

CONFINES SPACE TEMPLATE

Introduction

Background

A confined space is defined as any location that has limited openings for entry and egress, is not intended for continuous employee occupancy, and is so enclosed that natural ventilation may not reduce air contaminants to levels below the threshold limit value (TLV). Examples of confined spaces include: manholes, stacks, pipes, storage tanks, trailers, tank cars, pits, sumps, hoppers, and bins. Entry into confined spaces without the proper precautions could result in injury and/or impairment or death due to:

- * An atmosphere that is flammable or explosive
- * Lack of sufficient oxygen to support life
- * Contact with or inhalation of toxic materials, or
- * General safety or work area hazards such as steam or high pressure materials.

- * Engulfment in water

The overall objectives of this program is to provide the safety requirements to be followed while entering, exiting and working in confined spaces during environmental restoration work.

Highlights

- * Duties and responsibilities
- * Identification and evaluation
- * Hazard assessment
- * Hazard controls
- * Entry permits
- * Entry procedures
- * Opening a confined space
- * Atmospheric testing
- * Isolation and lockout/tag out safeguards
- * Ingress/egress safeguards
- * Warning signs and symbols
- * Training and
- * Emergency response

Section One - Duties and Responsibilities

1.0 Confined Space Manager

The Research Leader shall assign an individual within the (Name of Facility) to act as the Confined Space Coordinator. This individual shall be responsible for implementing the confined space program in accordance with this plan. This individual should be on the premises routinely and be familiar with the operations. At the NAA Locations this person is usually identified as the Facility Manager full time Safety Officer or maintenance staff member.

1.2. Confined Space Manager Responsibilities

The Confined Space Coordinator shall be responsible for implementing the confined space program and should:

- * Ensure that a list of confined spaces is maintained
- * Ensure that cancelled permits are reviewed for lessons learned
- * Ensure training of personnel is conducted
- * Ensure coordination with outside responders
- * Ensure equipment is in compliance with standards and
- * Maintain a master inventory of identified confined spaces.

1.2.1. Confined Space Coordinator

The Confined Space Coordinator is identified as the individual or service contractor that will technically approve the entry and complete the tasks identified below. The Confined Space Manager is typically eventide as the Confined Space Coordinator because many locations have no remote confined space entries that require a second individual to be identified. Service Contractors and third part contractor are responsible for this activity under their separate contracts. The Confined Space Coordinator or individual in charge of any confined space work should:

- * Ensure requirements for entry have been completed before entry is authorized;
- * Ensure confined space monitoring is performed by personnel qualified and trained in confined space entry procedures;

- * Ensure a list of monitoring equipment and personnel qualified to operate the equipment is maintained by the Management
- * Ensure that the rescue team has simulated a rescue in a confined space within the past twelve months;
- * Know the hazards that may be faced during entry including the signs or symptoms and consequences of exposure;
- * Fill out a permit;
- * Determine the entry requirements;
- * Require a permit review and signature from the authorized entry supervisor;
- * Notify all involved employees of the permit requirements;
- * Post the permit in a conspicuous location near the job;
- * Renew the permit or have it reissued as needed (a new permit is required every shift);
- * Determine the number of attendants required to perform the work;
- * Ensure the attendant knows how to communicate with the entrants and how to obtain assistance;
- * Post any required barriers and signs;
- * Remain alert to changing conditions that might affect the conditions of the permit (i.e. require additional atmospheric monitoring or changes in personal protective equipment);
- * Change and reissue the permit or issue a new permit as necessary;
- * Ensure that periodic atmospheric monitoring is done according to permit requirements;
- * Ensure those personnel doing the work and all support personnel adhere to permit requirements;
- * Ensure the permit is canceled when the work is done; and
- * Ensure the confined space is safely closed and all workers are cleared from the area.

1.2.3. Entry Supervisors

An Entry Supervisor is a qualified person authorized to approve confined space entry permits. This person should be responsible for:

- * Determining if conditions are acceptable for entry
- * Authorizing entry and overseeing entry operations
- * Terminating entry procedures as required
- * Serving as an attendant as long as the person is trained and equipped appropriately for that role
- * Ensuring measures are in place to keep unauthorized personnel clear of the area
- * Checking the work at least twice a shift to verify and document permit requirements are being observed (more frequent checks should be made if operations or conditions are anticipated that could affect permit requirements)
- * Ensuring that necessary information on chemical hazards is kept at the work site for the employees or rescue team
- * Ensuring a rescue team is available and instructed in their rescue duties (e.g. an onsite team or a prearranged outside rescue service) and
- * Ensuring at least one member of the rescue team has current certification in First Aid and CPR.

1.2.4. Employees Entering Confined Space

Employees who are granted permission to enter a confined space should:

- * Read and observe the entry permit requirements;
- * Stay alert to the hazards that could be encountered in a confined space;
- * Use the protective equipment required by the permit;
- * Immediately exit the confined space when:
 - Ordered to do so by the attendant

- Automatic alarms sound
- They perceive they are in danger or
- They notice physiological stresses or changes in themselves or co-workers (e.g. dizziness blurred vision shortness of breath).

1.2.5. Attendant(s)

The Attendant which can also be the entry supervisor should be stationed outside the work space and should:

- * Be knowledgeable of and be able to recognize potential confined space hazards;
- * Maintain a sign-in/sign-out log with a count of all persons in the confined space and ensure all entrants sign in/sign -out;
- * Monitor surrounding activities to ensure the safety of personnel;
- * Maintain effective and continuous communication with personnel during confined space entry work and exit;
- * Order personnel to evacuate the confined space if he/she:
 - Observes a condition which is not allowed on the entry permit;
 - Notices the entrants acting strangely possibly as a result of exposure to hazardous substances;
 - Notices a situation outside the confined space which could endanger personnel;
 - Notices within the confined space a hazard which has not been previously recognized or taken into consideration;
 - Must leave his/her work station; or
 - Must focus attention on the rescue of personnel in some other confined space that he/she is monitoring;
- * Immediately summon the Rescue Team if crew rescue becomes necessary; and
- * Keep unauthorized persons out of the confined space order them out or notify authorized personnel of the unauthorized entry.

1.2.6. Rescue Team

The Rescue Team members shall:

- * Complete a training drill using mannequins or personnel in a simulation of the confined space prior to the issuance of an entry permit for any confined space and at least annually thereafter;

- * Permit for any confined space and at least annually thereafter;
- * Respond immediately to rescue calls from the Attendant or any other person recognizing a need for rescue from the confined space;
- * In addition to emergency response training receive the same training as that required of the authorized entrants; and
- * Have current certification in first-aid and CPR.

Section Two- Hazard Assessment and Management

2.0 Hazard Assessment

A hazard assessment should be completed prior to any entry into a confined space. The hazard assessment should identify the sequence of work to be performed in the confined space the specific hazards known or anticipated and the control measures to be implemented to eliminate or reduce each of the hazards to an acceptable level. No entry should be permitted until the hazard assessment has been reviewed and discussed by all persons engaged in the activity. Personnel who enter confined spaces should be informed of known or potential hazards associated with the confined spaces to be entered. Keep in mind that confined space programs must include Lock Out of Energy Sources.

2.1 - Hazard Controls

Hazard controls include changes in the work processes and/or working environment with the objective of:

- * Controlling the health hazards either by eliminating the responsible agents (electricity water engulfment hazard etc...)
- * Reducing health hazards below harmful levels and
- * Preventing the contaminants from coming into contact with the workers.

The following order of precedence should be followed in reducing confined space risks:

- * Engineering controls such as ventilation to limit exposure to hazards;
- * Work practice controls such as wetting of hazardous dusts frequent cleaning; and
- * Use of PPE such as air purifying or supplied-air respirators.

2.2 Engineering Controls

Engineering controls are those controls which eliminate or reduce hazards. These controls shall be implemented.

Ventilation is one of the most common engineering controls used in confined space. When ventilation is used to remove atmospheric contaminants from the confined space, the space should be ventilated until the atmosphere is within acceptable range for human occupancy. Ventilation should be maintained during the occupancy if there is a potential for the atmospheric conditions to move out of the acceptable range. When ventilation is not possible or feasible alternate protective measures or methods to remove air contaminants and protect occupants should be determined by the qualified person prior to authorizing entry. Conditions regarding continuous forced air ventilation should be used as follows:

- * Employees should not enter the space until the forced air ventilation has eliminated any hazardous atmosphere
- * Forced air ventilation should be so directed as to ventilate the immediate areas where an employee is or will be present within the space
- * Continuous ventilation is maintained until all employees have left the space and
- * Air supply for forced air ventilation should be from a clean source.

2.3 Work Practice (Administrative) Controls

Work practice (administrative) controls are those controls which eliminate or reduce the hazard through changes in the work practice (e.g. rotating workers reducing the amount of worker exposure housekeeping). Confined space should be cleaned/decontaminated of hazardous materials to the extent feasible before entry. Cleaning/decontamination is the preferred method of reducing exposure to hazardous materials. Where this is not practicable PPE should be worn by the entry personnel to provide appropriate protection against the hazards which may be present.

2.4 Personal Protective Equipment (PPE)

If the hazard cannot be eliminated or reduced to a safe level through engineering and/or work practice controls PPE should be used. A qualified person should determine PPE needed by all personnel entering the confined space including rescue teams. PPE which meet the specifications of applicable standards should be selected in accordance with the requirements of the job to be performed.

Section Three Entry into Confined Spaces

3.0 - Entry Permits

The Confined Space Entry Permit is the major tool in assuring safety during entry in confined spaces with known hazards or with unknown or potentially hazardous atmospheres. The entry permit process guides the supervisor and workers through a systematic evaluation of the space to be entered. The permit should be used to establish appropriate conditions. Before each entry into a confined space an entry permit will be completed by a qualified person and the contents communicated to all employees involved in the operation and conspicuously posted near the work location. A standard entry permit should be used for all entries.

3.1. Key Elements for Entry Permits

A standard entry permit should contain the following items:

- * Permit space to be entered;
- * Purpose of the entry;
- * Date of the permit and the authorized duration of the entry permit
- * Name of authorized entrants within the permit space;
- * Means of identifying authorized entrants inside the permit space
e.g. rosters or tracking systems;
- * Personnel by name currently serving as attendants
- * Individual by name currently serving as entry supervisor with a space for the signature or initials of the entry supervisor who originally authorized entry
- * Hazards of the permit space to be entered

- * Measures used to isolate the permit space and to eliminate or control permit space hazards before entry e.g. lockout or tag out of equipment and procedures for purging inerting ventilating and flushing permit spaces;
- * Acceptable entry conditions
- * 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;
- * Rescue and emergency services that can be summoned and the means (e.g. equipment to use phone numbers to call) for summoning those services
- * Communication procedures used by authorized entrants and attendants to maintain contact during the entry
- * Equipment to be provided for compliance with this section (e.g. PPE testing communications alarm systems and rescue);
- * Other information whose inclusion is necessary given the circumstances of the particular confined space in order to ensure employee safety; and
- * Additional permits such as for hot work that have been issued to authorize work in the permit space.

Appendix D of 29 CFR 1910.146 provides an example permit containing these items.

A permit is only valid for one shift. For a permit to be renewed several conditions should be met before each re-entry into the confined space. First atmospheric testing should be conducted and the results should be within acceptable limits. If atmospheric test results are not within acceptable limits precautions to protect entrants against the hazards should be addressed on the permit and should be in place. Second a qualified person should verify that all precautions and other measures called for on the permit are still in effect. Finally only operations or work originally approved on the permit should be conducted in the confined space.

A new permit should be issued or the original permit reissued whenever changing work conditions or work activities introduce new hazards into the confined space. The employer should retain each cancelled entry permit for Section Three - Entry Procedures.

Whenever entry into a confined space is needed either an Entry Supervisor or the person in charge of the job may initiate entry procedures including the completion of a confined space entry permit. Entry into a confined space should follow the standard entry procedure.

The following are requirements for standard entry:

- * Training to establish personnel proficiency in the duties required
- * Atmospheric testing for entry and
- * Atmospheric monitoring during the entry.

Before an employee enters the space the internal atmosphere should be tested with a calibrated direct-reading instrument. If a hazardous atmosphere is detected during entry:

- * The space should be evaluated to determine how the hazardous atmosphere developed and
- * Measures should be implemented to protect employees before any subsequent entry takes place.

Personnel should be prohibited from entering hazardous atmospheres without wearing proper respiratory equipment as determined by qualified entry supervisors. The entire confined space entry permit should be completed for a standard entry. Entry should be allowed only when all requirements of the permit are met and it is reviewed and signed by an Entry Supervisor.

3.2 - Opening a Confined Space

Any conditions making it unsafe to remove an entrance cover should be eliminated before the cover is removed. When entrance covers are removed the opening should be promptly guarded by a railing temporary cover or other temporary barrier that will prevent anyone from falling through the opening. This barrier or cover should protect each employee working in the space from foreign objects entering the space. If it is in a traffic area adequate barriers should be erected.

3.4 - Atmospheric Testing

Atmospheric test data is needed prior to entry into any confined space. Atmospheric testing is required for two distinct purposes: evaluation of the hazards of the permit space and verification that acceptable conditions exist for entry into that space. If a person must go into the space to obtain the needed data then Standard Confined Space Entry Procedures should be followed (i.e. rescue team attendant entry supervisor). Before entry into a confined space a qualified person should conduct testing for hazardous atmospheres. The internal atmosphere should be tested with a calibrated direct-reading instrument for the following in the order given:

- * Oxygen content
- * Flammable gases and vapors and
- * Potential toxic air contaminants.

Testing equipment used in specialty areas should be listed or approved for use in such areas. This listing or approval should be from nationally recognized testing laboratories such as Underwriters Laboratories or Factory Mutual Systems.

3.5 Evaluation Testing

The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity and specificity. The analysis should 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 certified industrial hygienist registered safety engineer certified safety professional).

3.6 Verification Testing

A confined space which may contain a hazardous atmosphere should be tested for residues of all identified or suspected contaminants. The evaluation testing should permit specified equipment to determine that residual concentrations at the time of testing and entry are within acceptable limits. Results of testing (i.e. actual concentration) should be recorded on the permit. The atmosphere should be periodically retested to verify that atmospheric conditions remain within acceptable entry parameters. Initial testing of atmospheric conditions and subsequent tests after a job has been stopped should be done with the ventilation systems shut down. If the confined space is vacated for any period of time the atmosphere of the confined space should be retested before re-entry is permitted. Further testing should be conducted with ventilation systems turned on to ensure the contaminants are removed and that the ventilation system is not causing a hazardous condition.

3.7. Acceptable Limits

The atmosphere of the confined spaces should be considered within acceptable limits whenever the following conditions are maintained:

- * Oxygen - 19.5% to 23.5%
- * Flammability - less than 10% of the Lower Flammable Limit (LFL) and
- * Toxicity - less than recognized ACGIH exposure limits or other published exposure levels (e.g., OSHA PEL's NIOSH REL's).

Whenever testing of the atmosphere indicates levels of oxygen flammability or toxicity that are not within acceptable limits entry should be prohibited until appropriate controls are implemented. If the source of the contaminant cannot be determined precautions should be adequate to deal with the worst possible condition in the confined space. If there is the possibility that the confined space atmosphere can become unacceptable while the work is in progress the atmosphere should be constantly monitored and procedures and equipment should be provided to allow the employees to quickly and safely exit the confined space.

3.8 - Isolation and Lockout /Tagout Safeguards

All energy sources which are potentially hazardous to confined space entrants should be secured relieved disconnected and/or restrained before personnel are permitted to enter the confined space. Equipment systems or processes should be locked out or tagged out or both per 29 CFR 1910.147 and ANSI Z244.1-1982 Lockout/Tag out of Energy Sources prior to permitting entry into the confined space. The current lockout/ tag out program being used at the site should be used as guidance. In confined spaces where complete isolation is not possible provisions should be made for as rigorous isolation as practical. Special precautions should be taken when entering double walled jacketed or internally insulated confined spaces that may discharge hazardous material through the vessel's internal wall.

Where there is a need to test position or activate equipment by temporarily removing the lock or tag or both a procedure should be developed and implemented to control hazards to the occupants. Any removal of locks tags or other protective measures should be done in accordance with ANSI Z244.1-1982.

3.9 - Ingress / Egress Safeguards

Means for safe entry and exit should be provided for confined spaces. Each entry and exit point should be evaluated to determine the most effective methods and equipment to be utilized to enable employees to safely enter and exit the confined space.

Appropriate retrieval equipment or methods should be used whenever a person enters a confined space. Use of retrieval equipment may be waived by the designated qualified persons if use of the equipment increases the overall risks of entry or does not contribute to the rescue. A mechanical device should be available to retrieve personnel from vertical type confined spaces greater than five feet in depth.

3.10 - Warning Signs and Symbols

All confined spaces that could be inadvertently entered should have signs identifying them as confined spaces. Signs should be maintained in a legible condition. The signs should contain a warning that a permit is required before entry. Accesses to all confined spaces should be prominently marked.

Section Four - Training

4.0 Training

The employer should 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 their duties in confined spaces. Training should be provided to each affected employee:

- * Before the employee is first assigned duties under this section
- * Before there is a change in assigned duties
- * Whenever there is a change in permit space operations that presents a hazard for which an employee has not been trained and
- * Whenever the employer has reason to believe either that there are deviations from the permit space entry procedures required in this section or that there are inadequacies in the employee's knowledge or use of these procedures.

The training should establish employee proficiency in the duties required by this section and should introduce new or revised procedures as necessary for compliance with this section.

4.1. General Training

All employees who will enter confined spaces should be trained in entry procedures. Personnel responsible for supervising planning entering or participating in confined space entry and rescue should be adequately trained in their functional duties prior to any confined space entry.

Training should include:

- * Explanation of the general hazards associated with confined spaces;
- * Discussion of specific confined space hazards associated with the facility location or operation;
- * Reason for proper use and limitations of PPE and other safety equipment required for entry into confined spaces;
- * Explanation of permits and other procedural requirements for conducting a confined space entry;

- * A clear understanding of what conditions would prohibit entry;
- * How to respond to emergencies;
- * Duties and responsibilities as a member of the confined space entry team; and
- * Description of how to recognize symptoms of overexposure to probable air contaminants in themselves and co-workers and method(s) for alerting attendants.

Refresher training should be conducted as needed to maintain employee competence in entry procedures and precautions.

4.2. Specific Training

4.2.1. Training for Atmospheric Monitoring Personnel

Training should include proper use of monitoring instruments such as:

- * Proper use of the equipment;
- * Knowledge of calibration;
- * Knowledge of sampling strategies and techniques; and
- * Knowledge of PELs TLVs LELs UELs etc.

4.2.2. Training For Attendants

Training for attendants shall include the following:

- * Procedures for summoning rescue or other emergency services and
- * Proper utilization of equipment used for communicating with entry and emergency/rescue personnel.

4.2.3 Training for Emergency Response Personnel

Training for Emergency Response personnel shall include:

- * Rescue plan and procedures developed for each type of confined space that is anticipated to be encountered
- * Use of emergency rescue equipment
- * First aid and CPR techniques and
- * Work location and confined space configuration to minimize response time.

4.2.4 Verification of Training

Periodic assessment of the effectiveness of employee training should be conducted by a qualified person. Training sessions should be repeated as often as necessary to maintain an acceptable level of personnel competence.

Section Five - Emergency Response

5.0 Emergency Response Plan

A plan of action should be written with provisions to conduct a timely rescue for individuals in a confined space should an emergency arise.

5.1 Retrieval Systems or Methods to Facilitate Non -entry Rescue

Retrieval systems should be used whenever an authorized person enters a permit space unless the equipment increases the overall risk of entry or the equipment would not contribute to the rescue of the entrant. Retrieval systems should have a chest or full body harness and a retrieval line attached at the center of the back near shoulder level or above the head.

If harnesses are not feasible or create a greater hazard wristlets may be used in lieu of the harness. The retrieval line should be firmly fastened outside the space so that rescue can begin as soon as anyone is aware that retrieval is necessary. A mechanical device should be available to retrieve personnel from vertical confined spaces more than five feet deep.

Section Six- References

6.0 References

1. 29 CFR 1910.146 "Permit-required Confined Spaces."
2. National Safety Council Data Sheet 12304-0704 "Confined Space Entry Control System for Research and Development Operations."
3. American National Standard Institute (ANSI) Z117.1 -1989 "Safety Requirements for Confined Spaces."
4. DHHS (NIOSH) Publication No. 87-113 "Working With Confined Spaces."
5. ANSI Z 244.1-1982 "Lockout/Tag out of Energy Sources."
6. 29 CFR 1910.147 "The Control of Hazardous Energy (Lockout/ Tag out)."

Appendices and Exhibits to Follow

Permit Required Confined Space Program

APPENDIX A (Excerpt from CCMAR)
CONFINED SPACE EVALUATION FORM

This form is intended to help "responsible persons" evaluate confined spaces prior to entry.

-Reminder- a confined space is large enough to bodily enter, one in which work can be performed within, and is not designed for continuous occupancy.

Mark the box to the right of a characteristic if it applies to the Confined Space.		
Category I	1. The confined space contains moving parts that can be eliminated prior to entry by following a lock-out procedure.	<input type="checkbox"/>
	2. The confined space contains electrical hazards that can be eliminated prior to entry by following a lock-out procedure.	<input type="checkbox"/>
	3. The confined space contains hydraulic or pneumatic hazards that can be eliminated prior to entry by following a lock-out procedure.	<input type="checkbox"/>
	4. The confined space contains an engulfment hazard which hazard can be eliminated prior to entry.	<input type="checkbox"/>
	5. The internal configuration of the confined space is arranged such that it presents a serious safety hazard (i.e. converging walls that could constrict an entrants diaphragm).	<input type="checkbox"/>
	6. The confined space contains a recognized serious safety hazard due to energy sources (live electrical potential energy of a suspended beam or die etc.) which can be eliminated prior to entering the confined space.	<input type="checkbox"/>
Category II	7. The confined space is sub-surface.	<input type="checkbox"/>
	8. The work to be performed in the space involves cleaners glues or other solvents.	<input type="checkbox"/>
	9. The space contains or has previously contained water contaminated with organic matter such as but not limited to plant or animal debris.	<input type="checkbox"/>
	10. Combustion occurs in or around the space (this includes road traffic).	<input type="checkbox"/>
	11. The confined space contains or has contained toxic chemicals.	<input type="checkbox"/>
	12. The confined space contains or has the potential to contain a hazardous atmosphere.	<input type="checkbox"/>

Category III	13. One or more boxes are marked in both Category I and Category II sections above	<input type="checkbox"/>
	14. One or more boxes in the Category II section are marked but the atmospheric hazard(s) cannot be controlled by using forced air ventilation.	<input type="checkbox"/>
	15. The confined space contains moving parts that cannot be eliminated prior to entry.	<input type="checkbox"/>
	16. The confined space contains electrical hazards that cannot be eliminated prior to entry.	<input type="checkbox"/>
	17. The confined space contains hydraulic or pneumatic hazards that cannot be eliminated prior to entry.	<input type="checkbox"/>
	18. The confined space contains an engulfment hazard that cannot be eliminated prior to entry.	<input type="checkbox"/>
	19. The internal configuration of the confined space is arranged such that it presents a serious safety hazard (i.e. converging walls that could constrict an entrant's diaphragm) which hazard cannot be eliminated prior to entry.	<input type="checkbox"/>
	20. The confined space contains a recognized serious safety hazard due to energy sources (live electrical potential energy of a suspended beam or die et.) which cannot be eliminated prior to entering the confined space.	<input type="checkbox"/>

Location Building/Area Evaluator Date
Categorization

This completed evaluation form was sent to XYZ on Date: _____

APPENDIX B
EXHIBIT SPECIFIC LOCK-OUT PROCEDURE

Location xx	LOCATION NAME AND ID WITH A NUMBER AS NEEDED
Equipment	reservoir tank
Work to be Performed	Cleaning /pipe-work etc.
Power / Hazard Sources	Water supply to tank
Specific Energy Control Steps (Numbers Correspond with Power/Hazard Sources)	Unplug main circulating pump and insert plastic plug end casing and lock with approved lock. Ensure return flow from fish tanks and overflow from oxygen contactor and reservoir has ceased. Make sure seawater supply valve is in a closed position. Place a properly sized plastic "Ball Valve Lockout" onto the valve and seawater line. Then place an approved padlock through the proper hole on the "Ball Valve Lockout" and close the lock. Drain the tank.

APPENDIX C
LOCK-OUT OF SIMPLE ELECTRICAL EQUIPMENT OR MACHINERY

Lock-Out may be performed following the procedures outlined below for electrical equipment or machinery meeting the following criteria (a -f):

- (a) The machine or equipment has no potential for stored or residual energy or re - accumulation of stored energy after shutdown which could endanger employees.
- (b) The machine or equipment has a single energy source that can be easily identified and isolated.
- (c) The isolation and locking out of that energy source will completely de -energize and deactivate the machine or equipment.
- (d) The machine or equipment is isolated from that energy source and locked out during servicing or maintenance.
- (e) A single lockout device will achieve a locked -out condition.
- (f) The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance and may not be used shared or removed by other employees.

LOCK-OUT OF SIMPLE EQUIPMENT OR MACHINERY

General Lock-Out procedures for simple machines or equipment are as follows :

- Notify all affected employees that servicing or maintenance is required and that the machine or equipment must be shutdown and locked out to perform the servicing or maintenance and not to attempt to remove the lock or start the machine or equipment.
- Ensure that all of the tools and equipment necessary for you to perform the servicing and/or maintenance have been obtained.
- If the machine or equipment is in operation shut it down by following operating procedures (e.g.; depress stop button open switch etc).
- Isolate the energy source by securing a lock on the disconnect device (cut -off switch or breaker switch) used to isolate equipment on which work is to be performed. Lock-out energy isolating device(s) in the open position with assigned individual locks (note: each authorized individual conducting maintenance or servicing shall ensure that the lock has their name and work phone number attached).
- Ensure that the equipment or machinery is disconnected from the energy source(s) by first checking that no personnel are exposed and then verify the isolation of the equipment by actuating the start button or switch. Caution: Ensure that the actuation device returns to neutral or "off" position after verifying the machine or equipment is isolated.
- Perform maintenance and servicing of equipment or machinery.

Follow procedures for "Releasing Equipment or Machinery From Lock -Out":

- Check the machine and the immediate area around the machine to ensure that non-essential items have been removed and that the machine guards and other components are operationally intact.
- Check the work area to ensure that all employees have been safely positioned or removed from the area. And notify them that the machine or equipment is going to be released from Lock-Out.
- Verify machine controls are in neutral or off position.
- Remove Lock-Out devices and re-energize the machine or equipment.
- Notify affected employees that servicing or maintenance is completed and the machine or equipment is ready for use.

EXHIBIT for USE (CCAR)

LOCATION PERMIT REQUIRED CONFINED SPACE PROGRAM CATEGORY II SOP: MITT #1 BOILER TANK 6' x 4' x 4' DEEP SOP FOR WHEN EMPTY

This SOP will be reviewed prior to each entry with the entrants and attending worker. Such training must be documented in a separate folder maintained with the confined space program and include the signatures of those individuals involved in the training.

At least 2 people will be present during entry into the boiler tank in X-C LOCATION #ASSIGNED; an entrant and an attendant located just outside the space.

The Orion Multi-Gas meter (4-gas meter) or other confined space gas meter shall undergo a calibration check prior to each space evaluation. Those individuals using the meter must be properly trained.

Prior to Authorizing Entry:

During normal operation this tank will be full of running water and is thus classified as a Category III Space. In order for this SOP to apply the tank must be pumped out and the lid removed. According to Appendix B of the Permit -Required Confined Space program the hazards posed by the boiler tank in MITT #1 are water (engulfment) and an actual or potential hazardous atmosphere. Prior to every entry into the reservoirs the entrants must ensure that this categorization is proper. In other words LOCATION will reassess the space prior to each entry and re -categorize them when necessary to ensure that the proper entry procedures are being followed. When reevaluating the hazards contained within the sump LOCATION workers must disturb any water located in the space while monitoring the atmosphere within the space for (ANY HAZARD THAT APPLIES) (this procedure must be performed without entry). If

a hazardous concentration of XYZ gas is found within the space workers are not allowed to enter the space.

*Note - Examples of some situations that require a space to be re-evaluated and possibly re-categorized include: fish dying in the space chemicals being brought into the space a build-up of scum within the space changes in the use or configuration of the space stagnation of water that was once moving and equipment being introduced into the confined space.

Complete the Pre-Entry Checklist (Appendix D):

The Pre-Entry Checklist (Appendix D) must be completed prior to entering any category space and shall include the date location of the space nature of work to be performed within the space a description of the methods used to eliminate the hazards found in the space and the signature of the person evaluating the space.

Extra Precautions:

Prior to and throughout entry the atmosphere within the confined space will be continuously monitored with an Orion multi-gas meter (4-gas meter) or one of LOCATION choice. The readings will be documented on the form prior to entry and at least once every hour. O₂ combustible gas CO and H₂S readings must indicate a safe level upon entry into the space.

If the space was evaluated under typical conditions – such as- it did not contain any water then in order to use this SOP the same conditions must apply and the water supply must be locked out prior to entry (see Lock out Tag out program for SOP). If the tank contains water (other than surface moisture) or is connected to the water supply then they are to be classified as category III spaces and entry is only allowed by following category III procedures. The tank is only 4' deep and so the use of a step ladder will be sufficient to ensure adequate means of egress. The use of forced air ventilation is not required.

PRE-ENTRY CHECKLIST (29CFR1910.146 APPENDIX D-1)

CONFINED SPACE ENTRY PERMIT

DATE AND TIME ISSUED: _____ DATE AND TIME EXPIRES: _____
JOB SITE/SPACE I.D.: _____ JOB SUPERVISOR: _____
EQUIPMENT TO BE WORKED ON: _____ WORK TO BE PERFORMED: _____

STAND-BY PERSONNEL: _____

1. ATMOSPHERIC CHECKS: TIME _____

OXYGEN _____ %	EXPLOSIVE _____ %L.F..L.	TOXIC _____ PPM
2. TESTER'S SIGNATURE	TESTER'S SIGNATURE	TESTER'S SIGNATURE

3. SOURCE ISOLATION (NO ENTRY)

	N/A	YES	NO
PUMPS OR LINES BLINDED			
DISCONNECTED OR BLOCKED			

4. VENTILATION MODIFICATION			
	N/A	YES	NO
MECHANICAL			
NATURAL VENTILATION ONLY			
5. ATMOSPHERIC CHECK AFTER ISOLATION AND VENTILATION : TIME _____			
OXYGEN _____ % > 19.5%	EXPLOSIVE _____ % L.F.L < 10%	TOXIC _____ PPM < 10 PPM H(2)S	
TESTERS SIGNATURE	TESTER'S SIGNATURE	TESTER'S SIGNATURE	
6. COMMUNICATION PROCEDURES:			

7. RESCUE PROCEDURES:			

8. ENTRY STANDBY AND BACK -UP PERSONS:			
	YES	NO	
SUCCESSFULLY COMPLETED REQUIRED TRAINING?			
IS IT CURRENT?			

9. EQUIPMENT			
	N/A	YES	NO
Direct reading gas monitor-tested			
Safety harnesses and lifelines for entry and standby persons			
Hoisting equipment			
Powered communications			
SCBA's for entry and standby persons			
Protective Clothing			
All electric equipment listed Class I Division I Group D and non-sparking tools			

10. PERIODIC ATMOSPHERIC TESTS	
Oxygen _____ % Time _____	Oxygen _____ % Time _____
Oxygen _____ % Time _____	Oxygen _____ % Time _____
Explosive _____ % Time _____	Explosive _____ % Time _____
Explosive _____ % Time _____	Explosive _____ % Time _____
Toxic _____ % Time _____	Toxic _____ % Time _____
Toxic _____ % Time _____	Toxic _____ % Time _____

We have reviewed the work authorized by this permit and the information contained here -in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any squares are marked in the "No" column. This permit is not valid unless all appropriate items are completed.

Permit Prepared By: (Supervisor) _____

Approved By: (Unit Supervisor) _____

Reviewed By (C's Operations Personnel): _____

(Printed Name)

(Signature)

This permit to be kept at job site. Return job site copy to Safety Office following job completion.

Copies:

Safety Office

Unit Supervisor

APPENDIX D-2 (29CFR1910.146)

ENTRY PERMIT

PERMIT VALID FOR EIGHT (8) HOURS ONLY. ALL COPIES OF PERMIT WILL REMAIN AT THE JOB SIDE UNTIL JOB IS COMPLETED.

DATE: -- SITE LOCATION and DESCRIPTION _____

PURPOSE OF ENTRY _____

SUPERVISOR(S) in charge of crews. Type of Crew Phone # _____

COMMUNICATION PROCEDURES _____

RESCUE PROCEDURES (PHONE NUMBERS AT BOTTOM) _____

*BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED AND REVIEWED PRIOR TO ENTRY *

REQUIREMENTS COMPLETED	DATE	TIME
Lock Out/De-Energize/Try Out		
Line(s) Broken-Capped-Blanked		
Purge-Flush and Vent		
Ventilation		
Secure Area (Post and Flag)		
Breathing Apparatus		
Resuscitator – Inhalator		
Standby Safety Personnel		
Full Body Harness w/ “D” ring		
Emergency Escape Retrieval Equipment		
Lifelines		
Fire Extinguishers		
Lighting (Explosive Proof)		
Protective Clothing		
Respirator(s) (Air Purifying)		
Burning and Welding Permit		
Note: Items that do not apply enter N/A in the blank		

**** RECORD CONTINUOUS MONITORING RESULTS EVERY TWO (2) HOURS**

CONTINUOUS MONITORING ** PERMISSIBLE: _____

TEST(S) TO BE TAKEN Entry Level

	HOUR	HOUR	HOUR	HOUR	HOUR	HOUR	HOUR	HOUR
Percent Of Oxygen 19.5% to 23.5%								
Lower Flammable Under 10%								
Carbon Monoxide + 35 PPM								
Aromatic Hydrocarbon + 1 PPM * 5PPM								
Hydrogen Cyanide (Skin) * 4 PPM								
Hydrogen Sulfide + 10 PPM *15 PPM								
Sulfur Dioxide + 2 PPM * 5PPM								
Ammonia *35PPM								

Short-term exposure limit: Employee can work in area up to 15 minutes.

+ 8 hour Time Weighted Avg.: Employee can work in area 8 hours (longer with appropriate respiratory protection).

REMARKS:

Gas tester name	Check #	Instrument used	Model	Serial #

SAFETY STANDBY PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK
SUPERVISOR AUTHORIZING – ALL CONDITIONS SATISFIED

Name/Title:

DEPARTMENT/ PHONE :

AMBULANCE :

SAFETY :

GAS COORDINATOR:

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