

# **Confined Space Program**

**University of California San Francisco  
Office of Environmental Health and Safety**

**Renewed September 2005**

## Table of Contents

<b>I. Introduction and Scope.....</b>	<b>3</b>
<b>II. General Information and Definitions.....</b>	<b>3</b>
<b>III. Responsibilities.....</b>	<b>5</b>
<b>IV. Initial Evaluation and Inventory of Confined Spaces.....</b>	<b>5</b>
<b>V. Posting and Notification.....</b>	<b>6</b>
<b>VI. Training Requirements.....</b>	<b>6</b>
<b>VII. General Confined Space Entry Requirements.....</b>	<b>7</b>
<b>VIII. Specific Confined Space Entry Procedures.....</b>	<b>8</b>
<b>Appendix A.....</b>	<b>13</b>
<b>Appendix B.....</b>	<b>15</b>
<b>Appendix C.....</b>	<b>16</b>

# UCSF Confined Space Program

## I. Introduction and Scope

This confined space entry program was developed by the UCSF Office of Environmental Health and Safety (OEHS) to protect employees and contractors at UCSF from exposure to the hazards encountered during entry into confined spaces. Entry into confined spaces is necessary for many functions, including inspection, cleaning, repairing, sampling, demolition, maintenance, and construction. Objectives of this program are as follows:

- Define department specific confined space responsibilities
- Prepare and maintain an inventory of confined spaces at UCSF.
- Provide signage and notification
- Provide training
- Establish training requirements
- Define entry requirements
- Discuss emergency response and rescue procedures

Individuals who do not comply with program requirements risk the possibility of injury or death. Employee failure to comply with program requirements may result in disciplinary action.

This program is designed to comply with Cal-OSHA General Safety Orders, Article 108, Title 8 CCR 5156-5157. Other Cal-OSHA regulations may also be applicable including, but not limited to, the Injury and Illness Prevention Program, Airborne Contaminants including Carcinogens, Respiratory Protection, Electrical Safety Order, Lockout/Tagout, Pressure Vessel Orders, Flammables, and Equipment Guarding.

## II. General Information and Definitions

### A. Confined Space Definition

A "confined space" is defined as any area that meets the following three criteria.

- 1) Is large enough for a worker to enter and perform assigned work.
- 2) Has limited or restricted means of entry or exit.
- 3) Is not designed for continuous human occupancy.

Any area in the workplace that meets these three criteria is considered to be a confined space and is subject to regulation by the Cal-OSHA standard. Examples of confined spaces that may exist include storm drainpipes, sewers, vaults, storage tanks, building crawl spaces with limited means for entry and exit, ceiling plenums, utility tunnels, manholes, and boilers.

### B. Categories of Confined Spaces

1. **Non-Permit Confined Spaces** are defined as low-hazard spaces that contain no physical hazards capable of causing death or serious physical harm. It must be documented in writing that an individual space has no possibility of containing **any** atmospheric hazard capable of causing death or serious physical harm (Refer to Appendix A for required form). Examples of low hazard non-permit confined spaces include pits or vaults that do not have actual or potential hazards, building crawl spaces with limited means for entry and exit and ceiling plenums. A low hazard confined space can become hazardous when chemicals such as cleaners, paints, and solvents are introduced into the confined space. Welding or equipment failure can also cause a low hazard confined space to become a high hazard one.
  
2. **Permit Confined Spaces** are defined in the Cal-OSHA standard as any confined space as defined above that meets **one** of the following four criteria.
  - a) An actual or potential hazardous atmosphere which meets one or more of the following listed elements.
    - Flammable gas, vapor, or mist greater than 10% of the lower flammable limit (LFL).
    - Airborne combustible dust at a concentration that meets or exceeds its LFL.
    - Oxygen concentration less than 19.5% or greater than 23.5%
    - Any airborne contaminant that may expose a worker above an acceptable dose or the permissible exposure limit.
    - Any other condition recognized as immediately dangerous to life or health.
  
  - b) An internal configuration such that an entrant could be trapped or asphyxiated e.g. inwardly converging walls or a floor that slopes downward and tapers to a smaller cross section or;
  
  - c) Contains a material with the potential to engulf an entrant by a liquid or finely divided flowable solid substance that can be aspirated and may cause death by filling or plugging the respiratory system or can exert enough force on the body to cause death by strangulation, constriction, crushing or;
  
  - d) Contains any other serious safety or health hazard.

**3. Alternate Procedures Permit Confined Space** is a less stringent high-hazard classification that can be applied in some, but not all Permit Confined Spaces. It allows for entry when the only hazard is

atmospheric and the employer can demonstrate the effectiveness of forced air ventilation alone as a means of controlling the airborne hazards in the space. The space is initially deemed and treated as a Permit Confined Space until testing and monitoring results show that a controllable hazardous atmosphere is the only hazard and it can be controlled with forced air ventilation.

### **III. Responsibilities**

#### **A. Office of Environmental Health and Safety (OEHS)**

- Preparing and maintaining a written program which complies with the requirements of applicable Cal-OSHA requirements.
- Providing instruction to Facility Management supervisors on the major elements of the Confined Space Program.
- Working with Facilities Management personnel to identify confined spaces.
- Performing periodic audits of Program implementation.

#### **B. Facilities Management**

- Designating personnel as “authorized supervisors, entrants, and attendants” and identifying those personnel who are considered “affected employees”.
- Ensuring that all authorized and affected employees have received proper training on Confined Spaces.
- Incorporating the major elements of the Program into written standard operating procedures pertaining to energized equipment maintenance.
- Identifying and maintaining an inventory of all confined spaces.

#### **C. Department Chairs or Directors**

- Ensuring that all confined spaces within their department are included in the Confined Space Program and affected employees are trained.

#### **D. Authorized personnel and affected employees**

- Complying with the provisions of the Confined Space Program, as described in this document and in the training sessions they attend.

#### **E. Material Management and Contracts**

- Ensuring that all bid specifications involving work in confined spaces contain language requiring the contractor to adhere to the UCSF Confined Space Program.

### **IV. Initial Evaluation and Inventory of Confined Spaces**

#### **A. Initial Evaluation**

To develop a confined space program it is necessary to evaluate the workplace and identify the confined spaces. After spaces are identified it is necessary to determine the nature and severity of hazards before categorizing confined spaces into one the three defined categories. This must be done by qualified Facilities Management personnel

that have the training, education and experience to recognize possible hazards in the confined space. Conditions outside the space such as traffic, operation of other equipment in the vicinity, vermin, weather conditions etc., must be evaluated as well. As a result of this notification a written inventory of all confined spaces shall be established and maintained as part of this program (Refer to Appendix B for UCSF confined space inventory).

All spaces that meet the definition of confined space must be initially classified as either low hazard **Non-Permit Confined Spaces** or high hazard **Permit Confined Spaces**.

## **V. Posting and Notification**

### **A. Permit Confined Space Posting**

1. All **Permit Confined Spaces** must have signage such as “DANGER—PERMIT CONFINED SPACE, DO NOT ENTER” or any other equally effective means of identifying the existence of the permit confined space, its location and the danger posed by the space.
2. Other measures must also be taken to prevent entry.

### **B. Contractor Notification**

1. Contractors must be notified of all permit-required confined spaces in their designated work areas. All contract work must be performed in compliance with a confined space program meeting all applicable UCSF and other regulatory requirements.
2. Contractors must be informed of procedures that have been implemented for employee protection in or near the permit space where contractor personnel will be working.
3. Entry operations must be coordinated whenever employees of more than one employer are simultaneously working in the area, so that employees of one employer do not endanger the employees of any other employer.
4. Debrief the contractor when work is completed regarding any hazard encountered or created in the permit space during entry.

## **VI. Training Requirements**

### **A. Confined Space Training**

All affected employees must receive the training:

1. Prior to the employee performing work involving confined spaces for the first time.
2. When the employee is assigned different duties which involve confined entry work;

2. Whenever a new procedure is introduced, a new space becomes part of the program or the procedure is revised;
3. Whenever there is a change in permit space operations that presents a hazard;
4. Whenever there is reason to believe there are unacceptable deviations from the permit space entry procedure;
5. Whenever there is reason to believe there are inadequacies in the employee's knowledge or use of these procedures.

This training must be in compliance with Cal-OSHA General Safety Orders, Article 108, Title 8 CCR 5156-5157.

## **VII. General Confined Space Entry Requirements**

### **A. Atmospheric testing for Permit Required Confined Spaces**

Pre-entry evaluation typically employs direct reading instruments to evaluate: first the level of oxygen, then combustible materials and finally contaminants. If the measurements indicate that the atmosphere is within acceptable limits, entry may proceed. If not, additional ventilation or protective respiratory equipment must be provided. The space must be tested or monitored as necessary to determine if acceptable entry conditions are being maintained during the course of work

#### **1. Pre-Monitoring Requirements**

- A designated person is responsible for air monitoring whenever an employee enters a permit required confined space.
- If entry is performed by a contractor, the contractor is responsible for air monitoring.
- Air monitoring must be conducted before entering and during entry into any category of confined space.
- The monitoring instrument must have evidence of a current calibration as required by the manufacturer.
- Users of monitoring equipment must be trained on the operation and maintenance of the monitoring instrument prior to use. This includes reading and understanding the owner's manual for the instrument prior to use and referring to the manual for repair and preventive maintenance of the instrument.
- Instruments must be on a preventative maintenance program to ensure that the batteries are properly charged and the instrument operates properly when in use.

#### **2. Air Monitoring Requirements**

- One measurement must be made at a point furthest from the entrance to the space. This can be accomplished by extending the air monitoring probe

and hose to the bottom of a manhole or mounting the probe on a pole that can be inserted into the confined space.

- **Acceptable range of measurements inside permit confined spaces:** Oxygen Level (19.5% - 23.5%), Flammables (Less than 10% of the Lower Explosive (or Flammable) Limit, Toxic Atmosphere (Acceptable levels must be listed on the permit and will vary depending on substance and respiratory equipment use).

Results of monitoring must be recorded on the Certificate of Safe Entry and/or Confined Space Entry Permit.

## **B. Personal Protective Equipment**

Suitable protective equipment varies depending on the job. Such equipment may include respiratory protection; gloves specifically designed for the material being handled; and protection for the eyes, face, head, and feet. An annual medical clearance is required for respirator use. Contact OEH&S for additional information, if necessary.

## **C. Recordkeeping**

1. Confined space entry program records are maintained by Facilities Management including:
  - Inventory of confined spaces and results of the hazard assessment.
  - Entry permits on file for a minimum of three years.
  - Training verification documents i.e. employees name, signature and social security number, date of training, course content and duration of training, name of instructor and affiliation.
  - Training records shall maintain for 30 years.

# **VIII. Specific Confined Space Entry Procedures**

## **A. Alternate Entry Confined Space**

Prior to entry into **Alternate entry confined spaces**, as defined in section II B, the following conditions must also be satisfied.

1. Any condition making it unsafe to remove an entrance cover must be eliminated before the cover is removed, and the opening should be guarded if necessary.
2. Before an employee enters the space, the internal atmosphere must be tested, with a calibrated direct-reading instrument, for the following conditions in the order given. 1) oxygen level (19.5% - 23.5%), 2) flammables (less than 10% of the Lower Explosive (or flammable) limit, 3) toxic atmosphere.
3. There may be no hazardous atmosphere within the space whenever any employee is inside the space.
4. Continuous forced air ventilation shall be used, as follows:
  - An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere;

- The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space;
  - The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
5. The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.
  6. If a hazardous atmosphere is detected during entry each employee must leave the space immediately.
  7. Implement Lockout/Tagout as necessary
  8. Utilize Hot work permits when necessary
  9. The space shall be evaluated to determine how the hazardous condition developed.

## **B. Permit Confined Space**

In addition to the requirements spelled out above for **Alternate Entry Confined Spaces**, those spaces considered to be a high-hazard Permit Confined Spaces have the following requirements.

1. A written permit must be completed (Refer to Appendix C for permit).
2. All Procedures and requirements from **Alternate Procedure Spaces** with the exception that all hazards don't necessarily need to be eliminated, if properly mitigated.
3. Evaluate the confined space hazards.
4. Specify acceptable entry conditions
5. Isolate the space and purge, inert, flush, or even ventilate space as necessary to eliminate or control atmospheric hazards.
6. Provide pedestrian, vehicle or other barriers as necessary to protect entrants from external hazards.
7. Verify that conditions for permit required confined space are acceptable for entry throughout the duration of entry.
8. Provide equipment necessary for safe entry into and for rescue from permit required confined spaces.

## **C. Entry Supervisor Responsibilities**

1. Complete the appropriate training.
2. Ensure that individuals under their supervision receive the proper training for confined space entry, including medical examinations when applicable.
3. Perform pre-operational review activities in confined spaces and discuss with entrants the potential hazards, the appropriate safeguards, and the personal protective equipment required.
4. Be knowledgeable of the hazards one may encounter upon entering a permit confined space, including the mode, signs, symptoms, and consequences of exposure.

5. Check that the necessary procedures, practices, and equipment used for safe entry into confined spaces are in effect before authorizing entry or re-entry.
6. Sign the confined-space entry permit. This signature officially allows entry into the designated confined space and will verify that all actions and conditions necessary for safe entry are provided and will be maintained. Conditions and actions include:
  - Ensuring that all atmospheric tests have been conducted, all equipment is in place and has been properly calibrated and all procedures are known before entry by the entrant.
  - Ensure that rescue services are available before entry is made.
  - Ensure that transfer is made to another authorized supervisor whenever the responsibility for a permit space entry changes, and that the terms and conditions of the permit are maintained.
  - Take appropriate measures to remove unauthorized personnel who are in or about to enter confined spaces.
  - Cancel the permit authorization whenever unacceptable conditions exist or upon completing permitted activities. If unexpected hazards arise, all employees must leave the area immediately and notify the responsible health and safety technician so that he/she can re-evaluate the space before re-entry.
  - Provide copies of the permit upon completing the work to all listed parties.
  - Maintain copies of all confined-space entry permits.
  - Audit compliance with procedures for confined space before each entry.
  - Ensure that operations comply with the terms and conditions on the permit.

#### **D. Entrant Responsibilities**

1. Complete the appropriate training.
2. Confer with space/equipment owners to identify any modification to the space, and review the hazards and safeguards associated with confined-space entry to determine if additional evaluations are necessary.
3. Take the necessary measures to ensure that the equipment used in confined spaces is properly isolated.
4. Be knowledgeable of the hazards associated with confined spaces; recognize the signs and symptoms of exposure, including behavioral effects; and understand the consequences of exposure to the hazards in these spaces.
5. Maintain an awareness of the appropriate personal protective equipment and its proper application.
6. Read the confined-space entry permit and agree to accept and abide by its conditions.
7. Maintain contact with the attendant in charge of the confined space.
8. Notify the attendant of a self-initiated evacuation of a confined space.
9. Exit a confined space when
  - instructed by an attendant;
  - an alarm is activated;
  - danger is perceived.
8. Stop work if conditions can adversely affect entrants or if the equipment has been changed. Advise the entry supervisor of these conditions.

9. Clean up the area upon completing work, and return any equipment that was checked out the same day.

### **E. Attendant Responsibilities**

Attendants must comply with the requirements below for confined space entry. In cases where they may serve as atmospheric monitors, attendants shall adhere to the requirements of Air Monitoring Program.

1. Complete the appropriate training.
2. Primary responsibilities include:
  - Consulting with supervisor with any questions regarding job.
  - Ensuring safety of all personnel working in confined space.
  - Maintaining an accurate count of all persons working in confined space.
  - Maintaining the conditions and requirements listed on permit.
  - Knowing what emergency numbers to call for help if an emergency arises.
  - Maintain effective and continuous contact with entrants.
  - Do not leave post while personnel are inside the confined space except to get help in an emergency. If other duties require you to leave your post, have all personnel evacuate the space.
  - Prevent fouling of air lines and/or lifelines.
  - Be alert. Try to anticipate and prevent any condition that would foul equipment or lifelines in case use is necessary.
  - Clean and return special equipment to its original location upon job completion.
3. Do not perform other tasks that might interfere with your primary duty of monitoring and protecting entrants.
4. Be knowledgeable of the hazards associated with confined spaces; recognize the signs and symptoms of exposure, including behavioral effects; and understand the consequences of exposure to the hazards of these spaces.
5. Monitor inside and outside the area for any change or condition that could adversely affect entrants.
6. Maintain continuous and effective contact with entrants.
7. Sign the confined-space entry permit, if one is required, and agree to accept and abide by its conditions.
8. Take the necessary measures to remove unauthorized persons who are in or about to enter confined spaces.
9. Do not attempt to enter a confined space during an emergency. If possible, an attendant may rescue a victim from a confined space using a retrieval system and without additional help if such rescue does not require entering the space.
10. Provide rescue team incident commander with the confined space entry permit, including any information on the events leading up to the emergency.

**F. Rescue team.**

An effective confined space entry program attempts to identify and control all of the hazards to which entrants may be exposed. If everything goes as expected, work proceeds safely and nobody gets hurt. However things sometimes go wrong and emergencies arise. Therefore UCSF will perform on-site rescue for confined space emergencies. At a minimum Rescue team must receive training in the following:

1. Confined space entry hazards and the entry requirements for emergency actions.
2. Rescue procedures for high-hazard confined spaces. Members must practice making rescues in confined spaces at least every 12 months. These drills should be representative of actual situations.
3. All rescue team members shall receive training in operation of rescue harness system.
4. The removal of dummies, mannequins, or persons from actual or simulated confined spaces.
5. Certification in first aid **and** cardiopulmonary resuscitation.
6. Use of a harness retrieval system. The OSHA standard requires that a non-entry retrieval system consisting of a rescue harness and lifeline (unless it increases the risk of entry) be employed whenever an authorized entrant goes into a confined space. Each rescue worker must also wear a suitable harness attached to one end of a lifeline by a quick-release catch to permit escape if the lifeline breaks, provided that use of the harness will not increase the overall risk of the entry or hinder rescue. The other end of the lifeline shall be secured outside the entry opening to a retrieval system or another fixed point so that retrieval can begin as soon as the rescuer becomes aware that rescue is necessary. The harness and lifeline may also be required even when no respiratory equipment is needed. When entry is through an opening at the top of a confined space, rescue workers must wear a harness-type safety belt that suspends them upright.

**G. Annual Program Evaluation**

The Confined Space Program will be evaluated annually by OEHS and Facilities Management.

**Appendix A  
Certificate of Safe Entry**

*All answers to the following questions must be "Yes" to allow entry. DO NOT ENTER THE CONFINED SPACE TO ANSWER ANY QUESTIONS! If entry is necessary, use Appendix B "Entry Permit" and follow procedures for high hazard Permit Confined Spaces. This form is intended for use in Non-Permit Confined Spaces and Alternate Procedure Confined Spaces.*

**Confined Space Description/Location:**

**1. Is it safe to remove the entrance cover?** \_\_\_\_\_

**2. Is a temporary barrier in place to protect the opening?** \_\_\_\_\_

**3. If a ladder is used, is it secured and extend 3 feet above opening?** \_\_\_\_\_

**4. Is the confined space atmosphere for the following tested in the order listed and found to be safe? Record every 30 minutes.**

**-Oxygen level (O<sub>2</sub>) 19.5% - 23.5%**

---

---

---

**-Lower flammable limit (LFL) of flammable gases or vapors**

---

---

---

**less than 10% of the LFL.**

---

---

---

**-Carbon Monoxide (CO) level less than 5 ppm**

---

---

---

**-Toxic Air Contaminants approximately background or zero**

---

---

---

**5. Do the work areas where employees will be in the space have direct, forced ventilation?**

**6. Is the air supply for the forced air ventilation obtained from a clean source?**

**7. Will the atmosphere within the confined space be tested continuously or periodically (at least every hour) to ensure that hazardous atmosphere is not developing? (Does the personal gas alarm monitor meet established requirements?)**

**8. Have the employees entering the space completed necessary training?**

**Entrant Name** \_\_\_\_\_ **Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Entrant Name** \_\_\_\_\_ **Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Appendix B  
Confined Space Inventory**

<u>Campus</u>	<u>Description</u>	<u>Building(s)</u>	<u>Permit Required</u>
Mission Bay	All cooling towers	All	N
	Air handlers and supply & exhaust ductwork and plenums	All	N
	Emergency Diesel Generator Plenums	Genentech Hall	N
	Basement Crawl Spaces	Genentech Hall	N
	CUP Transition Vault	Byers Hall	N
	Electrical vaults	Genentech Hall Rock Hall Byers Hall	N
MCB	Fan inside 300M1	MCB	N
	Abandon stairwells	MCB	N
Mt. Zion	Air handlers	All	N
	Cooling Towers	All	N

**Permit Required Confined Space Inventory**

<u>Campus</u>	<u>Description</u>	<u>Building(s)</u>	<u>Permit Required</u>
Mission Bay	Diesel fuel tank underground storage vault	Genentech Hall	Y
	Flammable and combustible waste tanks underground storage vault	Genentech Hall	Y
	Lab waste pit (in the chiller room)	Rock Hall	Y
	All boilers (inside)	All	Y
	All exhaust ductwork & plenums serving all flammable storage, FM welding shop, chemical distillation, hydrofluoric, perchloric, radioisotope fume hoods	All	Y
	General exhaust ductwork & plenums	Rock hall Byers hall	Y
MCB	Vault under the café	MCB	Y
Mt. Zion	Electrical Vaults in loading dock	Cancer Center	Y
	Sump Pumps – sewer, rainwater, ground water	All	Y
	High pressure boilers – fire box, tube, stack	B-Building	Y
	Steam Trench – basement of bldg A-B	Building A-B	Y
Parnassus	Manhole, steam - just outside of gas compression room	CUP	Y
	Manhole, steam – near Med Center Way stop sign	CUP	Y
	Electrical vault – 12kV west of the CUP parking area	CUP	Y
	Manhole, steam – in parking area (Long EDG RM door)	Long	Y
	Manhole, steam – to HCM near trash compactor	Long	Y
	Manhole, sewage pump – ER parking area near air vent	Long	Y
	Electrical vault – 12 kV Parnassus and Med Center Way	Parnassus	Y
	Manhole, steam – Parnassus and Med Center Way	Parnassus	Y

Parnassus	Manhole, steam – LPPI bus stop	Parnassus	Y
	Manhole, steam – Emergency Room exit near bus stop	Parnassus	Y
	Electrical Vault – 12kV Emergency Room exit near bus stop	Parnassus	Y
	Manhole, steam – HCM near circle	Parnassus	Y
	Manhole, steam – Clinical Sciences Building sidewalk	Parnassus	Y
	Electrical vault – 12kV 2 <sup>nd</sup> floor between buildings (HSE west side)		Y
	Electrical vault – HSW west side gravel area	HSW	Y
	Manhole, steam – Rad lab parking area (west side)	Rad Lab	Y
	Pit – Ammonia shed	Ammonia Shed	Y
	Manhole, electrical – in walkway between Nursing and Rad Lab	Rad Lab	Y
	Manhole, electrical – ent of walkway between UCH & VR	UCH	Y
	Manhole, electrical – NW end of CUP / MSB	CUP	Y
	Manhole – west end of utility tunnel		Y
	Electrical vault – HSIR	HSIR	Y
	Auxillary Boiler #1 Steam Drum	CUP	Y
	Auxillary Boiler #1 Mud Drum	CUP	Y
	Auxillary Boiler #1 Fire Box (rear)	CUP	Y
	Auxillary Boiler #1 Exhaust path (lower)	CUP	Y
	Auxillary Boiler #1 Economizer	CUP	Y
	Auxillary Boiler #1 Exhaust stack	CUP	Y
	Auxillary Boiler #2 Steam Drum	CUP	Y
	Auxillary Boiler #2 Mud Drum	CUP	Y
	Auxillary Boiler #2 Fire Box (rear)	CUP	Y
	Auxillary Boiler #2 Exhaust path (lower)	CUP	Y
	Auxillary Boiler #2 Economizer	CUP	Y
	Auxillary Boiler #2 Exhaust stack	CUP	Y
	Heat Recovery Steam Generator #1 Before CO Catalyst	CUP	Y
	Heat Recovery Steam Generator #1 After CO Catalyst	CUP	Y
	Heat Recovery Steam Generator #1 Duct burner section	CUP	Y
	Heat Recovery Steam Generator #1 before SCR catalyst	CUP	Y
	Heat Recovery Steam Generator #1 after SCR catalyst	CUP	Y
	Heat Recovery Steam Generator #1 Economizer section	CUP	Y
	Heat Recovery Steam Generator #1 Exhaust stack	CUP	Y
	Heat Recovery Steam Generator #1 “A” Steam Drum	CUP	Y
	Heat Recovery Steam Generator #1 “A” Mud Drum	CUP	Y
	Heat Recovery Steam Generator #1 “B” Steam Drum	CUP	Y
	Heat Recovery Steam Generator #1 “B” Mud Drum	CUP	Y
	Heat Recovery Steam Generator #2 Before CO Catalyst	CUP	Y
Parnassus	Heat Recovery Steam Generator #2	CUP	Y

	After CO Catalyst		
	Heat Recovery Steam Generator #2 Duct burner section	CUP	Y
	Heat Recovery Steam Generator #2 before SCR catalyst	CUP	Y
	Heat Recovery Steam Generator #2 after SCR catalyst	CUP	Y
	Heat Recovery Steam Generator #2 Economizer section	CUP	Y
	Heat Recovery Steam Generator #2 Exhaust stack	CUP	Y
	Heat Recovery Steam Generator #2 "A" Steam Drum	CUP	Y
	Heat Recovery Steam Generator #2 "A" Mud Drum	CUP	Y
	Heat Recovery Steam Generator #2 "B" Steam Drum	CUP	Y
	Heat Recovery Steam Generator #2 "B" Mud Drum	CUP	Y
	Deaerator "A" tank	CUP	Y
	Deaerator "B" tank	CUP	Y
	Electrical vault – 12kV between Heat Recovery Steam Generators	CUP	Y
	Steam pit – north west corner	CUP	Y
	NOx water tank (Hillside)	CUP	Y
	Diesel Fuel day tank (#6)	Long	Y
	Oil separator tank (CUP)	CUP	Y
	Charcoal filter tank – ammonia shed	Ammonia Shed	Y

**Appendix C**  
**Confined Space Entry Permit**

**Reason for Entry:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Location:** \_\_\_\_\_  
\_\_\_\_\_

**Date/Time:** \_\_\_\_\_

**Entrant Names:**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Are all employees properly trained? \_\_\_\_\_

Were the following systems properly isolated: Electrical, Mechanical equipment, Valves and Pipe lines, Gas Lines?

\_\_\_\_\_  
\_\_\_\_\_

Will any toxic materials be used? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Is purging or ventilation required? \_\_\_\_\_

Is qualified rescue personnel and equipment available? \_\_\_\_\_

Is Protective Equipment Required? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What Type of Sampling Equipment will be used including model number and calibration date?

---

---

---

---

Testing Conducted:

Oxygen

Level: \_\_\_\_\_

---

---

Combustibility: \_\_\_\_\_

---

---

Carbon

Monoxide: \_\_\_\_\_

---

---

Other: \_\_\_\_\_

---

---

Other Hazards associated with  
space: \_\_\_\_\_

---

---

—

Comments: \_\_\_\_\_

---

---

Entry Supervisor Approval \_\_\_\_\_ Date \_\_\_\_\_