



SAFETY MANAGEMENT MANUAL

7.8.1 Confined Space Entry

Originator:

Hank Ayers

Approved By:

Timothy Twomey

1. Purpose

The purpose of this procedure is to set forth policies concerning confined space entry both at sea and in port.

2. Responsibility

It shall be the responsibility of the Master to ensure that policies set forth in this procedure are followed on vessels operated by Woods Hole Oceanographic Institution. The Master may designate an individual to coordinate the proper training of personnel in confined space entry.

3. Definitions

- A. Confined Space – A confined space is any poorly ventilated space that has limited entry and exit openings. Such spaces may lack sufficient oxygen to support life or may contain flammable liquids, and explosive or toxic gases. Examples of confined spaces are cargo holds, tanks, voids, cofferdams, double bottoms, and lazarettes.
- B. Gas Free Certificate – A gas free certificate is a document issued by a Marine Chemist stating tests were conducted and the status of a space at the time of his or her test. The certificate will also indicate the type of work that is permitted in the space (Safe for Workers, Safe for Hot Work, etc.).
- C. Hot work – Hot work are activities that involve riveting, welding, burning, grinding, or like fire-producing actions. (46CFR35.01-1(b))
- D. Marine Chemist – An individual recognized by the National Fire Protection Agency (NFPA) as qualified to test confined spaces and determine their condition with respect to oxygen sufficiency, explosive vapors or toxic gases.
- E. Competent Person – An individual that has been trained and qualified to conduct testing of confined spaces that have been previously tested by a marine chemist. This person is usually provided at a shipyard or repair facility to check the spaces daily after the marine chemist.
- F. Safe for Workers – Means that in the space so designated: (a) the oxygen content of the atmosphere is at least 19.5% by volume; (b) toxic materials in the atmosphere are within permissible concentrations; and (c) residues are not capable of producing toxic materials under existing atmospheric conditions while maintained as directed.
- G. Safe for Hot Work – Means that in the space so designated: (a) oxygen content of the atmosphere is at least 19.5% by volume, with the exception of inerted spaces, where external hot work is to be performed; (b) the



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concentration of flammable materials in the atmosphere is below 10% of the lower flammable limit; (c) the residues are not capable of producing a higher concentration than permitted by (b) above under existing atmospheric conditions in the presence of fire, and while maintained as directed; and that (d) all adjacent spaces containing or having contained flammable or combustible materials have been cleaned sufficiently to prevent the spread of fire, or are satisfactorily inerted, or, in the case of fuel tanks or lube oil tanks, or engine room bilges, have been treated in accordance with the Marine Chemist's requirements.

4. General

All confined spaces should be assumed to be dangerous until proven otherwise. Such spaces must be ventilated and tested prior to entry. The possible exception to this would be to repair damage, control flooding or extinguish fires, in which case all personnel should already be wearing proper safety equipment.

It is easy to become relaxed concerning the entry into spaces that have limited ventilation. This kind of attitude has the potential for disastrous results that can cause injuries or death. This can be averted through increased awareness of the hazards of entering confined spaces and following safety precautions before any person enters that space.

Normal fresh air contains about 20.9% oxygen by volume. Oxygen is consumed by internal combustion engines, by individuals breathing in the space, and by chemical reactions, such as the formation of rust or the action of bacteria decomposing organic material. Spaces should be thoroughly ventilated until the oxygen content is at least 19.5%, the minimum required to sustain life. Any space that does not have at least 19.5% should not be entered without a self-contained breathing apparatus.

All confined spaces need to be opened and ventilated prior to entry. It is preferable to ventilate confined spaces using a portable blower. This portable blower should be explosion proof; however, if a non-explosion proof device is used to ventilate a confined space, care must be used in setting up the device so that the vapors contained in the space are not drawn through the ventilating device. This can be accomplished by using the device to supply fresh air into the space and provide an alternate exhaust path for the vapors to exit from the space.

The space must be tested for oxygen content and the presence of explosive gases prior to entry. At sea, the two individuals that are responsible to test the conditions of a confined space are the Chief Mate and the Chief Engineer. They may have other individuals check the space and report to them. Equipment is maintained on each vessel to perform these tests. The Chief Mate or Chief Engineer will ensure that individuals conducting the tests know how to use the equipment.



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In port, anytime hot work is to be performed by an outside contractor, a Marine Chemist must test the space and issue a certificate. Once the certificate has been obtained, it can be maintained in force through the periodic checking of a Competent Person. Care must be taken to ensure that the validity of a certificate is maintained. A change in the condition of a space will invalidate a Marine Chemist's certificate and will require the Marine Chemist to return to re-certify the space.

A space tested and found "Safe for Workers" is not necessarily "Safe for Hot Work." Prior to testing, it must be decided what the test is to determine. If a space has been tested and found "Safe for Workers," it needs to be retested prior to the performance of hot work.

Once a space has been tested, the individual determining the condition of the space may place requirements on the entry of the space. This may include but not be limited to, continued ventilation, retesting, emergency gear on location, type of communications required, and additional cleaning. These stipulations must be followed.

A confined space should not be entered without attendance of someone outside the space. This individual must be knowledgeable in identifying warning symptoms that something is wrong in the space, know what to do if something is wrong, and how to get assistance.

5. Reporting

The deck watch officer shall be notified anytime a confined space is being entered. This officer shall be advised as to the reason for entering the space, who tested it for entry, and how long the space will be entered.

Any time a confined space is entered, the Chief Mate or Chief Engineer shall maintain a record of that entry. The information can be recorded on a form similar to the form attached to this procedure.

The record of a confined space entry shall be maintained aboard ship for at least one year and shall extend through the safety management audit cycle to provide evidence that this procedure is being followed.

It is not necessary for a formal qualification to be entered into training records. The Chief Mate or Chief Engineer allowing an individual to conduct the tests will still be the individual responsible for the test and need to ensure qualifications of the individual conducting the test.



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CONFINED SPACE ENTRY

Under NO circumstance will anyone be permitted to enter a confined space unless it has been deemed safe for entry by either the Master, Chief Mate, or Chief Engineer.

The following information must be known:

- Date of Entry _____
- **Notify Bridge** _____
- Space Entered _____
- Reason for Entry _____
- Expected Duration of Entry _____
- Person Entering _____
- Person Standing By _____
- **Stage Rescue Equipment Outside Space to be entered** _____
- Level of Oxygen _____
- Measure of Explosive Gases _____
- Additional Requirements _____
- Person Testing the Space _____

Comments: _____

KEEP THIS COPY FOR ONE YEAR