



DEPARTMENT OF THE NAVY  
BUREAU OF MEDICINE AND SURGERY  
WASHINGTON, D.C. 20372

IN REPLY REFER TO

BUMEDINST 10330.2

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3 Mar 1978.

BUMED INSTRUCTION 10330.2

From: Chief, Bureau of Medicine and Surgery  
To: Ships and Stations Having Medical/Dental Personnel

Subj: Medical gas systems

Ref: (a) NFPA 56F, Standard for Nonflammable Medical Gas Pipeline Systems (NOTAL)  
(b) NAVFAC Guide Specification TS-15403 of Apr 1977 (NOTAL)  
(c) NFPA 56A, Inhalation Anesthetic (NOTAL)

1. Purpose. To delineate the procedure to test nonflammable medical gas pipeline systems after installation or repair and prior to use in patient care.

2. Background

a. The lay press has reported incidents where, in some cases, the death of patients has occurred as a result of cross-connection of medical gas pipeline systems. However, the common thread that ran through all of these incidents was the failure to check the content of the pipeline systems at the station outlet.

b. Reference (a) requires that all pipeline systems be checked for gas content after installation. Reference (b) requires that not only the content of the gas be checked, but also the gas be checked for impurities such as hydrocarbons, particulate matter, water, and carbon monoxide. Reference (c) requires that each anesthesia machine be checked at the common gas outlet for appropriate continuity of medical gas systems after each repair.

3. Action

a. In addition to the tests required by reference (a), the commanding officer shall ensure that after installation of new piping systems or after repair of existing piping systems, each station outlet of the gas piping system is analyzed for the appropriate gas. Further, samples of gas shall be tested for contaminants and shall be obtained from

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an outlet of the piping system, the location of which will ensure that the gas sample has traversed the maximum length of the pipeline being tested. The sample shall be tested as follows:

| <u>Component</u>      | <u>Method</u>      | <u>Max.Allowable Concentration</u> |
|-----------------------|--------------------|------------------------------------|
| Solid particulate     | Millipore filter   | 2 mg/M <sup>3</sup>                |
| Hydrocarbon           | Gas chromatography | 1 ppm V/V                          |
| Water moisture        | Pittsburgh cup     | 1 ppm V/V                          |
| Halogenated compounds | Mass spectrometer  | 2 ppm V/V                          |
| Carbon monoxide       | Gas chromatography | 2 ppm V/V                          |

A piping system shall be considered to be unlikely to contribute contaminants to a gas transmitted by it providing that a sample of gas from an outlet (a) does not have a noticeable odor different from that of the major component of the sample, and either (b) does not have a higher contaminant level than that listed above, or (c) has a higher contaminant level than that listed above, but not above that found in a sample of a gas taken from the source.

b. The chief of anesthesia of each medical treatment facility shall ensure that upon delivery of new anesthesia machines or repair of existing anesthesia machines, the common gas outlet efflux is tested for the appropriate gas as described in reference (c), appendix F.

c. The tests and analyses required in paragraphs 4a and b shall be performed by qualified personnel and records of such tests and analyses shall be retained 2 years for paragraph 4a and until the next repair for paragraph 4b.

  
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