temporary barrier that will prevent an accidental fall through the opening and will protect each employee working in the space from foreign objects entering the space.
 - d) Before an employee enters the space, the internal atmosphere shall be tested with a calibrated direct - reading instrument for oxygen content, flammable gases and vapors and toxic gases and vapors (in that order). Note that some instruments test for multiple gases simultaneously. If the presence of a toxic gas or vapor is suspected in a confined space, other than carbon monoxide or hydrogen sulfide, contact Safety & Risk Management for advice on air sampling. Hot air and steam shall be ventilated from steam vaults prior to testing the atmosphere.
 - (1) If possible, the atmosphere immediately inside the cover (entry point) shall be tested without removing the cover. This can be accomplished using a short section of plastic tubing and the hand - held aspiration bulb attached to the gas meter. If the cover does not have a sampling port, carefully open the cover a small amount and check the atmosphere immediately inside the cover or inserting the tube and using the hand held aspiration bulb.
 - (2) After testing the atmosphere immediately inside the confined space, carefully remove the cover. Test the atmosphere from the top to bottom and around ductwork and uneven surfaces. This can be done by slowly lowering the gas meter extension probe. Do not let the gas meter or extension probe submerge in any water that might be present. For horizontal confined spaces and confined spaces that must be entered from the bottom, it will be necessary to use a pole to test the atmosphere;
 - (3) Avoid leaning over the space or placing your head inside the confined space you are testing.
 - e) If the oxygen concentration test indicates an oxygen deficiency (less than 19.5%) or an excess (more than 23.5%), the gas meter should sound an alarm and forced ventilation of the confined space shall be required. No entry into the confined space shall be permitted until follow - up tests after ventilation indicate that the atmosphere is safe.
 - f) If the flammability test (combustible gas) indicates a flammable concentration greater than 10% of the lower explosive limit, the gas meter should sound an alarm and forced ventilation must be provided. No entry shall be permitted until follow - up tests indicate that the atmosphere is safe.
 - g) The gas meters test for carbon monoxide and hydrogen sulfide. Carbon monoxide is produced by internal combustion engines and hydrogen sulfide is often found in sewers. If the gas meter indicates levels of either carbon monoxide that exceed 25 parts per million (ppm) or hydrogen sulfide that exceed 10 ppm, the gas meter should sound an alarm and forced ventilation is required. No entry shall be made until the atmosphere is safe.
 - h) After purging, sufficient ventilation shall be supplied to the confined space where needed, making sure that your source of ventilation air is not contaminating the confined space (i.e. carbon monoxide from traffic).
 - i) At this point the confined space entry permit (for permit - required confined spaces) or check list (non - permit required confined spaces) must be completed. Each person entering the confined space must sign the confined space entry permit. The confined space entry permit must be posted near the entrance to the confined space. For outdoor entry points during wet or windy weather, the permit may be kept in a nearby location such as a department vehicle. It is now acceptable to enter the confined space.
 - j) Pre - entry retesting for air contaminants in the confined space atmosphere must be made after every work break.
 - k) If a hazardous atmosphere is detected while individuals are in the space, each employee shall leave the space immediately.
 - l) If an attendant outside the confined space orders an evacuation or if the gas meter signals an alarm, all employees shall immediately evacuate the confined space. The space shall not be re - entered until the source of the problem has been identified and corrected.
 - m) The completed confined space entry permit or checklist must be kept in the department files and a copy forwarded to the Safety Committee Secretary.

- II. In addition to the minimum requirements before entry, the following procedures must be observed for entry into a permit - required confined space:
 - a) An attendant must be stationed outside the confined space to maintain voice and/or visual contact with entrants and to recognize early symptoms of danger in the space. The attendant must be fully familiar with the proper rescue procedures and recognition of hazardous conditions. The attendant must not enter the confined space in an emergency. The attendant shall order an evacuation of the confined space if a hazardous condition develops or when the workers inside the confined space appear to be in danger.
 - b) When applicable, a lifeline or full - body harnesses shall be provided for each person in the confined space. In some cases, it will not be possible to use these rescue features based on the shape, size or contents of the particular confined space.
 - c) A portable radio or other device shall be used to maintain communication between the attendant and the entrant(s);
 - d) The number of employees allowed to enter a permit-required confined space shall be kept to a minimum.
 - e) The supervisor on site, or a designated authorized person, shall complete the entry permit and make sure all entrants have signed it prior to entry. The supervisor shall cancel the permit at the completion of the job or when conditions substantially change within the confined space such that the permit is no longer valid.
- III. Rescue procedures
 - a) If an employee is injured, or becomes unconscious in a permit-required confined space, they shall be retrieved using the rescue tripod and winch or lifeline (if provided). Emergency personnel shall be summoned via 911 as soon as possible after it is recognized that a problem exists. In some instances, the notification may have to be delayed until the injured person has been removed from the space.
 - b) The attendant must never enter a confined space. If rescue cannot be accomplished outside the confined space by using a tripod/winch or lifeline, then rescue assistance shall be summoned immediately by calling 911 or the use of portable radios to contact the dispatcher.

Guide to Mechanical Ventilation of Confined Spaces

In many situations, it will be necessary to ventilate a confined space prior to entry and to maintain forced ventilation while the space is occupied. This is required to remove air contaminants, provide oxygen and to keep the air as clean as possible. The following is a guide to help ventilate confined spaces. Some confined spaces have a single opening; others have multiple openings or are connected to tunnels, etc.

1. It is best to blow air into the confined space and draw it out simultaneously. This generally requires two or more openings. For ventilation purposes, it is generally best to open as many of the adjacent entry points as possible.
2. With a confined space that has only a single entry point or when only a single exhaust fan is available, air should be blown into the confined space. A flexible hose is helpful in directing the air to the bottom of the confined space.
3. It is important that the intake for ventilation air not be contaminated. In some cases, a portable gasoline powered generator will be used to power the ventilation fan(s). The generator should be located as far as possible from the fan air intake. Motor vehicles or other internal combustion engines should not be allowed to operate with their exhaust pipes located near the air intakes.
4. When using ventilation, it is important to have a rough idea of the volume of the confined space to be entered. It is also important to know the rating of the ventilation fan. When forced ventilation of a confined space is required, at least three air changes should be provided prior to re-sampling. Here is an example:

An underground fault is 10 feet wide by 8 feet high by 10 feet long. Multiplying these three dimensions yields 800 cubic feet. The fan to be used is rated for 400 cubic feet per minute.

800 cubic feet
400 cubic feet per minute

Thus it will take the fan two minutes to ventilate the confined space. It will take 6 minutes to provide the necessary three air changes.

Equipment for Confined Space Entry

The following is a list of equipment that may be necessary for safe entry of the confined space:

- a. Fire Extinguisher - if work presents a fire hazard.
- b. When using a portable ladder, it must extend at least three feet above the entry point.
- c. Lock, key, multiple - lock hasp, tags and other necessary equipment for lockout/tagout.
- d. Respirator approved for the expected hazards.
- e. Other personal protective equipment that is necessary such as coveralls, safety shoes, eye protection, hearing protection, etc.
- f. Portable communication radios.
- g. Lighting equipment suitable for use in confined spaces.
- h. Temporary barriers to prevent falls into a confined space.
- i. Permit form, for permit - required confined spaces or a pre - entry checklist for non - permit - required spaces.

Confined Space Entry Permit

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

1. The permit space to be entered.
2. The purpose of the entry.
3. The date and the authorized duration of the entry permit.
4. The authorized entrants within the permit space.
5. The personnel, by name, currently serving as attendants.
6. The individual, by name, currently serving as entry supervisor, with a space for the signature or initials of the entry supervisor who originally authorized entry.
7. The hazards of the permit space to be entered.
8. The measures used to isolate the permit space and to eliminate or control permit space hazards before entry.
9. The acceptable entry conditions.
10. The results of initial and periodic tests performed, accompanied by the names or initials of the testers and by an indication of when the tests were performed.
11. The rescue and emergency services that can be summoned and the means (such as the equipment to use and the numbers to call) for summoning those services.
12. The communication procedures used by authorized entrants and attendants to maintain contact during the entry.
13. Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment, to be provided for compliance with this section.
14. Any other information whose inclusion is necessary, given the circumstances of the particular confined space, in order to ensure employee safety.

Training

1. The Town of Mount Carmel shall provide training so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.
2. Training shall be provided to each affected employee:
 - i. before the employee is first assigned duties under this section.
 - ii. before there is a change in assigned duties.
 - iii. whenever there is a change in permit space operations that presents a hazard about which an employee has not been previously trained.
 - iv. Whenever the Safety Director has reason to believe either that there are deviations from the permit space entry procedures required by this section or that there are inadequacies in the employer's knowledge or use of these procedures.
 - v. The training shall establish employee proficiency in the duties required by this section and shall introduce new or revised procedures, as necessary, for compliance with this section.
 - vi. The Safety Committee shall certify that the training required by this section has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

Duties of Authorized Entrants

The Safety Committee shall ensure that all authorized entrants:

1. Know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
2. Properly use equipment as required by this section.
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 as required by this section.
4. Alert the attendant whenever:
 - i. The entrant recognizes any warning sign or symptom of exposure to a dangerous situation
 - ii. The entrant detects a prohibited condition
5. Exit from the permit space as quickly as possible whenever:
 - i. An order to evacuate is given by the attendant or the entry supervisor.
 - ii. The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.
 - iii. The entrant detects a prohibited condition
 - iv. An evacuation alarm is activated.

Duties of Attendants

The Safety Committee shall ensure that each attendant:

1. Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
2. Is aware of possible behavioral effects of hazard exposure in authorized entrants.
3. Continuously maintains an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants under this section accurately identifies who is in the permit space.
4. Remains outside the permit space during entry operations until relieved by another attendant.

5. Communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space under this section.
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:
 - i. if the attendant detects a prohibited condition
 - ii. if the attendant detects the behavioral effects of hazard exposure in an authorized entrant
 - iii. if the attendant detects a situation outside the space that could endanger the authorized entrants
 - iv. if the attendant cannot effectively and safely perform all the duties required under this section.
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:
 - 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.
 - iii. Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.
9. Performs non - entry rescues as specified by the employer's rescue procedure.
10. Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

Duties of Entry Supervisors

The Safety Committee shall ensure that each entry supervisor:

1. Knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
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.
3. Terminates the entry and cancels the permit as required by this section.
4. Verifies that rescue services are available and that the means for summoning them are operable.
5. Removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations.
6. Determines, whenever responsibility for a permit space entry operation is transferred and at 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.

Rescue and Emergency Services

1. Town of Mount Carmel shall utilize the Mount Carmel Fire Department, Church Hill EMS to conduct any rescue from a permit-required confined space.
 - i. All portable communication radios used by entrants and attendants are two channel radios and have the capability of communicating with the Supervisor.
 - ii. In an emergency situation the Supervisor is to notify 911 and request Confine Space Rescue Response from Mount Carmel Fire Department and Church Hill EMS.
2. When an employer (host employer) arranges to have persons other than the host employer's employees perform permit space rescue, the host employer shall:
 - i. inform the rescue service of the hazards they may confront when called on to perform rescue at the host employer's facility, and
 - ii. Provide the rescue service with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plans and practice rescue operations.
3. To facilitate non - entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements:
 - i. Each authorized entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near 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 best alternative.
 - ii. The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet deep.

4. 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 worksite, that MSDS or written information shall be made available to the medical facility treating the exposed entrant.
 - i. Any injuries or Confine Space Rescue the Supervisor is to contact the Safety Director after all emergency personnel have been notified.

Procedures for Atmospheric Testing

Atmospheric testing is required for two distinct purposes: evaluation of the hazards of the permit space and verification that acceptable entry conditions for entry into that space exist.

1. Evaluation testing. The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity to identify and evaluate any hazardous atmospheres that may exist or arise, so that appropriate permit entry procedures can be developed and acceptable entry conditions stipulated for that space. Evaluation and interpretation of these data, and development of the entry procedure, should be done by, or reviewed by, a technically qualified professional (e.g. OSHA consultation service, or certified industrial hygienist, registered safety engineer, certified safety professional, etc.) based on evaluation of all serious hazards.
2. Verification testing. The atmosphere of a permit space which may contain a hazardous atmosphere should be tested for residues of all contaminants identified by evaluation testing using permit specified equipment to determine that residual concentrations at the time of testing and entry are within the range of acceptable entry conditions. Results of testing (i.e., actual concentration, etc.) should be recorded on the permit in the space provided adjacent to the stipulated acceptable entry condition.
3. Duration of testing. Measurement of values for each atmospheric parameter should be made for at least the minimum response time of the test instrument specified by the manufacturer.
4. Testing stratified atmospheres. When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately 4 feet (1.22 m) in the direction of travel and to each side. If a sampling probe is used, the entrant's rate of progress should be slowed to accommodate the sampling speed and detector response.

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