SOP-GEN-004 Confined Space Entry

1.0 Introduction

The purpose of this SOP is to address the protocols required for the entry of a permit-required confined and enclosed space on each vessel operated by TDI-Brooks.

2.0 Definitions

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. The OSHA definitions for confined space and permit required confined space are listed below.

Confined spaces are typically defined by meeting all of the following criteria:

- An area large enough for someone to bodily enter the space to perform work.
- An area that has limited or restricted means for entry or exit. Openings can be considered to limit entry or exit by either being small in size or difficult to access.
- The space is not designed for continuous employee occupancy. The space may be designed to only store products, enclose materials, equipment and processes. These types of spaces only require

occasional employee entry for inspections, maintenance, or repair.

A **Permit-required confined space** has one or more of the following characteristics:

- Contains or has potential to contain a hazardous atmosphere;
- Contains material with the potential to engulf someone who enters the space;
- Has an internal configuration that might cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a downward sloping floor that tapers to a small cross section; and/ or
- Contains any other recognized serious safety or health hazards.

IMO Resolution A. 1050(27) 2.1 states that an **Enclosed Space** has one or more of the following characteristics:

- has limited openings for entry and exit
- has inadequate ventilation
- and is not designed for continuous worker occupation.

The **Authorized Person** signing the permit is the TDI-Brooks management representative responsible for ensuring that the permitting process and associated safety procedures to be followed meet or exceed the TDI-Brooks requirements.

- At sea, the authorized person is both the Master and the chief engineer (both must sign off on the permit).
- In shipyards, at the dock or in the absence of a chief engineer or Top side officer, the Authorized Person is the Port Engineer.

3.0 Confined and Enclosed Space Hazards

Once an area has been identified as a confined or enclosed space, then the potential hazards associated with that space must be identified. These spaces may present one or more of the following hazards: oxygen deficient atmospheres, flammable atmospheres, toxic atmospheres and mechanical/ physical hazards.

4.0 Confined and Enclosed Spaces Registers

A Hazard Analysis was conducted to evaluate the spaces of all vessels in the fleet, to identify all confined and enclosed spaces on each vessel and determine requirements for entry into each space. Confined space registers are located in the vessel specific confined space SOPs.

4.1 Categories of Confined Spaces

There are three categories of confined and/ or enclosed spaces on our vessels.

Category 1 are confined spaces that **would be entered at sea only in an extreme emergency and then must follow emergency entry procedures (refer to section 5.2.1 of this SOP).** The entrances to these spaces shall be clearly marked with signage or painted to indicate "Confined Space- No Entry" (The exception is the engine room in case of fire/ smoke/ CO2 activation. The engine room will not be marked as "Confined Space-No Entry").

Category 2 confined/ enclosed spaces may be entered at sea with an appropriate permit, atmospheric oxygen testing and forced air ventilation.

Category 3 confined/ enclosed spaces may be entered at sea without a permit due to lack of atmospheric risk on entry. The table below lists all categories of confined spaces for each vessel.

5.0 Confined/ Enclosed Space Entry Procedures

Procedures for entry into a confined/ enclosed space will depend on the category of the space, the conditions under which the entry is to be made, and where the entry is to be made (at sea, dockside or shipyard). Confined / enclosed Space entry will be avoided while at sea. The following describe the procedures for all possible confined/ enclosed space entry scenarios on TDI-Brooks SOLAS vessels.

5.1 Entry Procedure at Dockside (Vessel)

Before anyone may enter a **Category 1** confined space on a TDI-Brooks vessel at a shipyard or dockside at a repair facility, the appropriate regulations of 29 CFR 1915 will apply. That is, the space must be tested, certified, and posted safe for entry by a Marine Chemist or the shipyard's authorized person.

Confined space entry at a shipyard or shore side repair facility will follow the permit procedures of that facility unless the Port Engineer and facility representative agree to follow TDI-Brooks procedures in the Contractor Safety Meeting.

5.2 Entry Procedures at Sea (Operational)

SOLAS regulations XI-1/7 and III/19.3.6.2.3 are applicable to vessel operations at sea and not in shipyard situations as covered previously. The following procedures address entry into the three categories of our confined spaces.

5.2.1 Emergency Entry Procedure (Category 1 Spaces)

Emergency situations such as fires, flooding and equipment damage/ failure in enclosed spaces may require an immediate response at sea. In situations where timely entry is critical to the safety of life or the vessel and the atmosphere is assumed to be hazardous, any entry deemed necessary to respond to the emergency will follow the requirements of **USCG 46 CFR 148.86 (b)**.

"(b) In an emergency, a confined space may be entered by a trained person wearing self-contained breathing apparatus (SCBA), suitable protective clothing (PPE) as necessary, and a wire rope safety line tended by a trained person outside the hold or in an adjacent space. Emergency entry into a confined space must be supervised by a responsible person as defined in 148.3 of this part."

An emergency entry into a permit required confined space requires four people:

1. **Supervisor**- A responsible person (trained in confined space entry and rescue) must supervise the entry and maintain communications with the bridge.

2. **Entrant**- must be trained in confined space entry and rescue, be trained in the use of an SCBA, **wear an SCBA and a wire rope lifeline** attached to him/ her and wear appropriate protective clothing and other applicable PPE.

3. **Attendant/ Line Tender**- must be trained in confined space entry and rescue, must remain outside the confined space to monitor the entrant, and have agreed on some means of communication with the entrant.

    - **O** - OK (1 pull on the lifeline)
    - **A** – Advance (2 pulls on the lifeline)
    - **T** – Take up slack (3 pulls on the lifeline)
    - **H** – Help (4 pulls on the lifeline)

4. **Stand by Rescuer**- must remain outside the confined space fully dressed out with a harness, lifeline, full SCBA gear, and any other equipment identified in the JSA that may be needed in a rescue event.

5.2.2 Regular Permit Required Entry Procedure (Category 2 Spaces)

Operational considerations require that we may occasionally enter Category 2 confined or enclosed spaces while at sea.

To enter these spaces, a **confined space permit with integrated JSA is required, as well as atmospheric O2 testing both prior to and during the confined space entry.** All personnel involved in the confined space entry must participate in the development and review of the JSA for the permit and sign off on it. Personnel required for a regular permit confined space entry include:

1. **Supervisor**- a responsible person (trained in confined space entry and rescue) must supervise the entry and maintain communications with the bridge.

2. **Entrant**- must be trained in confined space entry and rescue, **wear a harness with lifeline attached to him/ her**, a personal oxygen monitor and appropriate PPE to enter the space.

3. **Attendant/ Line Tender**- must remain outside the confined space to monitor the entrant and have agreed on some means of communication with the entrant.

4. **Stand by Rescuer**- must remain outside the confined space, fully dressed out in a harness, lifeline, full SCBA gear, and any other equipment identified in the JSA that may be needed in a rescue event.

5.2.3 Non-Permit Required Entry Procedure (Category 3 Spaces)

These spaces, while meeting some of the criteria of confined/ enclosed spaces, do not present an atmospheric hazard. Therefore, a permit is not required to enter these spaces. However, prior to entry to perform any task, the bridge should be notified of the entry. **If the work to be performed** in the confined/ enclosed space **alters the atmosphere (i.e. painting, welding, grinding), then a confined space entry permit and integrated JSA must be completed.**

6.0 Required Training

All persons participating in confined space entry/ rescue and in the required monthly drills must have completed the confined space training required by the TDI-Brooks Required Training Matrix.

7.0 Drills

Confined space drills will be held every month and will include all the content prescribed in SOLAS Regulation III/19 (stated below). **Drills will rotate to include all the confined spaces on the vessel up to the point of entry.**

SOLAS Chapter III Regulation 19 3.6 “Enclosed space entry and rescue drills” specifies what is to be covered in the drills.

3.6.1 Enclosed space entry and rescue drills should be planned and conducted in a safe manner, taking into account, as appropriate, the guidance provided in the recommendations developed by the Organization.

3.6.2 Each enclosed space entry and rescue drill shall include:

- checking and use of personal protective equipment required for entry;
- checking and use of communication equipment and procedures;
- checking and use of instruments for measuring the oxygen in enclosed spaces;
- checking and use of rescue equipment and procedures; and
- instructions in first aid and resuscitation techniques.

Vanuatu Fleet Safety Letter 092413.GEN states that Vanuatu requires enclosed space entry drills monthly and that these drills include the following training:

1. Identification of the hazards likely to be faced during entry into enclosed spaces;
2. Recognition of the signs of adverse health effects caused by exposure to hazards during entry; and
3. Knowledge of personal protective equipment required for entry.

8.0 References

- OSHA 29 CFR 1915 Subpart B “Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment”
- IMO Resolution A.1050(27) Revised Recommendations for Entering Enclosed Spaces Aboard Ships
- SOLAS III Regulation 19 Section 3.3 Enclosed space drills required every 2 months: “Crew members with enclosed space entry or rescue responsibilities shall participate in an enclosed space entry and rescue drill to be held on board the ship at least once every two months.”

- Vanuatu Fleet/ Safety Letter 092413.GEN- Enclosed space drills and training required monthly
- SOLAS III Regulation 19 Section 3.6
- 46 CFR 148.86
- USCG MSIB 005 6-1