**NFPA 306 Standard for the Control of Gas Hazards on Vessels *Changes***

2009

**3.3.1 Adjacent Space**

Those spaces in all directions from subject space, including all points of contact, corners, diagonals, decks, tank tops, and bulkheads, ~~and including areas affected by hot work, where slag, products of combustion, and sparks would be expected to fall or accumulate.~~

**3.4.2 Hot Work**

Any activity involving riveting, welding, burning, the use of powder actuated tools or similar fire producing operations, including any operation that raises the temperature of the work piece to 204°C (400°F) or above. Grinding, drilling, abrasive blasting, or similar spark-producing operations are also considered hot work except when such operations are isolated physically from any atmosphere containing more than 10 percent of the lower explosive limit of a flammable or combustible substance.

2014

**3.3.1 Adjacent Space**

Those spaces in all directions from subject space, including all points of contact, corners, diagonals, decks, tank tops, and bulkheads.**Pipelines are not adjacent spaces and are not considered safe for hot work unless noted on the Marine Chemist Certificate.**

**Substantiation**: Reverting back to the 2003 definition of adjacent space which was based on points of contact; this is more in line with the regulatory definition which is structurally based. OSHA uses the phrase “bordering a subject space”. The addition clarifies that pipelines should be considered as Not Safe for Hot work unless noted on the marine chemist certificate.

**3.4.2 Hot Work**

Any activity involving any of the following: riveting, welding, burning, the use of powder-actuated tools or similar fire-producing operations; any operation that raises the temperature of the work piece equal to or greater than 204°C (400°F); or grinding, drilling, abrasive blasting, or *similar operations in the presence of or against the accumulations of readily combustible materials or flammable or combustible liquids or vapors when the atmosphere exceeds 10 percent of the LEL.*

**Substantiation**: The temperature reference remained in the definition; it is considered useful by the committee. Wording was change to clarify the definition.

2009

**4.3.1 ATMOSPHERE SAFE FOR WORKERS**

(4) The residues or chemicals associated with the work authorized by the Certificate are not capable of producing ~~uncontrolle~~d toxic ~~chemicals~~ under existing atmospheric conditions while maintained as directed on the Certificate.

2014

**7.1.1 ATMOSPHERE SAFE FOR WORKERS**

(4) The residues or chemicals *remaining in a certified space are not capable or producing toxic materials that exceed permissible concentrations under existing atmospheric conditions* while maintained as directed on the certificate.

**Substantiation**: Wording was unclear. This clarifies that a chemist is ensuring that any remaining residues have been addressed.

**7.1.3 ENTER WITH RESTRICTIONS**

***NEW*** 7.1.3.1 The Certificate shall include a statement describing the specific conditions of personal protection equipment, clothing, time, or any or all of the aforementioned. These areas shall be listed on the Certificate under the heading “Restrictions.”

**Substantiation**: Just as SAFE FOR LIMITED HOTWORK requires the heading “Limitations,” ENTER WITH RESTRICTIONS suggests there is something unique about a designated space. The respective headings, “Limitations” and “Restrictions,” thus reinforces this uniqueness and, more importantly, prompts workers to read further what the special “limitations” and “restrictions” are before entering and/or working in a space. This requires the restrictions to be noted “in writing” on the Marine Chemist Certificate. This is consistent with 1915.7(c)(1) in which a Competent Person shall have the “ability to understand and carry out written or oral information or instructions left by a Marine Chemist.” These conditions should not be left to verbal transference.

2009

**4.3.4 SAFE FOR HOT WORK**

(3) The residues, scale, or preservative coatings are cleaned sufficiently to prevent the spread of fire and are not capable of producing a higher concentration than permitted by 4.3.4(1) or (2) under existing atmospheric conditions in the presence of hot work and while maintained as directed on the Certificate…

(4) All spaces adjacent to cargo tanks certified “SAFE FOR HOT WORK” have been cleaned sufficiently of residues, scale, or preservative coatings to prevent the spread of fire, or are inerted.

(5) All other spaces adjacent to spaces certified “SAFE FOR HOT WORK” are treated in accordance with Marine Chemist requirements and acknowledged on the Certificate.

2014

**7.1.4 SAFE FOR HOT WORK**

(3) The residues, scale, or **soft and greasy** preservative coatings **in the entire space** are cleaned sufficiently to prevent the spread of fire and are not capable of producing a higher concentration that permitted by 7.4.1(1) or (2) under existing atmospheric conditions in the presence of hot work and while maintained as directed on the Certificate.

**Substantiation:** The Committee added the words soft and greasy to describe preservative coatings. It was never the intent of this requirement in the Standard to remove all hardened preservative coatings such as paint.

(4) All spaces adjacent to cargo tanks certified “SAFE FOR HOT WORK,” **as well as all cargo tanks adjacent to a hot work site, have combustible gas readings less than 10 percent of the LEL and** have been cleaned sufficiently of residues, scale, or preservative coatings to prevent the spread of fire, or have been inerted.

**Substantiation:** Added “as well as any cargo tank adjacent to a hot work site” because the 2009 standard did not cover cargo tanks unless they were adjacent to hot work in other cargo tanks. Cargo tanks adjacent to non-cargo tank hot work sites were not covered by existing text, which allowed cargo tanks to be treated “according to the Chemist’s requirements.” Added “have combustible gas readings less than 10% LEL” because this section was inadvertently deleted in the last revision.

(5) **Non-cargo tank** spaces adjacent to **cargo spaces** certified “SAFE FOR HOT WORK” are treated in accordance with Marine Chemist requirements and acknowledged on the Certificate.

**Substantiation:** This proposed wording clarifies how non-cargo spaces adjacent to cargo spaces must be treated.

2009

**4.3.4 SAFE FOR HOT WORK (cont.)**

(3)…or, in the case of the engine room or fire room bilges, or other machinery spaces, or spaces that have not contained flammable or combustible cargo, fuels, or ~~coils~~ are treated in accordance with the Marine Chemist’s requirements.

**4.3.6 SAFE FOR LIMITED HOT WORK**

(3)(a) The space or compartment is inerted in accordance with 4.3.8, adjacent spaces shall be treated in accordance with 4.3.4(4), and the hot work shall be limited to the specific location or locations described in the “limitations” in 4.3.6(2).

2014

**7.1.4 SAFE FOR HOT WORK (cont.)**

***NEW*** (6) Spaces such as passageways, living spaces, or store rooms that are not adjacent to cargo tanks, and are undergoing hot work, meet the requirements of 7.1.4(1) and 7.1.4(2). These spaces, along with any adjacent spaces, shall be treated in accordance with the Marine Chemist’s instructions and be free of material that could ignite under conditions of work or be protected with barriers to prevent the spread of fire.

**Substantiation:** This section outlines how a Marine Chemist must address spaces which are not adjacent to cargo. It clearly states how a Chemist must address hot work in living, storage or miscellaneous areas shipboard. It also requires the chemist to address any adjacent spaces as they deem necessary.

(7) Engine room or fire room bilges, or other machinery spaces, or spaces that have not contained flammable or combustible cargo, fuels, or **oils** are treated in accordance with the Marine Chemist’s requirements.

**7.1.6 SAFE FOR LIMITED HOT WORK**

(3)(a) The space or compartment is inerted in accordance with 7.1.8, and the hot work is limited to the specific location or locations described in the “Limitations” in 7.1.6(2). *At the time of the inspection, the Marine Chemist verifies that the atmosphere of the adjacent space(s) meets the requirements of 7.1.4(4) or 7.1.4(5) or is inerted.*

**Substantiation**: This new wording will not permit hot work if an adjacent cargo tank or space adjacent to a cargo tank has greater than 10% LEL.

2009

**4.3.6 SAFE FOR LIMITED HOT WORK (cont.)**

(3)(b) The space or compartment meets the requirements of 4.3.4(1), (2), (3), and (4); the hot work shall not be allowed on adjacent spaces or pipelines, or both as applicable; and the hot work limitations shall be described in the “limitations” in 4.3.6(2).

2014

**7.1.6 SAFE FOR LIMITED HOT WORK**

**(cont.)**

(3)(b) The space or compartment meets the requirements of 7.1.4(1), 7.1.4(2), and 7.1.4(3); adjacent spaces meet 7.1.4(4) or 7.1.4(5); and the hot work is not allowed on pipelines. The hot work restrictions shall be listed under “Limitations” in accordance with 7.1.6(2). *The marine chemist verifies that the concentration of flammable materials in the atmosphere is less than 10 percent of the LEL or that the space is inerted in accordance with 7.1.8.*

***NEW*** (3)(d) In compartments or spaces on vessels that are not considered cargo or fuel tanks and have not contained and are not subject to concentrations of combustible, flammable, or toxic liquids, vapors, or gases, the Marine Chemist shall survey the spaces and the adjacent spaces in accordance with 6.2.1. The Certificate shall include a statement under the heading “Limitations” that describes the locations and type of hot work, and instructions for the competent person to maintain safe work conditions.

**Substantiation:** Marine Chemists frequently perform inspections in areas not covered by the scope of 306. The employer is utilizing the experience of the chemist to prescribe safe precautions for completing the work. Many of these spaces will contain ordinary combustible materials that are covered by OSHA29 CFR 1915 Subpart P. Subpart P permits protection of the combustible materials and/or the use of fire watches when combustible materials cannot easily be removed or protected. However, paragraph 5.1.3 of NFPA 306 does not permit the use of fire watches in lieu of cleaning, therefore, the Marine Chemist must mandate that the combustible materials are removed to issue a certificate. Having a client remove a rug, glued to the deck in a berthing space, seems extreme when other protective methods are available.

2009

**4.3.8 INERTED**

(1) Carbon dioxide or other nonflammable gas acceptable to the Marine Chemist shall have been introduced into the space in sufficient volume to maintain the oxygen content of the atmosphere of the ~~enclosed~~ space at or below 6 percent or 50 percent of the amount required to support combustions, whichever is less…

2014

**7.1.8 INERTED**

(1) Carbon dioxide or other nonflammable gas acceptable to the Marine Chemist shall have been introduced into the space in sufficient volume to maintain the oxygen content of the atmosphere of the space at or below 6 percent or 50 percent of the amount required to support combustions, whichever is less…

**Substantiation:** “Enclosed” was deleted because 5.2.3 (All spaces to be inerted shall be sufficiently intact to retain the inerting medium) demands a vapor-tight condition, which only exists in confined, not enclosed, spaces. “Enclosed” spaces (29CFR1915, Subpart B) merely have deck, overhead, and bulkhead enclosure. However, “confined spaces” should not be substituted for “enclosed” spaces because “confined spaces” implies possible entry, whereas often the Chemist inerts spaces (rudders, bilge-keels, etc.) which are hollow or inaccessible. Best to simply reference to “spaces”.

***NEW*** (2) Spaces other than cargo tanks and fuel tanks shall have been filled to overflow with water, and the water level shall be maintained throughout the intended work. Valves shall be tagged or by written notice positioned to restrict operation to maintain the water level. If any headspace remains in the tank, it shall meet the requirements of 7.1.4(2).

**Substantiation:** The previous 4.3.8.2 section instructed to flood the space, but then contradicts itself by allowing hot work below three feet of the surface of the water and permits headspace. This section will clarify the inerting by water practice by splitting it into two sections. One will allow flooding the space and the other will permit hot work 3 feet below the water level.

2009

**4.3.8 INERTED (cont.)**

(2) The space is ~~flooded~~ with water~~,~~ and that level shall be maintained throughout the intended work by ~~securing~~ valves and lines to the space, and provided that any hot work shall be performed against the water layer and at least 0.9 m (3 ft) below the level of the water inside the space. The gas content of the atmosphere or head space above the liquid level inside the space shall not exceed 10 percent of the LEL. Any such procedure shall be approved by the Marine Chemist.

2014

**7.1.8 INERTED (cont.)**

(3) The space shall have been *filled* with water so that the water level is a minimum of 0.9 m (3 ft) above the intended exterior hot work and the atmosphere of the headspace meets the requirements of 7.1.4(2). The water level shall be maintained throughout the intended work by *tagging* valves in a position to maintain the water level. Any such procedure shall be approved by the Marine Chemist.

**Substantiation:** This clarifies and separates the two methods of inerting with water, filling to overflow and partial filling with water. It also requires that any valves are positioned and tagged to maintain the water level. The previous method required the valves to be closed and this may not always be the case.

***NEW*** (4) All valves, vent lines, and other openings to the inerted spaces shall be positioned in such a manner and tagged as to prevent or, by written notice, restrict operation.

**Substantiation:** A new section to the inerted safety designation requiring valves to be tagged or by written notice restricted to prevent changing valve position.

**5.1.3 Partial Cleaning for Limited Hot Work**

***NEW*** (C) When subject spaces are cleaned to meet 5.1.3(A) and 5.1.3(B), adjacent spaces shall be permitted to be cleaned to meet the requirements of 5.1.3(A) and (B), provided the residues or preservative coatings meet the requirements of 5.1.3(A).

**Substantiation:** This addition permits spaces adjacent to partially cleaned spaces to meet the same requirement. This would apply if the work is on the common bulkhead.