



*Please print and post at your vessel/ facility for all employees to view*

## **Fleet Memo #24: Confined Space Entry Policy Revised**

TDI-Brooks International has revised the written company policy regarding confined space entry. These changes are most easily summarized in the new introduction to SOP-GEN-007G which now states:

The purpose of this SOP is to address the protocols required for the entry of a confined space. Vessels in the TDI-Brooks fleet are small and have limited opportunities for a confined space entry such as fuel, water, and waste tanks. ***A confined space entry would only be made on any vessel if it was in a shipyard and the atmosphere had been tested by a Certified Marine Chemist and declared safe for entry. The only personnel allowed to enter a confined space under these conditions are Port Engineers for the purposes of inspection.***

This memo has been sent to emphasize to all employees that no one except the Port Engineer under the above conditions is allowed to enter any confined space for any reason - including service or repair of scientific gear installed in tanks. These must be serviced by third party contractors.

There are many hazards associated with working in confined spaces and several OSHA regulations have been developed to prevent accidental death or injury resulting from these hazards. TDI-Brooks employees are not trained to recognize or deal with the hazards of these spaces.

Be aware that the GeoExplorer and Gyre have a few confined spaces that are accessible by a hatch on the deck. These spaces are occasionally used for storing mooring lines/ ropes. However, these screw down hatches must be kept locked at all times when not in use. In addition, the mooring ropes and lines are to be tied off near the hatch so that a crewman may easily pull them up without entering the space.

# Notice of Change to Controlled Documents #125 /06 Feb 2013

## Summary of Changes

NOC#	Ch., Sec., SOP	Summary	Revision#
125	SOP-GEN-007G	Entire SOP revised, old definitions removed, Certified Marine Chemist required to test confined spaces before entry, entry only by Port Engineer for purposes of inspection. No other TDI personnel allowed into confined spaces at any time.	9
	SOP-GEN-007H	Confined Space Rescue—entire SOP deleted	9
	Confined Space Entry Permit	Deleted	9

### NOC # SOP-GEN-007G Confined Space Entry All Sections

**Topic:** Entire SOP revised, old definitions removed, Certified Marine Chemist required to test confined spaces before entry, SOP-GEN-007H and confined spaces permits deleted.

Complete SOP-GEN-007G, Revision #9 below

SOP GEN-007G Confined Space Entry	
1.0	<a href="#"><u>Introduction</u></a>
2.0	<a href="#"><u>Definition</u></a>
3.0	<a href="#"><u>Reference</u></a>
4.0	<a href="#"><u>Confined Space Hazards</u></a>
	4.1 <a href="#"><u>Oxygen-Deficient Atmospheres</u></a>
	4.2 <a href="#"><u>Flammable Atmospheres</u></a>
	4.3 <a href="#"><u>Toxic Atmospheres</u></a>
	4.4 <a href="#"><u>Mechanical and Physical Hazards</u></a>
5.0	<a href="#"><u>Procedures</u></a>

## Revision/ Review Log

Revision Date	Approved by	Reviewed by	Revision Details/ Proposal Notes
11 January 2010 Revision #5	Dr. Jim Brooks	HSE Manager: Sue McDonald	
15 October 2010 Revision #6	Dr. Jim Brooks Dr. Bernie Bernard	HSE Manager: Russell Putt  Port Captain: Capt. Pat Fallwell	Changed to electronic format
10 December 2010 Revision #7	Dr. Jim Brooks Dr. Bernie Bernard	HSE Manager Designee: Dr. Jim Brooks Dr. Bernie Bernard	New Special Permit forms- changes suggested by crews and new JSA form added
03 May 2012 Revision #8	Dr. Jim Brooks Dr. Bernie Bernard	Dr. Jim Brooks Capt. Pat Fallwell Dr. Roger Fay	All permits require two signatures to be valid.
06 February 2013 Revision #9	Dr. Jim Brooks	Dr. Jim Brooks Capt. Pat Fallwell Dr. Roger Fay	Entire SOP revised, old definitions removed, confined space permit deleted, entire SOP- GEN-007H deleted.

### 1.0 Introduction

The purpose of this SOP is to address the protocols required for the entry of a confined space. Vessels in the TDI-Brooks fleet are small and have limited opportunities for a confined space entry such as fuel, water, and waste tanks. **A confined space entry would only be made on any vessel if it was in a shipyard and the atmosphere had been tested by a Certified Marine Chemist and declared safe for entry. The only personnel allowed to enter a confined space under these conditions are Port Engineers for the purposes of inspection.** ~~—or during an emergency. Should an emergency arise at sea, a confined space would need to be thoroughly evaluated prior to attempting entry.~~

~~—No confined space entry is to be attempted unless the atmosphere in the area has been tested by a qualified person and found to be safe and a rescue plan is in place. A confined space entry would not be permitted under the following situations:~~

- ~~• Lower explosive limit as measured by %LEL exceeds 10%.~~

- ~~Oxygen readings are below 19.5% and above 21.5%.~~
- ~~Carbon monoxide levels are above 25 ppm.~~
- ~~Hydrogen sulfide levels are above 10 ppm.~~

## 2.0 Definition

Confined spaces are potentially dangerous areas to work in due to associated hazards such as limited space for maneuvering, restricted entry/exit, oxygen limited atmosphere, or hazardous atmosphere. Confined spaces are typically defined by the following criteria:

- 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 that slopes downward and tapers to a smaller cross-section; or
- Contains any other recognized serious safety or health hazard. Examples of serious safety or health hazards on a vessel might include:
  - Fall hazards
  - Unguarded machinery
  - Extreme heat or cold
  - Steam pipes or chemical lines
  - Hazardous noise levels
  - Electrical hazards
  - Presence of asbestos

## 3.0 Reference

~~OSHA 29 CFR 1910.146~~

**OSHA 29 CFR 1915 Subpart B “ Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment”**

## 4.0 Confined Space Hazards

Once an area has been identified as a confined space area, then the potential hazards associated with that space must be identified. Confined space hazards may be categorized as oxygen deficient atmospheres, flammable atmospheres, toxic atmospheres and mechanical/physical hazards.

For this reason, any person entering a confined space must be trained in recognizing these hazards.

#### 4.1 Oxygen-Deficient Atmospheres

Our normal breathing atmosphere contains 21% oxygen and any atmospheres containing less than 19.5% oxygen will be considered oxygen-deficient. The oxygen in an atmosphere can be reduced by either consumption or replacement. Oxygen may be consumed by the combustion process (fire) of flammable materials or by bacteria, such as fermentation. Certain types of chemical reactions can also consume oxygen. For example the formation of rust is an oxygen consuming process. Also, the oxygen in a confined space can be depleted through too many employees or employees staying too long in an area that does not get its oxygen replaced readily. Oxygen levels can also be reduced as the result of oxygen displacement by other gases.

#### 4.2 Flammable Atmospheres

Flammable atmospheres are generally the result of flammable gases, vapors, dust mixed in certain concentrations with air, or an oxygen-enriched atmosphere. Oxygen-enriched atmospheres are those atmospheres that contain an oxygen concentration greater than 22%.

An oxygen- enriched atmosphere will cause flammable materials such as clothing and hair to burn violently when ignited. Combustible gases or vapors can accumulate within a confined space when there is inadequate ventilation. Gases that are heavier than air will accumulate in the lower levels of a confined space. **Therefore, it is especially important that atmospheric tests be conducted near the bottom of all confined spaces.**

Also consider that the type of work to be conducted may generate a flammable atmosphere such as spray painting, use of flammable solvents, and welding or cutting with an oxygen/acetylene device. Small holes in oxygen and acetylene hoses may also generate explosive atmospheres.

#### 4.3 Toxic Atmospheres

Toxic atmospheres may be present within a confined space as the result of a product stored in the confined space which may remain in the atmosphere due to out gassing or be absorbed by the walls or other items in the space and give off a toxic vapor when cleaned. Also toxic atmospheres may be generated as a result of the work being conducted such as cleaning (many solvents produce toxic vapors), painting, welding, etc.

#### 4.4 Mechanical and Physical Hazards

Mechanical and physical hazards should be evaluated prior to undertaking a confined space entry. The space should be examined for moving mechanical

parts and other energy sources such as electricity, hydraulics etc. All such sources of stored energy should be marked and isolated. Additionally, physical factors including temperature extremes, noise, and vibration must also be evaluated. Many potential hazards are listed on the permit.

## 5.0 Procedures

~~Before attempting a confined space entry, evaluate the hazards of the job by conducting a JSA with all personnel participating in the work. A blank JSA form may be found on the ship web pages, SMM Forms Only page.~~

### 5.1 Job Safety Analysis (JSA)

- ~~• Identify the confined space.~~
- ~~• Describe the work to be accomplished.~~
- ~~• List the risks and hazards of each step of the process.~~
- ~~• Describe mitigation measures.~~
- ~~• Identify any additional personnel or operations that may be affected.~~
- ~~• Identify any equipment and PPE to be used.~~
- ~~• Identify the need for any other special permits such as hot work or energy isolation.~~
- ~~• Establish clear methods of communication for those in and outside of the space during the work.~~

~~Once the JSA has been conducted, it must also be recorded in NS5 as a meeting in the Quality and Compliance module and linked to the original work order. All participating personnel must sign the JSA and that JSA must be attached to the Confined Space Entry Permit in the permanent file on the bridge.~~

**Always ensure that atmospheric testing is conducted by a Certified Marine Chemist prior to entering confined spaces. This information is to be recorded on the permit.**

**Before a Port Engineer may enter a confined space for inspection, a certified Marine Chemist must have tested the atmosphere and posted a **certificate** outside the space stating it is safe for entry. The Port Engineer will inspect the **certificate** before entering to ensure it is still current and valid.**

### 5.2 Permit

~~———— The permit for confined space entry must be filled on in its entirety and signed by the Chief Engineer and all participating personnel. **All permits require at least two signatures in order to be valid.** No one may write their own permit without notifying and obtaining the signature of a second party.~~

~~It is imperative that someone is aware of your intentions to enter a confined space for safety reasons. **A stand-by person must be present at the work site and remain outside of the confined space.** It is recommended that the stand by person have a means of quickly communicating to the bridge crew.~~

### ~~5.3 — Preparing for Confined Space Entry~~

~~After the Confined Space Entry Permit and the job Safety Analysis have been completed, the following steps are recommended prior to entry of a confined space.~~

- ~~• Place appropriate barriers or warning signs.~~
- ~~• Put all tools, chemicals, safety equipment and etc. near confined space area.~~
- ~~• Ensure that all employees are using/ wearing appropriate PPE.~~
- ~~• Lockout/tag-out all mechanical and electrical hazards.~~
- ~~• Ventilate area if necessary.~~
- ~~• Verify that all appropriate paperwork has been signed and filed on the bridge.~~
- ~~• Verify that a stand-by person is present.~~

### ~~5.4 — Completion of Work~~

~~Once the job has been completed, all locks and tags, warnings and barriers are to be removed. The bridge and engineering departments must be notified that the work is complete and the area is secured. All permits will be signed as “closed” and filed on the bridge.~~

## ~~6.0 — Permit~~

~~In the highly unusual event that a confined space must be entered, a Confined Space Entry permit must be filled out and signed by the personnel doing the work and Chief Engineer. The **SMM Forms Only** page on the ship web pages contains the permit.~~

~~It is required that a copy of the permit be posted at the site where the entry is made. Therefore, after the all parties have signed the permit, make a copy to post at the work site and file the original on the bridge. Once the work is completed, the work site copy must be removed and the bridge copy signed as closed by all parties involved.~~

The Chief Engineer is responsible for creating a work order in NS5 recording the work done, writing the work order number on the signed paper permit and ensuring the signed paper permit is filed in the correct location on the bridge.