



West Virginia University

Environmental Health and Safety



PERMIT-REQUIRED CONFINED SPACE PROGRAM

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WEST VIRGINIA UNIVERSITY
OFFICE of ENVIRONMENTAL HEALTH & SAFETY

TABLE OF CONTENTS

1.0	Scope	2
2.0	Purpose	4
3.0	Definitions and Type of Confined Spaces.....	4
4.0	Roles and Responsibilities.....	9
5.0	Training Requirements	13
6.0	Procedures	14
6.9	Identification and Evaluation of Confined Spaces.....	22
6.10	Contractor and Telecommunications Guidelines for Confined Space Entry.....	25
7.0	Recordkeeping	27
8.0	References	27
9.0	Program Review	27
10.0	Program Revisions.....	27
11.0	Approval of The Confined Space Program.....	28
12.0	Appendices	29
	Appendix A - (Confined Space Entry Permit)	
	Appendix B - (Instructions Confined Space Entry Permit)	
	Appendix C - (Confined Space Reclassification Permit)	
	Appendix D - (Steam Tunnel Entry Permit)	
	Appendix E - (Steam Tunnel Permit Information)	
	Appendix F - (Hot Work Permit)	
	Appendix G - (MSA Multi Gas Detector)	
	Appendix H - (Quick Start Card for MSA Gas Detector)	

1.0 Scope

This program includes all aspects of a permit required confined space entry program as described in 29 CFR 1910.146, including: identification and classification of spaces, monitoring and evaluation, control of hazards, posting of spaces, training of employees, responsibilities and duties, emergency procedures, contractor requirements, and review of program.

1.1 Types of Confined Spaces

1.1.1 Non-Permit Required Confined Spaces

- ❖ A Non-Permit Confined Space contains only secondary hazards which are not anticipated to cause death or injury or other serious physical harm under normal operating conditions. A non-permit confined space does not contain a hazardous atmosphere or have the potential to contain a hazardous atmosphere under normal operating conditions.
- ❖ Conditions inside a non-permit required confined space can change given the activities that are undertaken (i.e. welding, grinding, drilling, cutting or the use of pesticides, paints, chemicals or any other toxic , flammable or combustible substance). In cases where additional hazards are introduced into a confined space or changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants the employer shall reevaluate the space and, if necessary reclassify the space as a **permit required confined space**.

1.1.2 Permit Required Confined Spaces

- ❖ Permit required confined spaces may only be entered by personnel who are appropriately trained and adhere to the requirements noted in this program.

❖ Examples of Permit Required Confined Spaces at West Virginia University may include but are not limited to:

- Sewer Manholes
- Storm Water Manholes
- Feed Bins
- Grain Silos
- Grease Pits
- Air Handling Units
- Elevator Pits
- Electrical Vaults
- Crawl Spaces
- Steam Tunnels (See notes below)

NOTE 1:

The WVU steam distribution tunnel system presents a unique situation in regards to confined space entry procedures and compliance with OSHA's 29 CFR 1910.146. It is difficult to define the entire system as a confined space and it is equally challenging to identify specific areas or passages as confined spaces.

NOTE 2:

Given this set of unique factors as well as the recognized serious safety and health hazards, the steam tunnel systems must be labeled as a Permit-Required Confined Space.

NOTE 3:

As modified, the Steam Tunnel system may be entered using the Steam Tunnel Entry Permit.

2.0 Purpose

- 2.1 The comprehensive Confined Space Program is developed to protect West Virginia University employees and inform contractors who are required to enter permit required confined spaces during the course of their work.
- 2.2 The purpose of the program is to identify and create awareness of the various permit required confined spaces at WVU. A complete understanding of permit required confined space hazard identification, evaluation, and control measures is required for employees who may enter a permit required confined space.
- 2.3 The program is intended to fulfill the requirements of the permit required confined space standard set forth by the Occupational Safety and Health Administration (OSHA) in 29 CFR 1910.146.
- 2.4 The program shall be used in conjunction with other West Virginia University Environmental Health and Safety Programs. Associated safe work practices include but are not limited to, personal protective equipment, the handling of hazardous materials, the isolation of energy sources, and special work permits.

3.0 Definitions and Type of Confined Spaces

- 3.1 **Acceptable entry conditions** – the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.
- 3.2 **Attendant** – the individual stationed outside a permit required confined spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.
- 3.3 **Authorized entrant** – an employee who is authorized by the employer to enter a permit required confined space and is familiar with the hazards associated with the space and methods for controlling and mitigating hazards.
- 3.4 **Blanking or blinding** – 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.

- 3.5 Confined space** – a space that meets all three of the following criteria:
- ❖ It 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 occupancy
- 3.6 Double block and bleed** – 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.
- 3.7 Emergency** – any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.
- 3.8 Engulfment** – the surrounding and effective capture of a person by a liquid or finely divided (flow able) 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.
- 3.9 Entry** – 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.
- 3.10 Entry permit** – the document that is provided by the employer to allow and control entry into a permit space and contains the information necessary for proper entry and documentation.
- 3.11 Entry Supervisor** – Any Supervisor or Lead at WVU may be the entry Supervisor if they have completed confined space training. The WVU Supervisor is 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 terminating entry if necessary.

NOTE:

An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required 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.

3.12 Hazardous atmosphere – an atmosphere that may expose employees to the risk of death, incapacitation, and 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:

3.12.1 Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);

3.12.2 Airborne combustible dust at a concentration that meets or exceeds its LFL;

NOTE:

This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet or less.

3.12.3 Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

NOTE:

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

3.12.4 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 that comply with the Hazard Communication Standard, §1910.1200, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

3.13 Host employer – any employer who arranges to have the employees of another employer (contractor) perform work for them.

3.14 Hot work permit – the employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition. See Appendix C.

3.15 Immediately Dangerous to Life or Health (IDLH) – 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 space.

(Example: Some materials - hydrogen fluoride gas and cadmium vapor, for example - may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possible fatal collapse 12 - 72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health)

3.16 Inerting – the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

NOTE:

This procedure produces an IDLH oxygen-deficient atmosphere.

3.17 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; 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.

3.18 Line breaking – 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.

3.19 Non-permit 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 serious physical harm.

3.20 Oxygen-deficient atmosphere – an atmosphere containing less than 19.5 percent oxygen by volume.

3.21 Oxygen-enriched atmosphere – an atmosphere containing more than 23.5 percent oxygen by volume.

- 3.22 Permit-required confined 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-sections; or
 - ❖ Contains any other recognized serious safety or health hazard.
- 3.23 Permit-required confined space program (Confined Space Entry Program)** WVU's overall program for controlling, and where appropriate, for protecting employees from, permit space hazards, and for regulating employee entry into permit spaces.
- 3.24 Permit system** – the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.
- 3.25 Prohibited condition** – any condition in a permit space that is not allowed by the permit during the period when entry is authorized.
- 3.26 Rescue service** – the personnel or department designated to rescue employees from permit spaces.
- 3.27 Retrieval system** – equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.
- 3.28 Testing** – process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

4.0 Roles and Responsibilities

The Permit Required Confined Space Program roles and responsibilities are identified and delineated below. The duties and responsibilities of the entrants, attendants, supervisors, and other groups at West Virginia University play an important role in supporting the successful implementation and maintenance of this program. The success of the entire Permit Required Confined Space Program relies on the WVU employees adhering to and following this procedure. All employees are charged with providing full support to this Program.

4.1 Environmental Health and Safety

Environmental Health and Safety (EHS) provides expert technical guidance to support safe entry into any confined space

- ❖ Design, develop, implement and maintain a Permit Required Confined Space Program for WVU.
- ❖ Review and audit program elements annually and revise as necessary.
- ❖ Label and identify confined and permit required confined spaces.
- ❖ Provide guidance to West Virginia University Employees concerning any questions that they have concerning the Permit Required Confined Space Program.
- ❖ Provide technical guidance on the selection of personal protective equipment and entry equipment.
- ❖ Update and make changes to the program and inventory as new spaces are classified.
- ❖ Manage and update the information in the confined space inventory database. Ensure appropriate staffs have access to the confined space inventory database.
- ❖ Coordinate the Confined Space training with entrants, attendants, supervisors and others in the individual departments as developed by Safety and Health Extension.
- ❖ Coordinate emergency response training drills as necessary.
- ❖ Provide safety expertise and regulatory guidance.
- ❖ Provide technical expertise and assistance in air monitoring.
- ❖ Maintain entry permits and training records.

4.2 Safety and Health Extension – Facilities Safety and Training

- ❖ Develop curriculum and provide confined space training.
- ❖ Assist in confined space hazard evaluations.
- ❖ Assist in monitoring equipment selection.

4.3 Contractors

Contractors shall comply with OSHA 29 CFR 1910.146 requirements and as outlined in Section 8 of this document. (See Section 8, page 8)

4.4 Individual Departments Heads

- ❖ Implement and maintain this program and provide needed tools for adherence to this program.
- ❖ Ensure employees and contractors know the requirements of CFR 1910.146 and are aware of the requirements of the WVU Permit Required Confined Space Program.
- ❖ Inform contractors of entry requirements if their work will involve entering into a permit required confined space.
- ❖ Assure employee participation in the Permit Required Confined Space Training.
- ❖ Contact Environmental Health and Safety to identify and assess suspected confined spaces.
- ❖ Attend training as necessary.
- ❖ Assure employees on job sites follow program and training requirements.
- ❖ Provide management commitment and operational support for the successful implementation and maintenance of this program.

4.5 Entry Supervisor/Lead

This individual must be a WVU Supervisor or Lead and is 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 terminating entry if necessary.

- ❖ Attend confined space training and follow requirements of the training and confined space program prior to assuming Entry Supervisor duties.
- ❖ Assure that all personnel involved in the work are trained in accordance with 29 CFR 1910.146 as well as other required regulations.
- ❖ Inform Authorized Entrants and Attendants of the potential hazards associated with entering each space.
- ❖ Responsible for ensuring that air monitoring equipment is in proper working order and is maintained and functioning according to the manufacture's specifications.
- ❖ Verify all tests specified by the permit are conducted and all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.
- ❖ Assure that the confined space entry permit is properly completed and that all other requirements are met.
- ❖ Assure that entry permit is posted at the confined space and made available to all persons involved in the confined space entry.

- ❖ Coordinate confined space entry operations with contractor if work involves WVU and contractor employees in the same confined space.
- ❖ Determine and provide all necessary safety equipment.
- ❖ Check that the entry operations are consistent with those outlined in the confined space plan.
- ❖ Authorize the termination of the entry and cancel the permit as necessary.
- ❖ Ensure the means for summoning the Rescue Service is available and functioning.
- ❖ Complete permit required confined space entry permit form.
- ❖ Submit entry permit within five working days once entry activity is complete to:

Environmental Health and Safety
 PO Box 6551
 Morgantown, WV 26506
 or
 Fax: 304-293-7257

4.6 Authorized Entrant

An employee who is authorized by the employer to enter a permit required confined space.

- ❖ Attend confined space training prior to assuming Authorized Entrant duties.
- ❖ Check the confined space inventory to determine the classification, potential hazards, and entry requirements for that space prior to starting the work.
- ❖ Understand all the hazards associated with working in the identified space.
- ❖ Know of the signs and symptoms of exposure.
- ❖ Wear and utilize the proper safety equipment to include personal protective equipment (PPE) as required by the task.
- ❖ Maintain constant communication with the Attendant.
- ❖ Assure that appropriate methods of hazard control are practiced; including lock-out-tag-out, hot work permits, and ventilating a hazardous atmosphere.
- ❖ Exit the confined space whenever:
 - An order to evacuate is given by the attendant or the entry supervisor.
 - The entrant recognizes any warning signs or symptoms of exposure to a dangerous situation.
 - The entrant detects a prohibited condition.
 - An evacuation alarm is activated.

4.7 Attendant

The individual stationed outside a required confined space who monitors the authorized entrants and who performs all attendants' duties assigned in the employer's permit space program.

- ❖ Attend confined space training prior to assuming Attendant duties.
- ❖ Determine from the confined space inventory database if the space is a permit required confined space.
- ❖ Know the hazards that may be faced during entry, including information on the mode, signs, or symptoms, and consequences of exposure.
- ❖ Know the behavioral effects of hazard exposure in authorized entrants.
- ❖ Track and communicate with authorized entrants at all times.
- ❖ Remain outside the permit space during operation until relieved by another attendant.
- ❖ Continually monitor hazards both inside and outside the space to determine if it is safe for authorized entrants to remain in the space.
- ❖ Test the atmosphere with a four gas meter and ensure that the required conditions are met, prior to entering the space.
- ❖ Keep unauthorized persons from entering the space.
- ❖ Re-test the space prior to allowing re-entry under the following circumstances:
 - ❖ The space is temporarily closed.
 - ❖ After breaks or any other times when the space has been unoccupied.
 - ❖ Maintain communication with the entrants in the event problems arise.
 - ❖ Order the entrant to exit immediately if a prohibited condition exists.
 - ❖ Perform non-entry rescue *only*.
- ❖ Determine if entrant requires assistance to escape the permit space and, if necessary, summon rescue services (911). Performs no duties that might interfere with the attendant's primary duty to monitor and protect authorized entrants.

5.0 Training Requirements

All employees involved with permit-required confined space work must be trained to assure the knowledge, understanding, and skills necessary for the safe performance of their duties and attend the General Awareness, Permit Required Confined Space and Instrumentation classes. These courses describe the necessary measures and precautions that must be taken when working around a confined space and permit required confined space.

5.1 GENERAL AWARENESS

- ❖ Definition of a confined space
- ❖ Definition of a permit-required confined space
- ❖ History of the OSHA standard
- ❖ Overview of the regulation
- ❖ Responsibilities of bystanders

5.2 PERMIT-REQUIRED CONFINED SPACE

- ❖ OSHA's Permit-required confined space standard
- ❖ West Virginia University's confined space standard
- ❖ Hazard recognition and control
- ❖ Communications
- ❖ Personal Protective Equipment
- ❖ Atmospheric monitoring
- ❖ Safe work practices
- ❖ Work planning and supervision
- ❖ Duties of an entrant
- ❖ Duties of an attendant
- ❖ Duties of the supervisor
- ❖ The confined space permit
- ❖ Emergency procedures
- ❖ Confined Space rescue

5.3 INSTRUMENTATION

- ❖ OSHA's Permit-required confined space standard
- ❖ West Virginia University's confined space policy
- ❖ Calibration of air monitoring
- ❖ Reading an Air Monitor display
- ❖ Proper usage of the Air Monitor
- ❖ Limitations of the Air Monitor
- ❖ Charging the Air Monitor
- ❖ Personnel that are to operate the confined space Multi gas meter are to attend the Confined Space Instrumentation class.

5.4 Employee training records will be maintained by Environmental Health and Safety with training modified and provided as directed below.

- ❖ Before the employee is assigned any confined space entry duties.
- ❖ Before a change in assigned confined space entry duties.
- ❖ Whenever there is a modification to the confined space entry procedures, duties.
- ❖ A review that points to confined space entry inadequacies, all affected employees will be informed of any changes.
- ❖ Whenever the employer believes that an employee displays inadequacies of knowledge or the use of procedures.

For training coordination, contact Environmental Health and Safety Training Specialist at 293-3792.

6.0 Procedures

6.1 Confined Space Entry Permit

- ❖ **The Entry permit** is the written or printed document provided by WVU to allow and control entry into a permit required confined space.
- ❖ The completed permit shall be made available at the time of entry to all authorized entrants.
- ❖ Methods to meet the intent of the OSHA standard for entry permit must adhere to the confined space program and 1910.146.
- ❖ Additional information will be posted at the confined space to provide warnings and instructions for the use of the Permit Tag. (Entry Log)

6.2 Entry/Operating Procedures

6.2.1 Permit Required Confined Spaces

- ❖ Identify need to enter permit required confined space.
- ❖ Complete Confined Space Entry Permit (see Appendix A)
- ❖ Provide appropriate equipment
- ❖ Establish communication systems
- ❖ Authorized attendant shall remain outside permit space.
- ❖ Post completed Confined Space Permit or Tag at site.
- ❖ Identify hazards on the Confined Space permit and methods that are to be used to control the hazards. Communicate this information to entry personnel and contractor.
- ❖ Identify appropriately trained entry attendant and personnel to enter the confined space

6.2.2 Confined Space Entry Permit includes:

- ❖ Identification of the space.
- ❖ Purpose of entry.
- ❖ Date.
- ❖ Length of the permit.
- ❖ Names and signatures of authorized entrants and the attendant
- ❖ Name and signature of supervisor who authorized the entry.
- ❖ Results of atmospheric monitoring.
- ❖ Acceptable entry conditions.
- ❖ Hazard Elimination and Control.
- ❖ Rescue procedures.
- ❖ Communication procedures.
- ❖ PPE to be used.

6.2.3 New Hazard to Confined Space

- ❖ If a new hazard is introduced during the course of work in the space, the permit must be modified, revalidated, and a new permit completed for entry.
- ❖ The entry permit must be kept at the work site over the course of the entire operation.
- ❖ If the job runs longer than what was previously listed on the permit or beyond that particular shift a new permit is needed.

When the job is completed, the permit must be returned to the supervisor. The Entry Supervisor keeps a copy of the permit and forwards a copy **within five working days** to Environmental Health & Safety.

6.3 Atmospheric Testing/Monitoring

- ❖ Air monitoring must be performed by a trained employee prior to entering any permit required confined space to evaluate potential atmospheric hazards and determine if acceptable entry conditions exist.
- ❖ The atmosphere shall be tested to determine if a hazardous condition or oxygen deficiency or enrichment exists.
- ❖ At minimum oxygen, combustible gases, carbon monoxide and hydrogen sulfide must be monitored.

The atmospheric monitoring will be performed using, at a minimum, a four-gas meter that offers real time sampling results as well as audible and visible alarms to warn the user of dangerous situations. The low and high limits are preset to the levels set forth by OSHA Standards which are:

- ❖ Oxygen content less than 19.5% and greater than 23.5%
- ❖ Combustible gases-Greater than 10% LEL (lower explosive limit)
- ❖ Hydrogen Sulfide-Greater than 10 ppm (parts per million)
- ❖ Carbon Monoxide-Greater than 35 ppm

Note:

If it is thought that sampling is needed for another type of toxic atmosphere contact Environmental Health and Safety prior to entry

6.3.1 Air testing must be done prior to entry and in the following order.

Note: All conditions must be simultaneously met.

- ❖ **Oxygen Content.** Results greater than 19.5% but less than 23.5%.
- ❖ **Flammable/combustible gas content.** Results must indicate less than 10% of the LEL (lower explosive limit).
- ❖ **Toxic gases** such as carbon monoxide and hydrogen sulfide levels. Results should indicate Hydrogen Sulfide concentrations less than 10 ppm (parts per million) and carbon monoxide concentrations less than 35 ppm.
- ❖ If the pre-entry testing shows that there is no hazardous atmosphere or oxygen deficiency/enrichment within the space, and there is no reason to believe that there is a chance for one to develop, and other potential hazardous conditions have been removed or controlled, the space may be entered, and work can begin.
- ❖ Environmental Health and Safety is available to provide technical expertise and assistance in air monitoring if hazardous air conditions may be generated in the space.

6.3.2 Monitoring in a Stratified Atmosphere

- ❖ Atmospheric measurements shall be taken every 4 feet from the **top, middle, bottom every 4 feet in the direction of travel and to each side** following the procedures set forth in OSHA 1910 146, Appendix B.
- ❖ Different gasses accumulate at different levels in a given space. For example, methane is lighter than air and will usually be found higher; at the top of a space. Likewise, hydrogen sulfide is heavier than air and will tend to collect on the bottom portion of a space.

6.3.3 Continuous Air Monitoring

Air quality inside the permit confined space must be continuously monitored due to the potential for changing atmospheric conditions. These results are to be recorded on the entry permit. To meet this requirement a four-gas meter is used to continuously monitor the atmosphere inside the space. The preceding shall be done by using one of the following methods:

- ❖ Place the monitor inside with the worker.
- ❖ Place the monitor inside, set up a remote alarm outside with the attendant.
- ❖ Set up the remote sampling tube with the worker and set up the monitor outside with the attendant.

If unacceptable levels are measured, the space must be vacated immediately. The space must be re-tested and determined that it is safe to re-enter the space.

6.4 Calibrating and Maintaining Air Monitoring Equipment

- ❖ All monitoring equipment must be properly calibrated and maintained in good working condition by the WVU Department or shop that has purchased an air monitoring unit for their use.
- ❖ All calibrations shall be done according to the manufacturer's specifications.
- ❖ Calibration logs for each instrument shall be kept up-to-date and inspected regularly to ensure their accuracy.
- ❖ The MSA Altair 5 shall be returned to its docking station in the "ON" position. The meter shall go through its required calibration cycle.
- ❖ The docking station records all calibration information.
- ❖ A Data Recording card is located on the docking station and can be retrieved and placed in a card reader for computer printout.
- ❖ Calibration logs and information can be printed out on request.
- ❖ Prior to purchasing any monitoring equipment, contact EHS for assistance.

6.5 Hazard Elimination and Control

The Entry Supervisor will identify all potential hazards concerning the permit required confined space. Each hazard will be eliminated or controlled. Hazards may exist in any of the following categories:

6.5.1 Atmospheric Hazards

Forced fresh air ventilation is the first option for correcting an atmospheric hazard. If forced air ventilation is used for other than the control of heat Environmental health & Safety will be contacted. Ventilation of the space for the removal of heat will be done using the following procedure:

- ❖ Place the ventilator outside the space to be entered with the ventilator inlet six to ten feet from the entrance to the confined space.
- ❖ Extend the flexible duct from the ventilator outlet into the area to be ventilated.
- ❖ Position the duct so the end of the duct is suspended approximately two (2) feet above the bottom of the space.
- ❖ Ventilate the space for a period of not less than ten (10) minutes before entry.
- ❖ Continue the ventilation process until the atmosphere is acceptable.
- ❖ Maintain the ventilation process during the entire space entry operation.

NOTE:

A space that is oxygen deficient or contains a flammable or toxic atmosphere “SHALL NOT” be entered by WVU personnel. Environmental Health & Safety (293-3792) shall be contacted for assistance and evaluation of the space.

6.5.2 Ventilation:

- ❖ Force fresh air into space.
- ❖ Make sure source air is fresh.
- ❖ Get air flow to bottom of space.
- ❖ Use continuously

6.5.3 Contents and Residues

Contents should be removed from the space when possible. Entrants must assume that residues may be present and protect themselves from contact with harmful materials.

- ❖ Remove contents.
- ❖ Clean space.
- ❖ Isolate space.
- ❖ Protect personnel from contact with materials.

6.5.4 Potential Energy

Potential energy sources must be secured. Potential energy sources include:

- ❖ Electrical equipment and circuits.
- ❖ Hydraulic equipment and systems.
- ❖ Pneumatic equipment and systems.
- ❖ Mechanical equipment and systems.
- ❖ Gravity operated equipment and systems.
- ❖ Thermal Energy equipment, systems or appurtenances.

The control of hazardous energy and employee exposure to this type of stored energy shall be controlled in accordance with OSHA 1910.147. West Virginia University has established a program and procedures that is designed to prevent the unexpected energizing, start up or release of stored energy to prevent injury to employees.

All WVU employees **shall** adhere to the WVU's adopted program for the control of hazardous energy.

6.5.5 Environment in the Space

Entrants will need to address any safety issues. Examples include:

- ❖ Slippery surfaces.
- ❖ Extreme temperatures.
- ❖ Extreme surface temperatures.

6.5.6 Configuration of the Space

The configuration of the space can make safe operations more difficult. Use particular care when any of the following are present:

- ❖ Unusual shape or slope
- ❖ Low overhead clearance
- ❖ Drop offs in floors
- ❖ Complex layout

6.5.7 External Hazards

- ❖ External hazards such as vehicle traffic, machinery, equipment, and processes may increase the hazards of the confined space entry.
- ❖ External hazards must be secured prior to entering the confined space.

6.6 Confined Space Entry Equipment

The entry equipment that is needed is based on the hazards in the space at the time of entry and the hazards that are created by the work being performed. Maintenance of the entry equipment is the responsibility of the supervisor or their designee. The following is a partial list of equipment maintained by West Virginia University:

- ❖ Rescue Rated Tripods
- ❖ Full body harnesses
- ❖ Mechanical Lifting Devices
- ❖ Ventilation Equipment including blowers and flexible ductwork
- ❖ Intrinsically safe lighting equipment
- ❖ Communication devices
- ❖ Air Monitoring Equipment

6.7 Rescue Procedures

The employer will choose and evaluate a Rescue Team or Rescue Service as indicated in OSHA 1910.146 Appendix F and NFPA 1670. West Virginia University's evaluation of the required Rescue Service will consist of the following;

6.7.1 The initial Evaluation:

- ❖ An examination will conclude that the Rescue Service is adequately trained and equipped to perform permitted space rescues. The employer shall determine if the Rescue Service is so equipped and can perform both horizontal and vertical retrievals.
- ❖ If no trained rescue service is available, **DO NOT** enter the permit required confined space and have the required service contracted out.

6.7.2 The Performance Evaluation:

- ❖ A scheduled performance evaluation, at least annually, shall measure the performance of the Rescue Team during an actual or practice rescue. The annual practice requirement shall be waived in the event the Rescue Service has successfully performed a permit space rescue within that time.
- ❖ West Virginia University, through the office of Environmental Health & Safety shall perform these evaluation evolutions as direct in OSHA 1910.146, Appendix F, Sections A and B. WVU shall determine if the performance of the Rescue Team and it's on-hand equipment is adequate to effect a timely and effective rescue from permitted spaces.
- ❖ The Rescue service shall be able to respond and begin rescue operation within 10-15 minutes of being alerted to a rescue situation. Any time there is a possibility that WVU employees will enter a space that has the potential to contain a IDLH atmosphere, the Morgantown Fire Department will respond and be deployed and ready at the entry site before an entry attempt is made.

- ❖ West Virginia University uses a non-entry rescue procedure for its employees. Any means of rescue shall be done from outside the space by the use of retrieval devices. If rescue operations require entering a space, the professional services of the Morgantown Fire Department are to be used.

6.8 Confined Space Evacuation/Emergency Procedures for Onsite Personnel

In the event of an emergency the following steps shall be performed:

- ❖ Notify the entry supervisor immediately if an evacuation is necessary due to hazardous conditions
- ❖ Contact the Morgantown Fire Department (9-911 campus phone, 911 all other).
- ❖ Provide exact location of emergency and a short description of the situation.
- ❖ Perform a non-entry rescue if possible.
- ❖ Remain at the location.
- ❖ Remain a safe distance away.

6.8.1 Order Entrants to evacuate the space immediately whenever a prohibited condition is determined, or;

- ❖ If the signs and symptoms of exposure or uncontrolled hazards are identified.
- ❖ A situation outside the space that could endanger those inside is observed.
- ❖ If the attendant has to leave the space to perform work duties interfering with the attendant responsibilities.

**NEVER ENTER THE SPACE
THOUGH TEMPTED TO DO SO**

6.8.2 Non-Entry Rescue

- ❖ Used only if the rescue means does not create a greater hazard.
- ❖ Entrants shall use a full body harness with a rescue line attached.
- ❖ Wristlets may be used if the harness is infeasible or creates a greater hazard.
- ❖ The retrieval line must be attached to a mechanical lifting device or a fixed point in such a manner that rescue may begin as soon as the attendant becomes aware of a problem.
- ❖ A retrieval device must be used for vertical entries greater than 5 feet deep.
- ❖ Environmental Health and Safety is responsible for ensuring that the rescue procedures are reviewed as necessary.

6.9 Identification and Evaluation of Confined Spaces

EHS has identified confined spaces on the WVU campus. These spaces are identified as confined spaces and an identification number is assigned to each space. Information concerning a particular space can be located on the EHS Web site under the Confined Space Inventory database.

6.9.1 Steam Tunnels, Crawl Space and Interstitial Spaces

- ❖ A confined space not otherwise classified.
- ❖ Identification of these spaces is difficult to define and normal confined space procedures are impractical and do little to protect the health and safety of employees that must enter for routine maintenance and inspection.
- ❖ Identification, location and entry shall be by other equally effective means of the location and conditions required to work in these spaces (i.e., tagging system, and other methods as mentioned in this document).
- ❖ Employees shall be trained as to the identification, recognition and procedures required to work in these spaces.
- ❖ These spaces have been evaluated by the employer and determined what the best practice for entry procedures are.
- ❖ Spaces classified simply as a Confined Space, do not require the use of an entry permit.

6.9.2 Air Handling Units/Alternative Markings

- ❖ Exposed employee's notified by other equally effective means of the dangers posed by permit spaces. OSHA 1910.146 (c),(2)
- ❖ Additional markings shall inform and direct the employee as to how the space may be entered, lock out/ tag out requirements as well as the danger present.
(See page 14 for examples of these markings.)
- ❖ The **GREEN ENTRY LOG** will be dated and signed by the employee entering the space to indicate the program is being followed and hazards eliminated before entering the space.

DATE	TIME	SIGNATURE

6.9.3 Identification of New Spaces and Re-Evaluation

- ❖ Contact EHS (304-293-3792) whenever a confined space is changed, created, modified and/or permanently changed.

NOTE:

Temporary changes do not require contacting EHS unless there is a question or concern regarding method for entry or permit changes.

6.9.4 Permit Required Confined Space may be reclassified as a Non-Permit Required Confined space under the following procedures.

- ❖ If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space have been eliminated without entry into the space, the space is reclassified as a no-permit required confined space as long as the non-atmospheric and all other hazards remain eliminated.
- ❖ If it is necessary to enter a permit space to eliminate hazards, entry shall be performed as specified in Section 7.2, Entry/Operating Procedures for A. Permit Required Confined Space.
- ❖ If testing and inspection demonstrate that all hazards have been eliminated, the space may be reclassified as a non-permit required confined space for the time period the hazards remain eliminated.
- ❖ The Supervisor shall document that all hazards have been removed and complete the Confined Space Reclassification Permit.
(See Appendix C)
- ❖ If, during entry, hazards arise within a space that has been reclassified as a non-permit required confined space, all employees in the space shall exit immediately. The space is re-evaluated and a determination made on classification.

NOTE:

Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards.

See Section 7.5 for further explanation concerning Hazard Elimination and Control procedures for Atmospheric and Ventilation hazards, contents and residues and potential energy.

6.9.5 Confined Space Marking

(Shown are the examples of markings encountered in the field)



- ❖ Permit required confined spaces will be marked with the **DANGER** label, as shown above, and include an ID tag with a number. This number will be used to research the Confined Space data base to determine entry information and hazards.
- ❖ Non-permit confined spaces are marked by a smaller label that states, *NON-PERMIT REQUIRED CONFINED SPACE* with ID.NO. Introducing hazards to a non-permit confined space may change that space to a permit required space. Contact Environmental Health and Safety if you have questions.

6.9.6 PRT Space Labeling

- ❖ The PRT section has identified their respective spaces and has developed an identification numbering system that includes brass or copper identification tags that are superior in longevity and wear. Staff and employees at the PRT sites are familiar with this numbering and identification system and the various confined spaces located on their property.
- ❖ OSHA 1910.146 (C), (2) states that the employer shall notify exposed employees by posting danger signs or by any other equally effective means, of the existence, danger and location of permit spaces. The current training, confined space inventory and marking system that has been established by the PRT for its employees, provides the intent of current OSHA requirements for the notification of exposed employees.

6.10 Contractor and Telecommunications Guidelines for Confined Space Entry

6.10.1 Contractors, Utility Services, Installation Companies, Fiber Optic and Communication Providers, and any Construction Operations or their agents and Representatives whose work requires entering any Permit-required confined space shall have a Permit-required Confined Space Program that will, at a minimum, meet the following.

- ❖ The WVU department utilizing the services of the contractor is responsible for providing the contractor with documents of the known and potential hazards associated with entering a given space. Contact Environmental Health Safety for permit required space identification.
- ❖ Comply with the requirements of OSHA's Confined Space Standard (29 CFR 1910.146).
- ❖ Contractors may develop their own Permit-required confined space program as long as that program meets all criteria set forth in the current OSHA standard.
- ❖ All confined space entry and program specific efforts shall be coordinated with the WVU Project Engineer/Manager as well as Environmental Health & Safety when entry is to be made by both contractor and WVU employees into a Permit-required confined space.
- ❖ Any Entity or Individual who has not received training on proper Permit-required confined space entry techniques, nor uses a Permit-required confined space program **SHALL NOT** enter any permit required confined space at WVU.

- ❖ Any Entity or Individual entering a Permit-required confined space, identified and marked by West Virginia University, for the purpose of providing service or maintenance of equipment and machinery, shall follow their respective companies program for the control of hazardous energy (Lockout/Tagout) that meets the requirements of 29 CFR 1910.147.
- ❖ Maintain all permits as required by WVU and provide a copy to EHS (Environmental Health and Safety, PO Box 6551, Morgantown, WV 26506-6551 or Fax: 304.293.7257) upon completion of work.
- ❖ Obtain approval before entry into WVU confined spaces by contacting the respective Project Manager, Facilities personnel or Environmental Health and Safety personnel.
- ❖ When a coordinated entry into a confined space is conducted by WVU and a Contractor, each respective organization will provide their individual confined space permits as well as approved entry personnel and equipment

6.10.2 Telecommunications Manholes and Underground Vaults

- ❖ Telecommunications are regulated under Sections 29 CFR 1910.268 (o) for protection to hazards within a manhole or vault.
- ❖ Requirements for entry into telecommunication manholes and unvented cable vaults will be, but not limited to, the following:
 - ❖ A ladder shall be used to enter and exit manholes or vaults exceeding 4 feet in depth.
 - ❖ The space shall be tested for combustible gas and the atmosphere shall be tested for oxygen deficiency.
 - ❖ The space shall be provided with continuous forced ventilation while work is being performed
- ❖ Section 29 CFR 1910.146 applies to confined space telecommunications hazards not covered in 190.268 (o).

7.0 Recordkeeping

7.1 Record Retention

Item	Records Location	Retention Period
Confined Space Permits and Tags	EH&S	1 year
Employee Training Records	EH&S	30 years
Equipment Calibration	EH&S/FM	4 years

8.0 References

- ❖ 11.1 29 CFR 1910.14

9.0 Program Review

9.1 The Confined Space Program is reviewed as necessary by the Environmental Health and Safety. The program coordinator from Environmental Health and Safety will act as the primary facilitator for this review. Findings of this review will be used to update and make changes to the program as needed. The review is scheduled as needed or if one of the following situations arises.

- ❖ Employee or contractor concern.
- ❖ Unauthorized entries.
- ❖ A near miss or injury while entering the space.
- ❖ A change in the configuration of the space.
- ❖ The introduction of a new space.
- ❖ The identification of a condition not covered by the permit.

10.0 Program Revisions

10.1 Explanation for Change

10.2 Changes from last revision

11.0 Approval of The Confined Space Program

The Confined Space Program for West Virginia University is approved for implementation to WVU employee's and affected personnel. This document may change per code or procedure revision.

[signature]

[date]

**John Principe,
Director
Environmental Health and Safety**

12.0 Appendices

- Appendix A – Confined Space Entry Permit
- Appendix B – Instrumentation Confined Space Entry Permit
- Appendix C – Confined Space Reclassification Permit
- Appendix D – Steam Tunnel Entry Permit
- Appendix E – Stem Tunnel Permit Information
- Appendix F – Hot Work Permit
- Appendix G – MSA Multi Gas Detector
- Appendix H – Quick Start Card for MSA Gas Detector

APPENDIX A - Confined Space Entry Permit

CONFINED SPACE ENTRY PERMIT

Work Order:		Date:		Time:	<input type="checkbox"/> AM	<input type="checkbox"/> PM
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Location:				Confined Space #:		
Entry Date:		Beginning Time:	<input type="checkbox"/> AM <input type="checkbox"/> PM	Ending Time:	<input type="checkbox"/> AM <input type="checkbox"/> PM	Valid For: ONE Shift PER DAY ONLY

Reason for Entry:	
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Equipment Taken Into Space:		
Equipment/Tools	Materials	Chemicals

Atmospheric Hazards:	<input type="checkbox"/> Oxygen Deficiency	<input type="checkbox"/> Combustible Gas	<input type="checkbox"/> Toxic Contaminants			
Tests	Acceptable Entry Conditions	Record Reading Results/Time				
		1st	2nd	3rd	4th	5th
Oxygen	19.5 – 23.5%					
Combustible Gas	Below 10% LEL					
Carbon Monoxide	0 – 25 ppm					
Hydrogen Sulfide	0 – 10 PEL					

Physical Hazards:	<input type="checkbox"/> Chemical/Biological	<input type="checkbox"/> Electrical	<input type="checkbox"/> Steam	<input type="checkbox"/> Mechanical
	<input type="checkbox"/> Gravity	<input type="checkbox"/> Hydraulic	<input type="checkbox"/> Noise	<input type="checkbox"/> Heat
	<input type="checkbox"/> Temperature Readings: _____ 1 st _____ 2 nd _____ 3 rd			
Hazard Controls:	<input type="checkbox"/> Lockout/Tagout	<input type="checkbox"/> Personal Protective Equipment	<input type="checkbox"/> Ventilation	
	<input type="checkbox"/> Other (Specify):			

Trained Authorized Personnel	Print (Name and Department)	Signature
Supervisor		
Attendant		
Entrant		
Entrant		
Entrant		

Communication – Personal Protective Equipment – Hot Work Permit	
Communication Methods with Entrants:	<input type="checkbox"/> Voice <input type="checkbox"/> Radio <input type="checkbox"/> Phone <input type="checkbox"/> Visual <input type="checkbox"/> Rope Signals
Communication Methods to Contact Emergency Services:	<input type="checkbox"/> Phone <input type="checkbox"/> Radio <input type="checkbox"/> Other
Personal Protective Equipment:	<input type="checkbox"/> Coveralls <input type="checkbox"/> Tyvek® Suite <input type="checkbox"/> Leather Gloves <input type="checkbox"/> Chemical Resistant Gloves
	<input type="checkbox"/> Welding Gloves <input type="checkbox"/> Welding Hood <input type="checkbox"/> Eye Protection <input type="checkbox"/> Hearing Protection
	<input type="checkbox"/> Hard Hat <input type="checkbox"/> Safety Shoes/Boots <input type="checkbox"/> Respiratory Protection <input type="checkbox"/> Tripod/Winch
	<input type="checkbox"/> Other
Traffic Control:	<input type="checkbox"/> Barricades <input type="checkbox"/> Vests <input type="checkbox"/> Flags <input type="checkbox"/> Signs
Hot Works:	<input type="checkbox"/> Yes (Hot Works Permit Required) <input type="checkbox"/> No

Approvals	
Entry Supervisor (Print):	(Sign):
I assumed the responsibility of Entry Supervisor on:	Date: _____ Time: _____ <input type="checkbox"/> AM <input type="checkbox"/> PM
This Confined Space Entry Permit has been revoked because:	
Comments: (Write any additional comments on back of Permit Form)	

APPENDIX B – Instructions Confined Space Entry Permit

INSTRUCTIONS – CONFINED SPACE ENTRY PERMIT

The Confined Space Entry Permit process shall be completed before any West Virginia University employee enters a space designated as a “Permit Required Confined Space.”

Check the Confined Space Inventory as <https://confinedspace.wvu.edu/search.cfm> to verify that the space that will be entered is listed in the inventory. If it is, use the information found in the inventory listing for identifying the location, type of space, and hazards on the permit. If the information in the inventory is NOT correct or the space is NOT listed, contact Environmental Health and Safety at 293-3792.

- Step #1** When applicable; enter *work order number* and the date and time.
- Step #2** Enter the *location* of the space to be entered and the *Confined Space ID number*.
- Step #3** Enter *date of entry* and *beginning time*. Enter *ending time* at completion of entry activities.
- Step #4** Define *reason* for entry.
- Step #5** List all *equipment* that will be taken into the space for the task to be completed.
- Step #6** Record your *atmospheric hazard* readings including increment readings during entry activity. Record the *time* the reading was taken in the same box as the reading.
- Step #7** Identify and list all *physical hazards* that will be encountered and *hazard controls* to be Used.
- Step #8** Identify and list all *trained authorized personnel*; include printed name and *signature* of each participant.
- Step #9** Identify and list all *required PPE, communication equipment, traffic control and hot work permit* that have been obtained. **NOTE: If a Hot Work Permit is utilized, a copy must be forward to Environmental Health and Safety.**
- Step #10** *Sign approved permit.*

List any *comments* that are applicable to the entry activity on the back of the permit.

POST APPROVED ENTRY PERMIT AT ENTRY SITE

- Step #11** *Forward* completed permit to:

Environmental Health and Safety
Attention: Confined Space Section
975 Rawley Lane
PO Box 6551
Morgantown, WV 26506

APPENDIX C - Confined Space Reclassification Permit

CONFINED SPACE – RECLASSIFICATION PERMIT

APPLICATION #1: If it is necessary to enter the space to eliminate hazards then the Permit-required confined space program shall be followed.

Date:		Time:	<input type="checkbox"/> AM	<input type="checkbox"/> PM
Space ID Number:		Space Location:		

NOTE: IF ANY OF THE FOLLOWING CHECK “YES” A PERMIT IS REQUIRED.

RECLASSIFICATION REQUIREMENTS (check mark appropriate box)		
Hazardous Atmosphere Assessment	YES	NO
Flammable gas, vapor or mist in excess of 10% of its Lower Flammable Limit?		
Airborne combustible dust meets or exceeds its Lower Flammable Limit?		
Oxygen concentration is NOT between 19.5 % and 23.5%?		
Are there any dangerous substance in the atmosphere that are passed the Permissible Exposure Limit (PEL) or dose? (Published in 29 CFR 1910 Subpart G or Z)		
Are there any atmospheric condition/s that are immediately dangerous to life and health?		

RECLASSIFICATION REQUIREMENTS (check all that apply)		
Hazard Assessment - Control of Energy in a Confined Space	YES	NO
Is there any <i>uncontrolled Electrical</i> energy?		
Is there any <i>uncontrolled Thermal</i> energy?		
Is there any <i>uncontrolled Nuclear</i> energy?		
Is there any <i>uncontrolled Mechanical</i> energy?		
Is there any <i>uncontrolled Hydraulic</i> energy?		
Is there any <i>uncontrolled Pneumatic</i> energy?		
Is there any <i>uncontrolled Chemical</i> energy?		
Is there any <i>uncontrolled Gravity</i> energy?		
Is there any OTHER <i>uncontrolled</i> means of energy?		

APPLICATION #2: If testing and inspection during entry demonstrate that the hazards within the space have been eliminated the space may be reclassified as non-permit required as long as the hazards remain eliminated.

Supervisor:

(Print)

(Sign):

THIS RECLASSIFICATION PERMIT WILL BE MADE AVAILABLE TO EACH EMPLOYEE ENTERING THE SPACE OR TO THAT EMPLOYEE’S AUTHORIZED REPRESENTATIVE.

Return completed form to Environmental Health & Safety, PO Box 6551, Morgantown, WV 26506

APPENDIX D – Steam Tunnel Entry Permit

STEAM TUNNEL ENTRY PERMIT

The employee's immediate supervisor shall be notified prior to any entry.

The employees and their supervisor shall discuss the nature and sequence of task(s) to be performed and the types of hazards that may be encountered.

Entrant(s): Carry a four gas personal oxygen monitor, and ensure monitor is operational at all times.

If more than one Entrant is authorized and Entrants are working in separate locations, a four gas oxygen monitor and Attendant is required for each Entrant.

Attendant(s): Have the ability to call **(9-911 WVU Internal Phone or 911 from cell phone or external phone).**

Communication: WVU radios will be placed in the **“TALK”** feature to ensure radio to radio communication during tunnel entry and while any work is being completed.

A copy of the completed Steam tunnel permit shall be forwarded to EH&S for tracking purposes.

Reason for Entry:					
Location:					
Supervisor:					
Potential Hazards					
Temperature Readings:	_____ 1 st	_____ 2 nd	_____ 3 rd		
Entrant(s):					
Attendant: (Shall monitor entry and progress of activities)					
Lighting Provided: (Sufficient Lighting shall be provided and utilized for entry and work)					
Communications Provided: (Viable communications between the attendant and the entrants shall be maintained)					
Date:		Time In:		Time Out:	

APPENDIX E – Steam Tunnel Permit Information

STEAM TUNNEL ENTRY PERMIT INSTRUCTIONS

The West Virginia University Steam Tunnel System presents a unique situation in regards to confined space entry procedures. It is difficult to define the entire system as a confined space and it is equally difficult to identify specific areas or passages as confined spaces. In addition, normal confined space entry procedures are both impractical and do little to protect the health and safety of employees entering the University's Steam tunnel system. However, authorization and procedures must be established for the safety of those employees who must enter these types of spaces.

SCOPE:

University Employees

- This Steam Tunnel Entry Permit must be followed by any WVU employee who will enter the Steam Tunnel System for any purpose.
- WVU employees must follow the elements of the Permit Required Confined Space program if outside hazards are introduced or if existing hazards warrant additional safety precautions.

Outside Entities

- To gain entry approval, outside entities shall contact the appropriate Project Manager or the Facilities Management Plumbing Shop (304-293-8125).
- The entry of any outside entity/contractor shall adhere to or exceed the requirements of the *WVU Steam Tunnel Entry Permit*.
- A Permit Required Confined Space Program is required if outside hazards are introduced or if existing hazards warrant additional safety precautions.

Environmental Health and Safety
PO Box 6551
One Waterfront Place
Morgantown, WV 26506-6551

APPENDIX F – Hot Work Permit

HOT WORK PERMIT

Use following link:

<http://ehs.wvu.edu/r/download/164998>

APPENDIX G – MSA Multi Gas Detector

ALTAIR 5 – Multi Gas Detector



APPENDIX H – Quick Start Card for MSA Gas Detector

ALTAIR[®] Multigas Detector Quick Start Card

Please review the back of this card for a detailed illustration of the following components:

① ▼ Button ② ▲ Button ③ ⏻ Button

- Charge battery as needed (rechargeable units only).
- Turn the instrument ON with the ⏻ button. Instrument performs a self test and will warm up and show info & set points.
- A blocked flow test must be performed before use. See section 4.2 of the manual.
- Fresh Air Setup: press buttons corresponding with 'YES' or 'NO' on the display.
- To page through the screens, use the ▼ button from the Normal Operation screen; follow display instructions and press corresponding buttons to advance to next page.
- To reset alarms press ▲ button.
- Perform a Calibration Check daily for each installed sensor per section 3.8 of the manual.
- To Calibrate: ensure you are in fresh air and press and hold the ▲ button and follow instructions on the screen. See section 3.9 of the manual for complete calibration instructions.
- To activate / deactivate MotionAlert™ feature, page through screens until MotionAlert screen and follow display instructions.
- To activate InstantAlert™, press and hold ▼ button.
- Turn the instrument OFF by holding the ⏻ button.

WARNING

This quick start card provides only a brief description of the operating instructions for the ALTAIR 5 Multigas Detector Alarm. The user of this instrument must be fully aware of the limitations and instructions supplied in the operating instruction manual. Failure to follow the instructions may lead to serious personal injury or death.