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ENVIRONMENT, SAFETY & HEALTH DIVISION

Chapter 6: [Confined Space](#)

Entry Procedures

Product ID: [155](#) | Revision ID: 1746 | Date published: 5 June 2015 | Date effective: 5 June 2015

URL: <http://www-group.slac.stanford.edu/esh/eshmanual/references/confinedProcedEntry.pdf>

1 Purpose

The purpose of these procedures is to ensure that entry into any confined space is planned and documented as required in order to identify and control hazards. They cover the entry method selection, planning, and documentation of entry into confined spaces of both classifications: *non-permit-required confined space (NPRCS)* and *permit-required confined space (PRCS)*. They apply to workers, workers, confined space entry supervisors, confined space owners, area and building managers, line management, field construction and service managers, and the program manager.

2 Procedures

Requirements for entering a confined space depend on the hazards present as determined by information in the [confined space inventory](#) and by observation. The first step is to determine the applicable entry method as described in Section 2.1. (For a description of the inventory, see Section 2.5.4)

All entries must be reviewed and confirmed as described below and in the required form or permit. To ensure entry conditions are acceptable, forms are good for one day only. For work lasting more than one day, a separate form is needed for each day's work. Completed forms must be kept at or near the entrance to the space during the entry.

Note A signed and approved [hot work permit](#) is required for any spark or flame-producing activities to be done in the space. Proper lock out/tag out procedures must be in place where applicable, and must be performed by authorized persons properly trained as described in [Chapter 51, “Control of Hazardous Energy”](#).

The *two-person rule* applies to all confined space entries; that is, every confined space entry requires the presence of at least two qualified persons:

- For NPRCS entries, the minimum qualification is that both workers are current in the training required at the *attendant* or *entrant* level.
- All PRCS entries must be supervised by a *confined space entry supervisor* and carried out by workers who are current in the training required at the attendant or entrant level.

Additional requirements for all types of entry are described in Section 2.5.

2.1 Determining the Applicable Entry Method

The four possible methods of confined space entry are non-permit-required and three variants for spaces classified as a PRCS: alternate entry, temporary declassification, and permit required. The required method depends on the confined space classification (NPRCS or PRCS), identified hazards listed in the [confined space inventory](#), and hazards introduced by the work to be done. Each type of entry requires a specific procedure and a form or permit as described below. (For an overview, see Figure 1.)

2.1.1 Non-permit-required Confined Space Entry

NPRCS entry applies when no hazards are present. The confined space entry supervisor must confirm that no hazards exist and none will be introduced (see Section 2.2).

Note *The NPRCS entry supervisor may reclassify the entry if hazardous materials or activities are involved.*

2.1.2 Permit-required Confined Space Entry

A PRCS entry applies when hazards are present. The applicable form or permit requires that all hazards are listed and it specifies the required controls that mitigate or eliminate each hazard.

Entry into a confined space classified as a PRCS may qualify for an alternate procedure or a temporary declassification if hazards can be eliminated as described below. If hazards exceed the stated conditions, a permit is required.

2.1.2.1 Alternate Entry

A PRCS for which the only identified hazard is an actual or potential hazardous atmosphere qualifies for the alternate entry procedure (Section 2.3) if it can be demonstrated by air monitoring that continuous forced air ventilation alone is sufficient to remove the hazardous atmosphere and maintain the space safe for entry. A confined space entry supervisor must complete the [Confined Space: Alternate Entry Form](#) (or equivalent subcontractor's SLAC-approved form) to verify these conditions.

2.1.2.2 Temporary Declassification

A PRCS may be temporarily declassified if both these conditions apply:

1. No actual or potential atmospheric hazards are present
2. All hazards within the space can be eliminated from outside the space for the duration of the entry

A confined space entry supervisor temporarily declassifies a PRCS by signing a completed [Confined Space: Temporary Declassification Form](#) (or equivalent subcontractor's SLAC-approved form) (see Section 2.3). All hazards must remain completely eliminated for the duration of the entry. Evacuation and reassessment is mandatory if any change in conditions introduces a hazard.

2.1.2.3 Permit Required

If entry conditions do not qualify for the alternate entry or a temporary declassification, entry into the PRCS must follow the entry procedure for PRCS (Section 2.4) and be controlled by a [Confined Space:](#)

[Entry Permit](#) (or equivalent subcontractor's SLAC-approved permit) that is administered and carried out by a confined space entry supervisor.

2.1.3 Confined Space Entry Method Selection Procedure

Step	Person	Action
1.	Confined space entry supervisor / entrant / attendant or, for work involving subcontractors: field construction manager (FCM) / service manager (SM)	If the confined space is identified with a posting: uses identifying information to check the confined space inventory for profile information. If the space is listed in the inventory but not posted: contacts the listed confined space owner to request that a posting with identifying information is put in place. If the work space is not posted and not listed: determines if this is a new confined space – it is large enough to enter and perform work, have limited means of access/egress, and is not designed for continuous human occupancy? If all three attributes apply, a profile must be created: contact the confined space program manager.
2.	Confined space entry supervisor	Determines or confirms applicable entry method (for an overview, see Figure 1): <ul style="list-style-type: none">▪ If the listed classification is NPRCS and no new hazards are identified in the space or from the work to be performed: the procedure in Section 2.2 applies. If new hazards associated with the space are identified, contact the confined space program manager to reclassify the space.▪ If the listed classification is PRCS and if the hazards are atmospheric only and it can be controlled by forced air ventilation: the procedure in Section 2.4 applies▪ If the listed classification is PRCS and hazards other than atmospheric are present, determines if a temporary declassification applies.¹ If so, the procedure in Section 2.4 applies▪ If none of the above apply, use the procedure in Section 2.4
3.	Confined space program manager	Updates confined space inventory when new confined spaces or hazards are reported
4.	Confined space owner	Ensures that identifying information is available at the confined space location as described in Confined Space: Posting Requirements

¹ 29 CFR 1910.146, paragraph (c)(7), states that if all hazards associated with a permit-required confined space can be eliminated before entry, then the space can be reclassified as a non-permit-required confined space (NPRCS) for the time necessary to accomplish the work and the hazards remain eliminated.

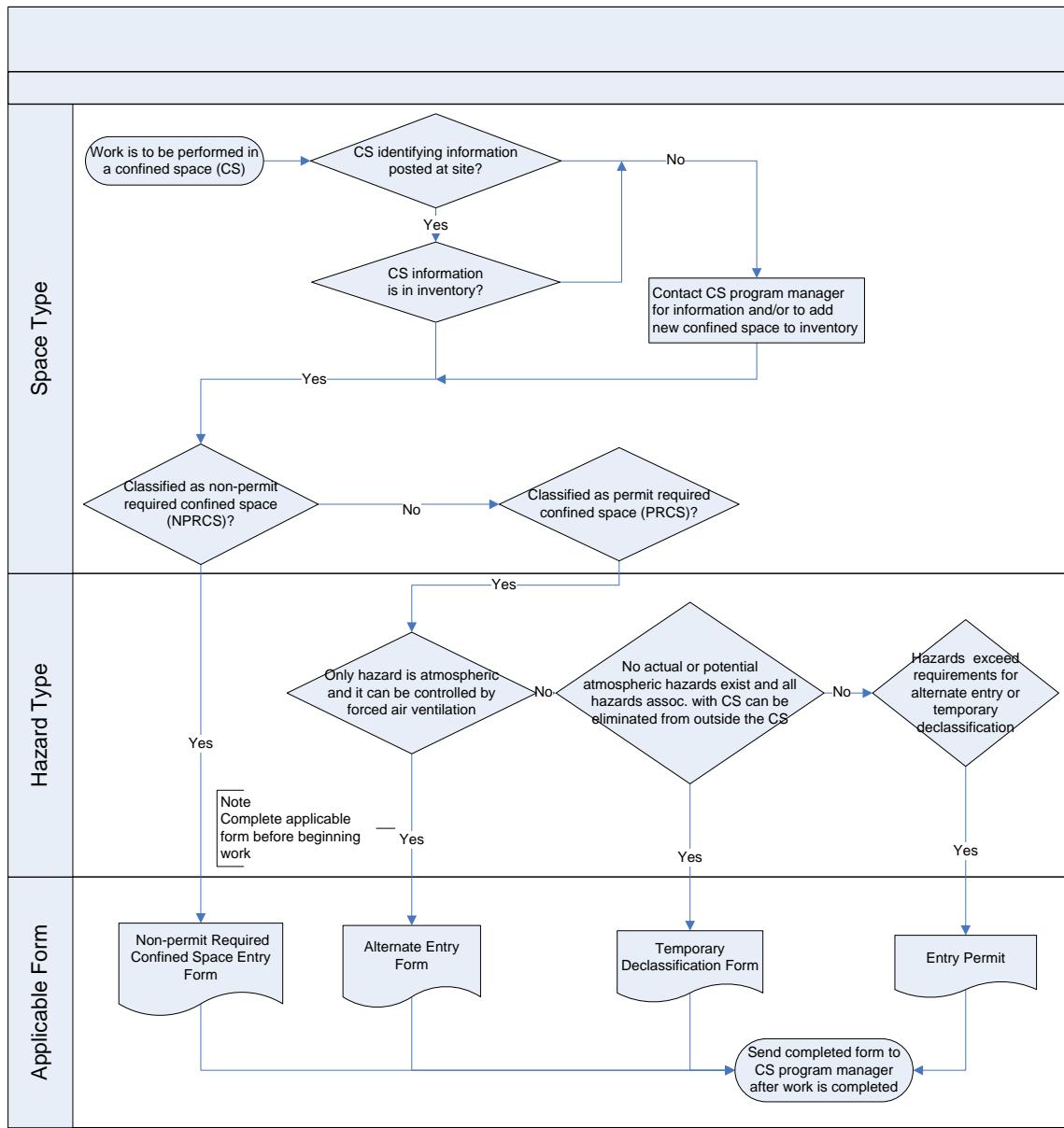


Figure 1 Entry Method Selection Process

2.2 Entry Procedure for Non-permit-required Confined Space (NPRCS)

Step	Person	Action
1.	Entrant / attendant	Completes Confined Space: Non-permit-required Confined Space Entry Form (or equivalent subcontractor's SLAC-approved form) to establish that the confined space still qualifies as non-permit required and that no hazardous work ¹ will be performed.
2.	Confined space entry supervisor / confined space program manager	Before any confined space work is begun, confirms NPRCS entry conditions by signing the form or determines that another entry method applies
3.	Entrant / attendant	Takes precautions, as necessary <ul style="list-style-type: none">Installs vehicular and pedestrian traffic controls as neededPosts warning signs and any required permit at the work locationTakes measures to prevent hazards near the confined spaceDons any required personal protective equipment
4.	Entrant / attendant	Performs authorized work <ul style="list-style-type: none">One person must remain outside the confined spaceIf a hazardous condition is encountered, evacuates immediately and reports to supervisor
5.	Entrant / attendant	Sends entry form to the confined space program manager (Mailstop 22) once work is completed
6.	Confined space program manager	Reviews form, updates confined space inventory as necessary, and keeps form on file for a minimum of one year

1 Hazardous work includes painting, cleaning with acids or solvents, welding, brazing, torch cutting, sanding with power tools, sandblasting, breaking utility lines, using cryogenic gases, conducting work that involves reduction-oxidation reactions, or operating valves capable of releasing material, such as water or gas, in a quantity sufficient to engulf a person or cause a hazardous atmosphere.

2.3 Entry Procedure for Alternate Entry and Temporarily Declassified Confined Spaces

Step	Person	Action
1.	Confined space entry supervisor	Confirms that entry conditions qualify for the selected entry method (as determined in Section 5.1) by signing the applicable form (or equivalent subcontractor's SLAC-approved form): <ul style="list-style-type: none">Confined Space: Alternate Entry FormConfined Space: Temporary Declassification Form
2.	Confined space entry supervisor	Ensures that hazards and controls are understood by the entrant(s) and attendant(s)

Step	Person	Action
3.	Entrant / attendant	Secures the work site <ul style="list-style-type: none"> ▪ Installs barriers and/or controls vehicular and pedestrian traffic as needed ▪ Posts warning signs and any required permits at the work location ▪ Takes measures to prevent hazards near the confined space
4.	Entrant / attendant	Ensures hazard is controlled before entry <ul style="list-style-type: none"> ▪ For alternate entry, ensures atmospheric testing is conducted as necessary to determine that entry conditions remain acceptable, and ensures forced air ventilation is in place if required (see completed form) ▪ For temporary declassification, ensures hazards are eliminated as specified on completed form¹
5.	Entrant / attendant	Performs work as long as hazards are controlled as specified on the form <ul style="list-style-type: none"> ▪ Any change that introduces hazards requires that the space be vacated ▪ New hazards must be re-assessed and a new entry method may apply; no entry is allowed until all hazards are eliminated
6.	Entrant / attendant	Sends completed form to the confined space program manager (Mailstop 22) once the work is finished
7.	Confined space program manager	Reviews form, updates confined space inventory as necessary, and keeps form on file for a minimum of one year

¹ Specified hazard elimination activities may include

- *Flushing chemicals*
- *Verifying a safe pH*
- *Isolating incoming fluid or gas lines*
- *Removing or locking out any exposed mechanical and electrical energies*

2.4 Entry Procedure for Permit-required Confined Space (PRCS)

Step	Person	Action
Planning		
1.	Confined space entry supervisor	Determines if non-entry rescue can be performed. If it cannot, entry is prohibited; contacts the confined space program manager
2.	Confined space entry supervisor	Determines control measures for hazards associated with the confined space entry
3.	Confined space entry supervisor	Verifies that all required equipment, attendants, and entrants are available
Pre-entry		
4.	Confined space entry supervisor	Documents the pre-entry process with the Confined Space: Entry Permit (or equivalent subcontractor's SLAC-approved permit)
5.	Confined space	Ensures that the confined space's atmosphere is ventilated as necessary and tested

Step	Person	Action
	entry supervisor	<p>prior to entry using properly calibrated monitoring equipment. (For assistance with obtaining monitoring equipment, contact the confined space program manager or ESH coordinator.)</p> <p>Results for the following must be recorded on the permit</p> <ul style="list-style-type: none"> ▪ Oxygen ▪ Flammability (percent of lower explosive limit) ▪ Hydrogen sulfide ▪ Carbon monoxide ▪ Any other suspected or known atmospheric hazard <p>If at any time the oxygen concentration falls below 19.5 percent, the cause of the deficiency must be determined and controls must be in place before entry is allowed. If entry is necessary to correct the deficiency, self-contained breathing apparatus must be worn.</p> <p><i>Note: the entrant has the right to witness atmospheric testing.</i></p>
6.	Confined space entry supervisor	<p>Secures the work site as appropriate</p> <ul style="list-style-type: none"> ▪ Installs barriers and/or controls vehicular and pedestrian traffic as needed ▪ Posts warning signs and any required permit(s) at the work location ▪ Takes measures to prevent hazards near the confined space
7.	Confined space entry supervisor	<p>Conducts pre-entry briefing for all personnel involved in the entry that includes at minimum these topics</p> <ul style="list-style-type: none"> ▪ Work to be performed ▪ Anticipated hazards, including signs, symptoms and consequences of exposure ▪ Hazard control measures ▪ <i>Prohibited conditions</i> (specified in the permit) ▪ Non-entry rescue procedures; generally these involve using a full-body harness with a retrieval line attached to a mechanical device or fixed point. (Wristlets may be used to aid in a difficult extraction; however, wristlets should not be used to support the person's weight.)
8.	Confined space entry supervisor	<p>Verifies that</p> <ul style="list-style-type: none"> ▪ All control measures, procedures, and equipment specified by the permit are in place ▪ Entry conditions are acceptable
9.	Confined space entry supervisor	<p>Signs the pre-entry certification section of the permit</p>
Confined space entry		
10.	Entrant	<p>Enters the permit-required confined space only if</p> <ul style="list-style-type: none"> ▪ Listed on the permit ▪ Entry conditions are acceptable ▪ All control measures and specified non-entry rescue provisions are implemented
11.	Confined space entry supervisor	<p>Verifies that acceptable entry conditions are maintained and that entry operations remain consistent with terms of the permit and the hazards associated with the planned</p>

Step	Person	Action
work		
12.	Attendant	<ul style="list-style-type: none"> ▪ Maintains communication with the entrant(s) and performs no other duties that might interfere with his or her ability to observe and protect the entrant(s) ▪ Controls entry by remaining at the work site and keeping an accurate accounting of entrants on the permit ▪ Does not become an entrant unless he/she is both listed as an entrant and has been replaced by a qualified attendant.
13.	Entrant	Maintains communication with the attendant. Maintains readiness to exit if ordered by attendant.
14.	Attendant	<p>Orders entrant(s) to evacuate the space if one or more of the following occurs:</p> <ul style="list-style-type: none"> ▪ Detects a <i>prohibited condition</i> ▪ Observes any behavioral effects of exposure to any hazard ▪ Identifies a nearby situation that may endanger the entrant(s) ▪ Becomes unable to effectively and safely perform all required duties
Post-entry / documentation		
15.	Confined space entry supervisor	Conducts a post-entry debriefing with entrants and attendants
16.	Confined space entry supervisor	<p>Closes the permit by signing the permit closure section of the permit as warranted</p> <ul style="list-style-type: none"> ▪ At the completion of the job ▪ At the end of the work shift ▪ When a change occurs in work conditions or methods that requires additional controls ▪ When a changes occurs that affects acceptable entry conditions <p>If the permit is closed due to a new hazardous condition, a new permit is required.</p>
17.	Confined space entry supervisor	Fowards the permit to the confined space program manager at Mailstop 22
18.	Confined space program manager	Reviews the closed permit, updates the confined space inventory if necessary, and maintains permits for at least one year from date of entry

2.5 Additional Requirements

2.5.1 Preventing Unauthorized Entry

Confined space owners must post an identifying sign at the entrance of each confined space as specified in [Confined Space: Posting Requirements](#).

The following are additional measures that can be taken to prevent unauthorized persons from entering a PRCS:

- Engineering controls such as
 - Locking or bolting the entrance

- Making access to the entrance difficult without the use of tools, heavy equipment, or several workers
- Welding the entrance shut
- Administrative controls such as ensuring personnel are trained to recognize hazards or PRCS conditions

2.5.2 Equipment

Owners of equipment used for confined space entry – such as air monitors, full body harnesses, lifelines, tripods, hoists, respirators, and any other types of personal protective equipment (PPE) – will develop and follow a maintenance schedule, and the equipment will carry inspection and calibration information when appropriate.

2.5.3 Rescue

All permit-required entries must have a *non-entry rescue* plan and *retrieval system* in place before entry. No entry for which entry rescue is required will be authorized, as there is no active confined space entry rescue team at SLAC. When rescue is needed, the following actions will be taken:

1. Perform non-entry rescue
2. Call 911
3. Call SLAC Site Security (ext. 5555)
4. Notify supervisor
5. Prevent entry into space

2.5.4 Confined Space Inventory

2.5.4.1 Inventory Maintenance

The confined space program manager will maintain the [confined space inventory](#), which includes all identified confined spaces and provides the basis for entry method selection.

Each confined space profile includes

- A profile (confined space owner, dimensions, location, and description)
- Hazards and controls
- Classification (PRCS or NPRCS)

The program manager must keep the inventory current by reviewing forms and permits for all confined space entries.

Upon creation or discovery of a new or suspected confined space

- The building or area manager designates a confined space owner and notifies the confined space program manager.
- The confined space program manager evaluates the confined space and adds it to the confined space inventory.

- The confined space owner identifies the confined space with the posting appropriate to the space classification (see [Confined Space: Posting Requirements](#)).

3 Forms

The following forms (or equivalent subcontractor's SLAC-approved forms) are required by this procedure:

- [Confined Space: Entry Permit](#) (SLAC-I-730-0A21J-002)
- [Confined Space: Alternate Entry Form](#) (SLAC-I-730-0A21J-010)
- [Confined Space: Non-permit-required Confined Space Entry Form](#) (SLAC-I-730-0A21J-006)
- [Confined Space: Temporary Declassification Form](#) (SLAC-I-730-0A21J-009)
- [Confined Space Inventory](#)

4 Recordkeeping

The following recordkeeping requirements apply for this procedure:

- Completed forms must be kept at or near the entrance to the space during entry. SLAC forms must be sent to the confined space program manager (Mailstop 22) once work is completed; subcontractors maintain their own forms.
- The confined space program manager (or subcontractor) will compile all closed permits and all completed non-permit-required confined space entry, alternate entry, and temporary declassification entry forms and retain them for a minimum of one year for use in program assessments.

5 References

[SLAC Environment, Safety, and Health Manual](#) (SLAC-I-720-0A29Z-001)

- [Chapter 6, "Confined Space"](#)
 - [Confined Space: Posting Requirements](#) (SLAC-I-730-0A21S-051)
- [Chapter 29, "Respiratory Protection"](#)
- [Chapter 51, "Control of Hazardous Energy"](#)

Other SLAC Documents

- [Hot Work Permit-Fire](#)

Other Documents

- Title 29, *Code of Federal Regulations*, "Labor", Subtitle B, "Regulations Relating to Labor (Continued)", Chapter 17, "Occupational Safety and Health Administration, Department of Labor", Part 1910, "Occupational Safety and Health Standards", Subpart J, "General Environmental Controls", Section 146, "Permit-required Confined Spaces" ([29 CFR 1910.146](#))