

Chapter 26 – Confined-Space Entry (REDACTED)

26.1 Introduction

NASA Ames Research Center is firmly committed to providing each of its employees a safe and healthy work environment. Anyone involved in confined-space operations may face special dangers such as possibility of oxygen deficiency, toxic atmosphere, flammable/explosive atmosphere, physical, chemical, or mechanical hazards, or a combination of any of the above. This written Confined-Space Entry Program aims to minimize these hazards and resulting mishaps through training, an entry permit system, classification of confined-spaces, permitted and alternate procedures for personnel working in confined spaces operations, contractor communication, and availability of forms for confined space entry. The procedures in this chapter enable Ames managers and employees to effectively meet Federal OSHA requirements designated in 29 CFR 1910.146, Permit-Required Confined-Spaces.

26.2 Purpose

The purpose of this chapter is to provide procedures and documentation that implement safety controls for confined spaces at Ames Research Center and at Ames controlled off-site locations.

26.3 Applicability

This manual is applicable to: (1) all Ames Employees; and (2) all persons and entities who agree in writing to comply with this manual.

26.4 Definitions

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.
2. **Alternate Entry Procedure:** Entry into a Permit Required Confined Space without using rescue standby or filling out the formal permit provided that the only hazard posed by the permit space is an actual or potential hazardous atmosphere and continuous forced air ventilation is applied to maintain safe entry conditions. If any other hazards exist within then the alternate entry procedure cannot be used.
3. **Attendant:** An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.
4. **Authorized entrant:** An employee who is authorized by the employer to enter a permit space.
5. **Blanking or blinding:** The absolute closure of 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.
6. **Confined space:** A space that:
 - Is large enough and so configured that an employee can bodily enter and perform assigned work; and

- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
- Is not designed for continuous employee occupancy.

Note: There are two types of confined-spaces: non-permit required confined-spaces (NPRCS) and permit-required confined-spaces (PRCS). See these definitions for more details. There are three possible ways to enter a PRCS depending on the conditions within the space. One method is entry by full permit, another is Alternate entry Procedure, and the third is non permit entry by reclassification of the PRCS. These methods will be discussed further in Section 26.7. [29 CFR 1910.146(c)(5)(i), (c)(5)(ii), and (c)(7).]

7. **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.
8. **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.
9. **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.
10. **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.
11. **Entry permit:** The written or printed document that is provided by the employer to allow and control entry into a permit space.
12. **Entry supervisor:** The person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this section. 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 by this section 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.
13. **Hazardous atmosphere:** An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:
 - Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL) or 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 (1.52 m) or less.

 - Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.
 - Atmosphere concentration of any substance for which a dose or a Permissible Exposure Limit (PEL) is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, of 29 CFR and which could result in employee exposure in excess of its dose or PEL.
 - Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this provision.

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

Note: For air contaminants for which OSHA has not determined a dose or PEL, other sources of information, such as Material Safety Data Sheets (MSDSs) that comply with the Hazard Communication Standard, §1910.1200 of 29 CFR, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

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.
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. **Note:** 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, possibly fatal collapse 12 to 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.
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.
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.
18. **Non-permit confined-space:** A confined-space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazards capable of causing death or serious physical harm. The Non-Permit Confined Space Entry Checklist needs to be filled out prior to entry.
19. **Oxygen deficient atmosphere:** An atmosphere containing less than 19.5-percent oxygen by volume.
20. **Oxygen enriched atmosphere:** An atmosphere containing more than 23.5-percent oxygen by volume.
21. **Permit-required confined-space (permit space):** A confined-space that has one or more of the following characteristics:
 - Contains or has 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 that slopes downward and tapers to a smaller cross-section.
 - Contains any other recognized serious safety or health hazard (ex. Traffic, chemical hazard, process hazard, mechanical hazard, electrical hazard, and biological hazard).

Note: If the only hazard posed by the permit space is an actual or potential hazardous atmosphere and the employer can demonstrate that continuous forced air ventilation alone is sufficient to maintain the space safe for entry then the Alternate Entry procedure can be used. [29 CFR 1910.146(c)(5) & (c)(7)]. If the permit required confined space does not have an actual or potential hazardous atmosphere and all serious safety hazards have been removed the permit space can be temporarily reclassified as a non permit space for as long as the

hazards do not exist. A non permit/reclassification checklists shall be filled out to document procedures followed to reclassify the space.

22. **Permit-required confined-space program (permit space program):** The employer's overall program for controlling, and where appropriate, for protecting employees from permit space hazards and for regulating employee entry into permit spaces. (29 CFR 1910.146 (d))
23. **Permit system:** The employer's written procedure for preparing, issuing and returning completed permits for each confined space entry and for returning the permit space to service following termination of entry.
24. **Prohibited condition:** Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.
25. **Reclassification of Spaces:** A space classified by the employer as a permit required confined space may be reclassified as a non permit confined space if the permit space does not pose an actual or potential atmospheric hazard and if all hazards within the space are eliminated prior to entry into the space. Also a non permit confined space may be reclassified as a permit required confined space if any atmospheric or serious safety hazard is present in the space during the time of entry or if work in the space will create a hazardous condition.
26. **Rescue service:** The personnel designated to rescue employees from permit spaces.
27. **Retrieval system:** The equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for nonentry rescue of persons from permit spaces.
28. **Testing:** The 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.

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

26.5 Responsibility

26.5.1 Overview

The chain of responsibility for ensuring there is safe work environment at Ames Research Center that follows safety standards, regulations, codes and guidelines starts with the Center Director and flows downward through the management and supervisors. In addition to this, every employee who works at ARC must understand that a condition of their employment is to follow all safety precautions and specifications that apply to their tasks being performed.

26.5.2 Supervisor and Manager

1. through 7. **REDACTED**
8. Ensure that contractors involved in confined space entries within your area or under contract with your code are informed of the following:
 - Inform the contractor that confined space entry is allowed only through compliance with this chapter. This includes an evaluation of non-permit confined spaces.
 - Appraise the contractor of the elements that make a space in question a permit required space, including hazards identified and the host employer's experience with the space.
 - Appraise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit-required confined spaces where contractor personnel will be working.
9. Coordinate entry operations with the contractor when both host employer personnel and contractor personnel will be working in or near permit-required confined spaces.

10. Ensure the terminated Permit of associated monitoring forms are returned to the Confined Space Program Representative at [REDACTED] at completion of entry. This includes any contractor confined space entry forms as well.

26.5.3 Code QH

Code QH, has oversight responsibility for confined space entry and as such incurs the following responsibility:

1. Develop and maintain a confined space safety program for ARC.
2. Provide information and consultation to project management and employees involved in confined space operations.
3. Perform an annual review of this chapter and the confined space program.
4. Review permits, alternate entry forms, and non permit checklists periodically for compliance and communicate any deficiencies to the relevant (involved) parties.
5. Provide training to civil service staff and onsite contractors.
6. Provide contract and specifications review as requested by Ames management.
7. Maintain a file of permits received and the locations of all confined spaces identified at ARC.
8. Function as the regulatory liaison with regulatory agencies as needed for confined space entries.

26.5.4 Entry Supervisor

The entry supervisor is the responsible person overseeing the safe entry into and work within the permit required confined space and responsible for: Note: The Supervisor of employees who enter a confined-space may not be acting as the "Entry Supervisor." The employees' supervisor may delegate these responsibilities to other qualified individuals but is also fully responsible for ensuring that the assigned person meets all the requirements of this chapter. For example, Branch Chief is not required to act as the "Entry Supervisor" but may assign the daily responsibilities required of an "Entry Supervisor" to a lead person. In this case, the lead person would ensure that the requirements for specific confined-space entries are met, with periodic program review from the Branch Chief. The Branch Chief is ultimately responsible for ensuring that the requirements of this chapter are met, even though his/her employees may be acting as "Entry Supervisors."

1. Completing the Confined Space Entry Permit found at <http://q/gh/forms/>.
2. Review the confined space and project hazards for the confined space to be entered each time the space is entered. Consult the Safety Division if you need assistance at [REDACTED].
3. Make the Confined Space Entry Permit available to employees and post the form near the entry point for the confined space during the entire entry.
4. Verify the entry personnel and attendants are qualified, required forms are complete, necessary pre-entry tests have been done, required PPE is worn by Entrants, and necessary equipment is in place including non-entry rescue, and communications when require.
5. Ensure that conditions are monitored, that they do not degrade from initial evaluation, and that conditions remain consistent with the entry permit.
6. Ensure hazards listed on the confined space entry forms are controlled or eliminated.
7. Provide appropriate barriers to isolate the area and protect the entrants from external hazards.
8. Return the permit to the Confined Space Program Representative at [REDACTED] at completion of entry.

26.5.5 Attendant

1. The attendant is stationed outside a permit-required confined space to monitor the conditions of the Entrants.
2. Attend biannual training as required by their supervisor or employer.
3. Be aware of the hazards that may be faced during entry, including physical and behavioral changes in Entrant and know the consequences of exposure.
4. Maintain effective communications with all Entrants.
5. Monitor entry activities inside and outside the permit space and ensure entry conditions remain consistent with the terms of the entry permit. Attendants may not be assigned another duty that could possibly distract them. Attendant will not leave their location until completion of entry unless relieved by another qualified attendant.
6. Ensure the removal of unauthorized individuals who enter or who attempt to enter the permit-required confined space during entry operations.
7. Order the Entrants to cease all activities and exit the confined space if any of the following conditions occur:
 - A prohibited conditions exists
 - A behavior or other unusual conditions occurs inside or outside the space
 - An unsafe condition occurs inside or outside the space
 - The attendant is unable to fulfill their duties
8. Perform non-entry rescue and notify emergency rescue if necessary. NEVER Enter a confined space for rescue purposes unless properly trained and certified in Confined Space Rescue.

26.5.6 Authorized Entrant(s)

Employees entering the confined space shall know the potential hazards that may be encountered during entry and the proper use and limitations of equipment to control those hazards. Entrants must also:

1. Attend biannual training and obtain medical evaluations as required by their supervisors or employer.
2. Alert the attendant (if one is needed) whenever:
 - The entrant recognizes any warning signs or symptoms of exposure to a dangerous substance
 - The entrant detects a prohibited condition
3. Communicate with the attendant (when there is one needed), as necessary to enable the attendant to know the status of the need to evacuate the confined space.
4. Exit from the permit space as quickly as possible whenever:
 - An order to evacuate is given by the attendant or the entry supervisor.
 - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.
 - The entrant detects a prohibited condition.
 - An evacuation alarm is activated.

26.5.7 Contracting Officer

26.5.7.1 Off-site contractors

The contracting officer will inform off-site contractors involved in confined space entry of the following:

- That confined space entry is allowed only through compliance with the contractor's approved confined space entry program or this procedure (ARC Handbook Chapter 26.) If a contractor's program is used it must be approved by the Safety Division.
- The hazards associated with the confined space and any past experience with the space.
- Coordinate the work with both the onsite and offsite contractors when both will be working in or near confined spaces.

26.5.7.2 Multiple Contractors

If more than one contractor will be entering a confined space the Contracting Officer Technical Representative (COTR) responsible for the project will coordinate entry operations and ensure that each contractor is aware of the operations of the other(s) and that each contractor signs the entry permit.

26.5.7.3 Documentation

The COTR shall request necessary documentation from the contractor, such as training records, PPE training, etc., prior to the start of work.

26.5.7.4 Contractors who perform Confined Space Operations

1. Ensure that their employees and sub-contractors comply with all procedures in this chapter.
2. Obtain any available information regarding permit space hazards and entry operations from the Contracting Officer Technical Representative (COTR), area supervisor, and the Safety Division.
3. Coordinate entry operations with the COTR and area supervision when both NASA personnel and contractor personnel will be working in or near permit spaces.
4. Notify the Moffett Fire Department prior to each entry into a permit-required confined space. (Phone notification is acceptable).
5. Inform the COTR, project manager, and the area supervisor of the permit space program that the contractor will follow and any hazards confronted or created in the permit spaces. This information should be conveyed every time a confined space is entered.
6. Obtain all equipment, medical monitoring, and training necessary to conduct a safe entry, including calibrated monitoring equipment.

NOTE: NASA may provide certain items of equipment, if so specified in the contract. The contractor shall provide all other required equipment.

7. Provide a copy of the confined space program you will be following if other than this procedure as well as documentation of training to the COTR and project manager prior to the start of work.

26.6 Confined-Space Evaluation and Classification Procedure

26.6.1 Evaluation of Confined-Space by Supervisor/Manager

Every confined-space shall be evaluated by the employee supervisor, area supervisor, or an individual working on his/her behalf to determine if a space/area is a permit-required confined-space, non-permit-required confined-space, or neither. All confined spaces in the area should be properly labeled. If there are spaces in the area that are incorrectly labeled or have not yet been evaluated then the Safety Division should be contacted to perform an evaluation. This evaluation must take place prior to any Confined-Space Entry. The flow chart found in section 26.15.1 shall be used to assist with the evaluation. The area or employee supervisor is responsible for ensuring that the evaluation has been performed.

26.6.2 Confined-Space Evaluation Form

For every Confined Space at ARC there should be a confined space evaluation form on file. If there is not an evaluation on file then the area supervisor or Code QH should be contacted to ensure the space is properly classified and all potential hazards are identified prior to any confined space entry. If an area supervisor or manager completes an evaluation of a space a copy of that form must be returned to the Safety Division and one copy must be retained with the employee supervisor. A copy of the confined space evaluation form can be found in the section 26.15.2. **In the absence of a completed Confined-Space Evaluation Form, a confined-space shall be considered to be a Permit-Required Confined Space.**

26.6.3 Danger Sign

Danger Signs shall be posted at all permit-required confined spaces and Warning Signs shall be posted at all non-permit required confined spaces by the area or employee supervisor. The purpose of the sign is to inform employees of the existence, location, and danger posed by the permit-required or non-permit required confined-space. See sections 26.15.5 and 26.15.6 for confined-space danger and warning sign(s) to be used at Ames.

26.7 Confined-Space Entry Requirements

26.7.1 Non-Permit Confined Space Entry Control

A Non-Permit Required Confined Space (NPRCS) is confined space that does not contain, or with respect to atmospheric hazards, have the potential to contain any hazards capable of causing death or serious physical harm.

There are however, entry control procedures to ensure the safety of Entrants.

Pre-entry: Before entry into a non-permit space is authorized the designated Entrant shall, complete the Non-Permit Confined Space Checklist prior to entry.

The effective time of the Non-Permit Confined Space Checklist shall not exceed the time required to complete the task identified. If a new crew arrives, new forms must be completed by the new entrant.

The completed form shall be signed and dated by the entrant and returned to the Confined Space Program Representative at **REDACTED** Code QH at the completion of entry.

26.7.2 Permit Space Entry Control

1. A Permit Required Confined Space (PRCS) is a confined space that has one or more of the following:
 - Contains or has the 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 that slopes downward and tapers to a small cross-section
 - Contains any other recognized serious safety or health hazard

Note: A graded approach to PRCS entry is available. Alternate Entry Procedures for PRCS are allowed, provided that all the requirements in section 26.7.3 are met.

2. Pre entry: Before entry into a PRCS is authorized the Entry Supervisor shall, complete the Confined Space Entry Permit and document that the space is safe to enter.
3. All members of the crew involved with the Confined Space Entry shall sign the permit, verifying the information on the permit and acknowledge their understanding of the permit requirements.

4. All pre-entry preparation activities specified on the permit shall be completed before entry is authorized. These preparations include but are not limited to:

- Isolate the permit space.
- Depressurize equipment under positive and negative pressure.

Note: Jackets and vessels are to be depressurized. If work is to be performed that could compromise the integrity of the inner jacket wall, the jacket must be drained and free from extremely hot or cold, noxious poisonous or flammable materials.

- Lock out, tag out, and try out all sources of electrical, pneumatic, mechanical, chemical, thermal, or radiation hazards.
 - Purge, render inert, flush, or ventilate the permit space as necessary eliminate or control atmospheric hazards.
 - Provide pedestrian, vehicle, or other barriers as necessary to isolate the area and protect entrants from external hazards.
5. Evaluate permit space conditions as follows when entry operations are conducted:
- Test conditions in the permit space to determine if acceptable entry conditions exist before entry is authorized to begin, except that, if isolation of the spaces is not feasible because the space is larger or is part of a continuous system (such as a sewer), pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored in the area where the authorized entrant is working.
 - Test or monitor the permit space as necessary (every 15 minutes is recommended) to determine if acceptable entry conditions are being maintained during the course of the entry operation.
 - When testing for atmospheric hazards use a calibrated direct reading instrument and, test first for oxygen, second for flammable gases and vapors (LEL), and third for toxic gases and vapors.
6. The complete Permit shall be made available at the time of entry to all authorized entrants and attendants, by posting it at the entry portal or by any other equally effective means.
7. At least one attendant is required outside the permit space for the duration of the entry operation.
8. The permit space shall be evacuated immediately under any of the following conditions:
- The entrant or attendant detects a prohibited condition.
 - The entrant recognizes any warning signs or symptoms of exposure to a dangerous situation.
 - The attendant detects the behavioral effects of hazard exposure to an authorized entrant.
 - The attendant detects a situation outside the space that could endanger the authorized attendant.
 - The attendant cannot effectively and safely perform all the required duties.
9. When the job is completed, all entrants have exited the space, and the space is ready to return to its initial configuration, the Entry Supervisor shall note on the permit any problems encountered during the entry so that appropriate revision to the confined space entry program can be made.
10. The duration of the permit shall not exceed the time required to complete the task identified. The duration must not extend beyond one shift with the same crew. If a new crew arrives, new forms must be completed by the new Entry Supervisor.
11. The Entry Supervisor must indicate the time and date the Permit is terminated and return the complete permit to the Confined Space Program Representative at **REDACTED** within

ten days of completion. The Area Supervisor should also retain a copy of each canceled or completed entry permit for at least one year.

12. A copy of the Permit can be found on the Code QH, website, on the ARCWEB forms page, and in section 26.15.3 of this chapter.

26.7.3 Alternate Entry Requirements

In 29 CFR 1910.146 (c) (5) and (c) (7), OSHA allows use of an alternate entry procedure to enter a PRCS in place of an entry permit, provided that all of the following requirements are met:

1. It can be demonstrated that the only primary hazard posed by a PRCS is an actual or potential atmospheric hazard.
2. Continuous forced air ventilation is sufficient to maintain the space safe for entry.
3. There is documentation of air monitoring and inspection data that substantiate the conditions above.
4. Documentation to support the former conditions is recorded on the Alternate Entry Confined Space Procedures Authorization Form prior to entry into the space and made available to each employee who enters the permit space. A copy of this form can be found in section 26.15.4 of this chapter, on the Code QH website and on the ARCWEB forms page.
5. If any initial entry of the permit space is necessary to obtain the required monitoring and inspection data, the entry shall be performed under the regular procedures for entering a permit-required space including the completion of a Confined Space Entry Permit and the presence of an attendant.
6. If conditions exist that makes it unsafe to remove an entrance cover, the unsafe condition shall be eliminated before the cover is removed.
7. When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.
8. Before an employee enters the space, the internal atmosphere shall be tested with a calibrated, direct reading instrument for the following conditions in the order given:
 - Oxygen content
 - Flammable gases and vapors, and
 - Potential toxic air contaminants.
9. The authorized entrant or attendant if used is responsible to complete and record these atmospheric tests on the Alternate Confined Space Entry Form.
10. There shall be no hazardous atmosphere within the space whenever any employee is inside the space.
11. Continuous forced air ventilation shall be used as follows:
 - An employee shall not enter the space until the forced air has eliminated any hazardous atmosphere;
 - The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space;
 - The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.
12. If the hazardous atmosphere is detected during entry:
 - Each employee shall leave the space immediately

- The space shall be evaluated to determine how the hazardous atmosphere developed.
 - Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.
13. At the completion of the entry make sure that a copy of the Alternate Entry Confined Space Form is sent to the Confined Space Representative at **REDACTED**.

26.8 Safety Precautions

26.8.1 Confined-Space Hazards

Confined space hazards fall into two (2) general categories; hazardous atmospheres and physical hazards.

26.8.2 Atmospheric Hazards

Hazard	Description	Comments
O ₂ Deficiency	Less than 19.5% by volume	May cause light-headedness, dizziness or unconsciousness
O ₂ Increase	Greater than 23.5% by volume	Increase flammability and explosion possibilities
Hydrogen Cyanide	Poisonous gas	Has a bitter almond odor
Hydrogen Sulfide	Toxic gas	Has a rotten egg odor
Methane	Toxic, flammable, and explosive	Has no odor
Freon	May be toxic depending on type	Displaces breathing air
Vapors from Jet Fuels, gasoline, solvents, and other carbon based liquids	Usually toxic, flammable, and explosive	Get up wind from vapors
Dusts	May be explosive	May damage respiratory system
Carbon Dioxide (C O ₂) & Nitrogen (N ₂)	Can concentrate in low places	Displaces breathing air
Carbon Monoxide (CO)	Toxic gas	Replaces O ₂ in the blood
Fumes, vapors, mists, and gases	Welding, cutting, flames, sparks, etc.	Work being done may change the classification of the space

26.8.3 Test Conditions

1. Conditions must be tested in a confined space prior to entry to determine if acceptable entry conditions exist.
2. If isolation of the space is not feasible because the space is larger or is part of a continuous system, such as a sewer, pre-entry testing shall be performed to the extent feasible before entry is authorized and, if entry is authorized, entry conditions shall be continuously monitored where Entrants are working.
3. If hazardous atmosphere could be created by the work being done such as welding, cutting, brazing, open flames, etc., atmospheric monitoring will be continuous.

26.8.4 Test Sequence

When testing for atmospheric hazards it is CRITICAL that the order of testing be followed.

- Oxygen
- Combustible gases or vapors
- Toxic gases and vapors

26.8.5 Ventilation

Entrants will not enter a confined space that contains a hazardous atmosphere without appropriate respirators. The hazardous atmosphere must be eliminated from a PRCS by forced ventilation in order for the space to be re-classified. The airflow shall be directed to ventilate the immediate area where the Entrants are to be in the space and shall be directed to ventilate the immediate area where the Entrants are to be in the space and shall start 30 minutes prior to entry and continue until all Entrants have left the space. The air supply shall be from a clean source and may not increase the hazards in the space. The atmosphere shall be tested periodically or as directed by the permit or checklist to ensure the ventilation is adequate. Should a hazardous atmosphere be detected all Entrants will evacuate the space. The reason for the atmospheric change will be determined and corrected before Entrants may re-enter the space.

26.8.6 Physical Hazards

Physical Hazards Table		
Hazard	Description	Comments
Electrical	Electrical transmission line, equipment or machines	Lockout or tagout (LOTO) procedures may be required
Thermal Energy	Heat, steam, or hot atmosphere	May not require ventilation, LOTO, etc.
Becoming lodged	Space becomes narrower, slopes downward	Area requires a survey before entering and the use of an extraction harness
Falling objects	Debris, or tools that can fall into space	Isolate openings, Hard hats required and other precautions need to be taken
Falls	Falls from ladders or other support equipment	Use proper support equipment
Noise	Noise may be excessive where equipment or machinery is located in a confined space	
Hot Tap, welding, brazing, etc	Open flames, sparks	May require additional permits

26.9 Rescue

26.9.1 First Aid & CPR Certification

For entry involving Ames personnel, either the entry supervisor or the attendant will hold a current certification in First-Aid and CPR.

26.9.2 Retrieval Systems

To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a PRCS, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements:

1. Each authorized entrant shall use a chest or full-body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, or above the entrant's head. Wristlets may be used in lieu of the chest or full-body harness if the employer can demonstrate that the use of a chest or full-body harness is not feasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative.

2. The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary. A mechanical device shall be available to retrieve personnel from vertical permit spaces more than five feet deep.

26.9.3 Non-entry Rescue

If in the course of a PRCS entry, an attendant becomes aware that an entrant needs assistance in escaping from permit-required confined space hazards, the attendant shall:

1. Summon rescue and other emergency services.
2. Begin non-entry rescue procedures determined in the pre-entry safety briefing (e.g., use the mechanical retrieval system to extract the entrant from the confined space).
3. Attendants may not enter a permit-required confined space to attempt a rescue unless they have been trained and equipped for rescue operations, and if they have been relieved by another attendant.

26.9.4 Rescue that Requires Entry

1. Employees who enter PRCS to perform rescue services must meet the training requirements outlined in section 26.10.2.
2. If rescue cannot be accomplished using the non-entry procedure, the attendant shall:
 - a. Summon rescue and other emergency services.
 - b. Implement rescue support actions determined in the pre-entry safety briefing.
3. Qualified rescuers will follow their standard operating procedure for rescue operations in confined spaces.

26.9.5 Toxic Materials

If an injured Entrant is exposed to a substance for which a Material Safety Data Sheet (MSDS) or similar written information is required to be kept at the work site, that MSDS or written information shall be made available to the medical facility treating the exposed Entrant.

26.10 Training and Certification

26.10.1 Training Requirements

Entrants, Attendants, Entry Supervisors, and rescue service members shall be qualified for the position they fill. Training records shall include each employee's name, the signature or initials of the trainer, and the dates of the training. Training records will be available for inspection by authorized confined space team members and their authorized representatives.

Training shall at minimum, include the following:

1. The operations of the Confined Space Program.
2. The specific duties of each person involved in confined space operations.
3. The hazards of confined-spaces including information on the mode, signs or symptoms, and consequences of exposure.
4. The proper use of equipment required during confined space operations including testing and monitoring equipment, ventilating equipment, communication equipment, personal protective equipment, lighting equipment, barriers and shields, ingress/egress equipment, rescue and emergency equipment used for non-entry rescue.
5. The methods and importance of communication between Entrant and Attendant.
6. The conditions under which the space should be evacuated.
7. The procedures for summoning rescuers.
8. The procedures to be used for a non-entry rescue.

9. Each member of the confined space entry team at Ames will receive annual refresher training after the initial training course has been taken.

26.10.2 Rescue Training

Employees who enter permit-required confined spaces to perform rescue services shall receive all the training normally given to authorized Entrants, Attendants, and Entry Supervisors.

In addition their training shall also include the following:

1. The proper use of any PPE or rescue equipment necessary for making rescues
2. from permit spaces.
3. The specific duties required for rescue personnel.
4. Practice making confined space rescues at least once a year, by means of simulated rescue operation in which they remove dummies, mannequins, or actual person from the actual or representative permit spaces.
5. Basic first aid and CPR.

26.10.3 Employee Training

Training shall be provided to each affected employee:

1. Before the employee is first assigned confined-space operations duty.
2. Before there is a change in assigned duties.
3. Whenever there is a change in permit-required confined-space operations that presents a hazard about which an employee has not previously been trained.
4. Whenever anyone has reason to believe either that there are deviations from the permit-required confined space entry procedures or that there are inadequacies in the employee's knowledge or use of these procedures.
5. The training shall establish employee proficiency in the duties required of authorized Entrants, Attendants, Entry Supervisors, and rescue service members, and shall introduce new or revised procedures, as necessary.

26.10.4 Safety Division

Will provide confined space training to Ames personnel and on-site contractors. Off-site contractors will make appropriate arrangements for training and documentation in accordance with 29 CFR 1910.146.

26.10.5 Training Certification

Once trained, each employee who serves as an authorized Entrant, attendant, Entry Supervisor, or rescue service member shall have his/her training documented. The documentation shall contain the employee's name, the signature and initials of the trainer, and the dates of training. The documentation will be available for inspection by employees and their authorized representatives. A list of trained employees is located in the Safety Office.

26.11 Contractors Working in Confined Spaces

1. When contractors are hired to perform work that involves permit-required confined-space entry, the COTR, NASA Project Manager, or the NASA area supervisor shall:
 - Inform the contractor that the workplace contains permit spaces and that permit required confined space entry is allowed only through compliance with NASA's written Confined Space Entry Program.
 - Apprise the contractor of any precautions or procedures that NASA has implemented for the protection of employees in or near permit required confined spaces where contractor personnel will be working.

- Apprise the contractor of the elements, including the hazards identified and NASA's experience with the space that make the space in question a permit required confined space.
 - Debrief the contractor at the conclusion of the entry operations regarding the program followed and any hazards confronted or created in permit required confined spaces during entry.
 - Coordinate entry operations when employees of more than one employer are working simultaneously as authorized Entrants in a permit required confined space, so that employees of one employer do not endanger the employees of any other employer.
2. Each contractor who is retained to perform permit required confined space entry operations shall:
- Comply with all permit required confined space requirements outlined in the Ames Confined Space Entry Program.
 - Obtain any available information regarding permit required confined space hazards and entry operations from NASA.
 - Coordinate entry operations with NASA management and employees when both NASA personnel and contractor personnel will be working in or near permit required confined spaces.

26.12 Telecommunications Field Work

This section applies to the guarding of utility vaults and street openings, and to atmospheric testing and ventilation in utility vaults and non-vented vaults where telecommunications fieldwork is performed on or with underground lines. Telecommunications utility companies or contractors they control may perform work in spaces that NASA has classified as permit required confined spaces. The space may be reclassified so long as it has been documented that all potential or actual hazards have been eliminated prior to entry and at a minimum the requirements of this section are met.

26.12.1 Guarding Utility Vaults and Street Opening

When covers of utility vaults or street openings are removed, the opening shall be promptly guarded by a railing, temporary cover, or other suitable temporary barrier which is appropriate to prevent an accidental fall through the opening, and to protect employees working in the utility vault from foreign objects entering the opening.

26.12.2 Requirements Prior to Entering Utility Vaults and Non-vented Vaults

Before an employee enters a utility vault, the following steps shall be taken:

- the internal atmosphere shall be tested for oxygen deficiency, combustible gases, and toxic gases.
- when unsafe conditions are detected by testing, or other means, the work area shall be vented and otherwise made safe before entry.
- All air monitoring results shall be documented on the Non-permit Confined Space Entry Checklist. The checklist is used to verify that the vault is safe to enter and prior atmospheric conditions have not changed.

26.12.3 Air Supply

An adequate continuous supply of air shall be provided while work is performed in utility vaults under any of the following conditions:

1. Where combustible or explosive gas vapors have been initially detected and subsequently reduced to safe levels by ventilation, or;
2. Where solvents and other hazardous materials are used in the work procedure, or;

3. When open flame torches are used in the work procedure, or,
4. Where the utility vault is located in the portion of a public right of way open to vehicular traffic and/or exposed to seepage of gas or gases, or;
5. Where toxic gas or oxygen deficiency is found.

26.12.4 Joint Power and Telecommunication Utility Vault

26.12.4.1 First Aid and CPR

An employee with basic first aid and CPR training shall be available in the immediate vicinity to render emergency assistance when work is being performed in a utility vault occupied jointly by an electric and telecommunication utility. This employee is not precluded from occasionally entering a utility vault to provide assistance other than in an emergency. The requirements of this section does not preclude a qualified employee working alone from entering, for brief periods of time, a utility vault where energized cables or equipment are in service for the purpose of inspection, housekeeping, taking readings, or similar work when such work can be performed safely.

26.12.4.2 Ladders

Ladders shall be used to enter and exit utility vaults exceeding 4 feet in depth.

26.12.5 Open Flame

When open flames are used in utility vaults, the following precautions shall be taken to protect against the accumulation of combustible gas:

1. A Confined Space Entry Permit or Alternative Entry Form is required.
2. A test for combustible gas shall be made immediately before using the open flame device and continuously while using the device.
3. A fuel tank (e.g., acetylene, etc.) may not be in the utility vault except during actual use.
4. A welding, cutting and brazing permit (hot work permit) shall be filled out and approved by the appropriate department prior to performing any work that creates a flame or spark. Precautions shall be taken to guard against a build up of combustible, toxic gases, fumes, mist, etc., when open flames or welding operations are being performed in vaults.

26.13 Records

All Confined Space Forms shall be submitted to the Safety, Health and Medical Services Division at **REDACTED** at completion of each entry or task.

26.14 Review of Confined Space Entry Procedures

26.14.1 Permit Required Confined Space Entry

26.14.1.1 Entry Supervisor

1. Complete the Confined Space Entry Permit. Obtain necessary monitoring equipment and insure it is properly calibrated.
2. Verify that attendants and Entrants are qualified (training) and that proper PPE and required safety equipment is available.
3. Ensure that conditions are monitored periodically or continuously as required to ensure that conditions do not degrade from initial evaluation and that the operations remain consistent with the terms of the entry permit.
4. Remove unauthorized persons who enter or attempt to enter the confined space or secure area during entry operations.

5. Order evacuation of the space and cancel the permit when unsafe conditions exist or the task is completed. Return the original or a copy of the permit to **REDACTED**, Safety, Health and Medical Services Division.

26.14.1.2 Attendants

1. Ensure Entrants are properly equipped and that pre-entry testing and measurements have been taken prior to entry.
2. Maintain Entrant identification and effective communication with all Entrants.
3. Monitor entry activity and watch for prohibited conditions both inside and outside the confined space. Keep authorized personnel away from the entry site.
4. Order Entrants to cease operation and exit confined space when:
 - A prohibited condition exist
 - A behavior or unusual condition in an Entrant is detected,
 - An unsafe condition occurs inside or outside the permit space.
 - Unable to perform all necessary duties. In an emergency, initiate non-entry rescue and notify rescue services if necessary.

26.14.1.3 Entrants

1. Ensure that proper PPE is worn and functional and that required equipment is on site and functional.
 2. Communicate with the attendant to enable the attendant to maintain current status of the operation.
 3. In the event of an emergency notify the attendant when:
 - Any warning signs or symptoms of exposure to a substance is noted; or
 - A prohibited or dangerous condition is detected.
 4. Evacuate the space when:
 - An order to evacuate is given
 - A warning sign or symptom of exposure is recognize
 - A prohibited condition is detected
 - An evacuation alarm is activated
 - Atmospheric monitoring equipment indicates an unsafe atmosphere
-

26.15 Appendices

26.15.1 Appendix A: Permit-Required Confined-Space Decision Flow Chart

1. Does the workplace contain confined-spaces as defined below? Confined space means a space that: • Is large enough and so configured that an employee can bodily enter and perform assigned work; and • Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and • Is not designed for continuous employee occupancy.	NO! ➡	2. Consult other applicable OSHA standards STOP!	
YES!			
3. Does the workplace contain permit-required confined-spaces as defined below? Permit-required confined-space (permit space) means a confined-space that has one or more of the following characteristics: • Contains or has a potential to contain a hazardous atmosphere; • Contains a material that has the potential for engulfing an entrant; • Has an Internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or Contains any other recognized serious safety or health hazard.	NO! ➡	4. Consult other applicable OSHA standards STOP!	
YES!			
5. Inform employees as required by Sections 26.5 and 26.11			
6. Will permit spaces be entered?	NO! ➡	7. Prevent employee entry. Do task from outside of space. STOP!	
YES!			
8. Will contractors enter?	YES! ➡	9. Task will be done by contractors' employees. Inform contractor as required by Section 26.11. Contractor obtains information required by Section 26.11 from host.	
NO!		10. Both contractors and host employees will enter space?	NO! Go To 14
		YES!	
		11. Coordinate entry operations as required by Section 26.11.1(e). ➡	Go To 14
12. Will host employees enter to perform entry tasks?	NO! ➡	13. Prevent unauthorized entry. STOP!	
YES!			
14. Does space have known or potential hazards?	NO! ➡	15. Not a permit-required confined-space. Chapter 26 does not apply. Consult other OSHA standards.	
YES!			
16. Can the hazards be eliminated?	YES! ➡	17. Employer may choose to reclassify space to non-permit-required Confined space using Section 26.6. STOP!	
NO!			
18. Can the space be maintained in a condition safe to enter by continuous forced air ventilation only?	YES! ➡	19. Space may be entered under Section 26.8.2. STOP!	
NO!			
20. Prepare for entry via permit procedures.			
21. Verify acceptable entry conditions. (Test results recorded, space isolated if needed, rescuers/means to summon available, entrants properly equipped, etc.).	NO! ➡	22. Permit not valid until conditions meet permit specifications	
YES!			
23. Permit issued by authorizing signature. Acceptable entry conditions maintained throughout entry.	NO! ➡	24. Emergency exists (prohibited condition). Entrants evacuated, entry aborts. (Call rescuers if needed.) Permit is void. Re-evaluate program to correct/prevent prohibited conditions. Occurrence of emergency (usually) is proof of deficient program. No re-entry until program (and permit) is amended. (May require new program.) ➡ Go To 8	
YES!			
25. Entry tasks completed. Permit returned and canceled.			
26. Audit permit program and permit based on evaluation of entry by entrants, attendants, testers and preparers, etc.			

26.15.2 Appendix B: Confined-Space Evaluation Form

Confined Space Evaluation Form	NASA Ames Research Center
---------------------------------------	---------------------------

Identification # _____ Date: _____
 Location: _____ Dimensions: _____
 Description: _____
 Type Of Evaluation (Check one): Initial Re-evaluation
 Does this space meet the definition of a confined space? Yes No
 If no, evaluation is complete and space is not a confined Space. Sign, date, & file the evaluation form.

If yes, determine if the space is a Non-Permit Confined Space or a Permit-Required Confined Space.

Hazard Identification:	Yes or No	Describe:
Yes <input type="checkbox"/> No <input type="checkbox"/> Atmosphere (e.g. oxygen deficiency or enrichment; toxic air contaminants; combustible gases, vapors, or particulate; rust formation; biological decomposition; exhaust from internal combustion engines; etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Chemical contact (e.g. acids, alkalis, coal tar products, sensitizers, skin irritants, solvents, paints, cleaners, adhesives, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Electrical (e.g. lines and cables, transformers, capacitors, relays, switch gear, exposed terminals, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Biological (e.g. sewage, storm drains, waste water, blood or other bodily fluids, live/dead animals, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Environmental (heat stress; cold stress, slippery surfaces; lighting; potential for insects; flooding due to groundwater, tide or rain, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Hazardous Materials (e.g. pressurized fluids in chemical piping or hydraulic systems, residual process chemicals, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Ignition Sources (e.g. open flames, heat sources, frictional sparks, non-hazard classified electrical equipment, welding/cutting, hot riveting, hot forging, static discharge, grinding, chopping, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Mechanical (e.g. agitators, blenders, stirrers, conveyors, unguarded belts, unguarded fans, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Noise (e.g. posted high noise level area, fans and blowers, noise from work operations in space, or nearby equipment, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Physical Hazards (e.g. falls, engulfing materials such as liquids or flowing particles, entrapment due to confined space configuration, access, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Process Hazards (e.g. contaminant producing activities in or around the space such as sandblasting, painting, or other unique process activities). Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Radiation (e.g. lasers, welding flash, RF and microwaves, radioactive sources, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Traffic (e.g. pedestrian, public walk way, forklifts, etc.) Describe: _____		
Yes <input type="checkbox"/> No <input type="checkbox"/> Other: Describe: _____		

Oxygen Content: _____% H₂S: _____ ppm
 Flammability (LEL) _____%LEL CO: _____ ppm

The space has been determined to be (check one):
 Not a confined space Non-permit confined space Permit-Required confined space

If a confined space is the appropriate sign posted?
 If No, contact the Confined Space POC. Sign provided? Yes No

This space has been inspected and evaluated for the purpose of determining the permitting status as a confined space. Work in this space must be further evaluated prior to entry, as the status may change based on new conditions or the work performed.

Evaluator _____ Date: _____

26.15.3 Appendix C: Entry Permit For Permit Required Confined Spaces

NASA Ames Research Center	Entry Permit For Permit Required Confined Spaces							
Confined Space Number: _____ Location _____ Description of Confined Space: _____ Purpose for entry: _____ Date: _____ Time Issued: _____ Time Expired: _____ Evaluation Pulled: Yes ___ No ___								
Name of Entrants (Print)/ Date Trained:	Name of Attendants (Print)/ Date Trained:							
1) _____ / _____	1) _____ / _____							
2) _____ / _____	2) _____ / _____							
3) _____ / _____	3) _____ / _____							
4) _____ / _____	4) _____ / _____							
Confined Space Hazards:								
(Describe and state how the hazard was eliminated. If hazard does not exist enter N/A.)								
Atmospheric Hazards: (ie. O2 deficiency, O2 enrichment, toxicity, flammability) Describe: _____								
Mechanical Hazards: (ie. Agitators, blenders, fan blades) Describe: _____								
Chemical Hazards: (ie. Acids, alkalis, sensitizers, skin irritants) Describe: _____								
Electrical Hazards: (ie. lines and cables, high voltage, transformers, exposed terminals) Describe: _____								
Engulfment Hazards: (ie. Water, plastics and chemicals, inwardly converging walls, sloping floors) Describe: _____								
Ignition Hazards: (ie. open flames, heat sources, welding) Describe: _____								
Process Hazards: (ie. pressurized fluids, chemicals, hydraulic fluid, traffic hazards) Describe: _____								
Environmental Hazards: (ie heat, cold, insects, vermin, slippery surfaces) Describe: _____								
Noise Hazards: (ie. ambient noise levels, loud equipment) Describe: _____ Any								
Other Serious Safety Hazards: Describe: _____								
26.1.1.1 Personal Protective & Safety Equipment								
<input type="checkbox"/> Hard Hat <input type="checkbox"/> Coveralls <input type="checkbox"/> Boots <input type="checkbox"/> Face Shield <input type="checkbox"/> Explosion Proof Light <input type="checkbox"/> SCBA <input type="checkbox"/> gloves (Specify: _____) <input type="checkbox"/> Safety Harness <input type="checkbox"/> Goggles <input type="checkbox"/> Hot work permit <input type="checkbox"/> GFCI Equip. <input type="checkbox"/> Hearing Protection <input type="checkbox"/> Respirator (Specify: _____) <input type="checkbox"/> Fire Extinguisher <input type="checkbox"/> Crane/Tripod w Wench <input type="checkbox"/> Communication: Verbal, radio, visual (circle one) <input type="checkbox"/> Other:(Specify _____)								
Atmospheric Monitoring								
Acceptable Range	Pre Entry	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7
Oxygen 19.5 to 23.5%								
Flammability <10%LEL								
CO <12ppm								
H2S <5ppm								
Toxicity <1/2 PEL								
Testers Initials/Time								
Instrument Make Model	Serial Number		Calibration Date			Conditions Measured (O2, CO, LEL, etc)		
1.1.1.1 Rescue and Emergency								
<input type="checkbox"/> Notify NASA dispatch, REDACTED that a confined space entry is expected. <input type="checkbox"/> Pre entry Safety Mtg held, employees briefed on emergency Procedures <input type="checkbox"/> Ensure attendant understands methods of emergency alert to others, ie Health unit and fire Dept. <input type="checkbox"/> All entrants wear harness and are attached to lifeline. Unless retrieval equipment will increase overall risk or benefit during a rescue.								
1.1.1.2 Permit Authorization								
I certify that all actions and conditions necessary for safe entry have been performed.								
Entry Supervisor Name(Print)	Entry Supervisor Signature			Date:				

26.15.4 Appendix D: Confined Space Alternate Entry Form



26.1.5 Appendix E: Confined-Space Sign: Permit-Required



26.1.6 Appendix F: Confined-Space Sign: Do Not Enter



26.1.7 Appendix G: Non-Permit Required Space Reclassification Form

Non-Permit Confined Space Checklist

TELECOMMUNICATION VAULT OPERATING PERMIT

Space Number: Space Location: Date

Time manhole opened: Time manhole closed:

Entrants Name/Organization

- 1. _____ / _____ 3. _____ / _____
- 2. _____ / _____ 4. _____ / _____

• Do any potential hazards exist within the confined space?

- 1. Atmosphere: _____ 2. Chemical contact: _____
- 3. Electrical: _____ 4. Biological: _____
- 5. Process Hazards _____ 6. Environmental: _____
- 7. Hazardous _____ 8. Ignition: _____
- 9. Physical _____ 10. Other: _____

If yes, on any above, the conditions must be eliminated prior to entry or re-evaluated for Permit-Required Confined Space Entry.

- Secure the work site: Initials:
- Notify NASA dispatcher at **REDACTED** Initials:
- Set up warnings and traffic controls Initials:
- Post the area with appropriate signs: Initials:
- Place manhole guard at opening Initials:
- Power ventilate manhole Initials:
- Test manhole atmosphere: Initials:

Acceptable Range	Test 1	Test 2	Test 3
Oxygen% 23.5-19.5			
Flammability <10% LEL			
CO<12 ppm			
H2S 5 ppm			
Other <1/2 PEL			
Tester Initials			
Time			
Instrument Make, Model No.	Serial Number	Calibration Date	Conditions Measured

END OF DOCUMENT