Compliant Healthcare Technologies, LLC

NFPA 99, 2012 Changes"

November 13, 2013!
The NFPA 99 has now been upgraded from a “Standard” to a “Code”. This will put it in the same light as NFPA 70, and NFPA 101 Life Safety Code."
"
The code is now intended to be law in its entirety versus simply a reference."
Who is the new AHJ 1.3.4?

The governing body of the facility or its designee shall establish the following areas in accordance with the type of patient care anticipated and with the following definitions of the classification:

1. Critical care rooms
2. General care rooms
3. Basic care rooms
4. Support care rooms

Anesthesia. It shall be the responsibility of the governing body of the health care organization to designate anesthetizing locations.

1. Deep Sedation/Analgesia
2. General Anesthesia
3. Minimal Sedation
4. Moderate Sedation (Conscious Sedation)
Lost your levels for “categories”?! 

In the NFPA 2005, we had levels describing the facilities requirements, Level 1, Level 2, and Level 3. Often times this created confusion because of the conflict between Chapter 3 definitions and the definitions of care in chapters 13-21.

"New in 2012"

Who Determines The Category?

Chapter 4 Fundamentals:

- **Category 1.** Facility systems in which failure of such equipment or system is likely to cause major injury or death to patients or caregivers shall be designed to meet system Category 1 requirements as defined in this code.

- **Category 2.** Facility systems in which failure of such equipment or system is likely to cause minor injury to patients or caregivers shall be designed to meet system Category 2 requirements as defined in this code.

- **Category 3.** Facility systems in which failure of such equipment is not likely to cause injury to patients or caregivers, but can cause patient discomfort, shall be designed to meet system Category 3 requirements as defined in this code.
Do you know what category you are?!

For the purpose of this presentation, we will be only covering that which applies to Category 1.
New 5.1.1.5, 5.1.1.6, and 5.1.1.7!

- New facilities and facilities making changes must meet the requirements from 5.1.2 through 5.1.12.3.14.5 and 5.1.14.4.2. This includes altering any piping. This is the full standard and verification testing."

- Existing facilities must meet 5.1.14.4.3 through 5.1.14.4.9 and 5.1.13 through 5.1.15. This is the maintenance requirements added in this edition."

- New and existing facilities are also required to meet 5.1.14.3 and 5.1.14.4.1, this would reference labeling and proper record keeping."
Temperature exposure for gas storage
5.1.3.3.1.8 through 5.1.3.3.1.13!

The new temperature range is per manufacturer, but no less than -20°F compared to 20°F."

"Oxygen storage was specific and referenced a 20,000 ft³ maximum for indoor storage. The same capacity also applies to inert gases and their systems. Carbon dioxide and nitrous oxide still have their individual requirements for bulk storage."
Outdoor enclosures 5.1.3.3.2(3)!

Detail 7
Manifold enclosure with two entry/exit doors
Manifold room electrical devices 5.1.3.3.2(10)!

The height requirement of 5 feet has been removed and replaced with protect devices from physical damage."

Medical gas storage room ventilation 9.3.7!

Natural ventilation requirement has moved to chapter 9 for HVAC. We now have a calculation for natural ventilation of $24\text{in}^2/1000\text{ft}^3$ of fluid designed to be stored at STP. In no case less than $72\text{in}^2$.

Mechanical ventilation should be continuous negative pressure. Exhaust shall be at a rate of 1 cfm per $5\text{ft}^3$ of fluid designed to be stored. Not less than 50 cfm nor greater than 500 cfm. The means of make up air can be from under a corridor door up to 50 cfm or 15% of the room exhaust per NFPA 90A."

"Chapter 9 is now heating, ventilation, and air conditioning"
A decision chart for ventilation!

Detail 28
Applying the new Ventilation Rules

Start Here

How much Gas to Consider?

Largest single vessel, OR greatest aggregate of interconnected vessels - whichever is greater.

Natural ventilation openings (2 req'd)
= 24 sqin per 1,000 cubic ft of gas at STP

One opening ≤1’ above FF
One opening ≤1’ below FF

For Example:
We have a manifold room with a 4 x 4 Nitrous manifold and a 6 x 6 Nitrogen manifold. We also store one set of Reserve cylinders for each manifold in the room.

The largest aggregate of connected vessels will be the 4 cylinders of Nitrous Oxide. Each cylinder holds 558 ft³ of gas so 558 x 4 = 2,232 ft³.

Natural ventilation will be 2,232/1000 = 2.23 x 24 = 53.5 in².

That is less than 72 in², so we need two 72 in² openings.

If we are satisfied with that, we can install it that way.

However, if we wish to move to mechanical ventilation, we have 2,232 ft³/5 = 446.

So we need to install a ventilating fan or blower capable of moving 446 ft³/minute.

Happy?

Yes

Mechanical ventilation flowrate
= 1 cfm per 5 cfm of gas at STP

x50 and ≤500?

Yes

< 50 = 50

>500 = 500

No

This is the flowrate needed to ensure adequate mechanical ventilation.

Contractor

Build IT!
Where can I pipe to 5.1.3.5.2?!

Only to areas where the gases will be used under the direction of licensed medical professionals for the purposes congruent with the following:

"1. Direct respiration of patients"
"2. Clinical application of the gas to patient"
"3. Medical device applications directly related to respiration"
"4. Power for medical devices used directly on patients"
"5. Calibration of medical devices 1 through 4"
Splitting system pressure 5.1.3.4!
Alarms wiring 5.1.9.1!

Alarm wiring still needs to meet the NFPA 70, 517.30(C)(3), we now have the correct reference. The wiring does not have to be continuous run; splicing is allowed. "

"The following are allowable methods to protect alarm wiring: "

- Conduit"
- Free air"
- Wire"
- Cable tray"
- Raceway"

Alarm wiring must not be interchangeable, unable to cross connect."
NFPA 70 571.30(C)(3)!

(3) Mechanical Protection of the Emergency System. The wiring of the emergency systems in hospitals shall be mechanically protected. Where installed as branch circuits in patient care areas, the installation shall comply with the requirements of 517.13(A) and (B). The following wiring methods shall be permitted:

1. Nonflexible metal raceways, Type MI cable, or Schedule 80 PVC conduit. Nonmetallic raceways shall not be used for branch circuits that supply patient care areas.

2. Where encased in not less than 50 mm (2 in.) of concrete, Schedule 40 PVC conduit, flexible nonmetallic or jacketed metallic raceways, or jacketed metallic cable assemblies listed for installation in concrete. Nonmetallic raceways shall not be used for branch circuits that supply patient care areas.

3. Listed flexible metal raceways and listed metal sheathed cable assemblies in any of the following:
   a. Where used in listed prefabricated medical head-walls
   b. In listed office furnishings
   c. Where fished into existing walls or ceilings, not otherwise accessible and not subject to physical damage
   d. Where necessary for flexible connection to equipment

4. Flexible power cords of appliances or other utilization equipment connected to the emergency system.

5. Cables for Class 2 or Class 3 systems permitted by Part VI of this Article, with or without raceways.

Informational Note: See 517.13 for additional grounding requirements in patient care areas.
Master alarm wiring 5.1.9.2.3.6!
Medical air!!

The medical air intake location has been clarified to align with the AIA Guidelines and FGI Guidelines.

The intake makeup can be the same as vacuum exhaust, allowing for a variety of coppers or stainless steel (5.1.3.6.3.12(F)).

Dew point is corrected in both locations, medical air quality and master alarm activation to 35°F.
Clarify medical air intake, 5.1.3.6.3.12!
Medical gas installations !!

More restrictive use of threaded joints…this section was clarified. Special fitting specifications was clarified, and prohibited joints for other type of quick connect fittings was clarified."
"
No longer required to come out above centerline of the main."
"
Clarification of the term for those installing and working on medical gas systems, now “all personnel” must have credential, no supervisor."
"
Initial vacuum testing shall be at 150 psi with pressure piping system."
"
Authority Having Jurisdiction must now witness 24 hour standing test and attest."
"
Medical air systems are required to operate for 12 hours at 25% duty versus 24 hours. This must be done prior to patient use."
Maintenance and TJC Considerations!

- Master alarm sensor locations
- Valve locations, locking or latching, labeling
- Area alarms- local versus remote sensors
- Flex connectors- what are they and what does it mean