

- 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 | | | | |
| E. Toxic Gases | | | | A. Purge-Flush and Vent |
| 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