

# CHAPTER 7

## CONFINED SPACES

### INTRODUCTION

The entry into a confined space is potentially one of the most dangerous activities associated with any hazardous substance operations. Due to the unique conditions that can exist, great care must be taken both before and during these work processes. This program is written to be in compliance with OSHA Regulation 29CFR1910.146, and designed to assist the employees of HTS AmeriTek when they perform heat treating services inside client identified confined spaces.

Since asphyxiation is the leading cause of death in confined spaces due to situations involving IDLH (immediately dangerous to life and health) atmospheres that are poorly ventilated, all efforts will be devised to control oxygen deficient/combustible/toxic environments that may be encountered prior to or during work activities. **Total energy isolation is required before any entry will be allowed.**

### DEFINITIONS

- **Confined Space** is any of the following characteristics:
  - 1) *The space is large enough for an employee to bodily enter and perform work.*
  - 2) *There are limited or restricted means for entry and exit.*
  - 3) *It is not designed for continuous employee occupancy.*
  - 4) *It contains or has the potential to contain a hazardous atmosphere.*
  - 5) *It has an internal configuration such that an entrant could be trapped or asphyxiated such as sloping walls and floors that converge to a point of constriction.*
  - 6) *Contains a material that has the potential of engulfing and entrant.*
  - 7) *Contains any other recognized serious safety or health hazard, e.g. possible exposure to hazardous energy, falls, heat stress, etc.*
  
- **Acceptable entry conditions** refer to conditions that must exist in a permit space to allow employees to enter and to ensure they can safely complete their work while in that confined space.
- **Attendant** refers to a person stationed outside the permit space that monitors the authorized entrants, and performs the duties assigned to them by this written program.
- **Authorized Entrant** refers to an employee who is authorized under this written program to enter a permit space.
- **Emergency** refers to an event that could endanger an authorized entrant whether it occurs inside or outside the permit space.
- **Entry** refers to the entrance of a person into a permit-required confined space. Entry is considered when any part of the body breaks the plane of entry into the space.
- **Entry Permit** refers to the written document that controls entry into a permit confined space, and contains all pertinent information required by the OSHA Standard.
- **Entry Supervisor** refers to the person designated with the responsibility to determine acceptable entry conditions, and to authorize, supervise, or terminate any entry.
- **Hazardous Atmosphere** refers to an atmosphere, which may expose a person to the risk of death, incapacitation, injury, acute illness, or impaired ability to escape unaided from an emergency
- **IDLH (immediately dangerous to life and health)** refers to a condition that threatens loss of life, adverse health effects, or impaired ability to escape unaided from an emergency.
- **Oxygen deficient atmosphere** refers to an atmosphere that contains less than 19.5% oxygen content.
- **Oxygen Enriched Atmosphere** refers to an atmosphere that contains more than 23.5% oxygen content.
- **Retrieval System** refers to equipment, which non-entry personnel can use to retrieve persons from a permit space in case of emergency.
- **Testing** refers to a process used to identify and evaluate a potentially hazardous atmosphere with monitoring instruments.

## MANAGEMENT/EMPLOYEE RESPONSIBILITIES

The **Responsible Safety Officer** is responsible for all the overall implementation of this program or the requirements of any host-facility program, while working on contracted projects at host facilities. Due to the extremely severe consequences possible if improper confined space entries are made, **all employees** will comply with the provision of this program that apply to their own actions or conduct.

## IDENTIFICATION

The identified confined space vessel will be revealed to all employees by the use of a red/white hazard-warning sign with black letters stating:

**DANGER  
PERMIT-REQUIRED CONFINED SPACE  
DO NOT ENTER**

## HAZARD EVALUATION

Testing or monitoring conditions prior to entry and during entry operations will be conducted by the host-facility unit operator, or host-facility designee, by the use of a calibrated, direct-reading, gas monitor. Oxygen levels must be tested first, a lack of oxygen will cause erroneous reading of flammable and toxins. The tests shall be performed in this order:

1. Oxygen concentration (19.5% - 23.5% range)
2. Flammable gases/vapors (less than 10% of LEL)
3. Potential toxic concentrations (less than listed PEL's)

The results shall be recorded on the host-facility entry permit, and entry into the confined space will not be allowed unless the defined acceptable entry conditions are met. Continuous atmospheric monitoring of the permitted space is required while employees are inside the confined space. Employees or their representatives are entitled and encouraged to request additional air monitoring at any timework is underway.

The instrument probe or line must extend into the confined space at least 4 feet so that the person performing the test is not entered into the space. Since particular gases can stratify in layers in the confined space, initial entry testing will be performed at multiple levels of the space to be entered. If entry is required to perform atmospheric testing, that individual shall wear a SCBA (self-contained breathing apparatus) or a positive pressure respirator with escape bottle.

If an instrument reading ever indicates an unusual, unexpected, or unacceptable atmospheric condition, it is never to be ignored or assumed to be instrument error. If a bad reading is ever indicated, all necessary measures will be taken to correct the situation (recalibrate instrument, ventilate space, etc.) Employees will not be expected to enter confined spaces until it is deemed safe to do so, and the acceptable entry conditions recorded on the entry permit. The size or design of a confined space may warrant the use of multiple gas monitors with their probes located at various levels.

Lighting sources to be used in the permit-confined space shall be explosive-proof and specifically approved by a recognized agency such as Underwriter Laboratory or the Mine Safety and Health Administration.

Any electrically operated tool taken inside the permit space shall be double insulated, inspected for defects, and connected to an approved ground fault circuit interrupter (**GFCI**) that has been inspected and tested before use.

All ladders used for entry/exit into the permit-confined space must meet all applicable codes and standards as outlined in 29CFR1910.23 or .26, and inspected prior to use. They must not interfere with rescue or retrieval systems, ventilation methods, and work operations.

## **VENTILATION**

Continuous ventilation must be provided in the confined space in a volume sufficient to maintain acceptable atmospheric conditions in accordance with the parameters in the Monitoring log section of the Entry Permit. The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.

If ventilation is unsuccessful, as demonstrated by unacceptable retesting results, or even if acceptable conditions are unable to be consistently maintained during actual entry operations, authorized entrants will be required to wear appropriate respiratory protective equipment in compliance with OSHA Regulation 29CFR1910.134, the Respiratory Protection Standard.

This equipment selection will be based on the atmospheric test results that will indicate the proper level of respiratory protection to be worn.

## **HAZARDOUS ATMOSPHERES**

An atmosphere is considered hazardous if it contains one or more of the following:

- Atmospheric oxygen concentration below 19.5% or above 23.5%.
- Flammable gas, vapor, or mist in excess of 10% of its lower explosive limit (LEL).
- Airborne combustible dust at a concentration that meets or exceeds its LFL, lower flammability limit, or (if the dust obscures vision at a distance of 5 feet).
- Atmospheric concentration of any substance where employee exposure would exceed any listed toxic dose or permissible exposure limit.
- Any other atmospheric condition that is immediately dangerous to life and health.

## **Entry Permits**

The authorized entry Supervisor shall prepare the entry permit, recording all testing results on the permit. This system will provide the best assurance that confined space entry takes place only after all actions and conditions necessary for the protection of authorized entrants have been performed. The entry permit will identify the following information:

- **Permit space** (name/location of space to be entered).
- **Purpose** (specify job/type of work to be performed in that space).
- **Date/duration of entry** (current date and length of time allowed).
- **Entrant names** (roster of authorized personnel for space entry).
- **Attendant name(s)** (at least one, but may rotate with entrants).
- **Entry Supervisor** (authorized for entry also).
- **List of Hazards** (observed or present).
- **Hazards control/isolation** (methods of elimination).
- **Acceptable entry conditions** (oxygen, combustible, toxins).
- **Test results** (initial/periodic monitoring & initials of tester).
- **Rescue provisions** (services to call, emergency #'s).
- **Communication methods** (phone, 2-way radio, voice, signals).
- **Tools/Equipment needed** (PPE, harnesses, retrieval lines, alarms).
- **Space specific information** (special precautions unique to the space).
- **Additional permits** (hot work, lockout/tagout).
- **Authorization of permit** (proper signatures of authority).

HTS Ameritek employees will have the opportunity to participate in the permit review and signing of this document prior to the commencement of permit authorized work activities.

## Hot Work Permit

- A hot work permit is also required in conjunction with the confined space entry permit if hot work tasks will be performed inside the permit required confined space.
- When welding or cutting is being performed in a permit required confined space the gas cylinders and welding machines shall be kept outside of the confined space.
- When authorized entrants leave a permit required confined space for lunch, long break, or shift change, all cutting hoses and torches must be removed from the confined space to eliminate the possible accumulation of explosive gasses.

## TRAINING

Whether you are an entrant, attendant, entry Supervisor, or part of the support personnel confined space training is mandatory. Most confined space accidents and fatalities are the result of the wide range of possible hazards to be encountered, as well as the lack of training, so this will be an important part of the confined space program. Training will be provided:

- Before any employee is assigned any duties.
- Before any assigned duties are changed.
- Whenever there is a change in operations affecting the space.
- Whenever an employee demonstrates deficiencies or deviations from the initial training provided.

Written certification to include employee's name, trainer signature/initials, and dates of training will be provided upon completion of required levels of training as provided by outside contract training resources or Management, and maintained in the Safety Department at the Main office. Certification must be made available to employees and their authorized representatives. Refresher training will be provided on an annual basis.

## DUTIES OF AUTHORIZED ENTRANTS

I shall ensure that all **authorized entrants**:

- Have a valid entry permit, read and understand it.
- Know the hazards that may be encountered during entry.
- Know the signs, symptoms, and possible behavior effects of the hazards and the consequences of exposure.
- Properly use all tools, PPE, and safety equipment as required.
- Only use pre-determined authorized entry and exit locations. (Must have an Entry Attendant)
- Communicate with the attendant periodically to enable the attendant to monitor the entrant(s) status.
- Ensure the Entry attendant properly documents your
- Alert all entrant(s) of the need to evacuate the space when requested by the attendant.
- Inform the attendant of any warning signs or symptoms of exposure noticed.
- Exit the confined space if they detect a prohibited condition.

## DUTIES OF ENTRY ATTENDANTS

**Before Entry**, the entry attendant must:

- Have a valid entry permit, read and understand it.
- Know the hazards that may be faced during entry.
- Know the signs, symptoms, and behavior effects of the hazards and the consequences of exposure.
- Know and understand the methods available to contact the Entry Supervisor
- Know and understand the methods available to contact emergency personnel.
- Know the location of the ventilation equipment and ensure that it is working during entry.
- Know the location of the power source and breakers for entry lighting.
- Barricade the entrance with tape and a "Confined Space Danger Sign" when the confined space is vacated and left unattended

**During Entry** the attendant must:

- Continuously maintain an accurate count of **authorized entrants** in the confined space.
- Monitor entrants for proper PPE usage.
- Monitor and document (every hour) the reading levels of the continuous atmospheric testing.
- Remain outside of the confined space during entry operations until relieved by another trained **entry attendant**.
- Communicate with **authorized entrants** periodically to monitor entrant(s) status.
- Summon Entry Supervisor as soon as they determine that authorized entrants may need assistance to escape from confined space hazards.
- Warn unauthorized persons that they must stay away from the confined space.
- Inform the authorized entrants and the **Entry Supervisor** if unauthorized persons have entered the permit space.
- Advise the unauthorized persons that they must exit immediately if they have entered the permit space.
- Perform no duties that might interfere with their primary duty to monitor and protect the **authorized entrants**.
- Order the entrants to evacuate the permit space ***immediately*** under any of the following conditions:
  - A condition inside or outside the confined space arises that presents a hazard to entrants.
  - If a sign, symptom, or behavioral effect of hazard exposure is observed.
  - If an uncontrolled hazard is detected (fire, spill, gas release, severe weather, or incident)
  - If they cannot, for any reason, effectively and safely perform all the duties required.

HTS Ameritek management does not allow an attendant to monitor more than one confined space at a time. If an emergency arises the attendant will contact the **Entry Supervisor** for assistance.

#### DUTIES OF ENTRY SUPERVISORS

The employee must ensure that all **Entry Supervisors**:

- Have a valid entry permit, read and understand it.
- Know the hazards that may be faced during entry.
- Know the signs, symptoms, and behavior effects of the hazards and the consequences of exposure.
- Verify the isolation of hazard (EIL) to the confined space.
- Verify that all tests specified by the permit have been conducted and all procedures and equipment specified by the permit are in place before signing the permit.
- Verify that rescue services are available and the means to summon them are operable.
- Inform and verify that authorized entrants only use the authorized entry and exit locations.
- If multiple authorized entry and exit locations are required: each location must have an entry attendant, every attendant shall have radio communication abilities to insure accurate entry logs.
- Complete a Confined Space Check List form and post it with the entry permit at the job site before allowing entry to begin.
- Remain on site and in close proximity of the permit required confined space.
- Verify the ventilation equipment operation, job conditions, PPE requirements, and entry attendant responsibilities at least every hour.
- Terminate the entry and cancel the permit as required.
- Remove unauthorized individuals who enter or attempt to enter the permit space during entry operations.
- Determine whenever responsibility for 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 acceptable entry conditions are maintained.
- Coordinate entry operations for multi-employers so that employees of one employer do not endanger the employees of any other employer.

## ENTRY PROCEDURES

No employee of HTS Ameritek will be allowed to enter a permit-confined space unless the following procedures are adhered to:

- (1) The confined space must be properly tested for acceptable ranges of oxygen content, flammable atmosphere, and toxic concentrations present, using a calibrated, direct-reading gas-monitoring instrument, operated or verified by a trained Supervisor. (There can be no longer than a 2 hour time-gap between tests performed and any space entry.)
- (2) The permit space shall be identified by appropriate signs, and the external area barricaded to ensure that no unauthorized persons, equipment, or vehicles present a danger to **authorized entrants**.
- (3) No smoking or flammable, combustible materials are allowed within this barricaded area. A properly inspected, charged ABC dry chemical fire extinguisher is required to be outside the permit space, ready to use. No welding gas tanks are allowed inside the permit space, and all hoses, regulators, leads, electrode holders or other welding/cutting equipment will be inspected before entry into the permit space. Equipment found to be defective will not be allowed for use.
- (4) Communication methods will be by voice, visual contact, or 2-way radios that are required to be intrinsically safe in design.
- (5) Properly inspected, approved entry/exit means will be secured into position, following all established safe ladder-use guidelines.
- (6) Ventilation equipment will be activated and provide continuous forced air from clean air sources, so that proper air exchanges for the enclosed space is maintained at all times for permit space occupancy.
- (7) Tag the air source valves to the ventilation equipment "Do Not Operate Confined Space Ventilation".
- (8) Approved, properly rated (12V-explosion-proof) light sources, or intrinsically safe flashlights will be provided for safe illumination while working inside a permit space.
- (9) Appropriately selected personal protective equipment will be donned prior to vessel entry, and worn at all times while inside the permit space.
- (10) After the space has been tested and declared safe for entry, the entry permit shall be completed, conditions explained to all authorized personnel, signed by all authorized personnel, and posted at a conspicuous location outside/on the vessel.
- (11) The **attendants** shall be assigned to their appropriate duties. The entrants may then enter inside the confined space, and the **Entry Supervisor** is accountable for maintaining safe operations.
- (12) Permits will be canceled upon completion of work, or for emergency evacuation due to dangers occurring inside or outside the space that could directly affect the life or health of an entrant.
- (13) If an emergency occurs and evacuation of the space is required, the space will be re-evaluated to determine the cause, extent, and nature of the hazard encountered. The hazard will be eliminated before entry is again permitted, after inspection and testing is satisfactory.
- (14) Upon job completion or evacuation, the word "CANCELLED" shall be written across the permit, noting date and time. (Cancellation reason to be listed **only if** a dangerous incident, injury, or hazard occurred.)
- (15) Permits or copies will be retained for a period of at least one year by the **Responsible Safety Officer** and maintained in files at the Main Office. The written program must be reviewed annually (unless no entries were made during the prior 12 month period) and revised as necessary to protect employees from confined space hazards when injuries, near misses, employee complaints, or unauthorized entry occurs.

## RESCUE AND EMERGENCY SERVICES

HTS Ameritek does not provide confined space rescue training to their employees. We will rely upon the rescue services of the host facility or from a rescue service contractor. The Safety Manager will verify the training records of the rescue personnel prior to the utilization of their services.

## CONCLUSION

By reading, understanding, and practicing the safety guidelines that have been outlined in this written program, you will be able to appreciate the benefits of complying with this regulation. They have been designed to protect your health and safety while performing confined space entry job tasks. Follow these written procedures, never take short cuts, and be aware of the hazards that can be encountered in confined spaces.

Non-compliance by any employee with any part of this described program will result in disciplinary action as outlined in the Company's Corrective Action/Disciplinary Program found in Chapter 4 of this manual.

## ENTRY SUPERVISORS CONFINED SPACE PRE-ENTRY CHECKLIST

|   |       |            |           |
|---|-------|------------|-----------|
| Facility Name:  | Unit: | Equipment: | Date:     |
| Is a valid entry permit is posted at the job site?                                      |       |            | Yes    No |
| Is a valid hot work permit is posted at the job site? (if required)                     |       |            | Yes    No |
| All authorized entrants have proof of current confined space training?                  |       |            | Yes    No |
| Hazard isolation has been personally verified?  |       |            | Yes    No |
| Entry attendant has all required tools and equipment at the job site to fulfill duties? |       |            | Yes    No |
| Entry attendant has proof of current entry attendant training?                          |       |            | Yes    No |
| Authorized entry locations established?   |       |            | Yes    No |
| Is atmospheric monitoring sufficient for the size and configuration of the space?       |       |            | Yes    No |
| Is there sufficient lighting inside and outside the confined space?                     |       |            | Yes    No |
| Is the ventilation system working and properly grounded or bonded?                      |       |            | Yes    No |
| Are flow indicators visible for ventilation systems?                                    |       |            | Yes    No |
| Are the ventilation system air valve(s) properly tagged?                                |       |            | Yes    No |
| Does the entry supervisor have proof of current CPR training?                           |       |            | Yes    No |
| Does the entry attendant have a sign to cover the entrance when job is complete?        |       |            | Yes    No |
| Communication methods in place and understood?  |       |            | Yes    No |
| Rescue personnel made aware of confined space activities?                               |       |            | Yes    No |
| Rescue plan posted at the job site (if required)?                                       |       |            | Yes    No |

**Note: Entry cannot be approved if any blanks are marked in the “NO” column.**

Print Entry Supervisor’s Name: \_\_\_\_\_

Entry Supervisor’s Signature: \_\_\_\_\_

The Entry Supervisor’s signature indicates; that all of the above requirements are met, in accordance to our policies, all known hazards have been removed or mitigated, and the confined space is acceptable for entry.

## CONFINED SPACE PERMIT

### General Information

|                           |       |                                |       |
|---------------------------|-------|--------------------------------|-------|
| Facility Name:            | Unit: | Equipment:                     | Date: |
| Time of authorized entry: | am/pm | Time authorized entry expires: | am/pm |
| Job Description:          |       |                                |       |
|                           |       |                                |       |

### Contact Information

|                     |               |
|---------------------|---------------|
| Site Supervisor:    | Contact Info: |
| Entry Supervisor:   | Contact Info: |
| Entry Attendant:    | Contact Info: |
| Emergency Rescue:   | Contact Info: |
| Emergency Services: | Contact Info: |

### Possible Hazards List

|  |
|--|
|  |
|  |

### Authorized Entrants

| Print Name | Employee No. | Print Name | Employee No. |
|------------|--------------|------------|--------------|
|            |              |            |              |
|            |              |            |              |
|            |              |            |              |
|            |              |            |              |
|            |              |            |              |

### Measures Used To Isolate the Permit Space:

|  |                     |
|--|---------------------|
| Are electrical sources secured per Lockout/Tagout Chapter? |                     |
| Mechanical lock out/block out?                             | Blanking/disconnect |

### Decontamination

|                    |
|--------------------|
| List methods used: |
|                    |

### Temperatures

|  |  |
|--|--|
| Current temperature inside confined space:         | Is a safe working inside the confined space? |
| Is a/c required for a safe working temperature?    | Are cool vest required?                      |
| Is a scheduled work and rest schedule in required? | If yes, describe plan:                       |

### Electrical Equipment

|  |                            |
|--|----------------------------|
| GFCI inspected and tested?   | GFCI inspected and tested? |
| 12 volt lighting required?   | 12 volt lighting required? |
| Are electrical power tools double insulated?   |                            |
| Are electrical power cords protected from damage where they enter the confined space |                            |



**Acceptable Entry Conditions**

|   |                                    |
|---|------------------------------------|
| <u>Acceptable oxygen content is between 19.5 and 23.5 percent.</u>                  |                                    |
| Person performing Test  | Calibration Date                   |
| Make and model of oxygen tester   |                                    |
| Measured oxygen content:     %  |                                    |
|   |                                    |
| <u>Acceptable gas, vapor, and dust concentrations are less than 10% of LEL</u>      |                                    |
| Person performing   | Calibration Date                   |
| Make and model of flammability tester:  |                                    |
| Measured flammability:     % of LEL/LFL.  |                                    |
|   |                                    |
| <u>Acceptable toxicity levels are those listed in the approved entry procedure.</u> |                                    |
| Person performing   | Calibration Date                   |
| Make and model of toxicity testers  |                                    |
| Measured toxicity:     % of PEL.  |                                    |
|   |                                    |
| <u>Ventilation</u>  |                                    |
| Is ventilation required?  | Is ventilation grounded?           |
| Is exhaust air directed away from work areas?                                       | Are air flow indicators installed? |
| Are "DO NOT Operate" tags installed on ventilation air source valves?               |                                    |
| Decontamination methods used:   |                                    |

**Additional Personal Protective Equipment Required**

|                          |                         |                           |
|--------------------------|-------------------------|---------------------------|
| Air purifying respirator | Supplied air respirator | Face shield               |
| Hand protection          | Foot protection         | Head protection           |
| Goggles                  | Protective clothing     | Double hearing protection |
| Personal monitors        | Rescue equipment        | Body harness              |
| Other:                   |                         |                           |

**Communications**

|  |
|--|
| Means of communication with site supervisor?     |
| Means of communication with entry supervisor?    |
| Means of communication with authorized entrants? |
| Means of communication with rescue services?     |
| Means of communication with emergency services?  |

**Rescue Plan**

|                                  |
|----------------------------------|
| Rescue plan (attach if required) |
| Date:                            |

**Authorization**

|  |            |
|--|------------|
| <i>I am satisfied that the vessel is safe for entry and the "Permit Required Confined Space Entry", Safety Procedures is being followed.</i> |            |
| Entry Supervisor:  | Date/time: |
| Site Supervisor (if applicable)  | Date/time: |
| Site Safety (if applicable):   | Date/time: |

## Entry Attendant Hand-out - Signs &amp; Symptom of Exposure of some Common Chemicals

| <b>Oxygen Deficient</b>       | <b>Sulfur Dioxide</b>   | <b>Iron Sulfide</b>                 |
|-------------------------------|---|-------------------------------------|
| Increased breathing rate      | Eye, nose, throat irritation  | Eye, nose, throat irritation        |
| Dizziness                     | Increased breathing rate  | Increased breathing rate            |
| Headache                      | Chocking sensation  | Chocking sensation                  |
| Increased heart rate          | Coughing  | Coughing                            |
| Inability to move             | Gasping for air   | Gasping for air                     |
| Loss of consciousness - Death | Death   | Death                               |
| <b>Hydrogen Sulfide</b>       | <b>Acids</b>  | <b>Phenol</b>                       |
| Smells like rotten eggs       | Eye, nose, throat irritation  | Dizziness                           |
| Headache                      | Respiratory track irritation  | Headache                            |
| Dizziness                     | Burns to skin   | Cold sweats                         |
| Nausea                        |   | Irregular or noisy breathing        |
| Eye irritation                | <b>Caustics</b>   | Skin becomes white and wrinkled     |
| Respirator paralysis          | Eye, nose, throat irritation  | Eye and skin irritation             |
| Loss of consciousness - Death | Respiratory track irritation  | Weakness                            |
|                               | Burns to skin   | Loss of consciousness - Death       |
| <b>Ammonia</b>                |   |                                     |
| Eye, nose, throat irritation  | <b>Welding fumes</b>  | <b>Chlorine</b>                     |
| Chest pain                    | Mild eye, nose, throat irritation   | Burning sensation eye, nose, throat |
| Indigestion                   | Metal fume fever – an acute condition which occurs 4-12 hours after exposure. | Coughing and wheezing               |
| Bronchial spasms              | Symptoms include fever, chills, and shaking.                                  | Loss of breathing                   |
| Loss of consciousness - Death |   | Loss of consciousness - Death       |
| <b>Carbon Monoxide</b>        |   | <b>Benzene</b>                      |
| Pounding heart                | <b>Heat</b>   | Headache                            |
| Dull headache                 | Hot, dry skin   | Nausea                              |
| Dizziness                     | Severe headache   | Eye, nose, throat irritation        |
| Ringing ears                  | Flushed face  | Central nervous system depression   |
| Red, flushed skin             | Muscle or abdominal cramps  |                                     |
| Loss of consciousness - Death | Dizziness   |                                     |
|                               | Loss of consciousness - Death   |                                     |

| <b>Duties before Entry</b>  | <b>Duties during Entry</b>   |
|---|--|
| <ul style="list-style-type: none"> <li>• Have a valid entry permit, read and understand it.</li> <li>• Know the hazards that may be faced during entry.</li> <li>• Know the signs, symptoms, and behavior effects of the hazards and the consequences of exposure.</li> <li>• Know and understand the methods available to contact the Entry Supervisor</li> <li>• Know and understand the methods available to contact emergency personnel.</li> <li>• Know the location of the ventilation equipment and ensure that it is working during entry.</li> <li>• Know the location of the power source and breakers for entry lighting.</li> <li>• Barricade the entrance with tape and a “Confined Space Danger Sign” when the confined space is vacated and left unattended</li> </ul> | <ul style="list-style-type: none"> <li>• Continuously maintain an accurate count of <b>authorized entrants</b>.</li> <li>• Monitor entrants for proper PPE usage.</li> <li>• Monitor and document (every hour) the reading levels of the continuous atmospheric testing.</li> <li>• Remain outside of the confined space during entry operations until relieved by another trained <b>entry attendant</b>.</li> <li>• Communicate with <b>entrants</b> periodically to monitor status.</li> <li>• Summon Entry Supervisor if determine that authorized entrants may need assistance to escape from confined space hazards.</li> <li>• Warn unauthorized persons that this is a confined space.</li> <li>• Inform the authorized entrants and the <b>Entry Supervisor</b> if unauthorized persons have entered the permit space.</li> <li>• Advise the unauthorized persons that they must exit immediately if they have entered the permit space.</li> <li>• Perform no duties that might interfere with their primary duty.</li> <li>• Order the entrants to evacuate the permit space <b>immediately</b> if: <ul style="list-style-type: none"> <li>○ A condition inside or outside the confined space arises that presents a hazard to entrants.</li> <li>○ If a sign, symptom, or behavioral effect of hazard exposure is observed.</li> <li>○ If an uncontrolled hazard is detected (fire, spill, gas release, severe weather, or incident)</li> <li>○ If they cannot, for any reason, effectively and safely perform all the duties required.</li> </ul> </li> </ul> |

## **PERMIT REQUIRED CONFINED SPACE ENTRY RESCUE PLAN**

**PROJECT:** \_\_\_\_\_ **NO:** \_\_\_\_\_

In the event of an emergency requiring the rescue of one or more employees engaged in a confined space entry, the procedures outlined in this plan will be followed for \_\_\_\_\_  
(Identification of confined space)

### **1.0 RESCUE PROCEDURES**

*The following procedures will be followed for confined space entry rescues.*

- 1.1 Attendant: A trained stand-by person (attendant) will be assigned to each confined space with a fully charged SCBA or Airline/Egress unit. The stand-by is to keep lifelines clear, to maintain contact with all workers within the confined space, and to summon help if needed. The stand-by must never enter the confined space unless relieved by rescue assistance. The stand-by may attempt a non-entry rescue by lifeline while waiting for rescue assistance.
- 1.2 Rescue Equipment: The equipment required to rescue a victim (Section 1.1) must be in place before the first person enters the confined space. A mechanical device will be in place to retrieve personnel from vertical type permit spaces more than five feet deep.
- 1.3 Evacuations: The attendant will monitor activities inside and outside the confined space to determine if it is safe to remain in the space and shall order the entrant to evacuate the space under any of the following conditions:
  - If the attendant detects a prohibited condition, e.g. unacceptable levels of toxic gases, oxygen, or combustible gases (see Site Safety and Health Plan).
  - If the attendant detects a situation outside the space that could endanger the entrants.
  - If the attendant cannot fulfill his duties.
  - If the attendant detects the behavioral effects of hazardous exposure in the entrants.
- 1.4 Rescue Procedures: If the confined space entry attendant determines that rescue of entrant is necessary; the following procedures will be followed.
  - All work activities in and around the confined space will be shutdown.
  - The confined space attendant will notify the site supervisor by radio or other means of communication that a rescue response is necessary.
  - The site supervisor will notify the rescue services (Section 1.3) to respond to the site.
  - The attendant will first attempt to rescue the entrants by use of the retrieval system.
  - If retrieval by the attendant from outside the confined space is unsuccessful, the attendant must wait for back-up assistance before entering the confined space to attempt rescue.
  - The site supervisor or attendant will notify the on-site rescue services by radios or other means of communication that a rescue response is necessary.
  - The attendant will brief all on-site/off-site rescue services of the current conditions and hazards before rescue is attempted. Air monitoring data (LEL/O<sub>2</sub>, Toxic Gases) will be updated.
  - No attempt will be made to proceed with rescue if for any reason this would jeopardize the safety of any rescue personnel or exacerbate the problem. All hazards will be abated (e.g., ventilation of space to remove flammable levels of gases) before rescue is attempted.
  - When all hazards to rescue personnel have been controlled and the necessary rescue equipment is available, proceed with the rescue.
  - If an injured entrant is exposed to a hazardous substance, a material safety data sheet will be made available to the medical facility treating the exposed entrant.

**2.0 TRAINING**

All employees authorized to perform rescue services will receive the following training:

- Each member of the rescue service will be trained to use properly the personal protective equipment and rescue equipment.
- Each member of the rescue service will be trained to perform the assigned rescue duties and know the hazards that may be faced during entry/rescue.
- Each member of the rescue service will practice making permit space rescues before actual rescue attempts.
- Each member of the rescue service will be trained in First Aid and CPR. At least one currently certified member shall be available on-site.

**3.0 RESCUE PLAN CERTIFICATION**

All rescue personnel shall review this plan and document their understanding of its content by signature.

| NAME  | SIGNATURE | DATE  |
|-------|-----------|-------|
| _____ | _____     | _____ |
| _____ | _____     | _____ |
| _____ | _____     | _____ |
| _____ | _____     | _____ |
| _____ | _____     | _____ |

**4.0 PLAN APPROVAL**

This plan has been completed and approved by the following personnel.

Completed By: \_\_\_\_\_ Title: \_\_\_\_\_

Approved By: \_\_\_\_\_ Title: \_\_\_\_\_

Date: \_\_\_\_\_

**CONFINED SPACE ENTRY LOG**

SIGN IN/OUT EACH TIME YOU ENTER OR LEAVE

LOCATION: \_\_\_\_\_ EQUIPMENT: \_\_\_\_\_ DATE: \_\_\_\_\_

(INDICATE TIME-MILITARY)

| AUTHORIZED ATTENDANTS                                     |              |             |              |             |              |             |              |             |
|---|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| NAME  | ON DUTY      | OFF DUTY    | ON DUTY      | OFF DUTY    | ON DUTY      | OFF DUTY    | ON DUTY      | OFF DUTY    |
| 1   |              |             |              |             |              |             |              |             |
| 2   |              |             |              |             |              |             |              |             |
| 3   |              |             |              |             |              |             |              |             |
| 4   |              |             |              |             |              |             |              |             |
| AUTHORIZED ENTRANTS                                       |              |             |              |             |              |             |              |             |
| ALL ENTRANTS SHALL REVIEW THE WORK PERMIT BEFORE ENTERING |              |             |              |             |              |             |              |             |
| NAME  | Time Entered | Time Exited | Time Entered | Time Exited | Time Entered | Time Exited | Time Entered | Time Exited |
| 1   |              |             |              |             |              |             |              |             |
| 2   |              |             |              |             |              |             |              |             |
| 3   |              |             |              |             |              |             |              |             |
| 4   |              |             |              |             |              |             |              |             |
| 5   |              |             |              |             |              |             |              |             |
| 6   |              |             |              |             |              |             |              |             |
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| 23  |              |             |              |             |              |             |              |             |
| 24  |              |             |              |             |              |             |              |             |
| 25  |              |             |              |             |              |             |              |             |