Report of the Committee on Industrial and Medical Gases

John Newquist, OSHA Training Institute

Committee on Industrial and Medical Gases

This Report has been submitted to letter ballot of the Technical Committee on Industrial and Medical Gases, which consists of 13 voting members; of whom 12 affirmatively and 1 ballot was not returned (Mr. Murray).

51-1 - (24-3): Accept in Principle in Part
Note: This proposal appeared as comment 51-2, which was held for further study from Fall 91 TCD, which was on proposal N/A.

SUBMITTER: John Newquist, OSHA Training Institute

RECOMMENDATION: Revise paragraph to read:

2-4.3 Oxygen cylinders in storage shall be separated from fuel gas cylinders or combustible materials (especially oil and grease) a minimum distance of 20 ft (6 m) or by a barrier of noncombustible material at least 5 ft (1.5 m) high having a fire resistance rating of at least 1/2 hour. The barrier shall have a minimum width as wide as the cylinders. This shall also apply to cylinders in welding carts when their regulators are removed.

SUBSTANTIATION: Many welders put in their welding carts, a barrier, that has a width less than that of the cylinders. They put these cylinder's regulators for the night. Since the regulators are removed, this is considered storage, and the cylinders of oxygen and fuel gas need to be separated or have an acceptable barrier according to the above proposal. This requirement would prevent both cylinders being involved in a fire simultaneously.

COMMITTEE ACTION: Accept in Principle in Part.

Revise 2-4.3 by adding:

"The barrier shall interrupt all lines of sight between oxygen and fuel gas cylinders within 20 ft of each other."

COMMITTEE STATEMENT: The dimension of the barrier is quantitated as suggested by the submitter. The proposed coverage of cylinders in welding carts with regulators removed is not accepted. See Committee Proposal 51-2 (Log #CP1).

51-2 - (1-15.1) Note: Accept

SUBMITTER: Technical Committee on Industrial and Medical Gases

RECOMMENDATION: Revise 1-15.1 as follows:

1.5.1 Systems comprised of a single cylinder of oxygen, a single cylinder of fuel gas, regulators, hoses, and hose reels; Systems consisting of a single cylinder of oxygen and a single cylinder of fuel gas used for welding and cutting. (See ANSI Z49.1, Safety in Welding and Cutting.)

NOTE: For information on safety in welding and cutting see ANSI Z49.1. Safety in Welding and Cutting.

SUBSTANTIATION: The exemption is revised to be consistent with NFPA 55, Standard for the Storage, Use and Handling of Compressed and Liquefied Gases in Portable Cylinders. The committee is not aware of a significant fire problem involving stored welding carts with hoses, regulators or torches removed.

COMMITTEE ACTION: Accept.
2-1.1 Design and Construction. Cylinders shall be designed, fabricated, tested, and marked (stamped) in accordance with regulations of the U.S. Department of Transportation (DOT), Transport Canada (TC), or the Rules for the Construction of Unfired Pressure Vessels, Section VIII, ASME Boiler & Pressure Vessel Code.

2. Renumber 2-1.1.1 to 2-1.2.

**SUBSTANTIATION:** The paragraphs are revised to reference DOT and ASME.

**COMMITTEE ACTION:** Accept.

51-6 - (2-2.2): Accept

**SUBMITTER:** Technical Committee on Industrial and Medical Gases,

**RECOMMENDATION:** Revise 2-2.2 to read:

2-2.2 Separate rooms or buildings used for gas cylinder storage shall be provided with natural or mechanical ventilation designed to provide a minimum of 1 cfm per sq ft (0.3 m³/m²) of floor area. Ventilation systems shall discharge a minimum of 50 ft (15 m) from intakes of air handling systems, air conditioning equipment and air compressors.

**SUBSTANTIATION:** Revised for consistency with NFPA 55, Standard for the Storage, Use and Handling of Compressed and Liquefied Gases in Portable Cylinders.

**COMMITTEE ACTION:** Accept.

51-7 - (3-2.3): Accept in Principle

**SUBMITTER:** Larry W. Cherne, Bentley Welding Supply

**RECOMMENDATION:** Change 6,000 cu ft to 14,000 cu ft.

**SUBSTANTIATION:** Linde HC-500 holds 504 cu ft - 12 cylinders in a cluster = 6,058. MVE & Taylor Whanton liquid oxygen containers hold 6,500 cu ft and it is common in industry to hook up to units one in use and one as a back-up.

**COMMITTEE ACTION:** Accept in Principle.

Change “6,000” to “6,500” in 3-2.3 and its exception.

**COMMITTEE STATEMENT:** The limit of oxygen connected to high pressure manifolds is increased to 6,500 SCF to accommodate currently available cylinders and containers. Further expansion is rejected as the standards permits larger quantities where stored outdoors or with fire separation covered in the exception. The proposal contains no substantiation to support significant increase in oxygen storage from a safety viewpoint.

51-8 - (4-5.1): Accept

**SUBMITTER:** Technical Committee on Industrial and Medical Gases.

**RECOMMENDATION:** Revise 4-5.1 to read:

4-5.1 Piping systems shall be hydrostatically tested and proved gastight leak free at one and one-half (11/2) times the maximum operating pressure, or tested in accordance with ASME B31.3, and thoroughly purged of air the test medium before being placed in service. The material used for pressure testing oxygen lines shall be oil-free and nonflammable. Material used externally for bubble testing oxygen lines shall be oil-free and, if combustible, shall be applied as a dilute water solution that will not leave an objectionable film.

**SUBSTANTIATION:** The requirement is revised to permit alternate testing methods in accordance with ASME B31.3.

**COMMITTEE ACTION:** Accept.

51-9 - (Chapter 5, Figures 1, 2 and 3): Accept

**SUBMITTER:** Technical Committee on Industrial and Medical Gases,

**RECOMMENDATION:** Revise Figures 1, 2 and 3 as shown below.

Schematic arrangement of piping and station outlet protective equipment. (See Sections 5-2, 5-3, and 5-4.)

**SUBSTANTIATION:** The figures are revised to more clearly show the intent of the text.

**COMMITTEE ACTION:** Accept.

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**Legend**

- P_F - Protective equipment in fuel gas piping
- V_F - Fuel gas station outlet valve
- V_O - Oxygen station outlet valve
- S_F - Backflow check valve
- S_O - Backflow check valve
- R_F - Pressure-relief device (fuel gas)
- R_O - Pressure-relief device (oxygen)

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**Figure 1**

- Option 1
- P_F in main piping
- Outlet piping
- Main piping
- Branch piping
- Fuel gas
- Oxygen

**Figure 2**

- Option 2
- P_F in branch piping
- Outlet piping
- Main piping
- Branch piping
- Fuel gas
- Oxygen

**Figure 3**

- Option 3
- P_F in outlet piping
- Outlet piping
- Main piping
- Branch piping
- Fuel gas
- Oxygen
51-10 - (6.4.1.6): Accept
SUBMITTER: Technical Committee on Industrial and Medical Gases,
RECOMMENDATION: Revise 6.4.1.6 by deleting "suitably", and adding the sentence. Ventilation shall permit dissolved acetylene gas to dissipate.
SUBSTANTIATION: To delete vague text and to clarify the Committee's intent for ventilation.
COMMITTEE ACTION: Accept.
(Log #CP5)

51-11 - (6.4.4.2, 6.5.3.2, 8.2.8 and 8.3.4): Accept
SUBMITTER: Technical Committee on Industrial and Medical Gases,
RECOMMENDATION: Revise 6.4.4.2, 6.5.3.2, 8.2.8, and 8.3.4 by substituting "Class 1, Division 2 or Class 1, Zone 2" for "Class 1, Division 2"
SUBSTANTIATION: For consistency with the 1996 National Electrical Code.
COMMITTEE ACTION: Accept.
(Log #CP10)

51-12 - (7.1.1): Accept
SUBMITTER: Technical Committee on Industrial and Medical Gases,
RECOMMENDATION: Revise 7.1.1 to read:
7.1.1 Calcium carbide shall be contained in metal packages of sufficient strength to prevent rupture. The packages shall be provided with a cover top or equivalent. These packages shall be constructed to be water and air tight. Solder shall not be used in such a manner that the package would fail if exposed to fire. Stored in packages meeting DOT or TC regulations.
SUBSTANTIATION: The text is revised to reflect DOT and Transport Canada regulations.
COMMITTEE ACTION: Accept.
(Log #CP3)

51-13 - (7.3.1): Accept
SUBMITTER: Technical Committee on Industrial and Medical Gases,
RECOMMENDATION: Revise 7.3.1 by deleting "metal".
SUBSTANTIATION: The text is revised to reflect DOT and Transport Canada regulations.
COMMITTEE ACTION: Accept.
(Log #CP4)

51-14 - (A-2.1.3 (New)): Accept
SUBMITTER: Technical Committee on Industrial and Medical Gases,
RECOMMENDATION: Add a new A-2.1.3 to read:
A-2.1.3 For information on marking and labeling of compressed and liquefied gas cylinders see CGA C-7, Guide to the Preparation of Precautionary Labeling and Marking of Compressed Gas Containers.
SUBSTANTIATION: Appendix material is added for consistency with NFPA 55, Standard for the Storage, Use and Handling of Compressed and Liquefied Gases in Portable Cylinders.
COMMITTEE ACTION: Accept.
(Log #CP7)