



Confined Space Entry Procedure

1. Purpose

- 1.1. To protect personnel when working in confined spaces from toxic, flammable, corrosive, and oxygen deficient atmospheres and to ensure that general operations are in compliance with Occupational Safety Health Administration 29 CFR 1910.146 and all construction operations are in compliance with 29 CFR 1926.1200 regulations.

2. Scope

- 2.1. This policy applies to all University personnel involved in confined space entries at University of Notre Dame.

3. Definitions

- 3.1. **Action Level:** One half ($\frac{1}{2}$) of the lowest established limit such as the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV), OSHA Permissible Exposure Limit (PEL), NIOSH Recommended Exposure Limit (REL) or other recognized limit.
- 3.2. **Attendant:** A trained individual stationed outside a permit-required confined space who monitors the authorized entrants and performs all attendant's duties.
- 3.3. **Authorized Entrant:** Individual who is authorized by the University, has received training and demonstrated competency to enter a confined space.
- 3.4. **Blanking or Blinding:** The absolute closure of a pipeline or duct by the fastening of a solid plate (such as a blind) that completely covers the bore and is capable of withstanding the maximum pressure of the pipeline or duct with no leakage beyond the plate.
- 3.5. **Bump Test:** A test of a portable gas detector performed in order to verify the functionality of sensor(s) and alarms. The test is performed by briefly exposing the instrument to a known concentration of the target gas(es) and verifying that the instrument responds accordingly.
- 3.6. **Competent Person:** An individual who is capable of identifying existing and predictable hazards in surroundings or working conditions which are

unsanitary, hazardous, or dangerous to the employees, and who has the authorization to take prompt corrective measures to eliminate the hazards. This person is responsible for:

- 3.6.1. Determining if acceptable entry conditions are present in a permit-required confined space.
 - 3.6.2. Authorizing entry and issuing the permit when required.
 - 3.6.3. Overseeing confined space entry operations.
 - 3.6.4. Terminating a confined space entry as required by this procedure.
- 3.7. **Confined Space:** A space that meets all of the following criteria:
- 3.7.1. Is large enough and so configured that an employee can bodily enter and perform assigned work.
 - 3.7.2. Has limited or restricted means for entry or exit.
 - 3.7.3. Is not designed for continuous employee occupancy.

Table 1 – Examples of Confined Spaces	
Boilers	Storage bins
Tanks	Vaults
Vessels	Sewers
Ventilation ducts	Tunnels
Silos	Ducts
Hoppers	Pipelines
Pits	Excavations deeper than 4 ft (Cedar Grove Cemetery is exempt)

3.8. **Engulfment:** 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.

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. **Hazardous Atmosphere:** An atmosphere that may expose personnel to the risk of death, incapacitation, impairment of ability to self-rescue, e.g., escape unaided from a permit-required confined space, injury, or acute illness from one or more of the following causes:

- 3.10.1. Flammable gas, vapor, or mist in excess of meter reading of 0% (non-detectable) of its lower explosive limit (LEL).
- 3.10.2. Airborne combustible dust at a concentration that meets or exceeds its LEL.

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

- 3.10.3. Atmospheric oxygen concentration below 19.5% or above 22%.
 - 3.10.4. Atmospheric concentration of any substance exceeding the action level for which a dose or an established exposure limit is published (e.g., ACGIH) and which could result in employee exposure in excess of its action level.
 - 3.10.5. Any other atmospheric condition that is immediately dangerous to life or health.
- 3.11. **Hazardous Energy:** Unexpected energization or startup of the machines or equipment. It can also be a release of stored energy that could harm employees. Examples of hazardous energy are electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other sources in machines and equipment that can be hazardous to personnel.
- 3.12. **Immediately Dangerous to Life or Health (IDLH):** An atmospheric condition that poses an immediate/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 space.
- 3.13. **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.
- 3.14. **Isolation:** 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 and tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

- 3.15. **Lower Explosive Limit (LEL):** The minimum concentration of vapor in air below which propagation of a flame does not occur in the presence of an ignition source
- 3.16. **Non-Permit Confined Space:** A confined space that does not contain or have the potential to contain any hazard capable causing death or serious physical harm.
- 3.17. **Oxygen Deficient Atmosphere:** Atmosphere containing less than 19.5% oxygen by volume.
- 3.18. **Oxygen Enriched Atmosphere:** Atmosphere containing more than 22% oxygen by volume.
- 3.19. **Permit-Required Confined Space:** A confined space that has one or more of the following characteristics:
- 3.19.1. Contains or has a potential to contain a hazardous atmosphere: flammable, toxic, and/or oxygen deficient.
 - 3.19.2. Contains a material that has the potential for engulfing an entrant.
 - 3.19.3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section.
 - 3.19.4. Contains any other recognized serious safety or health hazards.
- 3.20. **Permissible Exposure Limit:** An OSHA regulatory limit for employee's exposure to a chemical or a physical agent.
- 3.21. **Prohibited Condition:** A condition in a permit-required confined space that is not allowed by the permit during the period when entry is authorized, for example, LEL >0%.
- 3.22. **Retrieval System:** Equipment (including a retrieval line, full-body harness, and a lifting device or anchor point) specifically designed to be used for non-entry rescue of persons from the permit-required confined space.
- 3.23. **Testing:** Process by which the hazards that may confront entrants of 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.

- 3.24. **Threshold Limit Value (TLV):** The airborne concentration of a substance below which nearly all workers are believed to be protected while exposed to it day after day for 8 hour periods. This limit is established by the American Conference of Governmental Industrial Hygienists (ACGIH). Contact RMS for guidance on other applicable shorter time weighted values, if necessary, for entry into a confined space entry.
 - 3.25. **Volatile Organic Compound (VOC):** Organic chemicals that have a high vapor pressure at ordinary room temperature.
 - 3.26. **Zero Energy State:** Where all the energy sources (electrical, mechanical, hydraulic, pneumatic, chemical, thermal, kinetic, and any other form of energy) are properly removed or protected by following the Lock, Tag and Try-Zero Energy Procedure (Safe-14).
4. Responsibilities
 - 4.1. All confined space authorized employees are responsible for understanding and adhering to this procedure.
 - 4.2. University supervisors/project managers/principal investigators shall:
 - 4.2.1. Ensure all authorized employees are trained in this procedure prior to performing confined space activities or when refresher training is indicated.
 - 4.2.2. Ensure the competent person is identified. Verify they received Competent Person Training prior to authorizing Confined Space Entry Permits.
 - 4.2.3. Notify NDSP Dispatch at 1-5555 prior to entry into a permit-required confined space.
 - 4.2.4. Contact NDSP dispatch at 1-5555 when canceling the permit or the job task has been completed.
 - 4.2.5. Require all contractors to be properly trained before entering a confined space. Contractors shall submit training records upon request. (Section 6.3).
 - 4.2.6. Identify confined spaces within their area of responsibility and ensure proper signage is maintained.
 - 4.2.7. Maintain a list of all confined spaces and the hazards associated with each space within their area of responsibility.

- 4.2.8. Entry permits and reclassification forms shall be sent to Risk Management & Safety (RMS) within one (1) month of completion. For departments with a high number of permit-required confined space entries, they may work with RMS to identify a process to maintain records locally or electronically.
- 4.3. Competent Person is:
- 4.3.1. Responsible for the overall operation and safety of the confined space entry and for the implementation of the confined space entry requirements contained within this procedure.
 - 4.3.2. Responsible for completing the entry permit before authorizing entry.
 - 4.3.3. Responsible for completing reclassification form, if necessary.
 - 4.3.4. Responsible to identify existing hazards and predicting hazards in the work area. The competent person has the authority to decide whether the workplace is safe for entry and can stop any job activity to correct a hazardous situation.
 - 4.3.5. Responsible to reevaluate a non-permit confined space if there are any changes in the space that might increase the hazard to the entrants or if the initial evaluation of the space was inadequate.
- 4.4. Attendants shall:
- 4.4.1. Conduct confined space operations in accordance with this procedure.
 - 4.4.2. Be stationed at the access opening of a permit-required confined space while it is occupied. A minimum of one attendant is required for each permit-required confined space operation.
 - 4.4.3. Be able to recognize confined space hazards.
 - 4.4.4. Be able to recognize behavioral effects or symptoms of hazard exposure in the permit-required confined space.
 - 4.4.5. Monitor activities inside and outside the permit-required confined space to determine if it is safe for entrants to remain in the space.
 - 4.4.6. Remain outside the permit space during entry operations until relieved by another attendant.
 - 4.4.7. Provide and understand how to use the appropriate equipment to summon rescue services and emergency services.
 - 4.4.8. Maintain effective and continuous contact with authorized entrants during entry operations.
 - 4.4.9. Order entrants to evacuate the permit-required confined space immediately when:
 - 4.4.9.1. A condition is observed which is not allowed by the entry permit.

- 4.4.9.2. Behavioral effects or symptoms of hazard exposure are detected.
 - 4.4.9.3. A situation inside or outside the space is detected which could endanger the entrants.
 - 4.4.9.4. The attendant must leave the work station.
 - 4.4.10. Understand how to properly use the emergency rescue equipment provided and perform other assigned rescue and emergency duties without entering the permit-required confined space.
- 4.5. Authorized Entrants shall:
- 4.5.1. Conduct confined space operations in accordance with this procedure.
 - 4.5.2. Have approval by the competent person before entering the space.
 - 4.5.3. Review and understand the requirements and conditions of the permit-required confined space entry permit and proceed only when all the conditions are fully met.
 - 4.5.4. Understand how to properly use ventilation equipment to remove hazardous atmospheres in a permit-required confined space.
 - 4.5.5. Maintain effective and strong communication with the attendant.
 - 4.5.6. Leave the permit-required confined space immediately (self-rescue), if air monitor alarms or ND Alert alarm sounds.
 - 4.5.7. Be able to recognize the warning signs or symptoms of hazard exposure or prohibited conditions. The entrant shall notify the attendant if possible to perform self-rescue by exiting the permit-required confined space.
 - 4.5.8. Follow all directions from the attendant and evacuate immediately, if instructed to do so.
 - 4.5.9. Understand how to use the necessary personal protective equipment properly.
 - 4.5.10. Ensure that the equipment and area is maintained in a safe condition for the duration of the task.
 - 4.5.11. Exit the permit-required confined space unless physically impossible to do so when:
 - 4.5.12. Attendant orders evacuation
 - 4.5.13. Air monitor alarm is activated
 - 4.5.14. Authorized entrants perceive that they are in danger
- 4.6. ND Fire Department shall:
- 4.6.1. Provide monitors for all campus users who do not maintain and operate their own units.
 - 4.6.2. Calibrate their multiple gas monitors and personal gas monitors per manufacturers' recommendations.

- 4.6.3. Perform bump tests prior to use on their multiple gas monitors and personal gas monitors and retain documentation.
 - 4.6.4. Maintain fire fighters' training in confined space rescue.
 - 4.6.5. Have access to all confined space rescue plans.
 - 4.6.6. Conduct annual confined space entry drills by space type.
 - 4.6.7. Ensure non-tactical rescue fire fighters attend confined space awareness training annually.
- 4.7. All organizations owning their own atmospheric monitors shall:
- 4.7.1. Maintain and operate monitors only for their own department's use.
 - 4.7.2. Calibrate their multiple gas monitors and personal gas monitors per manufacturers' recommendations.
 - 4.7.3. Perform bump tests prior to use on their multiple gas monitors and personal gas monitors and retain documentation.
- 4.8. The Risk Management & Safety Department shall:
- 4.8.1. Audit compliance to this procedure using completed confined space permits and other data as necessary.
 - 4.8.2. Develop training for authorized entrants and attendants.
 - 4.8.3. Develop training and conduct training for competent persons.
 - 4.8.4. Retain confined space entry permits as required within this procedure.
 - 4.8.5. Conduct a pre-qualification review of contractors who are permitted to use their own confined space entry procedure (Section 6).
 - 4.8.6. Document with contractor any requirements to their policies or procedures that are needed to rise to the level of the University policy.
- 4.9. ND Security and Police Dispatch shall:
- 4.9.1. Maintain a log of active permit-required confined space entries when informed of an entry. The following information shall include:
 - 4.9.1.1. Date
 - 4.9.1.2. Location
 - 4.9.1.3. Start Time/End Time
 - 4.9.1.4. Who is entering the space (Company/Department)
 - 4.9.1.5. Name of contact
5. Permit-Required Confined Space Requirements
- 5.1. All confined spaces shall be treated as permit-required confined spaces until reclassification has been completed. (Section 7.0).

- 5.2. All known confined spaces shall be identified and placarded with a warning statement that says “Confined Space Do Not Enter” or similar wording. If a space has a locked entry cover or panel, or an access door that can only be opened with special tools, the use of permanent signs may be unnecessary. This is if all affected personnel are informed about confined spaces and know that the spaces are not to be opened without taking proper precautions, including posting temporary signs once opened.
- 5.3. Before entering any permit-required confined space, the competent person shall complete the Confined Space Entry Permit for each space and have it posted at every entrance to the confined space (Appendix A).
- 5.4. Only the competent person may issue the Confined Space Entry Permit.
- 5.5. The Confined Space Entry Permit is valid for the entrants’/attendants’ shift or the amount of time required to complete the assigned task described on the permit, whichever is less.
- 5.6. No authorized employees are permitted to enter the space until all items on the permit are checked “Yes” or “NA” and the competent person grants access. If an item remains unchecked, then the space shall not be entered until the item is addressed.
- 5.7. The name and signature of the competent person authorizing entry shall be on the permit prior entering the space. By signing the permit, the competent person authorizing entry is stating that all actions have been addressed and the space is safe to enter.
- 5.8. Non-entry rescue plans shall be developed prior entering space. The plan shall be listed on the Confined Space Entry Permit. This should include the type of non-entry rescue equipment setup at the space and method for non-entry retrieval, e.g., vertical or horizontal retrieval. Contact NDFD as necessary for assistance in developing non-entry rescue plans.
- 5.9. The permit shall be canceled when any of the following occur:
 - 5.9.1. All operations covered under the permit have been completed and all entrants have exited the space.
 - 5.9.2. The shifts for the attendants and entrants have ended.

- 5.9.3. When an unexpected hazard occurs in or outside the space that might have a negative impact on the safety of employees inside the confined space.
- 5.9.4. An emergency occurs in the area that could impact the entrants and the rescue plan.
- 5.9.5. The occurrence of any injury, illness or significant near miss within the space.
- 5.10. A new permit shall be issued if:
 - 5.10.1. Work operations were interrupted and personnel have left the space for more than 60 minutes.
 - 5.10.2. A new competent person is assigned to the job.
 - 5.10.3. Loss of mechanical ventilation which is required to maintain a safe atmosphere.
 - 5.10.4. A condition that is not allowed under the entry permit arises or affects the permit-required confined space.
- 5.11. Once entry has been planned, the competent person is responsible to ensure all employees involved are trained for their job task (entrant and attendant).
- 5.12. Before any entrance cover to a space is removed, it shall be determined whether it is safe to remove the closure or cover by checking for the presence of any atmospheric pressure, temperature differences and by evaluating whether there might be a hazardous atmosphere in the space. Any conditions making it unsafe to remove the closure or cover shall be eliminated before it is removed.
- 5.13. Prior to entering a permit-required confined space, there shall be protective barriers to prevent unauthorized people from entering the confined space while the job is being conducted. The opening shall be guarded by a compliant railing or a barrier that prevents accidental falls through the opening, if needed.
- 5.14. An energy control procedure shall be developed if Lock, Tag and Try is necessary. This procedure shall provide information on all equipment and lines associated with the confined space. All energy sources shall be in a zero energy state. Refer to Lock, Tag and Try-Zero Energy Procedure (Safe-14).
- 5.15. If the space is left unattended, the competent person shall ensure the confined space is secured or guarded to prevent inadvertent entry.

- 5.16. Anytime welding equipment is used in a permit-required confined space, it shall be provided with a shut off that is under control of the attendant. Gas cylinders or welding machines shall not be placed inside the space. Torches and hoses are the only hot work equipment that is acceptable inside the permit-required confined space. The Hot Work Permit (Safe-9) shall be completed and available at the job site.
- 5.17. The following equipment or conditions shall be available, inspected and tested prior to entering the space, as needed.
- 5.17.1. Air monitoring equipment. (May be obtained from NDFD. A department can own their own monitoring equipment, with approval from RMS and NDFD.)
 - 5.17.2. Air blowers shall be operating prior to entry to ensure the acceptable atmospheric conditions are met, if necessary. The air supply shall be from a clean source and shall not increase the hazards in the space.
 - 5.17.3. Communication devices such as radios shall be inspected and tested prior entering space to ensure the device is operating properly.
 - 5.17.4. Illumination shall be sufficient to allow entrants to work safely and exit quickly in an emergency.
 - 5.17.5. All exits shall be identified and cleared.
 - 5.17.6. All electrical equipment shall be protected by a ground fault circuit interrupter (GFCI). The GFCI shall be located outside the space and be tested before entry to ensure it is in good working condition.
 - 5.17.7. Retrieval systems shall be in place and tested prior to entry to facilitate non-entry rescue unless it has been approved not to be required by NDFD or RMS.
 - 5.17.8. Emergency communication shall be identified prior to entry.
- 5.18. The competent person shall conduct a pre-entry briefing. The meeting shall be held with all entrants and attendants. The pre-entry briefing shall cover all the information on the Confined Space Entry Permit.
- 5.19. An attendant shall:
- 5.19.1. Maintain effective and continuous contact with entrants.
 - 5.19.2. Complete the log on the permit showing entrants currently in the space. (Appendix A)
 - 5.19.3. Allow only authorized entrants to enter the space.

- 5.19.4. If necessary, order evacuation of the space and summon emergency services.
- 5.20. The competent person or the attendant shall conduct atmospheric testing using air monitoring equipment. The instrument shall be bump tested before using and be within the calibration date.
- 5.20.1. The competent person shall conduct initial monitoring of the atmosphere inside the permit-required confined space from a safe distance outside the space.
- 5.20.2. Continuous monitoring shall be conducted. Entry is not permitted until monitoring equipment is set up and shows readings within acceptable limits.
- 5.20.3. The competent person or attendant shall ensure sufficient atmospheric testing is being conducted. All testing shall be taken through a cross-section of the confined space to gather accurate air monitoring results of the environment.
- 5.20.4. Atmospheric testing results shall be maintained and documented on the Confined Space Entry Permit (Appendix A).
- 5.20.5. All personnel involved in the confined space entry shall be provided the opportunity to review the air monitoring results.
- 5.21. A permissible atmosphere of a permit-required confined space is acceptable for entry when the following conditions are met:
- 5.21.1. The oxygen concentration is between 19.5% and 22%.
- 5.21.2. Flammable gas and vapors are at a meter reading of 0% (non-detectable) of their lower explosive limit. Although 10% LEL is safe from a flammability concern, the non-detectable limit is an additional measure to ensure potential personnel exposure issues are resolved prior to entry.
- 5.21.3. Exposure measurements no greater than $\frac{1}{2}$ of the lowest established limit such as the Threshold Limit Value (ACGIH TLV), Permissible Exposure Limit (OSHA PEL), Recommended Exposure Limit (NIOSH REL) or other recognized limit.

Notes: Contact RMS or NDFD if assistance is needed in characterizing the space or determining safe entry conditions. RMS is available to assist with alternate entry conditions based on expected time in the space and PPE.

If mechanical ventilation is ineffective in providing a safe atmosphere as described in this section, entry shall not be made without approval from the RMS.

- 5.22. If there is a presence of contaminants at or above a recognized exposure limit then the space shall require further cleaning or venting. Proper protective clothing and respiratory protection shall be utilized if necessary.
- 5.23. All gas monitors shall be bump tested by a trained individual before taking the initial entry readings. If the competent person questions the accuracy of the monitor, the monitor shall be recalibrated or bump tested, or the competent person shall use a different instrument.
- 5.24. The entrants or attendant shall notify the competent person and ND Dispatch when the confined space entry is complete.
- 5.25. The competent person shall conduct a post job debriefing with the entrants and attendants. All discrepancies shall be noted on the Confined Space Entry Permit and reported to the RMS Department for program review and modification.
- 5.26. The competent person shall forward a copy of the permit to Risk Management and Safety. The permit shall be forward within one (1) month after permit was canceled. For departments with a high number of confined space entries, they may work with RMS to identify a process to maintain records locally or electronically.
6. Contractors
- 6.1. ND project managers (faculty or staff) or the competent person shall issue a ND Contractor Confined Space Information Form for all contractor entries into ND owned or managed confined spaces. (Appendix D).
- 6.2. The contractor shall have a competent person. The contractor may issue their company's permit and adhere to whichever program is more stringent (ND or the contractor's written program).
- 6.3. Contractors entering confined spaces shall be pre-qualified to perform such work by providing the following documentation to the project manager:
- 6.3.1. Their written confined space entry procedure. The procedure shall meet the requirements of OSHA standards 29 CFR 1910.146 and/or 1926.1200.
- 6.3.2. Their documented entry permit process.

- 6.3.3. Training certifications for all employees entering confined spaces, upon request.
- 6.4. Contractors shall have on file with Risk Management and Safety (RMS), an executed Insurance and Indemnification Agreement. In addition, a certificate of insurance meeting the requirements of the agreement shall be on file with RMS.
- 6.5. Contractor personnel shall conduct atmospheric monitoring using their own calibrated equipment unless a joint entry is made. In cases where joint entry is made, monitoring shall be completed by ND personnel using ND's air monitoring equipment.
- 6.6. Contractors shall have their own non-entry rescue equipment if it is a contractor only entry.
- 6.7. Contractors shall assign appropriate PPE for their personnel. ND's PPE shall not be used by the contractor.
- 6.8. Prior to entering a confined space, there shall be protective barriers to prevent unauthorized people from entering the confined space while the job is being conducted. The opening shall be guarded by a compliant railing or a barrier that prevents accidental falls through the opening, if needed.
- 6.9. Joint entries (ND and contractor) operations shall be coordinated by a ND competent person utilizing ND's confined space program and permit process.
7. Reclassification of Permit-Required Confined Spaces
- 7.1. A space classified as a permit-required confined space may be reclassified as a non-permit confined space under the following conditions:
- 7.1.1. The permit-required confined space has no actual or potential atmospheric hazards and all hazards within the space are eliminated without entry into the space. In order to ensure all hazards have been eliminated the competent person shall conduct atmospheric testing and inspections of the confined space prior to the entry. Supply air handlers are exempted from atmospheric monitoring.

- 7.1.2. The competent person shall complete the Permit Required Confined Space Reclassification form. Signature of the competent person, time and date shall be included in Appendix B.
- 7.1.3. Appendix B shall be posted at the opening of the confined space. This certification shall be sent to RMS Department within one (1) month of completion unless prior arrangements have been made with RMS.
- 7.1.4. If any hazards arise within the permit space that has been reclassified, all employees shall exit the space. The entrants or attendants shall inform the competent person and not re-enter the space until the competent person reevaluates the space to determine whether it should remain as a non-permitted space.
- 7.1.5. The reclassification is valid only for the duration of the job but no more than one shift.

8. Inventory

- 8.1. All identified confined spaces shall be evaluated for potential hazards.
- 8.2. A written inventory of all identified confined spaces and their hazard classifications shall be maintained and updated annually or as additional confined spaces are located or created. The inventory form in Appendix C or similar shall be used so long as it contains at least the same information.
- 8.3. Each Operation or Department shall be responsible for identifying and evaluating the confined spaces (Appendix C) within their area of responsibility.

9. Rescue and Emergency Services

- 9.1. To facilitate non entry rescue, a retrieval system shall be used for all permit-required entries (both horizontal and vertical) except as noted below.
- 9.2. A mechanical lifting device shall be set up to retrieve entrants from vertical permit-required spaces that are greater than 5 feet deep, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant.
- 9.3. Each authorized entrant shall use a full body harness with a retrieval line attached. The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space.

Note: Retrieval lines need not be attached to the entrant when circumstances such as agitators, baffle plates, column trays, scaffolding, would render the retrieval line ineffective for immediate rescue.

10. Training

- 10.1. Confined space entry training shall be provided to competent persons, authorized entrants, and attendants. The training shall be conducted annually. Retraining shall be conducted any time there is a change in the procedure or field evaluations reveal a misunderstanding of the requirements.
- 10.2. Identified members of NDFD shall receive annual authorized entrant, attendant, and competent person training in addition to confined space rescue training. They shall receive at least basic first aid and CPR training.
- 10.3. At least annually, each NDFD member of the rescue team shall practice making permit space rescues from actual or simulated confined spaces. Simulated confined spaces used for rescue training shall represent actual permit spaces with respect to opening size, configuration, and accessibility.
- 10.4. All confined space entry training documentation shall include the names of the trainees, date(s) of training, the signature of the trainer, and verification of each trainee's understanding (quiz, skill demonstration, etc.). The documentation shall be retained per ND records retention schedules.

11. Recordkeeping

- 11.1. Each department shall forward Confined Space Entry Permits to Risk Management and Safety. Departments may choose to work with Risk Management and Safety and maintain documentation within their department. Departments shall maintain permits for a minimum of the current year plus one (1) year.
- 11.2. Confined space inventories shall be maintained and updated as necessary when the work area has changed.
- 11.3. Calibration and bump test records shall be retained for the current year plus one year.

12. Procedure Evaluation

- 12.1. Confined Space Entry Evaluations (field audits) shall be documented using the form in Appendix E. Sufficient audits shall be performed to verify this procedure is understood and being followed. If gaps are identified they shall be addressed immediately and documented on the field audit form for future program review. Completed field audit forms shall be sent to the RMS Department for record retention.
- 12.2. An annual documented audit of the Confined Space Entry program and procedures shall be conducted by RMS. The audit shall include direct observation of confined space entry methods and verification that procedures are appropriate, understood and implemented. The audit shall ensure the process is being followed and permits are being completed correctly and accurately. As necessary, revision to the program or training process shall be made as a result of the audit.
- 12.3. Deviations or deficiencies shall be corrected.

13. Resources

- 13.1. The Occupational Safety and Health Administration, 29 CFR 1910.146
Permit-Required Confined Spaces
- 13.2. The Occupational Safety and Health Administration, 29 CFR 1926.1200
Confined Space in Construction
- 13.3. NFPA 350: *Guide for Safe Confined Space Entry and Work*

Revision Log

History	Effective Date
Procedure developed	April 2018
<ul style="list-style-type: none">• Minor grammatical corrections.• Clarification to LEL meter reading being “non-detectable”	November 2018

Appendix A

CONFINED SPACE ENTRY (CSE) PERMIT

Date / Time Issued ___/___/___ AM/PM Date / Time Expires (Not to Exceed Shift) ___/___/___ AM/PM

ALL INFORMATION MUST BE COMPLETED PRIOR TO ENTRY

Equipment / Space: _____ Area / Location: _____

Purpose of Entry: _____

Materials Previously in Space: _____

Hazards Being Introduced By Nature of Work: _____

Competent Person _____ Attendant(s) _____

Entrant(s) _____ (Use Entry Log)

Contractors _____ (Use Entry Log)

Hot Work Required? Yes No Lockout/Tagout Required? Yes No

This Permit Expires when: Operations covered by this Permit are complete and all Entrants have exited the space, the Entrant's or the Attendant's shift ends, a prohibitive condition / Injury occurs in or near the space, or an incident occurs which could impact entrants or rescue capabilities.

REQUIRED PRECAUTIONS & ENTRY CONDITIONS	HAZARDS IDENTIFIED, CORRECTED or MITIGATED	PERSONAL PROTECTIVE EQUIPMENT			
YES N/A	YES N/A				
1. Space drained and decontaminated <input type="checkbox"/> <input type="checkbox"/>	Toxic atmosphere <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Chemical Suit - _____			
2. All chemical, utility, and outlet lines isolated .. <input type="checkbox"/> <input type="checkbox"/>	Corrosive materials <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Chemical Boots			
3. Confined space purged with: water/steam <input type="checkbox"/> <input type="checkbox"/>	Inadequate light <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Gloves - _____			
air <input type="checkbox"/> <input type="checkbox"/>	Dust or fume <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Goggles <input type="checkbox"/> Face shield			
inert <input type="checkbox"/> <input type="checkbox"/>	Oxygen deficiency <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Respirator _____			
4. All aspects of lock, tag, and try are met <input type="checkbox"/> <input type="checkbox"/>	Oxygen enrichment <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Other: _____			
5. All electrical equipment GFCI protected <input type="checkbox"/> <input type="checkbox"/>	Heat/cold/weather <input type="checkbox"/> <input type="checkbox"/>	LIST ADDITIONAL PRECAUTIONS			
6. Vessel jackets properly isolated <input type="checkbox"/> <input type="checkbox"/>	Falling objects <input type="checkbox"/> <input type="checkbox"/>	_____			
7. Gas Monitor within current Calibration & Bump Check completed <input type="checkbox"/> <input type="checkbox"/>	Chemical reactivity <input type="checkbox"/> <input type="checkbox"/>	_____			
8. Atmospheric testing conducted and within limits (O ₂ , LEL, Toxic) <input type="checkbox"/> <input type="checkbox"/>	Sludge/residue <input type="checkbox"/> <input type="checkbox"/>	LIST NON-ENTRY RESCUE EQUIPMENT USED AT SPACE			
9. Continuous monitoring established <input type="checkbox"/> <input type="checkbox"/>	Poor visibility <input type="checkbox"/> <input type="checkbox"/>	_____			
10. Openings Identified & unobstructed <input type="checkbox"/> <input type="checkbox"/>	Chemical contact <input type="checkbox"/> <input type="checkbox"/>	_____			
11. Has fall protection been provided <input type="checkbox"/> <input type="checkbox"/>	Hot/cold contact <input type="checkbox"/> <input type="checkbox"/>	EMERGENCY COMMUNICATION METHODS			
12. Harness & lifeline worn & attached outside space <input type="checkbox"/> <input type="checkbox"/>	Sharp objects <input type="checkbox"/> <input type="checkbox"/>	Alarm Device(s) <input type="checkbox"/> Radio <input type="checkbox"/> Phone – 631-5555			
13. Emergency/rescue equipment available <input type="checkbox"/> <input type="checkbox"/>	Migrating vapors/gases <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Other _____			
14. Adequate lighting provided <input type="checkbox"/> <input type="checkbox"/>	Others: _____				
15. Retrieval device installed (5' vertical) <input type="checkbox"/> <input type="checkbox"/>					
16. Sharp edges & moving parts guarded <input type="checkbox"/> <input type="checkbox"/>					
17. Respiratory protection identified <input type="checkbox"/> <input type="checkbox"/>					
18. Mechanical ventilation required <input type="checkbox"/> <input type="checkbox"/>					
19. Rescue plan developed & noted below <input type="checkbox"/> <input type="checkbox"/>					
20. Personnel trained <input type="checkbox"/> <input type="checkbox"/>					
21. Attendant(s) assigned and present <input type="checkbox"/> <input type="checkbox"/>					
22. Communication method between Entrants & Attendants established <input type="checkbox"/> <input type="checkbox"/>					
23. CSE sign posted at opening(s) <input type="checkbox"/> <input type="checkbox"/>					
24. NDSP Dispatch (1-5555) notified <input type="checkbox"/> <input type="checkbox"/>					
Description of the Non-Entry Rescue Plan	ATMOSPHERIC TESTING RESULTS Use back for additional space				
	Condition	Limit	Result	Time	Vertical Depth (ft)
	Oxygen	19.5% - 22%			
	Flammable	0% LEL			
	CO	≤13 ppm			
	H ₂ S	≤0.5 ppm			
	VOC (If Needed)	≤100 ppm			
	Other:				

I have personally inspected the work site & approved this Permit – Competent Person Authorization:

Print Name _____ Signature _____ Date / Time _____ / _____

I have personally verified all Entrants have exited the space, conducted debriefing w/ Entrants/Attendants, certified the space ready to return to service, notified NDSP Dispatch and cancel this Permit. Signature _____ Date / Time _____ / _____

Debriefing Findings NO YES If Yes, document findings on back of this Permit.

Confined Space Entry Log

Emergency Contact: 574-631-5555 or 1-911 (Landline)

Attendant: Log Entrants "Time In" and "Time Out" of the space in the table below

Entrant's Name	Attendant's Initials	Time In	Time Out	Time In	Time Out	Time In	Time Out

Attendant's Duties Include:

- Control access to confined space
- Sign Entrants in and out of space
- Communicate continuously with Entrants
- Continuously evaluate Entrants' physical condition
- Monitor space for any changes which could create a hazardous condition
- Monitor atmosphere as described in Permit
- Implement Rescue Plan if needed – Attendant shall not enter the confined space to rescue Entrants
- Able to operate retrieval device
- Ensure equipment & area is maintained in a safe and orderly condition

Remove Entrants if any of the following are observed:

- Dizziness
- Nausea
- Lightheaded
- Headache
- Complaints of poor physical ability
- Staggering
- Unresponsive to communication efforts

ATMOSPHERIC TESTING RESULTS							
Condition	Limit(s)	Result	Time	Vertical Depth (ft)	Result	Time	Vertical Depth (ft)
Oxygen	19.5 - 22%						
Flammable	0% LEL						
CO	<13 ppm						
H ₂ S	<0.5 ppm						
VOC	<100 ppm						
Other							

Debriefing Findings:



**Appendix B
Permit Required Confined Space Reclassification Form**

All confined spaces at University of Notre Dame are considered permit required confined spaces. A permit required confined space may be reclassified as a non-permit if the space does not contain actual or potential atmospheric hazards and all hazards are eliminated without entry into the space. The reclassification of the confined space is only valid while the space is free of hazards. If hazards arise, the space shall be evacuated immediately and reevaluated. The reclassification form is valid only for the duration of the job but no longer than the shift of the workers. This form shall be sent to Risk Management and Safety within one (1) month of issuance unless other recordkeeping arrangements have been made with RMS.

Name of the Competent Person:	
Department:	
Who is Entering the Space?	

Confined Space Location:	
Type of Space: Ex. Air Handler	
Materials Previously in Space?	

Purpose of Entry:	
-------------------	--

Date and Time of Entering and Exiting Space:	Date: Start Time: End Time:
--	-----------------------------------

Pre-Entry Hazard Elimination Measures Taken (Yes or NA):

Complete the following prior to entry into the confined space considered for reclassification to a non-permit required confined space. **If answering YES, describe the action taken.**

- Has atmospheric testing of oxygen level, LEL, and toxic contaminants been conducted and verified that no actual or potential hazards exist?
(Supply air handlers are exempted.)
Yes
_____ Document results on Page 2 of this Form.
- Have the contents in space been drained and the space decontaminated?
Yes NA

- Are all chemical and utility lines isolated in a manner that eliminates hazards (Double Block Bleeding, Blanking, Blinding, or Dismantling)?
Yes NA

- Has Lock, Tag and Try been implemented to eliminate hazards (Electrical, Pneumatic, Mechanical, Hydraulic, Thermal, Fuel, Stored Energy, Radiation)?
Yes NA

5. Are portable electrical equipment GFCI protected?

Yes NA

6. Have fall and trip hazards been eliminated? (ex. water on the floor)

Yes NA

7. Are the exits into and out of the space open and clear?

Yes

8. Are any sharp edges protected or guarded?

Yes NA

9. Have control measures been developed to mitigate any hazardous substances that may be introduced into the space from the work being conducted? (e.g. using cleaning chemicals, loud noise from equipment, etc.) Identify hazards and control method.

Yes NA

10. Has adequate lighting been provided?

Yes NA

11. Have all employees been informed and debriefed about reclassifying the confined space?

Yes

List any additional hazard elimination measures taken

Identify the steps necessary to identify hazards created during entry, if any.

Atmospheric Monitoring Results – Complete Shaded Cells

Condition	Limit	Test Results	Test Time	Tester's Initials
Oxygen	19.5% - 22%	%		
Flammables	0% LEL	%		
Carbon Monoxide (CO)	≤ 13 ppm	PPM		
Hydrogen Sulfide (H ₂ S)	≤ 0.5 ppm	PPM		
VOC (If Needed)	≤ 100 ppm	PPM		
Other (List Below – If Needed)	Enter Limit Below:			

I (Name) _____ certify that all hazards have been eliminated and I authorize the reclassification of this space as a non-permit required confined space until (enter expiration time) _____.

Competent Person Signature: _____

Date/Time: _____



Appendix C

University of Notre Dame Confined Space Inventory Form

Hazards Associated With Confined Space(s)			
Confined Space #	Description of Space (ex. Water tank)	(Building/Room #)	Potential Hazard(s)

Inventory completed by: _____ Date of Completion: _____



Appendix D
Contractor Confined Space Information Form

This form is to be completed by the ND Project Manager or ND Faculty staff overseeing a non-ND contractor who will enter a ND confined space.

Contractor Representative: Contractor Organization:

ND Project Manager:

Space Name/Location: Date of Entry:

Section 1. Hazardous Element Identification Checklist (Completed by ND)
Table with 3 columns: Question, YES, NA. Rows include: 1. Has the contractor been informed of the following potential hazards? (sub-rows a-n), Oxygen deficiency, Toxic gasses or vapors, Hazards of Engulfment or Entrapment, Electrical hazards, Flammable hazards, Heat or Cold, Hazardous configuration, Mechanical hazards, Chemical hazards, Biological hazards, Fall hazards, Trip hazards, Noise hazards, Other.

Section 2. Precautions or Procedures Already Implemented
Table with 3 columns: Question, YES, NA. Rows include: 1. Has Lock, Tag, Try been implemented, energy control procedures, lock and tags?, 2. All chemical, utility and outlet lines isolated?, 3. Space drained and decontaminated?, 4. Continuous air monitoring established?, 5. Mechanical ventilation established?, 6. Sharp edges and moving parts guarded?, 7. Has adequate lighting available in the space been established?

Section 3. Emergency Communication

What are the means of summoning rescue and emergency services?

Section 4. Debriefing? List any hazards confronted or created in the space during operation entry.

I hereby confirm that I have reviewed the completed Contractor Confined Space Information Form with the visiting contractor. The contractor has been informed of all known potential hazards within the permit required space. By signing this form, the contractor acknowledges all the information listed above.

ND Project Manager Signature: Contractor Signature:
Date:

This form must be retained for record retention.

**Appendix E
Confined Space Entry Field Audit**

Confined Space Observed: _____

Department: _____

Competent Person: _____

 Is this a **Permit-Required** or **Non-Permit** entry? _____

Date: _____

<i>Confined Space Audit Questions</i>	Yes	No	N/A	Comment (If No please explain)
1. Is the CSE Permit properly filled out (with appropriate signatures) and posted near all entry points to the confined space?				
2. Is there any task being performed that requires an additional permit (hot work)?				
3. Was the "Permit Required Confined Space Reclassification Form" completed and correct?				
4. Has the Contractor Confined Space Information Form been completed?				
5. Was the attendant at his/her proper post during the entire observation?				
6. Does the attendant understand his/her responsibilities?				
7. If the space is permit-required, does the confined space have non-entry rescue equipment available, set up correctly and properly documented on the permit?				
8. Does the attendant have a communications device to call NDSP Dispatch readily available?				
9. Has NDSP Dispatch been notified (1-5555 or 574-631-5555)?				
10. Are all energy sources (electrical, pneumatic, hydraulic, pressurized, etc.) properly isolated and locked out?				
11. Is continuous forced ventilation equipment being used?				
12. Is continuous atmospheric monitoring being conducted?				
13. Has the atmospheric monitoring equipment been properly calibrated?				
14. Have all openings been identified and unobstructed?				
15. Affected area barricaded where needed with caution tape with the purpose of the barrier identified?				
16. Are all entrants wearing harnesses and lifelines while in the space?				
17. Is everyone involved in the entry wearing proper PPE and clothing?				
18. Are the portable lighting and electrical tools used in the confined space either battery powered or protected by a GFCI?				
19. Were any other problems noted during this observation?				

Completed by: _____ Signature: _____