

**Summary Report for Individual Task
551-8ST-8121
Perform Confined Space Entry IAW Policies and Procedures
Status: Approved**

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

DESTRUCTION NOTICE: None

Condition: These procedures apply to any entry into tanks, compartments, voids, manholes, vaults, sewers or other spaces that may be entered to perform work, have limited or restricted means of egress that would make escape difficult and are not designed for continuous human occupancy. Confined space entry procedures must be carried out properly by the vessels crew when training for emergencies (i.e., fire or damage control) at sea, in port, and during actual events using fall arrest device, non-entry rescue tripod, appropriate four-gas meter, and lock out tag out kit.

Standard: The Soldier will ensure that 100 percent of confined work spaces are maintained safe for entry and to perform work,IAW FM 4-01.502.

Special Condition: These procedures also apply to hot work adjacent to confined and other spaces that may present an explosion or other fire hazard. These procedures supplement federal occupational safety and health standards contained in 29 CFR 1910.146 and 29 CFR 1915 relative to confined space entry and gas free engineering.

Special Standards: None

Special Equipment:

Safety Level: Extremely High

MOPP:

Task Statements

Cue: None

DANGER

None

WARNING

None

CAUTION

None

Remarks: None

Notes: None

Performance Steps

1. Define frequently used vocabulary terms.

a. Adjacent spaces. Spaces bordering a subject space in all directions, including all points of contact, corners, diagonals, decks, tank tops, and bulkheads.

b. Attendant. An individual stationed outside, a permit required confined space who monitors the authorized entrants and who performs all duties assigned in accordance with the unit's permit space program.

c. Authorized entrant. An individual who has attended the required Confined Space Entry Competent Person training at the US Army Transportation School, the US Navy Gas Free Engineering course, or the National Fire Protection Association (NFPA) and is trained to enter a confined space.

d. Confined space. A confined space is one that meets the following conditions:

(1) Large enough that an individual can bodily enter and perform assigned work.

(2) Has limited or restricted means for entry or exit (for example, tanks, vessels, vaults, pits, fuel cells, all rub railings, sealed ramp compartments, kort nozzles and rudders, stanchions and handrails, mast framework, and any sealed spaces onboard all watercraft).

(3) Not designed for continuous occupancy.

e. Enclosed Space. Any space, other than a confined space, which is enclosed by bulkheads and overheads. It includes cargo tanks, tanks quarters, and machinery and boiler spaces.

f. Emergency. Any occurrence (including any failure of a hazard control or monitoring equipment) or event (internal or external) to the permit space that could endanger entrants.

g. 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.

h. Entry. Any action resulting in any part of an individual's body breaking the plane of any opening of the confined space, and includes any work activities inside the confined space.

i. Entry permit. The written or printed document that is provided by the Unit Safety Office to allow and control entry into a permit space and that contains the information specified in this manual.

j. Entry supervisor. The person 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.

k. Hazardous atmosphere. An atmosphere presenting a potential for death, disablement, injury, or acute illness from one or more of the following causes:

(1) A flammable gas, vapor or mist in excess of 10 percent of its lower explosive limit (LEL).

(2) An oxygen deficient atmosphere containing less than 19.5 percent oxygen by volume or an oxygen enriched atmosphere containing more than 22 percent oxygen by volume.

(3) Airborne combustible dust at a concentration that meets or exceeds its LEL (airborne combustible dust which obscures vision at five feet or less).

(4) Any other atmospheric condition that is immediately dangerous to life or health (IDLH).

WARNING

All spaces are Hot Work permit-required spaces for welding operations.

l. Hotwork permit. The written authorization to perform operations (such as welding, grinding, cutting, electrical drilling, etc) is capable of providing a source of ignition.

m. Immediately dangerous to life or health (IDLH). Any atmosphere that poses an immediate threat to life or that is likely to result in acute or immediate severe health effects.

n. Lockout-tagout. Placing locks and tags on energy isolating devices (e.g. breaker boxes, control switches, valves, etc.) to prevent the system from being re-energized while work is still being performed by personnel.

o. Oxygen deficient atmosphere. An atmosphere having an oxygen concentration of less than 19.5 percent by volume.

p. Oxygen enriched atmosphere. An atmosphere that contains 22.0 percent or more oxygen by volume.

q. Permit-required confined space. A space that meets the definition of a confined space and has one or more of these characteristics:

(1) Contains or has a potential to contain a hazardous atmosphere.

(2) Contains a material that has the potential for engulfing an entrant.

(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.

(4) Contains any other recognized safety or health hazard.

r. Permit required confined space program. The Command's overall program for controlling, and, where appropriate, for protecting personnel from permit space hazards and for regulating personnel entry into permit spaces.

s. Prohibited condition. Any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

t. Rescue teams. The personnel designated to rescue personnel from permit spaces.

WARNING

In the past, over 60 percent of all fatalities in confined spaces were untrained rescuers. The primary cause of injury or death in confined spaces is asphyxiation. The second leading cause is fire. Implementation of the U.S. Army Combat Readiness Center's Confined Spaces Program standard and application of these procedures will greatly reduce the potential for loss of life during entry into confined spaces.

u. Retrieval system. The equipment used for non-entry rescue of persons from permit spaces.

v. 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.

2. Recognize confined space entry roles and responsibilities.

a. Commanders

- (1) Establishing a confined space entry SOP within each organization conducting entry operations
- (2) Ensuring recommended equipment to support confined space entry operations is purchased and maintained
- (3) Ensuring personnel assigned confined space entry duties are adequately trained and certified
- (4) Maintaining an inventory of all confined spaces within the organization
- (5) Establishing risk approval procedures within the organization

b. Entry Supervisor

- (1) Knows the potential hazards during entry and work
- (2) Determine if acceptable entry conditions are present prior to entry and maintained throughout the work process.
- (3) Authorize entry before entry, by verifying that the permit is filled out completely and that all steps listed on it are taken.
- (4) Signs the form.
- (5) During Entry, the entry supervisor checks conditions to make sure they stay safe throughout the work.
- (6) Verifies that rescue services are readily available and that the means for summoning them are operable.
- (7) Terminate entry as required by 20 CFR 1910.146. (If conditions become unsafe, cancels the permit and orders everyone out of the space.)
- (8) Removes any unauthorized people from confined space entry sites.
- (9) Cancels the permit and concludes the operation, when the work is finished.

c. Entrant

- (1) Know hazards that may be faced during entry.
- (2) Recognize signs or symptoms of hazard exposure and understand the consequences of such exposure.
- (3) Use equipment properly.
- (4) Maintain communication with the attendant.
- (5) Alert the attendant to hazards discovered while in the space.
- (6) Exit the space quickly when required.

d. Attendant

- (1) Know hazards that may be faced during entry.
- (2) Recognize signs or symptoms of hazard exposure.
- (3) Maintain accurate entrant identification.
- (4) Remain outside the space at all times.
- (5) Maintain communication with the entrant and be able to communicate with the entry supervisor when needed.
- (6) Monitor entry activities.
- (7) Summon rescue services when needed.
- (8) Prevent unauthorized entry.
- (9) Perform non-entry rescue.
- (10) Perform no conflicting duties.

3. Prevent unauthorized entry.

a. Identify confined spaces which may be entered with a danger sign at the point of entry and require that entry be approved by an entry supervisor.

Note: During entry operations, an attendant will be positioned at the point of entry to ensure that only authorized entrants are allowed in the space. Attendants will summon the entry supervisor should unauthorized individuals interfere with safe operations, and the entry supervisor will remove such individuals.

b. Identify a safe zone around the point of entry using barricade tape or other means to warn individuals of a restricted area. This should aid in preventing unauthorized entry.

4. Perform classification of confined space.

a. Evaluate each space on its own merit at the time of entry.

b. Treat all spaces as permit spaces prior to entry despite leeway in the federal standards.

c. Expect the entry supervisor to verify and document test results for oxygen content, flammability and toxicity as well as evaluating other potential hazards prior to each entry.

d. Expect that the entry supervisor may modify entry procedures based on this initial evaluation by classifying the space as non-permit, but the space must clearly demonstrate no potential for developing a serious hazard during the work process.

Note: If a space is designated as non-permit, initial atmospheric test results must be documented and maintained on file for one year following the entry.

5. Perform checks of confined space equipment.

a. Check that the ship has a functioning meter capable of measuring oxygen, flammability, and any toxic gases that can reasonably be expected to exist in the space atmosphere.

Note: The following Army Watercrafts are authorized to acquire the necessary equipment: LSV, LT-800, and LCU Class 2000. DD Form 314, or other suitable records, must be maintained on all meters to document periodic, unit level calibration.

b. Calibrate the meter prior to each daily use, but if the meter is not in use only calibrate it monthly.

c. Verify that calibration gas and replacement sensors are available when needed.

d. Identify that other equipment required for safe entry is listed on the entry permit and is maintained and issued. (If the equipment is not available and working, entry may not proceed until it is obtained.) Equipment includes:

(1) Tripod with winch, lifeline and harness

(2) Non-sparking tools

(3) Lighting approved for hazardous atmospheres

(4) Ventilation blower

(5) Protective equipment (eye protection, hearing protection, gloves, etc)

6. Perform evaluation of confined space hazards.

a. Test the atmospheric criteria before entry.

(1) Test the space to verify that the percent of oxygen is between 19.5 percent and 22 percent.

(2) Test the space to verify that the percent of Lower Explosive Limit (LEL) is not above 10 percent.

(3) Test the space to verify that the parts per million of carbon monoxide are not above 35 parts per million (ppm).

(4) Test the space to verify that the other atmospheric hazards are not above the published permissible exposure limit (PEL). See the material safety data sheet (MSDS) for specific contaminants.

Note: If there is an indication that other atmospheric hazards may exist but cannot be identified at the unit level, contact the supporting Medical Department Activity (MEDDAC) for a consultation.

b. Perform a visual inspection of the space prior to entry to identify other hazards that may exist. Some common hazards include the following:

(1) Noise

(2) Fall hazards

(3) Entrapment hazards

(4) Extreme temperatures (heat/cold)

(5) High pressure lines

(6) Inadequate lighting

(7) Chemicals

(8) Piping carrying hazardous materials

(9) Moving machinery

(10) Electrical hazards

(11) Biohazards

(12) Radiation hazards

7. Control confined space hazards.

Note: The goal of each entry is to have optimum conditions. Strive to maintain 20.8 percent oxygen, zero percent LEL, zero ppm CO, zero ppm of other hazardous gases, and fully control all other hazards. The entry supervisor is trained to establish these controls.

a. Eliminate atmospheric hazards primarily through ventilation.

WARNING

Special attention must be taken on the quality of air from hazardous contaminants, keeping fresh air flowing through a manual intake system pushing contaminants out into the atmosphere.

b. Follow the basic ventilation standards:

(1) Take meter readings prior to and after ventilating to evaluate the effectiveness.

(2) Control oxygen hazards by blowing fresh air into the space.

(3) Control flammable/toxic hazards by exhausting contaminated air from the space.

(4) Continuously provide ventilation during the entry if hazardous conditions are being created during the work process

(5) Use local exhaust ventilation at single point hazards such as welding and burning.

(6) Exhaust low in the space and replace air high in the space when hazardous gases are heavier than air.

(7) Exhaust high in the space and replace air low in the space when hazardous gases are lighter than air.

(a) Refer to the contaminants vapor density on the MSDS for determination.

(b) Contact your supporting medical facility for a consultation if there is any doubt about the use of ventilation or its effectiveness.

c. Isolates hazardous conditions before entry is allowed.

(1) Verify that the space remains free from release of energy or other hazards while the space is open for entry operations.

(2) Check with the entry supervisor, as he or she is responsible for evaluating hazards and the most effective means of isolation.

(3) Some controls include the following:

- (a) Blanking and blinding
- (b) Removal of pipe sections
- (c) Double block and bleed
- (d) Lockout and/or tagout
- (e) Disconnecting mechanical linkages

d. Eliminate other hazards through cleaning, inserting, removal, guarding, reengineering, and soon should be the goal of the entry supervisor.

e. Use protective equipment if hazards cannot be fully controlled.

f. Maintain all controls identified on the entry permit during the work processor or the entry must be terminated.

8. Perform hot work.

a. Protect against the possibility of fire or explosion when performing hot work in or adjacent to confined spaces.

(1) Recognize what processes or procedures constitutes hot work prior to entry.

CAUTION

When open flame or heat producing work such as welding, cutting, or brazing is to be conducted, the worksite, regardless of the location, is to be inspected by the gas free engineer, safety NCO, fire department, or local approving authority as required by local standard operation procedure (SOP).

(2) Complete an entry permit and a hot work permit before work begins if atmospheric testing shows or a thorough evaluation of the work process indicates that a flammable environment is expected.

Note: Do not perform hot work in or near spaces containing more than 10 percent of LEL.

b. Make every attempt to engineer potentially flammable environments to 0 percent LEL before work commences or to fully control the potential hazard. Accomplish this by following these steps.

(1) Identify all sources of flammable/combustible liquids, gases, and solids and use an acceptable means of isolating such sources from the space.

(2) Insert spaces with a non-flammable inert gas, if deemed appropriate by the entry supervisor. (Remember that inserting creates an oxygen deficient atmosphere).

(3) Clean and purge the space to remove flammable/combustible materials and residue.

(4) Cover combustible surfaces with a welding blanket or other suitable barrier.

(5) Use non-sparking tools and electrical appliances approved for the class and group of hazardous location expected.

(6) Monitor LEL levels continuously when the work process may produce a flammable/combustible atmosphere.

(7) Evaluate all adjacent spaces to ensure that there is no potential for igniting products in those areas.

(8) Have adequate fire extinguishing equipment on hand.

(9) Use a fire watch when necessary.

9. Verify conclusion of confined space entries when the work is complete.

a. Cancel the permit.

b. File the permit for three months.

c. Close the space.

d. Verify that the space is identified as a restricted area by posting a "Danger Confined Space" sign at the point of entry.

(Asterisks indicates a leader performance step.)

Evaluation Preparation: Given an Army vessel, policies and procedures, perform confined space entry in order to prevent injury or death to yourself or crew.

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Defined frequently used vocabulary terms.			
a. Adjacent spaces.			
b. Attendant.			
c. Authorized entrant.			
d. Confined space.			
e. Enclosed Space.			
f. Emergency.			
g. Engulfment.			
h. Entry.			
i. Entry permit.			
j. Entry supervisor.			
k. Hazardous atmosphere.			
l. Hotwork permit.			
m. Immediately dangerous to life or health (IDLH).			
n. Lockout-tagout.			
o. Oxygen deficient atmosphere.			
p. Oxygen enriched atmosphere.			
q. Permit-required confined space.			
r. Permit required confined space program.			
s. Prohibited condition.			
t. Rescue teams.			
u. Retrieval system.			
v. Testing.			
2. Recognized confined space entry roles and responsibilities.			
a. Commanders			
b. Entry Supervisor			
c. Entrant			
d. Attendant			
3. Prevented unauthorized entry.			
a. Identified confined spaces.			
b. Identified a safe zone.			
4. Performed classification of confined space.			
5. Performed checks of confined space equipment.			
6. Performed evaluation of confined space hazards.			
7. Controlled confined space hazards.			
a. Elimated atmospheric hazards.			
b. Followed basic ventilation standards.			
c. Used protective equipment.			
8. Performed hot work.			
a. Used precaution agaisnt the possibility of fire or explosion.			
b. Completed permit.			
9. Verified conclusion of confined space entries when the work was complete.			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	FM 4-01.502	ARMY WATERCRAFT SAFETY	No	No

Environment: None

Safety: In a training environment, leaders must perform a risk assessment in accordance with FM 5-19, Composite Risk Management. Leaders will complete a DA Form 7566 COMPOSITE RISK MANAGEMENT WORKSHEET during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, NBC Protection, FM 3-11.5, CBRN Decontamination.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks : None

Supported Collective Tasks :

Task Number	Title	Proponent	Status
N/A	N/A	Not Selected	Obsolete