Columbus City Utilities
Lockout/Tagout Program

PURPOSE AND RESPONSIBILITY

This procedure establishes the minimum requirements for the lockout of energy isolating devices whenever maintenance or servicing is done on machines or equipment. It shall be used to ensure that a machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

All employees are required to comply with the restrictions and limitations imposed on them during the use of lockout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees upon observing a machine or equipment which is locked out or tagged out shall not attempt to start, energize, or use that machine or equipment.

Each department head shall be responsible for the establishment and implementation of this program within their respective departments. The Loss Prevention Coordinator will assist with the implementation, training, and inspections.

Each department will conduct a survey of their areas to determine locations of all hazardous energy sources supplying machines or equipment that is or will be maintained and serviced by their employees. These energy sources include but may not be limited to:

- Electricity
- Pneumatic (air)
- Hydraulic
- Elevated Machine Members
- Gas
- Mechanical
- Springs
- Falling
- Water Pressure
- Chemical
- Steam
- Thermal
- Nuclear

Methods to control unintended operation of machines or equipment being serviced or maintained shall be written on each individual unit. The written procedures shall be maintained in a common file within the department where the machine or equipment is located and a copy shall be maintained in the area near the machine or equipment.

DEFINITIONS

Affected Employee: An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area where such servicing or maintenance is being performed.

Authorized Employee: A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Capable of Being Locked Out: An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Energized: Connected to an energy source or containing residual or stored energy.

Energy Isolating Device: A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches, and other control circuit type devices are not energy isolating devices.

Energy Source: Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot Tap: A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout: The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout Device: A device that utilizes a positive means, such as a lock, either key or combination type, to hold an energy isolating device in a safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Servicing and/or Maintenance: Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or startup of the equipment or release of hazardous energy.

Setting Up: Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout: The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout Device: A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure to indicate that the energy being controlled may not be operated until the tagout device is removed. (NOTE: The state of Indiana does not recognize a tagout device as being acceptable in place of a lockout device.)

ENERGY CONTROL DEVICES

Energy Control Devices include but may not be limited to:

- Locks
- Self-locking Fasteners
- Chains
- Wedges
- Key Blocks
- Adapter Pins

Procedures for affixing energy control devices shall be a part of the written procedures for each machine or equipment.

All lockout devices shall be identified and used only for the purpose for which they are intended.

- Lockout devices shall be put in place only by a qualified person that has received the training that is necessary to safely work on the machine or equipment.
- Lockout devices shall be durable and capable of withstanding the environment in which they are used.
- Tags shall be capable of withstanding weather, damp locations, and corrosive environments.

- All lockout devices should be uniform in color, shape, and size within one are or department.
- Lockout devices shall only be removed by their installer. (See page 6 for exceptions to this).
- Lockout devices shall be substantial enough to prevent inadvertent or accidental removal and shall indicate the identity of the employee using the device and a warning of what precautions to take.

Lockout procedures shall be used in preference to tagout procedures. The State of Indiana does not recognize a tagout device as being acceptable in place of a lockout device.

There shall be a periodic inspection of the energy control procedures. This inspection shall be at least annually.

The inspection will be performed by an authorized employee other than the employee utilizing the energy control procedure being inspected. The inspection shall be designed to correct any deviations or inadequacies observed.

Where lockout is used for energy control, the periodic inspection shall include a review between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

TRAINING

Each affected employee shall be instructed in the purpose and use of the energy control procedure.

All other employees whose work operations are or may be in an area where energy control procedures may be utilized shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

Any unauthorized employee who attempts to restart or reenergize machines or equipment which are locked shall be considered as having committed a major violation. Discipline will be governed by the Personnel Policy for the City of Columbus.

Each employee shall be instructed that tags do not offer the same protection as locks.

Tags are to be removed only by the installer.

Tags must be legible and be familiar to all employees whose work is affected or may be in the affected area.

Tags and means of attachments must be capable of withstanding environmental conditions in the workplace.

Tagout devices shall be non-reusable and self-locking with minimum unlocking strength of no less than 50 pounds. (NOTE: The State of Indiana does not recognize a tagout device as being acceptable in place of a lockout device.)

Tags often evoke a false sense of security and their importance needs to be clearly understood by employees.

Training records shall include the name of the employee and the date of training and shall be kept in the employee's personnel file.

Retraining will be required when:

- There is a change in job assignments.
- A change in machines or equipment.
- Equipment or processes present a new hazard.
- There are deviations or inadequacies detected in the procedures.
- New or revised control methods are used.

Retraining records will be kept within the employee's personnel file.

CONTROL

All affected employees shall be notified of required servicing or maintenance of a machine or piece of equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.

Only trained and authorized employees shall affix lockout devices to energy isolating devices.

Lockout devices are to be affixed in such a manner that it will hold the energy isolating device in a safe or off position.

If a tag cannot be affixed directly to the energy isolating device, it should be located where it will be immediately obvious to potential operators.

Whenever major replacement, repair, renovation or modification of machines or equipment is performed and whenever new machines or equipment are installed, energy isolating devices shall be designed to accept a lockout device.

After lockout devices have been applied, stored energy or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe whenever possible.

If reaccumulation of stored energy to a hazardous level can take place, verification or isolation shall continue when service or maintenance is being performed until the work is completed.

Prior to servicing or maintaining machines or equipment, employees must verify that energy isolation and de-energization of the machines or equipment have been accomplished.

NOTE: The State of Indiana does not recognize a tagout device as being acceptable in place of a lockout device.

Before removing lockout devices from machines or equipment, authorized employees must take certain precautions:

- Inspect the work area to ensure non-essential items have been removed.
- Check the work area to see that all employees have been safely positioned.
- Before removing lockout devices, notify all affected employees.

Before lockout devices are removed and energy is restored, procedures shall be taken by authorized employees to ensure the following:

- If the employee who applied the lockout device is unavailable, the device may only then be removed under the direction of management.
- Management will verify that an employee who applied the device is not at the facility.
- Management has made all reasonable efforts to contact the employee to inform them that their device has been removed.
- Management will inform the employee the device has been removed before they return to work.

OUTSIDE CONTRACTORS

Management and outside contractors will inform each other of their respective lockout or tagout procedures.

Management will train all affected employees and prohibitions of contractor's energy control procedures.

It is the policy of the City of Columbus to be in compliance with all Federal and State Occupational Safety and Health Regulations and/or Standards. It is a requirement for any person, company, or corporation doing business with the City of Columbus to be in compliance with the appropriate OSHA and IOSHA Regulations and/or Standards. Any person, company, or corporation not in compliance shall hold the City harmless from any and all injuries, illness, and deaths arising out of the non-compliance with the OSHA and IOSHA Regulations and/or Standards and such non-compliance shall be considered in material breach of any contractual agreement with the City of Columbus.

GROUP LOCKOUT/TAGOUT

When servicing or performing maintenance of machinery and/or equipment is performed by more than one employee, each employee shall attach their own lockout device so that each employee has an equal level of protection.

Group requirements shall include but are not limited to the following:

- Primary responsibility shall be vested in one authorized employee for a number of employees under a group program with one employee having an operations lock.
- The authorized employee must ascertain the exposure of individual group members.
- If more than one group of employees is involved in a job associated assignment, the one authorized employee shall be designated to coordinate the affected workers.
- Each involved employee shall affix a lockout device to the group lockout device when beginning work and remove it when work is completed on the machine or equipment being services or maintained.

When a shift or personnel change occurs, a designated employee shall ensure the continuity of lockout protection.

The designated employee shall provide for the orderly transfer of lockout devices between off-going and oncoming employees to minimize risk employees from stored energy.

EXCLUSIONS

The following are exclusions to this program:

- Normal production operations including repetitive, routine minor adjustments and maintenance which would be covered under OSHA's machine guarding standards.
- Work on cord and plug connected electric equipment when it is unplugged, and the employee working on the equipment has complete control over the plug.
- Hot tap operations involving gas, steam, water, or petroleum products when the employer shows that continuity of services is essential, shutdown is impractical, and documented procedures are followed to provide proven effective protection for employees.
- Working on energized equipment: Only qualified persons may work on electric circuit parts or equipment that has not been de-energized under procedures of OSHA Standard 1910.333(b). Such persons shall be capable of working safely on energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

This entire program is to be reviewed annually and upgraded where necessary.

Any unauthorized employee who attempts to restart or reenergize machines or equipment which are locked out shall be considered as having committed a major violation. Discipline will be governed by the Personnel Policy for the City of Columbus.

FORMS

(Attached – pages 9 & 10)

HAZARDOUS ENERGY SOURCE LOCATION

Energy Source _____

General Location _____ Number _____

Specific Location (Optional) _____

Type of Energy (Circle One):

Electricity	Pneumatic (Air)	Hydraulic
Mechanical	Springs	Falling (Gravity)
Chemical	Steam	Thermal
Gas	Elevated Machine Members	Water Pressure
Other _____		

Control/Lockout Method _____

Sequence Order _____

_____

_____

_____

_____

_____

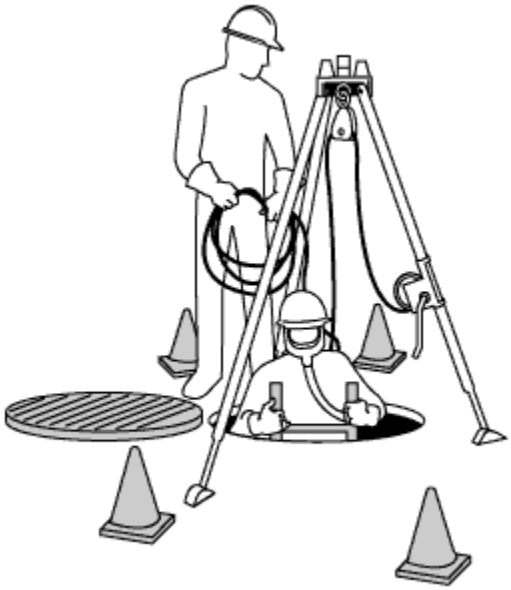
TRAINING SIGN OFF SHEETS

DATE _____ INSTRUCTOR_____

SIGNATURE	PRINTED NAME

Columbus City Utilities

Confined Space Entry Program



Introduction

Every year employees are killed as a result of hazardous conditions in confined spaces. Approximately 60% of these fatalities are would-be rescuers who enter these spaces in an attempt to retrieve the fallen individual(s), only to be overcome and become victims themselves.

As part of routine maintenance activities many employees of the Columbus City Utilities and contractors are required to enter potentially hazardous enclosed spaces. Confined spaces may have atmospheric conditions and/or physical hazards present and include: manholes, wet-wells, vaults, tanks, boilers, silos, bins, pits, sumps, and sanitary and storm sewers. Toxic and/or flammable gases and vapors may accumulate in these locations as a result of insufficient ventilation and deficient oxygen levels may be present as the result of corrosion and/or organic debris digestion. In addition, limited access to these locations complicates the retrieval of anyone incapacitated.

In accordance with the OSHA standard the regulations listed below provide minimum requirements for safe entry into these locations:

Electrical Transmission and Distribution – 29 CFR 1910.269
Permit-required Confined Spaces – 29 CFR 1910.146
Telecommunications – 29 CFR 1910.268

This manual contains the procedures and practices for safe entry into locations, used at Columbus City Utilities, falling under the above regulations.

Scope

The provisions of this program pertain to locations required to be entered by an employee(s) that either meet the definition or the description as outlined in the following regulations:

Permit-required Confined Spaces – 29 CFR 1910.146
Non-permit required Confined Spaces

- Electrical Transmission and Distribution - 29 CFR 1910.269 e(1-14) and t(1-8)
- Telecommunications - 29 CFR 1910.268 o(1-5)

Applicability

This program shall apply to all employees of the Columbus City Utilities in all facilities that fall under its responsibilities.

General Requirements

The CCU, in accordance with State and Federal regulations, has implemented this program to ensure safe entry into confined spaces. Before entry all potential hazards must be identified and controlled. A formalized training program has been designed to enable employees to recognize potential hazards and take the appropriate actions to control those hazards. For most work operations in electrical and telecommunication manholes safeguards and controls can be completed without entry into the location and in such cases the permit system is not required. However, if entrance into the enclosed space is required to implement hazard controls then the permit-required confined space program must be used.

Responsibilities

Each utility work group is responsible for reviewing the locations within their respective areas to identify either known or suspect confined space locations.

Supervisors must identify locations and provide a list of employees requiring training. Note: Supervisors are required to attend training in accordance with the regulations pertaining to the locations their employees are required to enter.

- Employees must complete the training as required by their supervisors and to follow the procedures as outlined in the training when entering a confined space. A written exam will be given to provide documentation of training proficiency. They should also assist in identifying potential confined space locations and notify their supervisor if they witness an unsafe entry.
- The Columbus City Fire Department will assume the responsibility of the on-site rescue team and the on-site first-aid responder.

Contractor Requirements

Any work at the Utilities in confined spaces must be conducted in accordance with the regulations specific to that location. Contractors must have a written confined space program that complies with the regulation pertinent to the areas to be entered. All contractors must provide copies of their written program(s) and employee training documentation to the contracting shop/department. Contractors are also responsible to supply all needed equipment to perform safe entry. When a contractor is required to enter or work in proximity to a permit required confined space, the contracting department will furnish a written copy of the hazards identified in that space to the contractor

Definitions

Acceptable Entry Conditions: Means the conditions that must exist in a space to allow entry and to ensure that the employees involved with a confined space entry can safely enter into and work within the space.

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

Authorized Entrant: An employee who is authorized by the employer to enter a confined space.

Confined Space: Is defined as a space that…

- Is large enough and so configured that an employee can bodily enter and perform assigned work; and
- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
- Is not designed for continuous employee occupancy.

Emergency: Any occurrence (including any failure of hazard control or monitoring equipment) or event(s) internal or external to the confined space, which could endanger entrants.

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

Entry: The act by which a person intentionally passes through an opening into a permit required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry Permit: The written or printed document provided by the employer to allow and control entry into a permit space and that contains the information specified in section (f) of the Permit Required Confined Space standard. Refer to forms CS-1 and CS-2 in Appendix 1 of the written program. Form CS-2 is required at the West Lafayette campus only. This form or an equivalent form may be requested by the regional campus' Response Rescue Team (e.g. responding fire department).

- The entry permit:
  - Defines the conditions under which the permit space may be entered.
  - States the reason(s) for entering the space.
  - Lists the anticipated hazards of the entry.
- For entries where the individual authorizing the entry does not assume direct charge of the entry:
  - Lists the eligible attendants, entrants, and the individuals who may be in charge of the entry; and
  - Establishes the length of time for which the permit may remain valid.
  - Establishes special procedures, hot work permits etc. that are required to ensure safe entry and work operations.

Entry Supervisor: The person (such as the employee, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry.

> Note: An entry supervisor may also serve as an attendant or as an entrant, as long as that person is trained and equipped as required by this program for each role he or she fills. Also, the duties of entry supervisor may be passed from one individual to another during the course of an entry operation.

Hazardous Atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is escape unaided from a permit space); injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);
- Airborne combustible dust at a concentration that meets or exceeds its LFL; o Note: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.
- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or permissible exposure limit;

  Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

- Any other atmospheric condition that is immediately dangerous to life or health.

  Note: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Hot Work Permit: The employer's written authorization to perform operations, which could provide a source of ignition, such as riveting, welding, cutting, burning, or heating.

Immediately Dangerous to Life or Health (IDLH): Any condition, which poses an immediate threat of loss of life, may result in irreversible or immediate sever health effects, may result in eye damage, irritation or other conditions which could impair escape from the permit space.

Immediate Severe Health Effects: Any acute clinical sign(s) of a serious, exposure-related reaction manifested within 72 hours after exposure.

Inerting: Means the displacement of the atmosphere in a permit required space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. It is a process of rendering the atmosphere of a permit required space nonflammable, non-explosive, or otherwise chemically non-reactive by such means as displacing or diluting the original atmosphere with steam or a gas that is non-reactive with respect to that space.

NOTE: .This procedure produces an IDLH oxygen-deficient atmosphere.

Isolation: The process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; mis-aligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tag-out of all sources of energy or mechanical linkages.

Non-Permitted Confined Space: A confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or egregious physical harm. A location that is governed by specific regulations may require special procedures to ensure all hazards are controlled before entry (i.e. telecommunications manholes or high voltage manholes).

Oxygen Deficient Atmosphere: An atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen Enriched Atmosphere: An atmosphere containing more than 23.5 percent oxygen by volume.

Permit Required Confined Space (Permit Space): A confined space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- Has an internal configuration such that an entrant could be trapped or asphyxiated by
- inwardly converging walls or by a floor which slopes downward and tapers to a smaller

- cross-section; or
- Contains any other recognized serious safety or health hazard.

Permit Required Confined Space Program: The employer's overall program for controlling, and where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

Permit System: The employer's written procedures for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

Prohibited Condition: Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Rescue Service: The personnel designated to rescue employees from confined spaces (such as Columbus Fire Department)

Retrieval System: The equipment (including a retrieval line, chest or full-body harness, wristlets, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

Testing: The process by which the atmospheric hazards that may confront entrants of a space are identified and evaluated. Testing includes specifying the tests that are to be performed in the space.

> Note: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to and during entry.

II. PERMIT REQUIRED CONFINED SPACE PROGRAM

For confined space locations containing atmospheric or physical hazards, where neither the electrical generation and distribution nor telecommunication regulations apply, the permit – required confined space regulation (29 CFR 1910.146) must be used. The provisions of this regulation require the employer to provide the means, procedures, training, and equipment to mitigate hazards. In addition documentation is required to verify compliance through the use of a written permit. The permit required confined space program has the following components:

- **Location Listings and Hazard Identification:** A list of permit-required confined spaces locations. The listing contains the location information, including a map when possible, and identifies the hazards of each location. The master list will be maintained by Radiological and Environmental Management and updated annually.
- **Employee Training:** the CCU shall provide training to all employees required to enter permit-required confined spaces and electrical and telecommunications manholes. Training must be conducted before the employee can participate in entries.
- **Permit System:** A written permit form provided by the CCU must be completed at the entry location and before entry occurs to identify hazards, hazard controls, verification of availability of emergency rescue team, and listing entry team members. Form must be completed and delivered to the department supervisor at least 24 hours before the entry is to occur. The duration of the permit is a maximum of 24 hours. Completed permits are the responsibility of the initiating department to maintain.
- **Safety Equipment:** Safety equipment for use in permit-required confined space entry or confined space entry shall be approved by the CCU. The CCU will calibrate confined space entry monitors in accordance with manufacture specifications of obtain through rental properly calibrated monitors.
- **Special Hazards:** Special permits may be required (i.e. burn permit) where welding or an open flame is to be used inside a building and also involves permit-confined space entry.

Purpose, Scope, and Policy

This section outlines the practices and procedures to protect The Columbus City Utilities employees and contract employees from the hazards associated with permit required confined space entry, as specified in OSHA's Confined Space Standard 29 CFR 1910.146. This document shall serve as the written program and shall apply to all personnel at Columbus City Utilities facilities and those working on CCU facilities within the public rights of way.

OSHA Requirements

The Supervisor shall:

- Identify confined space(s) encountered by his/her employees, submit a list of the confined spaces identified to REM, and post or distribute the list to affected employees. The list shall include:
    - Location
    - Physical dimensions and construction
    - Reason for employee entry
    - Potential hazards
    - Frequency of entry
- Submit the confined space list to REM within 60 days of the effective date of this program.
- Update the confined space list annually and whenever there are changes affecting work conditions or when new confined spaces are identified.
- Ensure that all associated safety equipment is maintained and routinely inspected.
- Submit a list of affected employees to Safety Director
- Update the list of affected employees whenever there are additions or deletions.
- Attend training for individuals in charge of or authorizing the entry or designating such individuals.
- Assure affected employees receive training as outlined below: o Employees working in proximity to permit required confined spaces shall receive awareness training that shall consists of:
- Understanding what constitutes a confined space
- Identification of potential hazards requiring permit entry procedures o Employees who are required to enter any location defined as a permit entry required confined space shall receive confined space entry training:

- Before there is a change in assigned duties;
- Whenever there is a change in permit space operations that presents a hazard about which an employee has not been previously trained and;
- Whenever the employer has reason to believe that there are deviations from the permit space entry procedure required by this program or that there are inadequacies in the employee's knowledge or use of these procedures. o The procedures and practices necessary for safe permit-required confined space entry, as outlined in the confined space training manual, include:
- Specifying acceptable entry conditions;
- Isolating the permit required space;
- Annually review completed permits.

Responding Fire Departments shall:

- Assume the role of the "In-Plant Rescue Team."
- Ensure that at least one member of each rescue team maintains current certification in basic first aid and cardiopulmonary resuscitation (CPR).
- Inspect and maintain emergency retrieval equipment.
- Conduct rescue team practice at least annually, simulating permit space rescues in which team member remove dummies, mannequins or personnel through representative openings and portals whose size, configuration and accessibility closely approximate those of the permit spaces from which rescues may be required.

General Requirements;

Hazard Identification: Each permit space shall be identified and evaluated, including a determination of the severity of the hazard. The supervisory staff shall report potential permit spaces to REM. REM shall maintain a listing of all permit spaces.
Permit System: A written permit system shall be utilized for entry into permit spaces. REM shall develop the written permit system.
Employee Information: Signs shall be posted where feasible near permit spaces to notify employees what hazards may be present and that only authorized entrants may enter the permit space. Where signage is not feasible, potentially exposed employees shall be trained with regard to the danger of unauthorized entry of permit spaces. REM shall be responsible for arranging signage of permit spaces.
Prevention of Unauthorized Entry: Unauthorized entry into permit spaces shall be prevented. Prevention measures include training, signs, and security measures. All employees in or around confined spaces shall attend confined space awareness training.
Equipment: Including: testing, monitoring, communication and personal protective equipment, shall be provided, maintained, and properly used. REM will specify minimum equipment requirements for each permit space.
Rescue: Rescue procedures and equipment shall be in place prior to entry into a permit space. The use of retrieval equipment shall be required where there exists a potential for an IDLH atmosphere, engulfment, or vertical entries. There must be adequate attachment points outside the confined space for tying-off or otherwise securing retrieval lines for all authorized entrants. Where retrieval lines themselves could constitute an entanglement hazard or otherwise cannot be used, an equivalent method for rescue shall be used.
Protection From External Hazards: Barriers necessary to protect entrants from

Conditions for Permit Entry without a Permit

The alternate procedure below may be used, provided that the following conditions are met:

- All employees involved in the entry (entry supervisor, entrant, and attendant) shall have received the training required by this program.
- The only existing hazard in the permit space is an actual or potential hazardous atmosphere;
- Continuous forced air ventilation is sufficient to maintain a safe atmosphere for entry.
- Monitoring and inspection data is developed showing that the only existing hazard was atmospheric and that forced air ventilation is adequate in removing the hazard, and this information is documented and made available to each entrant; and
- Ventilation and monitoring of the space is adequately conducted without entry. If entry is necessary, all procedures of permit entry must be followed.

For entries performed without a permit, which meet the set conditions above, the following entry procedure shall be used and documented using forms provided by the CCU:

- Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.

- When entrance covers are removed, the opening shall be promptly guarded by a railing, cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space.
- Before an employee enters the space, the internal atmosphere shall be tested with a calibrated direct-reading instrument for the following conditions and in the order given:
    - Oxygen content,
    - Flammable gases and vapors, and
    - Potential toxic air contaminants.
- There may be no hazardous atmosphere within the space whenever any employee is inside.
- 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 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; and
    - The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
- 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.
- If a hazardous atmosphere is detected during entry:
    - Each employee shall leave the space immediately;
    - The space shall be evaluated to determine how the hazardous atmosphere developed; and;
    - Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.
- The authorized entry supervisor shall verify that the space is safe for entry and that the measures required in Reclassification of Permit to Non-permit Space section have been taken. This is accomplished by a written certification containing the date, the location of the space, and the signature of the person providing the certification. The certification shall be made available to each employee entering the space.

Conditions for Space Reclassification - Non-Permit to Permit Space: When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, the Safety Director and the Safety committee shall re-evaluate the space and, if necessary, reclassify it as a permit required confined space.

Conditions for Space Reclassification - Permit to Non-Permit: A space classified, as a permit required confined space might be reclassified as a non-permit confined space under the following procedure:

- If the permit space possesses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.
- If it is necessary to enter the permit space to eliminate the hazards, such entry shall be performed under the permit entry system of this program. If testing and inspection during that entry demonstrate that the hazards within the permit space are eliminated the space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated.
- The maintenance work area is responsible for documenting that all hazards in a permit space have been eliminated using through a certification that contains the date, location of the space, and the signature of the person making the determination. The certification shall be available to each employee entering the space.
- If hazards arise within a permit space that has been declassified to a non-permit space, each employee in the space shall exit the space. REM shall then reevaluate the space and determine whether it must be reclassified as a permit space, in accordance with other applicable provisions of this program.

Duty to other Employers (Contractors) - When the Columbus City Utilities arranges to have employees of another employer (Contractor) perform work that involves permit space entry, the supervising department shall:

- Inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this program.
- Apprise the contractor of the elements, including the hazards identified and the CCU's experience with the space that make the space in question a permit space.
- Apprise the contractor of any precautions or procedures the CCU has implemented for the protection of employees in or near permit spaces where contractor personnel will be working.
- Coordinate entry operations with the contractor, when both CCU personnel and contractor will be working in or near permit spaces. When employees of more than one employer are working simultaneously as authorized

entrants in a permit space, the entry operations of one employer shall not endanger the employees of any other employer.

- Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations and complete Form CS-4 and return to REM.

Contractor Requirements In addition to complying with the permit space requirements that apply to all employers, each contractor who is retained to perform permit space entry operations shall:

- Obtain any available information regarding permit space hazards and entry operations from the supervising department.
- Coordinate entry operations with the supervising department when both CCU personnel and contractor personnel will be working in or near permit spaces, as required by this program.
- Inform the supervising department of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing (see Form CS-4) or during the entry.
- Coordinate emergency rescue availability using Form CS-2.

The Permit Confined Space Entry Program Shall Consists of:

Implementation of the necessary measures to prevent unauthorized entry.

- Identification and Evaluation of the hazards of permit spaces before entry.
- Following means, procedures, and practices necessary for safe permit space entry as outlined in the confined space training manual including any:
  - *Specifying acceptable entry conditions.*
  - *Isolation of the permit space.*
  - *Purging, inerting, flushing, or ventilating the permit space as to eliminate or control atmospheric hazards.*
  - *Provision for pedestrian, vehicle or other barriers as necessary to protect entrant from external hazards.*
- *V*erification that conditions in the permit space is acceptable for entry throughout the duration of an authorized entry.

Evaluate permit space conditions as follows when entry operations are conducted:

- Conditions shall be tested in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin except if isolation of the space is because the space is large or is part of a continuous system (such as a sewer). Pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the areas where authorized entrants are working.
- Test or monitor the permit space as necessary to determine if acceptable entry conditions are being maintained during the course of entry operations.
- When testing for atmospheric hazards, test first for oxygen, then for combustible gases and vapors, and then for toxic gases or vapors. NOTE: Atmospheric testing for sewer entry: Minimum tests are oxygen deficiency, lower explosive limit and hydrogen sulfide concentration.
- At least one attendant shall be provided outside the permit space into which entry is authorized for the duration of entry operations.
- If multiple spaces are to be monitored by a single attendant, include in the permit program the means and procedures to enable the attendant to respond to an emergency affecting one or more of the permit spaces being monitored without distraction from the attendant's responsibilities as outlined under “Duties of Attendant(s)” section of this document.
- Individuals shall be designated on the entry permit who are to have active roles (as, for example, authorized entrants, attendants, entry supervisors, or persons who test or monitor the atmosphere in a permit space) in entry operations, identify the duties of such employees, and provide each with the training specified in the “Training” section.
- Procedures for summoning rescue and emergency services, for rescuing entrants from permit spaces, and/or providing necessary emergency services to rescued employees and for preventing unauthorized personnel from attempting a rescue.
- A system for the preparation, issuance, use, and cancellation of entry permits.
- Procedures to coordinate entry operations when employees of more than one employer are working simultaneously as authorized entrants in a permit space, so that employees of one employer do not endanger the employees of any other employer.
- Procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed.

- Review entry operations when there is reason to believe that the measures taken under the permit space program may not protect employees, and revise the program to correctdeficiencies found to exist before subsequent entries are authorized. NOTE: examples of circumstances requiring the review of the permit required confined space program are any unauthorized entry of permit space, the detection of a permit space hazards not covered by the permit, the detection of a condition prohibited by the permit, the occurrence of an injury or near-miss during entry, a change in the use or configuration of a permit space, and employee complaints about the effectiveness of the program.
- Review the permit required confined space program using the canceled permits and revise the program as necessary to ensure that employees participating in entry operations are protected from permit space hazards.

Permit System

The Entry Permit form, CS-1, shall be completed before authorizing entry into the permit-required confined space. Before the entry begins:

- Hazard determination measures shall be documented by preparing an entry permit as outlined below.
- The entry supervisor, identified on the permit, shall sign the entry permit to authorize entry.

The entry supervisor shall terminate entry and cancel the entry permit when:

- The entry operation covered by the entry permit has been completed; or
- A condition that is not allowed under the entry permit arises in or near the permit space.

The supervising department shall retain each canceled entry permit for at least 1 year to facilitate the review of the permit required confined space program. Any problems encountered during an entry operation shall be noted on the permit so that appropriate revisions to the permit space program can be made.

Entry Permit

The entry permit authorizing entry into a permit space shall identify:

- The permit space to be entered.
- The purpose of the entry.
- The date and duration of the authorized entry permit.
- The name of each authorized entrants within the space.
- The personnel, by name, currently serving as entry supervisor, with a space for the signature or initials of the entry supervisor who originally authorized entry.
- The hazards of the permit space to be entered.
- The measures used to isolate the permit space and to eliminate or control permit space hazards before entry.
- The acceptable entry conditions.
- The results of initial and periodic tests accompanied by the names or initials of the testers and by an indication of when the tests were performed.
- The rescue and emergency services available and the means (such as the equipment to be used and numbers to call) for summoning those services.
- The communication procedures used by authorized entrants and attendants to maintain contact during the entry.
- Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment to be provided.
- Any other information whose inclusion is necessary, given the circumstances of the particular confined space, in order to ensure employee safety.
- Any additional permits, such as for hot work, issued to authorized work in the permit space.

The authorized entry permit shall be made available at the time of entry to all authorized entrants, by posting it at the entry portal or by any other equally effective means; so that the entrants can confirm that pre-entry preparations have been completed.

The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit in accordance with the purpose of the entry.

Training

Confined space awareness training shall be provided for CCU employees not required to enter permit required confined spaces as a part of their job duties, but who work in proximity to these areas. Awareness training shall consist of:

- Understanding what constitutes a confined space.
- Identifying potential hazards requiring permit entry procedures.

Confined space entry training shall be provided for employees required, in the course of completing their job duties, to enter any location defined as a permit entry required confined space. Training shall be provided to each affected employee:

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

The training shall establish employee proficiency in the duties required by this program and shall include new or revised procedures, as necessary, for compliance with this program.

Duties of the Entry Supervisor

- Know the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure;
- Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
- Terminate the entry and cancel the permit as required when: o
    - o The entry operation covered by the entry permit has been completed; or
    - o A condition that is not allowed under the entry permit arises in or near the permit space;
- Verify that rescue services are available and that the means for summoning them are operable.
- Remove unauthorized individuals who enter or who attempt to enter the permit space during entry operations.
- Determine, whenever responsibility for a permit space entry operation is transferred to a different entry supervisor and at intervals dictated by the hazards and operations performed within the space that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

Duties of the Authorized Entrant(s)

- Know the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure.
- Use equipment properly in accordance with training received.
- Communicate with the attendant as necessary to enable the attendant to monitor entrant status and to alert the attendant to the need to evacuate the space as required.
- Alert the attendant whenever: o The entrant recognizes any warning signs or symptoms of exposure to a dangerous situation, or o The entrant detects a prohibited condition.
- Exit from the space as quickly as possible whenever:
    - o An order to evacuate is given by the attendant or the entry supervisor,
    - o The entrant recognizes any warning sign or symptom of exposure to a dangerous situation,
    - o The entrant detects a prohibited condition, or
    - o An evacuation alarm is activated.

Protective Equipment.- Authorized entrant(s) shall:

- Implement non-entry rescue, retrieval systems or methods whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.
- Use a chest or full body harness, with a retrieval line attached at the center of the entrants back near shoulder level, or above the entrant’s head. Wrist-lets may be used in lieu of the chest or full body harness if it can be demonstrated that the use of a chest or full body harness is infeasible or creates a greater hazard and that the use wrist-lets is the safest and most effective alternative.
- Ensure the other end of the retrieval line is attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet deep.
- Be provided with the necessary personal protective equipment.
- Use all personal protective equipment, such as retrieval lines, respirators, or clothing needed for safe entry and exit in accordance with training received.

- Know of the external barriers needed to protect entrants from external hazards and of the proper use of those barriers (e.g., traffic barriers).
- Wear full body harness during all entries requiring portable ventilation.

Self-Rescue -Authorized entrant(s) shall exit the Permit Space when:

- The attendant orders evacuation;
- An automatic monitoring equipment alarm is activated; or
- The authorized entrant(s) perceive they are in danger.

Duties of the Attendant(s)

- Know the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure.
- Be aware of possible behavioral effects of hazardous exposure in authorized entrants.
- Maintain a continuous accurate count of authorized entrants in the permit space and ensure that the means used to identify authorized entrants accurately identifies who is in the permit space.
- Remain outside the permit space during entry operations until relieved by another authorized attendant.
- Communicate with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space.
- Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions: o If the attendant detects a prohibited condition; o If the attendant detects the behavioral effects of hazards exposure in an authorized entrant;
    - If the attendant detects a situation outside the space that could endanger the authorized entrants; or
    - If the attendant cannot effectively and safely perform all the duties required under this section.
- Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.
- Take the following actions when unauthorized persons approach or enter a permit space while entry is underway:
    - Warn unauthorized persons that they must stay away from the permit space;
    - Advise the unauthorized persons that they must exit immediately if they have entered the permit space; and
    - Inform the authorized entrants and entry supervisor if unauthorized persons have entered the permit space.
- Perform non-entry rescue as specified by the rescue procedure.
- Perform no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

Rescue and Emergency Services

- Personnel assigned to a rescue team shall be provided with and trained to make proper use of the personal protective equipment, including respirators, and rescue equipment necessary for making rescues from Permit Spaces.
- The rescue team shall be trained to perform the assigned rescue functions and shall be trained as authorized entrants.
- Rescue teams shall practice making rescues at least once every twelve months by means of simulated rescue operations in which they remove dummies, mannequins, or personnel through representative openings and portals whose size, configuration and accessibility closely approximate those of the spaces from which rescues may be required.
- Each member of each rescue team shall be currently certified in basic first aid and cardiopulmonary resuscitation (CPR) skills. At least one member of the rescue service holding current certification in first aid and CPR shall be available.
- When The Columbus City Utilities arranges to have persons other than CCU employees perform permit space rescue, the CCU shall.
- Inform the rescue service of the hazards they may confront when called on to perform rescue at CCU facilities, and
- Provide the rescue service with access to all permit spaces from which rescue may be necessary so that the rescue service can develop appropriate rescue plan and practice operations.

APPENDIX 1

PERMIT CONFINED SPACE ENTRY FORMS

INSERT HAZARDOUS WORK PERMIT HERE

NON PERMIT REQUIRED SPACE CERTIFICATION