



UNIVERSITY OF WEST FLORIDA

CONFINED SPACE SAFETY PROGRAM

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INDEX

PURPOSE	3
PROCEDURE	3
GENERAL CONFINED SPACE ENTRY PROCEDURES	5
CONFINED SPACE SAFETY AND TRAINING PROGRAM	6
CONFINED SPACE EMERGENCY RESCUE PROCEDURES	7
CONTRACTORS	8
APPENDIX I CONFINED SPACE HAZARDS	9
APPENDIX II SEWAGE SYSTEM / UTILITIES OPERATIONS	12
CONFINED SPACE ENTRY PERMIT CHECK OFF LIST	17

PURPOSE

The purpose of this Environmental Health and Safety program is to provide University Of West Florida (UWF) employees and contractors the mandatory level of safety while performing necessary work in confined spaces on the main campus and other properties of UWF. Death and injuries in confined spaces are often the result when employees disregard proper safety procedures, take short cuts, refuse to accept the fact that a space may have been safe for years in the past, could develop into a deadly hazardous space and when supervisory personnel fail to heed safety standards and management does not remain fully aware as to what is really taking place in their confined space activities.

Confined space accidents are completely preventable, and when proper training, supervision, equipment and devices are applied, confined space entry is a safe and routine working procedure. The currently accepted state-of-the-art policies and requirements for confined space entry is the OSHA standard 29 CFR 1910.146. Contractors providing services to the university are required to follow the OSHA requirements and the university as "host employer" is obligated to furnish to the employer information regarding permit spaces, hazards and internal program requirements.

PROCEDURE

IDENTIFICATION OF CONFINED SPACES ON THE CAMPUS OF THE UNIVERSITY OF WEST FLORIDA

For the purposes of this Environmental Health and Safety program, a confined space is an enclosed area that must be entered into to perform a maintenance task on a regular or emergency basis. The confined space may be difficult to enter and leave, have one or more physical or chemical hazards, and may have the remote possibility of trapping the person entering, especially if the person is incapacitated. This program will provide a method of planning and documenting an entry into such an area, provide a checklist of safety precautions, and assure that emergency rescue can be immediately accomplished, if it becomes necessary.

By definition, a confined space is a space that:

- *Is large enough to be entered;*
- *Has limited means of entry and exit; and*
- *Is not designed for continuous employee occupancy.*

For the purposes of this program, examples of confined spaces might include:

- *tanks*
- *vessels*
- *vaults*
- *pits (i.e., swimming pool valve and filter pits, etc.)*

- *elevated water towers*
- *boilers*

Note that these spaces could reasonably have atmospheres that are oxygen deficient or contain other hazards

For the purposes of this program, examples of spaces not generally defined as confined spaces might include:

- *building attics*
- *building crawl spaces*
- *some elevator shafts*
- *walk-in HVAC air handling units*

Note that these spaces generally contain ambient air of the building, do not present an atmospheric hazard or pose a danger from engulfment or entrapment.

All confined spaces under the control of UWF shall be ENTRY PERMIT REQUIRED CONFINED SPACES. Such confined spaces include, but are not limited to, electrical vaults, stormwater manholes, sewage manholes, sewage lift stations, and boilers.

University employees will not enter the following confined spaces under any circumstances:

- Boiler firebox
- Water tower reservoir tank
- Energized electrical transformer vaults

Note: Contractors working on the UWF campus may defer to the OSHA Telecommunication standard, 29CFR 1910.268 or Power Distribution standard, 29CFR 1910.335, where applicable. OSHA has determined that entry into permit required confined spaces (as designated by UWF) still require atmospheric testing and other precautions. References regarding these requirements are attached: Interpretation letter dated 08/08/1994 and an excerpt from 1910.268(o). Contractors deferring to 1910.268 are responsible for conducting testing and providing additional personnel, as required under that OSHA standard.

DANGER – PERMIT REQUIRED CONFINED SPACE signs, meeting OSHA specifications, shall be posted at all identified confined space entrances. Where not appropriate to place at the entrance (i.e. streets, sidewalks, etc.) the signs will be placed immediately under the cover (hatch, door, lid, etc.) in such a manner as to prevent entry unless the sign is removed.

GENERAL CONFINED SPACE ENTRY
PROCEDURES

1. All confined space entries will be documented on the Confined Space Entry Form (permit). No entry will be allowed unless the permit is completed and approved by the designated supervisor. An entry can be up to one shift or eight hours in length. If a confined space entry has been completed and must be re-entered during the same shift or eight-hour day, a new entry form or permit must be completed.
2. Confirm that all energy sources in the space are de-energized and are locked and tagged out, in strict compliance with proper lock out/ tag out (LOTO) procedures. Confirm that all engulfment hazards have been eliminated and persons controlling those hazards are aware of the space entry.
3. Before entry is made into any designated confined space, the atmosphere must be tested for adequate oxygen and possible presence of toxic gasses. Proper procedure is to test immediately under the cover (or top), near the middle of the space, and at the bottom of the space. If possible, the space shall be tested before removing the hatch or manhole cover.
4. Hard hats shall be worn at all times while working within confined spaces unless such use prevents a particular job from being performed and creates a greater safety hazard. The supervisor and the person authorizing the entry shall verify all conditions in which hard hats are not to be used.
5. A trained observer with visual or audible contact with the worker and radio contact for emergency forces notification shall be used on all confined space entries. At least one trained observer must be immediately outside the space entrance and in constant contact with entrant during the entire entry.
6. Training provided to university employees does not include entry rescue. Rescue must be accomplished by extraction of the worker from confined spaces.

NOTE: 60 PERCENT OF CONFINED SPACE FATALITIES ARE PERSONS ATTEMPTING TO RESCUE DOWNED EMPLOYEES.

7. Entry into a Permit Required Confined Space will not be initiated unless the entering employee is properly wearing a body harness and retrieval system (tripod) is attached.
8. Where more than one worker is required to enter the same space for a particular job, each worker must be attached to a separate retrieval system. Positions and moves must be coordinated to avoid entanglement of the equipment.
9. Mechanical ventilation shall be utilized and maintained for the duration of the entry on all confined space entries.

10. A means of communication (visible, audible, or electronic) must be established and maintained during the entire project between the person in the space and the outside observer. The observer must be fully equipped with all necessary personal protective equipment, and have no other duties or responsibilities than the safety of people inside of the confined space and will not leave that position until the project has been completed and all personnel have evacuated the confined space, or the observer is relieved by another fully qualified and equipped individual.
11. Lock-out/tag-out procedures as per 29CFR 1910.147, requiring the isolation of energy and physical hazards shall be observed.
12. Safety Related Work Practices as per 29CFR 1910.331 through 1910.335 shall be observed.
13. In all Permit Required Confined Spaces, continuous monitoring will be performed in addition to continuous mechanical ventilation. As long as the atmosphere is within safe limits the personnel will continue with the work assignment, inspection, or procedures with no deviations from normal routine. If the atmospheric conditions change, the personnel will exit immediately and take whatever precautions are necessary for self and crew protection. If conditions exist that inevitably will contribute to unsafe atmospheres (i.e. welding, use of hazardous chemicals, sewage manholes and lift stations), work will stop immediately upon the sounding of an alarm and the employee(s) will exit the space and not reenter until acceptable limits are restored. Employees will not reenter the space for one hour after the second evacuation, regardless of the conditions.
14. If the worker becomes drowsy, nauseous, has blurred vision or difficulty in breathing, the worker must evacuate immediately and notify the respective supervisor or foreman. Ringing in the ears indicates a serious lack of oxygen.
15. In the event of a severe injury or asphyxiation, emergency rescue procedures will be enacted immediately. The Department of Public Safety at X911 or by radio. Inform them that you have a "confined space emergency and to contact Ferry Pass/EMS Rescue and an ambulance immediately." Give the dispatcher your name and specific location. The emergency rescue unit will be notified and also the director of EH&S shall be informed.
16. All permit entry files, training records and permits must be kept on file at least 5 years from the date of the last training, inspection, test, maintenance or entry.

CONFINED SPACE SAFETY AND TRAINING PROGRAM

1. All employees performing confined space work will receive a minimum of eight hours initial training and sufficient (eight hours recommended) annual training to ensure competency during the entry.
2. Supervisors (those issuing and authorizing permits) shall receive an initial 20 hours of training and sufficient annual training (eight hours recommended) to maintain proficiency.
3. At least one member of the confined space entry team must be trained in CPR/First Aid. Recommendations are for all confined space entrants to be trained in first aid/CPR. In order to meet the requirements of emergency rescue, the employer shall ensure that rescue services are available. Due to the nature of potential confined space incidents, the time of emergency medical services availability is approximately four minutes. The University must be prepared to deal with such incidents and potential injuries.
4. Proper training means that the training shall not be considered complete until actual demonstration by the employee to the supervisor, foreman, or safety officer that they have attained an acceptable degree of proficiency for entering and working in confined spaces. Each employee satisfactorily completing the respective training shall be issued an individual identification card or certificate certifying that the employee is qualified to enter and to work in confined spaces.

CONFINED SPACE EMERGENCY RESCUE PROCEDURES

1. When an emergency rescue is necessary from any confined space, the rescue must be immediate. Always have sufficient and adequate emergency rescue equipment available for this purpose. Notify X911 and request an Emergency Rescue Unit immediately. Take steps to make the rescue without endangering other personnel. Do not enter the confined space. No rescue will be attempted by university personnel. Wait for professional rescue services.
2. Extract the incapacitated worker as quickly and safely as possible with the extraction equipment. Avoid further injury of the employee by guiding body and limbs past obstructions with poles and rods.
3. Immediately assess the injury or the problem to determine the injury, and the condition of the victim. You do not have time to conduct an extensive physical examination, only to determine the specific type of injury and the extent of the injury. Check for serious conditions starting with breathing, heartbeat, bleeding, fractures, bruises and then related injuries.
4. In the event of a back or neck injury, additional and extreme care must be exercised in order to prevent further damage or death to the victim. During the removal process and the transporting of the victim, the back

and neck must be maintained in normal alignment. Do not twist the back or the neck and make all body movements in one movement so as to maintain proper alignment.

5. Following the removal of the victim from the confined space provide for all necessary primary and follow-up life support assistance as necessary.

CONTRACTORS

OSHA regulations require that the host employer (University) supply all contractors, who may enter confined spaces, with appropriate information on the hazards associated with those areas. Contractor employees are under the same obligation as the University to comply with the confined space standards; therefore, all contracting agencies that enter confined spaces on any University controlled property shall meet or exceed the requirements of this policy. Any contractor who does not comply with this requirement or refuses to comply after being informed, will be issued a written notice by the Department of Environmental Health and Safety. Additionally, the entity issuing the contract will be notified of the non-compliance. Where the contractor has violated the terms of the contract referencing observance of applicable health and safety standards, the contractor's disregard and willful violation of the contract may cause the contract to be terminated.

CONFINED SPACE HAZARDS

Death, according to an alert published by the National Institute for Occupational Safety and Health January 1986, has resulted from the following:

EMPLOYEES DO NOT RECOGNIZE THE HAZARDS
EMPLOYEES TRUST THEIR SENSES
EMPLOYEES UNDERESTIMATED THE DANGER
EMPLOYEES BECOME COMPLACENT
EMPLOYEES TRY THE BUDDY SYSTEM, THAT IS SAVE YOUR BUDDY
Rescuers account for 60% of all confined space fatalities.

The first line supervisor or foreman shall ensure that all employees training records are current, safety and personal protective equipment is on site and functional during the confined space operation.

The safety officer is responsible for providing safety expertise, making safety recommendations and coordinating safety programs as required, coordinating safety training and specialized courses relative to the confined space safety program.

Each employee that may be required to enter into a designated confined space shall be properly trained in subjects that are necessary and applicable to their own confined space entry needs selected from the following list of subjects:

1. The potential hazards that could be confronted.
2. Safety precautions, emergency procedures and hazards exposure treatment.
3. Personal protective equipment, clothing and devices.
4. Inspection, use, selection and fitting of safety harness and life lines.
5. Traffic control and job-site protection.
6. First aid and cardiopulmonary resuscitation (CPR).
7. Proper testing and monitoring of confined spaces.
8. Decontamination of confined spaces.
9. Electrical, mechanical isolation procedures when required.
10. Proper ventilation procedures.
11. Emergency entry and exit procedures including solo escapes.

TYPICAL HAZARDS OF CONFINED SPACES

1. Vehicular traffic striking the employee while working on the streets or highways because of no, improper or inadequate job site safety signs, barricades or traffic cones.
2. Metal fatigue of built in steps or improperly installed and secured portable ladders inside the space.
3. Hang up of safety harness or life lines inside structures.
4. Loss of handgrip on steps or ladder while attempting to ascend or descend.
5. Carrying items in the hands instead of having them lowered or raised in a suitable bucket or container.
6. Slipping, tripping or falling in, on, or around internal structures because of water, sewer, grease, poor housekeeping or other debris.
7. Entrapment in trenches over 4-feet deep due to cave-ins.
8. Unexpected surge of sewage into the space due to failure to by-pass the flow while using air bags or J-Plugs, when the surge pressure builds up over the limits of the air bag or J-Plug.
9. Failure or breakdown of the fresh air ventilation device.
10. Carbon Monoxide or other contaminants being pulled into the fresh air blower.
11. Unexpected change of the atmosphere after the initial monitoring is completed. Fifty percent of confined space injuries involve changes to the atmosphere after the initial monitoring is complete and the workers fail to continuously test .
12. Unexpected seepage of methane gas into the space or an underground LP gas line rupture and the gas finding its way along underground sewer lines, water lines or electrical lines or ground cavities into the sewer or station.
13. Excessive noises preventing the worker from hearing the gas detector alarm, the air pack low air warning alarm, or the outside observer directing the worker to exit the space.
14. Objects falling into the space from overhead.
15. Breathing air Oxygen deficiency or enrichment.

16. Combustible gases or vapors.
17. Toxic gases or vapors.
18. Exhaustion of the worker inside the confined space.
19. Electrical hazards.

SEWAGE SYSEM and UTILITIES OPERATIONS**PUMPING STATIONS AND UNDERGROUND VENTILATION PROCEDURES:**

When necessary to ventilate a station, open all outside or adjacent manholes to provide for escape of incoming contaminants. Thirty-six-inch manhole lids should be lifted with a manhole lid lifter to minimize arm, back, shoulder or neck injuries.

Open all roll-up doors and windows that would provide for a better inflow of air. Auxiliary ventilation equipment may also be used to increase the value of the air being forced into the space.

Should these efforts fail to provided for a safe atmosphere that is within the acceptable limits, the space must now be considered as a permit entry space and the permit entry space requirements must be met.

SEWER LINES AND MANHOLE VENTILATION PROCEDURES:

All underground sewer lines and manholes will be tested for hydrogen sulfide, methane gas contamination and oxygen deficiency before permitting any person to enter the space for normal working assignments. Contaminated sewer lines and manholes will be decontaminated as follows:

- a. Safe atmosphere will contain from between 19.5% and 23.5% oxygen, toxic concentration no higher than 15 PPM, or more the 15 PPM of hydrogen sulfide concentration, flammable and explosive concentrations of less than 10% of its lower flammable limits (LFL).
- b. Using a manhole lid lifter, remove all manhole covers both upstream and down stream. Structures over any manhole shall be opened for ventilation. Place appropriate "men working" signs, traffic cones, barricades or markers around the job-site prior to starting the work. If the work is in the street or highway, or within 5-feet of a street or highway employees must wear fluorescent safety vests in addition to hard hats as additional protective measures.
- c. Test the atmosphere for safety. Should the atmosphere remain hazardous after the lids have been removed and ventilated for a reasonable period of time, the following procedures shall be conducted:
 1. A fresh air supply capable of ventilating the space shall be placed into position and the fresh air blower duct direct the fresh air into the manhole or sewer line. Do not permit internal combustion engine exhaust near the blower, or upwind of the blower.
 2. An exhaust blower should be positioned to remove the atmospheric

contamination from the manhole or sewer line should the fresh air blower not force the contamination out of the space. The discharge of the inlet fresh air blower and the intake of the exhaust blower should be positioned to maintain a circular air flow exchange within the sewer line or manhole.

Should the atmosphere change within the sewer line or manhole remain above the acceptable limits after considerable attempts to ventilate the space has failed, the following procedures shall be used to further clear the air:

- A. J-Plugs or air bags of appropriate size will be inserted in the upstream and down stream lines to isolate the manhole. By-pass pumps will be used to by-pass the manhole or sewer line when necessary. Continuous ventilation should be maintained during the work process.
- B. Use extreme caution when using J-Plugs and air bags. Follow the manufacturers recommendations regarding sizing and maximum air pressure to be used. Use a hand pump while inflating air bags and wear protective eye and face shields or goggles.
- C. For maximum convenience during entry and egress inside of small manholes the sewer saddle vent device should be used thereby permitting continuous ventilation of the manhole with a minimum of sacrificing the amount of open area in entering and leaving the manhole. In the event a rescue is necessary, the rescue can be accomplished without having to take the time to remove the air ventilation hoses.
- D. No employee shall be permitted to make a routine entry into any sewer line or manhole in which the atmospheric contamination exceeds the acceptable limits. Entry into a contaminated manhole or sewer line shall be made only for the purpose of emergency rescue, emergency repairs and/or decontamination purposes, and full safety and rescue equipment shall be used by the person entering the space with a standby observer, also fully equipped, and maintaining audible or visual contact at all times with the person inside of the manhole or the sewer line.

MANHOLE AND SEWER LINE FLOW CONTROL OPERATIONAL PROCEDURES

When constant sewage flow in large sewer lines must be stopped, the following procedures will be followed during the entire operation:

1. Prior to the start of the project the entire project will be reviewed by the job-site foreman and the person in charge of manual operation of the involved sewage pumping station, this includes emergency potentials and plans. Coordination between the sewer crew and the pump station operator shall be via direct radio contact.
2. The pump station operator shall determine the safe length of time the particular station can remain out of service and shall inform the sewer crew foreman of the allowable length of available time the crew will have to work when the station is turned off.
3. The sewer crew foreman shall plan his work assignment in accordance with the limited time available during the pump station shut down, and so advise the crew.
4. When the crew is ready to actually begin work, the station operator shall be notified. The station operator shall pump the station wet-well down to its lowest level without causing the pumps to become air bound (if the pumps are centrifugal) and then shut the pumping station off. The operator shall notify the sewer crew foreman that the pumps are off and the sewer crew will begin their work.
5. The station operator will notify the sewer crew foreman when one-half of the available time has expired, and thereafter in ten-minute intervals. Five minutes prior to having to start the pumping station pumps, the station operator will radio the sewer crew foreman who shall make certain that all personnel are out of the sewer line or manhole.
6. The sewer crew foreman will notify the station operator when all crew members are out of the manhole or the sewer line and shall instruct the station operator to turn the pumps on.
7. The pumping station operator shall not start up the sewage pumps until notified by the sewer crew foreman that all the members of the crew are out of the sewer line or the manhole.
8. The pumping station operator shall start the pumps in a moderate sequence so as not to hydraulically overload the sewer line and cause a rupture.

WATER RESERVOIR MAINTENANCE

The repair, cleaning, and sterilization of ground reservoirs is a specialized function. Procedures for reservoir cleaning are to provide safe working conditions and shall be done in the steps as listed below:

1. Inspection of exterior walking and working surfaces, ladders and safety railings. Aeration fans on reservoirs are to be arranged and equipped in a manner as to be inspected and repaired, if needed. Portable blowers must be ready for use if reservoirs are not the type equipped with aeration fans. Following the inspection and repairs, the tank would then be isolated from the treatment system and drained.
2. While the tank is draining, the position of the valves operated during this procedure shall be recorded in the plant log. The operations supervisor also shall be notified of the job status and record pertinent information in the central control log.
3. The reservoir entrance hatches shall be opened following the procedures and precautions necessary for various types of hatches requiring this preventative step. Protective barriers shall be properly placed.
4. Ground fault protected lamps shall be installed to provide illumination. Lamps shall normally be installed through roof openings. If roof openings are not available, lamp installation shall be delayed until the completion of the reservoir interior inspection.
5. The reservoir interior requires inspection before allowing a work crew to enter. The responsible supervisor shall ensure that all necessary protective barriers, warnings and guards are in place and shall examine the structural condition of the reservoir, and determine the type and amount of work to be accomplished.
6. The work to be performed inside the reservoir shall determine the type of protective equipment necessary to complete the task. All protective equipment and devices shall be on site ready for use prior to starting the project. Rubber boots, gloves and rain suits shall be used due to the conditions of the interior, and the type of cleaning procedures. Self-contained breathing apparatus, safety harness, lifeline and a retrieval system shall be on site and ready for emergency use on all reservoirs that do not have ground level access hatches. Pumps and blowers that are operated by internal combustion engines shall be set up away from hatches and air intakes to prevent the exhaust from entering the reservoir.
7. The length of time worked and the length and frequency of rest periods shall be determined by the job supervisor, based on conditions inside of the reservoir.

8. Only after the completion of the cleaning and removal of all equipment and personnel from the reservoir shall sterilization begin. Sterilization requires the use of chlorine compounds.
9. When application of the sterilizing agents is complete, the tank will be filled and allowed to stand for twenty-four hours to ensure complete disinfection. This procedure is recorded in the plant log book and the operations supervisor engineer is also advised.
10. After twenty-four hours, and after 3 bacterial samples have been approved, the tank will be filled with potable water. When returning the tank to service, the valve positions are recorded in the plant log book and the operations supervisor/engineer is notified.

CONFINED SPACE ENTRY PERMIT CHECK OFF LIST - Page 1

Address or location _____ Date _____ Time _____

What work is to be done? _____

Foreman or Supervisor to be in charge _____

List the possible hazards that could be present _____

List the appropriate traffic control and pedestrian protection that is required for this job site _____

Is safety equipment in its proper location? Yes/No _____

Serial Number of the gas detector _____

Date of last calibration _____ Model _____

_____ Type _____

Atmospheric conditions: Oxygen concentrations _____

Toxic Concentrations _____ Explosive Concentrations _____

Other Indicators _____ Temperature _____

Weather conditions _____

Physical condition of the confined space: Rust _____ Wet or moist _____

Oily _____ Standing water _____ Sludge _____ Trash _____ Grease _____

Leaves or grass _____ Other conditions or comments _____

Crew members names, training and physical condition:

Name _____ Physical condition _____

Certified in CPR? _____ First Aid _____

Trained in confined space emergencies _____

Any know physical or medical problems _____ If yes, list _____

Name _____ Physical condition _____

Certified in CPR? _____ First Aid _____

Trained in confined space emergencies _____

Any know physical or medical problems _____ If yes, list _____

Name _____ Physical condition _____

Certified in CPR? _____ First Aid _____

Trained in confined space emergencies _____

Any know physical or medical problems _____ If yes, list _____

(list additional crew members on the back)

CONFINED SPACE SAFETY PERMIT ENTRY CHECK OFF LIST – Page 2

If lockouts are required, what must be locked out _____

If isolation is required, what is to be isolated _____

Personnel protective equipment on site and ready to be used? _____

List the items to be worn by each crew member _____

Safety harness, life lines and retrieval unit ready for use? _____

Ventilation equipment in place and operational _____

First aid kit available and ready for immediate use _____.

Name of the safety observer _____

Job classification _____

Certified in CPR _____ First Aid _____

Trained in confined space emergencies _____

Provided with a means of communications with the person inside the confined space _____

Provide with special instructions _____

This is to certify that all provisions for a safe entry into a confined space as listed above have been completed and the space, all persons in the work crew are properly trained, equipped and physically capable of conducting the required work as assigned, and that the above listed crew have been trained in confined space emergency rescue procedures.

Signature of the supervisor/foreman _____

Date and Time of issuance _____

List any special instructions or changes below:

IN CASE OF ANY SERIOUS ACCIDENT NOTIFY THE DEPARTMENT OF PUBLIC SAFETY AND ENVIRONMENTAL HEALTH & SAFETY IMMEDIATELY AFTER NOTIFYING THE EMERGENCY RESCUE UNIT AT X911

GIVE SPECIFIC LOCATION ADDRESS AND TELEPHONE NUMBER