

# **Old Dominion University**

## ***Confined Space Entry Program***

Prepared by:  
Environmental Health & Safety Office  
October 1996

## Table of Contents

<b><u>Section</u></b>	<b><u>Page</u></b>
Responsibilities	i
I. Introduction	1
II. Training	1
III. Training Program Requirements	2
IV. Training Duties of Rescue and Emergency Services	3
V. Contractor Awareness, Duties and Responsibilities	3
VI. Identification of Permit-Required Spaces	4
VII. Entry Related Work Activities	4
Atmospheric Testing	4
Isolation	6
Ventilation	6
Entry Permits	7
Attendants	7
VIII. Permit-Required Confined Space Entry Procedures	7
IX. Terminating Procedures for a Permit-Required Confined Space	10
X. Non-Permit Required Confined Space Entry Procedures	10
XI. Terminating Non-Permit Required Confined Space Entry	11
XII. Rescue Procedures	11
XIII. Recordkeeping	11
XIV. Definitions	12
Training Record	Appendix A
Permit-Required Confined Space Inventory	Appendix B
Confined Space Entry Permit	Appendix C
Entry Debrief	Appendix D

# Responsibilities

## **The Administration will:**

- Support the requirements of this program
- Ensure funding is available for the administration, implementation, operation, and maintenance of this program

## **The Environmental Health and Safety Office will:**

- Oversee this program
- In cooperation with the departments, assist in the identification of confined spaces
- In cooperation with the departments, assist in the evaluation of confined space hazards
- In the event of a disagreement in classifying a confined space, be the final authority in determining which confined spaces will be designated as permit-required confined spaces
- Post danger signs on permit spaces
- Maintain records according to **Section XIII** of this program
- Coordinate and supervise annual training of all employees involved in confined space work
- Oversee and spot check entry conditions and ensure hazards are properly controlled
- Designate entry supervisors and arrange training to certify them
- Coordinate with the Norfolk Fire Department for provision of confined space rescue services
- Ensure testing equipment is calibrated according to the manufacturer's recommended calibration schedule
- Review terminated entry permits and debriefs from permit-required confined space entries.
- Review and update this program as necessary

## **The Department will:**

- Identify, in writing to the EHSO, employees authorized to work in confined spaces
- Ensure all employees involved in confined space work attend initial training and annual refresher training
- Maintain University's and contractor's terminated entry permits for review by the EHSO
- In cooperation with the EHSO, assist in the identification of confined spaces
- In cooperation with the EHSO, assist in the evaluation of confined space hazards
- Notify the EHSO when work is being conducted in a permit-required confined space
- Ensure the proper equipment (PPE, testing, retrieval, etc.) is available for employees working in permit-required confined spaces
- Coordinate with contractors as specified in **Section V**

## **The Entry Supervisor will:**

- Attend initial training and annual refresher training

- Ensure that all entrants and attendants have received training prior to assigning duties in permitted spaces
- Ensure that the appropriate information is included on the entry permit
- Ensure all tests specified by the permit have been conducted
- Ensure that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin
- Terminate entries and cancel the permit when either the entry operations have been completed or a condition that is not allowed under the entry permit arises
- Remove unauthorized entrants
- Verify that rescue services are available and that the means for summoning them are operable
- Ensure that entry operations remain consistent with terms of the entry permit and that acceptable entry condition are maintained whenever there is a transfer of responsibility for a permit-required confined space entry operation
- Calibrate testing equipment prior to entry in a permit-required confined space
- Complete and Entry Debrief Form at the end of each permit-required confined space entry.

**The Attendant will:**

- Attend initial training and annual refresher training
- Continuously maintain an accurate count of entrants in the permit-required confined space
- Ensure that the means used to identify authorized entrants accurately identifies who is in the permit-required confined space
- Remain outside the permit-required confined space during entry operations until relieved by another 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
- Summon rescue and other emergency services as soon as it is determined that the entrant needs assistance to escape from the space
- Warn unauthorized persons to stay away from the permit-required confined space
- Advise unauthorized persons to exit immediately if they have entered the permit-required confined space
- Inform the entrant and entry supervisor if unauthorized persons have entered the permit-required confined space
- Perform non-entry rescues
- Perform no duty that might interfere with their primary duty of monitoring and protecting the entrants

**The Entrant will:**

- Attend initial training and annual refresher training

- Maintain communication with the attendant as necessary during a permit entry
- Alert the attendant when a dangerous or prohibited condition exist
- Evacuate a permit-required confined space when ordered to do so by the entry supervisor or attendant
- Review work procedures, that will take place in a non-permit required confined space, with the entry supervisor before entry
- Properly use assigned PPE

**The Contractor working in a University permit-required confined space will:**

- Request written information from the department regarding permit-required confined space hazards in and about their intended work area and provide the department written acknowledgment of the information provided
- Coordinate entry operations with the department when they are working with University employees in or near permit-required confined spaces
- Inform the department of the provisions of the permit-required confined space program that they will follow
- Inform the department of any hazards that they will confront or create in the permit-required confined space
- Provide the department with a copy of all entry permits the contractor issues

## **I. Introduction**

The principal objective of this program is to implement practices and procedures that will protect employees from hazards that may exist in permit-required confined spaces. This objective is met by:

- The survey, inventory and evaluation of the workplace to determine if any spaces are permit-required confined spaces.
- Posting appropriate signs and providing training to employees so that they recognize and will not enter permit-required confined spaces unless authorized.
- Training employees who will enter permit-required confined spaces.
- Developing written entry practices and procedures, and by establishing atmospheric testing requirements.
- Implementing a permit system to control and monitor entry into permit-required confined spaces.

This program is designed to comply with the Virginia Occupational Safety and Health (VOSH) standard 1910.146. All University employees assigned to work in confined spaces will be affected by this program. The EHSO, in cooperation with University departments, will inventory and evaluate University confined spaces to determine if any of the spaces are permit-required confined spaces.

## **II. Training**

All employees involved in confined space entry work shall be trained and become proficient in the knowledge and skills necessary for the safe performances of their assigned duties. Training will include, but is not limited to: hazard recognition, personal protective equipment (PPE), safety equipment, communications equipment, procedures for calling rescue services, and proper use of rescue equipment. Training shall be performed before the employee is assigned duties in confined spaces. Retraining shall be conducted at least annually and whenever either the Department or the EHSO has reason to believe that there are deviations from the permit-required confined space entry procedures required by this document or that there are inadequacies in the employee's knowledge or use of those procedures. Training will be conducted under the coordination and supervision of the EHSO.

Training records will be maintained by the EHSO and shall include the date(s) of the training

program, the instructor(s) name(s) and signature(s), a description of the material presented, and the names, signatures, social security numbers and departments of the employees who were trained. **Appendix A** contains a copy of a blank training record.

### **III. Training Program Requirements**

All employees involved in entry into confined spaces shall receive appropriate training which shall include, at a minimum:

- The requirements of VOSH standard 1910.146
- The requirements of this program and the conditions that must be met for entry into a confined space.
- The identity of confined spaces and permit-required confined spaces within the boundaries of the University.
- The means of marking and identifying permit-required confined spaces within the boundaries of the University.
- The conditions or work practices that may produce a hazard in a non-permit confined space that may require the space to be reevaluated by the entry supervisor prior to entry.
- Hazard recognition, including information on the mode, signs and symptoms, and consequences of an exposure..
- The use of PPE and non-entry rescue equipment.
- The use of atmosphere testing (monitoring) equipment.
- The use of hazard control measures (e.g., ventilation, isolation).
- Entry procedures and precautions to include:

Maintaining communication with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space;

Alerting the attendant whenever warning signs or symptoms of exposure to a dangerous situation exist, or a prohibited condition exists.

- Requirements to evacuate whenever so ordered by the entry supervisor or attendant, whenever a dangerous or prohibited condition is recognized or an evacuation alarm is activated.
- Emergency and non-entry rescue methods (including hands-on rehearsal of such methods), and procedures for calling rescue services.

**Note:** The entry supervisor shall receive the training detailed above plus any additional training required to evaluate confined space hazards and complete entry permits.

## **IV. Training and Duties of Rescue and Emergency Services**

Rescue services will be provided by the City of Norfolk Fire Department. Rescue workers shall, through their own organization, receive appropriate training in confined space rescue. Rescue workers will be invited to attend our training and review our confined space entry program.

## **V. Contractor Awareness, Duties and Responsibilities**

When a department arranges to have employees of another employer perform work that involves permit-required confined space entry, the department shall:

- Inform the contractor in writing that the workplace contains permit-required confined spaces and that permit-required confined space entry is allowed only through compliance with a permit-required confined space program meeting the requirements set forth by VOSH.
- Inform the contractor in writing of the elements, including the hazard(s) identified and the University's experience with the space, that qualify the space as permit-required confined space .
- Inform the contractor in writing of any precautions or procedures that the University has implemented for the protection of employees in or near the permit-required confined space where contractor personnel will be working.
- Obtain written acknowledgment from the contractor that he/she has been informed about the items listed above.
- Coordinate entry operations with the contractor when both University personnel and contractor personnel will be working in or near permit-required confined spaces.

- Debrief the contractor's entry personnel at the conclusion of each entry on the permit-required confined space entry program used, any suggestions for improving the program, and any hazards confronted or created during entry. A written record of each debrief shall be maintained and attached to the canceled entry permit. A blank copy of an Entry Debrief Form is located in **Appendix D**.

All records associated with the above section shall be maintained as part of the permanent record with the terminated entry permit(s). The responsibilities of contractors who will perform work requiring permit-required confined space entry are in the "Responsibilities" section of this program.

## **VI. Identification of Permit-required confined spaces**

A survey of the University will be conducted by the EHSO in cooperation with the departments to identify, inventory and assess all potential permit-required confined spaces. The inventory will be maintained and update as needed. It shall include an assessment of the hazard(s) associated with each permit-required confined space. The inventory will be included in **Appendix B** of this written program.

A permit-required confined space which could be inadvertently entered will be labeled as a permit-required confined space. Obvious permit-required confined spaces, such as manhole, or non-permit-required confined spaces will not be labeled. The signs will read as follows:

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

## **VII. Entry Related Work Activities**

### **Atmospheric Testing**

The atmosphere in all permit-required confined spaces shall be tested for oxygen concentration, combustible gases, and any known or suspected toxic substances (in that order) prior to entry. Properly calibrated testing equipment, such as a multi-gas meter, shall be used. All testing equipment shall be calibrated according to the manufacturer's recommended calibration schedule. Testing equipment shall also be calibrated and field checked by the entry supervisor prior to entering a permit-required confined space. Copies of calibration records will be maintained by the EHSO.

Initial testing will be conducted from outside the space and shall be performed when possible at

various levels within the space, such as at the top, middle and bottom of the space, and around conduits, pipes, or cables, etc. Results of the testing shall be recorded on the entry permit. Testing results which would render a space unacceptable for entry include:

- Oxygen levels less than 19.5% or greater than 23.5%;
- Combustible gas present at greater than 10% of its lower explosive limit (LEL)
- Toxic substance in excess of a VOSH or American Conference of Governmental Industrial Hygienists (ACGIH) limit where exposure could result in death, acute illness, or impairment of ability to self rescue;
- If an airborne combustible dust obscures vision to five feet or less or;
- If any atmospheric condition recognized as immediately dangerous to life or health (IDLH) is present.

If atmospheric conditions are unacceptable, the entry supervisor shall prohibit entry until conditions are brought into acceptable limits by purging, cleaning and/or ventilating the space, or appropriate respiratory equipment is worn. The respiratory protection proposed for the entry must be approved by the EHSO. Re-testing of the space shall be done after purging of the space before entry is allowed.

When conducting atmospheric testing the following conditions must be met:

- Testing shall be repeated at least hourly or more often depending upon the conditions present in or around the space.
- Continuous air monitoring with a testing device capable of measuring multiple gases shall be performed if the potential for a hazardous atmosphere exists.
- Testing must be performed within 15 minutes of entry. Re-tests shall be performed any time the space has been vacated for more than 15 minutes.
- All atmospheric test results must be recorded on the entry permit.

At least one entrant in every entry shall wear a personal gas monitor with audible and visual alarms that can measure at least oxygen, lower explosive limit, carbon monoxide and additional toxic gases if the possibility for their presence exists.

## **Isolation**

Electrical and mechanical sources in a confined space that could be hazardous shall be tagged and locked out at the source by each individual or group prior to entry. Belt and chain drives and mechanical linkages on shaft-driven equipment will be disconnected when possible. Mechanical moving parts within a confined space will be secured with latches, chains, chocks, blocks, or other devices. All pumps or lines which convey flammable, injurious, toxic or oxygen displacing gases into a confined space shall be disconnected or shall be effectively isolated to prevent the introduction of a hazard into the space.

## **Ventilation**

Continuous forced mechanical ventilation shall be used in all permit-required confined spaces that contain a known or potential hazardous atmosphere.

- Mechanical ventilation must be used regardless of initial testing results if the potential for development of a hazardous atmosphere exists. The potential for a hazardous atmosphere to develop will be determined by the entry supervisor in consultation with the EHSO.
- If a hazardous atmosphere is detected, employees shall not enter the space until the hazardous atmosphere has been eliminated by continuous forced air ventilation.
- The forced air shall be directed to the immediate vicinity where an employee is or will be within the space. Ventilation shall continue until all entrants have left the space. If mechanical ventilation should fail during entry operations, all entrants shall immediately evacuate the space until ventilation is restored, and re-testing indicates acceptable entry conditions.
- Make-up air shall be verified to be clean by the entry supervisor prior to use.
- The ventilation method and equipment selected will depend on the size and configuration of the confined space and its opening, the gases exhausted, and the source of make-up air. Ventilation systems used in flammable atmospheres shall be explosion-proof and appropriately rated for the hazard.

Local exhaust ventilation shall be used during welding, cutting or other similar operations in confined spaces as necessary to remove harmful air contaminants. The confined space shall be continuously ventilated if a toxic solvent is used in the space. Oxygen shall not be used to ventilate a confined space.

## **Entry Permits**

A fully completed entry permit will be prepared by the entry supervisor prior to entry into the permit-required confined space. A blank copy of an entry permit is located in **Appendix C**. An entry permit shall only be good for the length of time necessary to perform the work/task

specified on the original permit. Any change in the work task shall require a new entry permit to be issued. The permit shall be updated and extended at the beginning of each subsequent shift only if entry conditions are still acceptable. The entry supervisor shall terminate the entry if a potentially hazardous situation occurs which exceeds the conditions authorized on the permit. The original entry permit shall be kept at the work site and shall be posted in a conspicuous location outside the entrance to the permit-required confined space. A copy of the entry permit shall be filed with the EHSO prior to making the entry. Hot work will be authorized on a separate permit and attached and noted on the entry permit. After the entry has been completed the permit will be canceled by the entry supervisor. The canceled permit shall be kept by the entry supervisor and a copy of the canceled permit shall be forwarded to the EHSO.

### **Attendants**

An attendant shall be assigned to remain outside the permit-required confined space at all times during entry operations. The attendant shall remain in constant communication with the entrants. The attendants shall be equipped with a communications radio and know who to contact in an emergency. The attendant will not enter the confined space for rescue purposes or for any other reason until properly relieved by another qualified attendant.

## **VIII. Permit-Required Confined Space Entry Procedures**

- The EHSO shall be notified prior to the conduct of permit-required confined space work.
- Only properly trained and authorized employees will be allowed to enter a permit-required confined space.
- Implement the measures necessary to prevent unauthorized entry.
- Testing equipment used in this procedure shall be calibrated accordingly and field-checked immediately prior to use.
- Establish a communication system between the attendant and the entrant.
- To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an entrant enters a permit-required confined space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.
- Identify and evaluate the hazards of the permit-required confined space before entry.
- Isolate the permit-required confined space to the extent possible.

- Purge or ventilate the permit-required confined space as necessary to eliminate or control atmospheric hazards.
- Verify that conditions in the permit-required confined space are acceptable for entry.
- All electrical equipment introduced into a confined space shall be appropriate for the hazard and meet the requirements of the National Electrical Code if a hazardous atmosphere is present.
- Cylinders of compressed gases shall never be taken into a confined space and shall be turned off at the cylinder valve when not in use. When the confined space is to be left unattended, the torch and hoses shall be removed from the confined space. Fuel gas and oxygen hoses shall be immediately removed from the confined space when they are disconnected from the torch or other gas consuming device.

**Note:** Exempt from this rule are cylinders that are part of a self-contained breathing apparatus or resuscitation equipment.

- Verify communication link and availability of rescue service.
- The entry supervisor shall complete the entry permit.

While a permit-required confined space is occupied, the following requirements must be satisfied:

- At least one entrant shall wear a personal gas monitor with audible and visual alarms that can measure oxygen, lower explosive limits, carbon monoxide, and toxic gases if the possibility of their presence exists.
- All safety rules and procedures will be followed. Metal ladders will not be used when working around electrical equipment. There will be no smoking in a confined space. Any use of chemicals, welding, soldering or cutting must be pre-approved by the EHSO. Adequate lighting will be provided.
- Isolate the permit-required confined space to the extent possible. If isolation of the permit-required confined space is not feasible because the space is large or part of a continuous system, entry condition shall be continuously monitored in the areas where authorized entrants are working.
- Test or monitor the space as necessary to determine if acceptable entry conditions are being

maintained during the course of the entry operations.

- An attendant is required at all times immediately outside the permit-required confined space. The attendant shall maintain an accurate account of the entrants and shall maintain communication with them.
- The entrants shall evacuate the space if ordered to do so by the entry supervisor or attendant, or if an evacuation alarm is activated, or if they recognize warning signs or symptoms of exposure to a dangerous situation.

If the permit-required confined space must be evacuated, the entry supervisor shall:

Order the entrants to exit the space.

Cancel the entry permit.

Retain the canceled permit.

Correct the unacceptable condition, if re-entry is planned.

Verify the conditions in the permit-required confined space are acceptable, if re-entry is planned.

Issue a new entry permit before allowing re-entry.

## **IX. Terminating Procedures for a Permit-Required Confined Space**

Upon the completion of the purpose of entry, noted on the permit, the entry supervisor shall terminate entry, cancel the entry permit, and close/secure the confined space to prevent unauthorized entry. A copy of the canceled permit shall be maintained by the Department to facilitate the annual review of the confined space program by the EHSO. Immediately after the entry, the Entry Supervisor shall review the entry with the entrants and attendants, and shall complete an Entry Debrief Form, which is located in **Appendix D**. Any problems encountered during the entry operation shall be noted on the Entry Debrief Form to facilitate revisions to the confined space entry program.

## **X. Non-Permit Required Confined Space Entry Procedures**

The EHSO shall be notified prior to the conduct of work in a confined space.

Before entry is authorized into a non-permit confined space, all of the following requirements must be verified and recorded on the entry permit:

The space must qualify as a confined space.

The space must exhibit acceptable entry conditions.

The space must be isolated as defined in this program.

The space must be free of any hazardous atmosphere.

The space must be protected against engulfment as defined in this program.

The space must not exhibit any IDLH condition.

- The entry supervisor shall verify that the above requirements have been satisfied and recorded on the entry permit. The entry supervisor may then sign the entry permit to approve entry.

**Note:** The permit used for non-permit-required confined space entry serves only to verify that the space entered is not a permit-required confined space.

- When there are changes in the use of a non-permit-required confined space that may increase the hazards, the space shall be reevaluated and classified as a permit-required confined space if necessary.

## **XI. Terminating Non-permit Confined Space Entry**

Upon completion of the purpose of entry, noted on the confined space entry permit, the entry supervisor shall terminate entry, cancel the entry permit, and close/ secure the confined space to prevent unauthorized entry. The canceled permit for non-permit confined space entry need not be retained for review.

## **XII. Rescue Procedures**

If it is necessary to rescue entrants from a permit-required confined space, the attendant will immediately notify the University dispatcher by dialing 683-4000 that a permit-required confined space emergency has occurred. The dispatcher will notify the Norfolk Fire Department and the EHSO. After notifying the dispatcher, the attendant will attempt to retrieve the worker using the retrieval line. Under no circumstances shall the attendant enter the confined space until help has arrived, and then only with the proper rescue equipment. The fire chief will coordinate the rescue efforts.

## **XIII. Recordkeeping**

The following records shall be kept by the EHSO for the periods of time specified:

- Canceled entry permits shall be retained for one (1) year
- Canceled entry permits with records of atmospheric testing showing other than normal test results are considered records of employee exposure and as such shall be retained for thirty (30) years.
- Training records shall be retained for thirty (30) years.
- Reviews of the confined space program shall be retained for one (1) year.

## **XIV. Definitions**

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

**Attendant** means an individual stationed immediately outside one or more permit-required confined spaces who monitors the authorized entrants and who performs all attendant's duties assigned in this program.

**Authorized entrant** means an employee who is authorized by the Environmental Health and Safety Office to enter a permit-required confined space.

**Combustible dust** means solid particles that if in sufficient concentration will ignite and burn rapidly.

**Confined space** means a space that meets the following criteria:

- 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; and
- Is not designed for continuous employee occupancy

Examples of confined spaces include boilers, storage tanks, sewer manhole, electrical manholes, crawl spaces, ventilation and exhaust ducts, pits, vats, vessels, vaults, pump or lift stations, septic tanks, pipelines, tunnels, elevator pits, trenches and excavations.

**Control measures** means a system or device used, or action taken, to control or prevent the introduction of physical or chemical hazards into a confined space. Control measures include:

**Blanking or blinding** means the absolute closure of a pipe, line or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line or duct with no leakage beyond the plate.

**Double block and bleed** means the closure of a line, duct or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

**Inerting** means the displacement of the atmosphere in a permit-required confined space by a

noncombustible gas to such an extent that the resulting atmosphere is noncombustible. Note: inerting creates an oxygen deficient atmosphere.

**Isolation** means the process by which a permit-required confined 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, misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

**Line breaking** means the intentional opening of a pipe, line or duct that is or has been carrying flammable, corrosive or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

**Lockout / tagout** means placing locks or tags on the energy isolating device to prevent the unauthorized re-energizing of the device or circuit while work is being performed by personnel.

**Zero mechanical state** means that the mechanical potential energy of all portions of the machine or equipment is set so that the opening of the pipe(s), tube(s), hose(s) or actuation of any valve, lever, or button will not produce a movement which could cause injury.

**Department** means any University or Research Foundation department that performs work in a confined space or permit-required confined space.

**Dispatcher** means the University dispatcher who is located in the Public Safety Building and who may be reached by dialing 683-4000.

**Emergency** means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit-required confined space that could endanger entrants.

**Employee** means any person hired by the University or Research Foundation as full or part-time personnel, including administrators, faculty, staff, students and work study students.

**Engulfment** means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid 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.

**Entrant** means any employee who enters a confined space.

**Entry** means the action by which a person 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** (permit) means the written or printed document that is provided by the company to allow and control entry into a permit-required confined space.

**Entry Supervisor** means an employee from the Environmental Health and Safety Office (EHSO), or their designate, responsible for determining if acceptable entry conditions are present at a permit-required confined space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as necessary.

**Note:** An entry supervisor may also be an employee from a department other than the EHSO who has received advanced training, and authorization from the EHSO to be an entry supervisor. An entry supervisor may act as an authorized entrant, as long as that person is trained for such 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.

**Ground-fault circuit-interrupter** is a device designed to disconnect an electric circuit when it seeks ground through a person or grounded object, thus preventing electric shock and fires.

**Hazardous Atmosphere** means 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-required confined space), injury or acute illness from one or more of the following causes:

- An oxygen deficient atmosphere containing less than 19.5% oxygen by volume or an oxygen enriched atmosphere containing more than 23.5% oxygen by volume.
- A flammable gas, vapor, or mist in excess of 10% of its lower flammable limit (LFL) or lower explosive limit (LEL). A hazardous atmosphere of airborne combustible dust.
- Having a concentration of any toxic substance above the VOSH permissible exposure limit (PEL) or the ACGIH threshold limit value (TLV)
- Any other atmospheric condition that is immediately dangerous to life or health.

**Hot work permit** (welding and flame permit) means the University's written authorization to perform operations (for example, riveting, welding, cutting, burning and heating) capable of providing a source of ignition.

**Immediately Dangerous to Life or Health (IDLH)** means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit-required confined space.

**Non-permit confined space** means 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 serious physical harm.

**Permit-required confined space** means a confined space that:

- Has limited or restricted means of exit and contains or has the potential to contain a hazardous atmosphere or a potential for engulfment, and is not intended for continuous employee occupancy; and/or
- 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 small cross section, or contains any other recognized serious safety and health hazard.

**Purge** means to clear a substance from the object that it is contained in; for example purging an explosive atmosphere from a tank so that work can be performed safely in the tank.

**Qualified person** means an entry supervisor who is trained to recognize and evaluate the anticipated hazard(s) of the confined space and who shall be capable of specifying necessary control measures to assure worker safety.

**Rescue team** means those persons designated by the EHSO prior to any permit-required confined space entry to perform rescues from confined spaces.

**Retrieval System** means the equipment used for non-entry rescue of persons from permit-required confined spaces, and includes retrieval lines, chest or full body harness, and a lifting device or anchor. A retrieval line is primarily used in vertical confined spaces, and shall not be used in confined spaces consisting of horizontal tunnels or spaces where obstructions could increase the hazard to the entrant during emergency non-entry removal.

**Testing** means the process by which the hazards that may confront entrants to a permit-required confined space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit-required confined space.

**University** means Old Dominion University and its Research Foundation.

**VOSH** means Virginia Occupational Safety and Health which is the state-run occupational safety and health program operated by the Virginia Department of Labor and Industry.

**Appendix A**  
**Training Record**

# Training Record

Training Topic **Confined Space Entry**

Date of Training \_\_\_\_\_

Name of Trainer(s) \_\_\_\_\_

Qualifications of Trainer(s)

\_\_\_\_\_

Summary of Content

\_\_\_\_\_

\_\_\_\_\_

Name (please print)

Soc. Sec. #

Signature

Department

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Appendix B**  
**Permit-Required Confined Space Inventory**

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

## Old Dominion University Confined Space Entry Permit

1.	Permit Space To Be Entered		
2.	Purpose of Entry		
3.	Date of Entry and Duration of Permit		
4.	Authorized Entrants	_____	_____
		_____	_____
		_____	_____
		_____	_____
5.	Attendant(s)	_____	_____
		_____	_____
6.	Name of Current Entry Supervisor(s)	1. _____	Time _____
		2. _____	Time _____
	Entry Supervisor who Originally Authorized Entry	_____	

7. Possible hazards of the permit space to be entered				<i>Signature or Initials</i>
Hazard	Yes	No	N/A	
A. Lack of oxygen				8. Check or list the measures used to isolate the permit space and to eliminate or control permit space hazards before entry
B. Combustible Gas				
C. Combustible Vapors				
D. Combustible Dusts				A. Purge-Flush and Vent
E. Toxic Gases				
F. Toxic Vapors				B. Ventilation
G. Chemical Contact				
H. Electrical Hazards				C. Lockout/ Tag Out
I. Mechanical Exposure				
J. Temperature				D. Inerting
K. Engulfment				
L. Entrapment				E. Blanking, Blocking, Bleeding
M. Oxygen Enrichment				
N. Others				F. External Barricades
				G. Confined Space Identification

**DO NOT DESTROY THIS PERMIT  
AFTER CANCELLATION THIS ENTRY PERMIT MUST BE RETAINED BY  
THE ENVIRONMENTAL HEALTH & SAFETY OFFICE FOR AT LEAST ONE YEAR**

9. Acceptable Entry Conditions

10. Test(s) To Be Taken	Permissible Entry Levels	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6
A. Percent of Oxygen	19.5% to 23.5%						
B. Lower Explosive Limit	<10%						
C. Carbon Monoxide	<35 ppm						
D. Hydrogen Sulfide	<10 ppm						
E.							
F.							
G.							
H.							
I.							
Name or Initials of Tester							
Test Times							

11. Rescue and Emergency Services Available:

Name ODU Dispatcher Name Norfolk Fire Department (HAZMAT)  
 Telephone 683-4000 Telephone 911

12. Communication procedures to be used by authorized entrants and attendants.

13. Equipment Supplied to the employee

Yes	No	N/A	Equipment	Description
			(i) Gas Test and Monitoring	Name Serial/Unit No. Model/Type
			(ii) Ventilating	
			(iii) Communications	
			(iv) Personal Protective Equipment	Safety Harness With Life Lines Respiratory Head Eye Ear Face Hand Foot Clothing
			(v) Lighting	
			(vi) Barriers/ Shields	Pedestrian Vehicle Other
			(vii) Safe Ingress/Egress	Ladders
			(viii) Rescue and Emergency	Lifelines Hoists Inhalator Resuscitator
			(ix) Other Safety Equipment	

14. Other information for this particular confined space to ensure employee safety.

15. Additional Permits Required. Hot Work Other

**THIS CONFINED SPACE ENTRY PERMIT HAS BEEN CANCELED:**

BY \_\_\_\_\_ AM  
 \_\_\_\_\_ PM \_\_\_\_\_ Date  
 Entry Permit Supervisor Time

**Appendix D**  
**Entry Debrief**

**Old Dominion University  
Confined Space Entry Debrief Form**

The following individuals attended this debriefing:

_____	_____
_____	_____
_____	_____
_____	_____

Did any injuries occur? If yes, briefly explain.....Yes\_\_\_ No\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Did any problems occur? If yes, briefly explain.....Yes\_\_\_ No\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Can procedures be improved? If yes, briefly explain..... Yes\_\_\_ No\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Comments about the entry:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Entry Supervisor: \_\_\_\_\_  
signature date

Environmental Health & Safety Office: \_\_\_\_\_  
signature date