

A PRESENTATION FOR
**HAAHE – Houston Area Association
for Healthcare Engineering**

NFPA 99 – 2012 Overview
Health Care Facilities Code

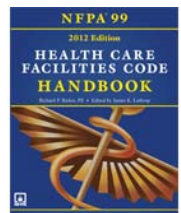
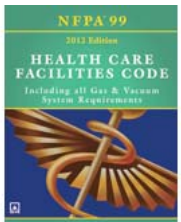
SSR Smith
Seckman
Reid, Inc.



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Health Care Facilities Code
Learning objectives

- NFPA 99-2012 Major Changes
- Major Electrical Changes
- Major MedGas Changes
- ANSI-adopted HCF Code; can now be incorporated into law as stand-alone document.



- Navigating the
NFPA 99-2012 Handbook

NFPA Disclaimer

- Although the speaker is Chairman of the NFPA Technical Committee on Emergency Power Supplies, which is responsible for NFPA 110 and 111, the views and opinions expressed in this presentation are purely those of the speaker and shall not be considered the official position of NFPA or any of its Technical Committees and shall not be considered to be, nor be relied upon as, a Formal Interpretation. Readers are encouraged to refer to the entire texts of all referenced documents.
- NFPA members can obtain staff interpretations of NFPA standards at www.nfpa.org.

www.nfpa.org/99
will always take you there

The screenshot displays the NFPA 99: Health Care Facilities Code webpage. At the top, it identifies the current edition as 2012 and the next as 2015, with a link to preview the 2012 edition. A navigation bar includes links for Document Information, Next edition, Technical Committee, Technical Questions, Products & Training, and Community. The main content area is titled 'Edition to display: 2012' and contains sections for 'What is NFPA 99?', 'What does NFPA 99 address?', 'Archived revision information', 'Tentative Interim Amendment (TIA)', 'Errata', and 'Additional Information'. A sidebar on the right features a search bar, a 'Documents Accessing Public Input' link, and a 'RELATED PRODUCTS' section listing the NFPA 99: 2012 Edition Handbook and Medical Gas and Vacuum Systems Installation Handbook. The bottom of the sidebar shows the item number SET103, a list price of \$316.00, a set price of \$270.50, and a member price of \$243.46.

CMS and the 2012 editions

- CMS: Examining NFPA 99-2012 and NFPA 101-2012
- CMS at NFPA Annual Conference: ~ 30 months to change the CoPs ... at least 2014.
- CMS said in its 2012 final regulation to revise CoPs *"We appreciate commenters' suggestions regarding the LSC regulations set out under our 'Physical environment' CoP at §482.41. Suggestions received were outside the scope of this final rule and will be considered through separate notice-and-comment rulemaking in a LSC omnibus rule, targeted for publication in the near future."*
- *Some rumors say as early as August 2013.*
- TJC, DNV expected to follow CMS shortly after adoption
- **Be aware** of changes in the newer referenced publications.

NFPA 101-2012

55 Referenced Publications, 1 of 2

REFERENCED PUBLICATIONS

101-23

- (1)*Documents referenced in this chapter, or portion of such documents, shall only be applicable to the extent called for within other chapters of this Code.
- (2) Where the requirements of a referenced code or standard differ from the requirements of this Code, the requirements of this Code shall govern.
- (3)*Existing buildings or installations that do not comply with the provisions of the codes or standards referenced in this chapter shall be permitted to be continued in service, provided that the lack of conformity with these documents does not present a serious hazard to the occupants as determined by the authority having jurisdiction.

2.2* NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 10, *Standard for Portable Fire Extinguishers*, 2010 edition.
NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, 2010 edition.
NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems*, 2011 edition.
NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems*, 2009 edition.
NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2010 edition.
NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*, 2010 edition.
NFPA 13R, *Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height*, 2010 edition.
NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2010 edition.
NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2012 edition.

NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems*, 2012 edition.
NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*, 2010 edition.
NFPA 92, *Standard for Smoke Control Systems*, 2012 edition.
NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, 2011 edition.
NFPA 99, *Health Care Facilities Code*, 2012 edition.
NFPA 101A, *Guide on Alternative Approaches to Life Safety*, 2010 edition.
NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives*, 2010 edition.
NFPA 110, *Standard for Emergency and Standby Power Systems*, 2010 edition.
NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, 2010 edition.
NFPA 160, *Standard for the Use of Flame Effects Before an Audience*, 2011 edition.
NFPA 170, *Standard for Fire Safety and Emergency Symbols*, 2009 edition.
NFPA 204, *Standard for Smoke and Heat Venting*, 2012 edition.
NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances*, 2010 edition.
NFPA 220, *Standard on Types of Building Construction*, 2012 edition.
NFPA 221, *Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls*, 2012 edition.
NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*, 2009 edition.
NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*, 2006 edition.
NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, 2008 edition.

NFPA 101-2012

55 Referenced Publications, 2 of 2

OTHER REFERENCED PUBLICATIONS:

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2012 edition.

NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, 2011 edition.

NFPA 17, *Standard for Dry Chemical Extinguishing Systems*, 2009 edition.

NFPA 17A, *Standard for Wet Chemical Extinguishing Systems*, 2009 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2011 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2012 edition.

NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products*, 2011 edition.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment*, 2011 edition.

NFPA 40, *Standard for the Storage and Handling of Cellulose Nitrate Film*, 2011 edition.

NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*, 2011 edition.

NFPA 54, *National Fuel Gas Code*, 2012 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2011 edition.

NFPA 70®, *National Electrical Code®*, 2011 edition.

NFPA 72®, *National Fire Alarm and Signaling Code*, 2010 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2010 edition.

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment*, 2009 edition.

NFPA 88A, *Standard for Parking Structures*, 2011 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 2012 edition.

OTHER REFERENCED PUBLICATIONS:

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, 2008 edition.

NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source*, 2011 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, 2007 edition.

NFPA 259, *Standard Test Method for Potential Heat of Building Materials*, 2008 edition.

NFPA 260, *Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture*, 2009 edition.

NFPA 261, *Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes*, 2009 edition.

NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls*, 2011 edition.


NFPA 271, *Standard Method of Test for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*, 2009 edition.

NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, 2011 edition.

NFPA 288, *Standard Methods of Fire Tests of Floor Fire Door Assemblies Installed Horizontally in Fire Resistance-Rated Floor Systems*, 2007 edition.

NFPA 289, *Standard Method of Fire Test for Individual Fuel Packages*, 2009 edition.

NFPA 415, *Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways*, 2008 edition.

2012 Edition 

2.4 References for Extracts in NFPA 99-2012 Mandatory Sections

- NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2010 edition.
- NFPA 30, *Flammable and Combustible Liquids Code*, 2012 edition.
- NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*, 2011 edition.
- NFPA 55, *Compressed Gases and Cryogenic Fluids Code*, 2010 edition.
- NFPA 70®, *National Electrical Code®*, 2011 edition.
- NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 2012 edition.
- NFPA 99B, *Standard for Hypobaric Facilities*, 2010 edition.
- NFPA 101®, *Life Safety Code®*, 2012 edition.
- NFPA 110, *Standard for Emergency and Standby Power Systems*, 2010 edition.
- NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, 2009 edition.
- NFPA 5000®, *Building Construction and Safety Code®*, 2012 edition.
- **NFPA 99-2012 references over 80 newer publications.**

During a survey ... The details are going to get you

- NFPA 99-2012
- NFPA 110-2010
- NFPA 13-2010
- NFPA 72-2010
- NFPA 25-2011
- NFPA 80-2010
- NFPA 70-2011
- NFPA 45-2011
- NFPA 92-2012



REMOVED from NFPA 99

- All of the Occupancy Chapters
 - "Requirements are based on the impact to the patient, regardless of the type of occupancy."
- Laboratory requirements (now refer to NFPA 45)
- Manufacturers' requirements on electrical equipment – now per IEC 60601-1, etc.
- Annexes B, D, & E were deleted. (They were technology no longer in use.)
 - *Annex B Nature of Hazards*
 - *Annex D Safe Use of High-Frequency Electricity ...*
 - *Annex E Flammable Anesthetizing Locations*

NFPA 99-2012 Chapters – (No occupancy chapters)

1. Administration
2. Referenced Publications
3. Definitions
4. Fundamentals *Extremely short*
5. Gas and Vacuum Systems
6. Electrical Systems
7. Information Technology & Communications Systems
8. Plumbing: *Added via TIA*
9. Heating, Ventilation and Air Conditioning (HVAC): *Added via TIA*
10. Electrical Equipment
11. Gas Equipment
12. Emergency Management
13. Security Management
14. Hyperbaric Facilities
15. Features of Fire Protection

Layout of NFPA 99-2012 Handbook *You should have a copy.*

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2. Referenced Publications
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3. Definitions
General, NFPA Official Definitions, General Definitions, BICSI (*Building Industry Consulting Services International*) Definitions
4. **Fundamentals** (*less than ½ Pg*)
Building System Categories, Risk Assessment, Application

NFPA 99-2012 Chapter Contents

5. Gas and Vacuum Systems (*48 pgs*)
Category 1, Category 2, Category 3
6. Electrical Systems (*14 pgs*)
Applicability, Nature of Hazards, Electrical System, Type 1 EES, Type 2 EES, Type 3 EES
7. **IT & Communications Systems for HCF** (*4 pgs*)
Applicability, Category 1, Category 2, Category 3
8. **Plumbing** (*1 pg*)
Applicability, System Category Criteria, General Requirements




NFPA 99-2012 Chapter Contents

9. HVAC (2 pgs)

Applicability, System Category Criteria, General

10. Electrical Equipment (6 pgs)

Applicability, Performance Criteria and Testing
for Patient-Care Related Electrical
Appliances and Equipment, Testing
Requirements – Fixed and Portable,
Nonpatient Electrical Appliances and
Equipment, Administration




NFPA 99-2012 Chapter Contents

11. Gas Equipment (5 pgs)

Applicability, Cylinder and Container Storage,
Cylinder and Container Storage
Requirements, Performance Criteria and
Testing, Administration, Operation and
Management of Cylinders, Liquid Oxygen
Entrapment

12. Emergency Management (4 pgs)

Scope, Responsibilities, Matrix Categories,
General, Category 1 and Category 2
Requirements




NFPA 99-2012 Chapter Contents

13. Security Management (2 pgs)

Scope, Security Vulnerability Assessment (SVA),
Responsible Person, Security-Sensitive
Areas, Access and Egress Security Measures,
Media Control, Crowd Control, Security
Equipment, Employment Practices, Security
Operations, Program Evaluation

14. Hyperbaric Facilities (11 pgs)

Scope, Construction and Equipment,
Administration & Maintenance



NFPA 99-2012 Chapter Contents

15. Features of Fire Protection (3 pgs)

Applicability, Construction and Compartmentation,
Special Hazard Protection for Flammable
Liquids and Gases, Laboratories, Utilities,
Rubbish Chutes Incinerators and Laundry
Chutes, Fire Detection Alarm and
Communications Systems, Automatic Sprinklers
and Other Extinguishing Equipment, Manual
Extinguishing Equipment, Compact Storage,
Compact Mobile Storage, Maintenance and
Testing, Fire Loss Prevention in OR's

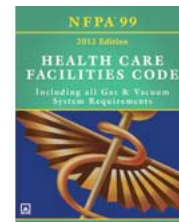
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Annex A Explanatory Material (50 pgs)
Annex B Additional Explanatory Notes (17 pgs)
Annex C Sample Ordinance Adopting NFPA 99
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New risk-based framework

“The risk to the patient does not change for a given procedure. If the procedure is performed in a doctor’s office versus a hospital, the risk remains the same. Therefore NFPA 99 eliminated the occupancy chapters and has gone to a risk-based approach. New Chapter 4 outlines the parameters of this approach. The Code now reflects the risk to the patient in defined categories of risk.”


- From the NFPA 99-2012 introduction





NFPA 99-2012 – Some of the major changes

- "Fundamentals" chapter - risk based on type of care provided
 - **Category 1:** equipment failure likely to cause major injury or death of patients or caregivers
 - **Category 2:** equipment failure likely to cause minor injury (*not serious or at risk of life*) to patients or caregivers
 - **Category 3:** equipment failure not likely to cause injury to patients or caregivers; can cause patient discomfort
 - **Category 4:** equipment failure would have no impact on patient care
 - Categories “determined by following and documenting a defined risk assessment procedure.”
 - Select systems or processes that are required for that risk category.



Major injury examples from the Ch.4 Annex (*invokes Category 1*)

- Amputation
- Loss of sight of an eye (even temporary)
- Burn to eye or any penetrating injury to eye
- Electric shock / electric burns: unconsciousness requiring resuscitation or ≥ 24 hours hospitalization
- Hypothermia, heat induced illness: unconsciousness requiring resuscitation or ≥ 24 hours hospitalization
- Loss of consciousness caused by asphyxia or lack of oxygen or exposure to a biological agent or harmful substance
- Absorption of any substance by inhalation, skin, or ingestion causing loss of consciousness or acute illness requiring medical treatment
- Acute illness requiring medical treatment where there is reason to believe the exposure was to biological agents, its toxins, or infected materials

Some system/equip. examples from the NFPA 99 Chapter 4 Annex

- Category 1
 - OR EP, ICU MedGas, Ventilator-assisted procedure in medical office OR suite, Cardiac cath equipment
- Category 2
 - Pt room task or procedure lighting, Pt care area potable water
- Category 3
 - Heating in the south; humidity control in non-operating areas, dental drills, motorized bed adjustments, cooling tower makeup water in NW
- Category 4
 - Gray water lawn sprinklers, seasonal lighting, PA, P-tube, vacuum system in research lab

Application

- All HC facilities *that treat humans* other than home care
- Construction & equipment requirements for new only
- Only altered or renovated or modernized portion of building
- If above modifies performance of a system it must be modified

How NFPA 99-2012 will work

- Determine the worst case procedure
- Use a documented process to select risk category
 - ISO/IEC 31010: *Risk Management—Risk Assessment Techniques*
 - NFPA 551: *Guide for the Evaluation of Fire Risk Assessments*
 - SEMI S10-0307E: *Safety Guideline for Risk Assessment and Risk Evaluation Process*
 - Other formal process
- Select the systems or procedures prescribed by that level of risk
 - Except for Hyperbaric Facilities where Ch. 14 applies (Hyperbaric Facility requirements are not Risk-Based)
- Additional FP specialties in Ch. 15

Some electrical changes

- Overcurrent protective devices: accessible only to authorized personnel; not public access areas
- Minimum # of receptacles: 8 in general care (Cat 2); 14 in critical care (Cat 1); 36 in ORs
- Single or multiple feeder between EES grouped distribution [6.4.2.2.2 *Feeders from Alt. Source*]
- 1 generator's fuel transfer pumps, receipts, vent fans, louvers, controls, cooling system, other needed gen accessories added to LS or gen output terminals with OCPDs [6.4.2.2.3.4]
- Selective coordination – added text to permit a 0.1 second delay

Some electrical changes

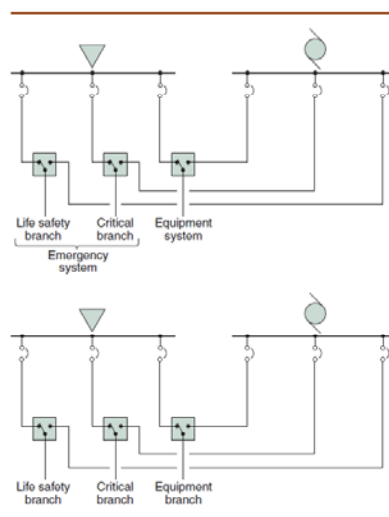
- MedGas alarms may be on CB or LS
- Generator testing – 10 sec not required during monthly testing – annual confirmation
 - 6.4.4.1.1.2 The 10-second criterion shall not apply during the monthly testing of an essential electrical system. If the 10-second criterion is not met during the monthly test, a process shall be provided to annually confirm the capability of the life safety and critical branches to comply with 6.4.3.1.
 - 6.4.4.1.1.3 Maintenance shall be performed in accordance with NFPA 110, Standard for Emergency and Standby Power Systems, Chapter 8. [\[2010 Edition\]](#)

Changes to Essential Electrical System Branches

EXHIBIT 6.8 Configurations of Emergency System: (top) Old Configuration; (bottom) New Configuration of Essential Electrical System.

“Previous editions of NFPA 99, as well as NFPA 70, defined the essential electrical system as a set of subsystems and branches. This distinction led to some confusion, particularly with respect to the number and arrangement of transfer switches. This edition eliminates the confusion by replacing the definition of the essential distribution systems with three simple branches.”

- NFPA 99-2012 Handbook p.311



6.4.2.2.2 Feeders from Alternate Source.

ORs are Wet Procedure Locations unless OR Risk Assessments state otherwise



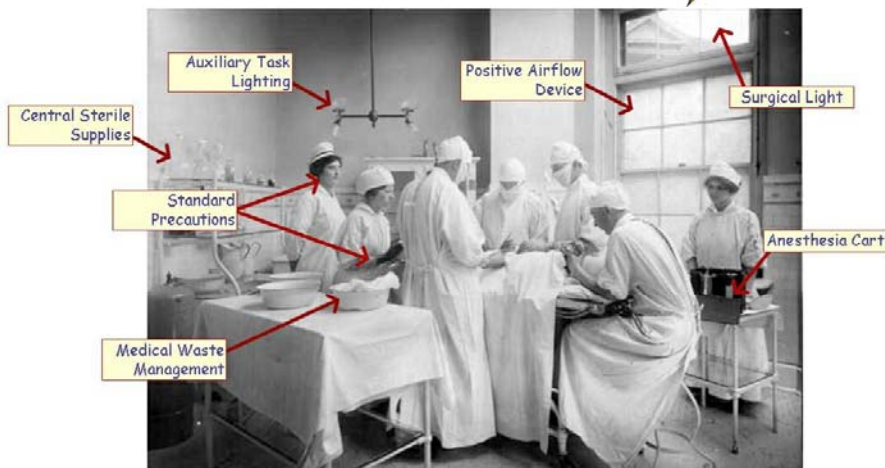
NFPA 99: How to Conduct Operating Room Risk Assessments

The National Fire Protection Association recently made an important code change that classifies operating rooms as wet procedure locations unless a risk assessment determines otherwise. Because wet procedure locations must be provided with special protection against electric shock, operating rooms defined as wet locations must be protected by either isolated power or ground-fault interrupters.


Previously, operating rooms were not considered wet locations by default (read more about the history of this issue and the recent code change at the end of this article). ASHE does not agree with the concept that all operating rooms should automatically be classified as wet locations unless risk assessments determine otherwise. However, the key to achieving compliance with this new requirement, and protecting scarce resources of time and money, is to perform a risk assessment to determine whether your operating rooms are wet locations.

How to Conduct an Operating Room Risk Assessment

Wet Procedure Location OR?




O.R.'s of the Future?




ASHE:
How to Conduct OR Risk Assessments

1. Form a risk assessment group to develop a process for evaluating ORs
2. The risk assessment group should gather information to help determine which surgical procedures, if any, qualify as wet procedures.*
**The 2012 edition of NFPA 99: Health Care Facilities Code defines wet procedure locations in 3.3.184: "The area in a patient care room where a procedure is performed that is normally subject to wet conditions while patients are present, including standing fluids on the floor or drenching of the work area, either of which condition is intimate to the patient or staff."*




ASHE:
How to Conduct OR Risk Assessments

3. When a more in-depth risk assessment is needed to determine if an operating room should be classified as a wet procedure location, evaluate the condition of the room during surgical procedures.
4. If the risk assessment group determines the facility has wet procedure locations, protect any wet procedure operating rooms with either isolated power or ground-fault interrupters.

ASHE:
How to Conduct OR Risk Assessments

5. If the facility has wet procedure locations, assess whether staff would be in danger of electrical shock from standing in a pool of water or other liquid and touching a faulty medical device.
6. Review the risk assessment annually to confirm the validity of the process and that conditions (e.g., different surgical procedures or new surgeons) have not changed for any operating room.

ASHE Believes Operating Rooms Should **Not** Be Considered Wet Locations by Default

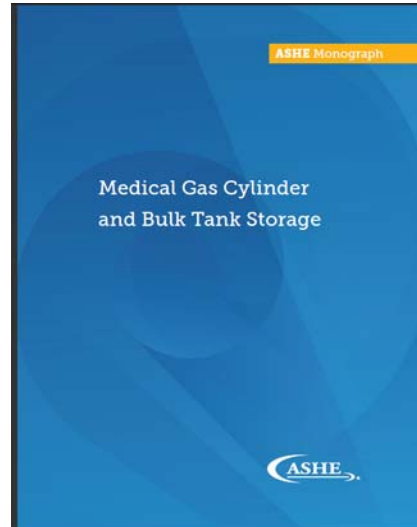
New IT & Communication Chapter 7

- Covers IT rooms, fire protection, nurse call, emergency call and staff emergency assistance.
- *Entrance Facility* (EF): At least 2 separate rooms; Can be located with the TER; Away from EMI & flooding; If remote data center, need onsite storage capacity for all inpt records; EPower = CB
- *Telecom Equipment Room* (TER): Separate space; Main network equip; Servers & data storage; Temp/Humid control; Positive pressure, other rules
- *Telecom Room* (TR): At least 1/floor; within 292 ft of data outlet; serves <20,000 sf

2012 ASHE Monograph on **Medical Gas Cylinder and Bulk Tank Storage**

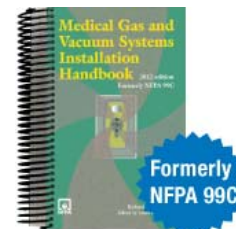
BASED ON NFPA 99-2012

1. Definitions
2. General Storage Requirements
3. Cylinder storage < 300 CF
4. Cylinder storage 300 – 3,000 CF
5. Cylinder storage > 3,000 CF
6. Signage requirements
7. Requirements for transfilling liquid O₂
8. Outdoor bulk tank storage



New NFPA Medical Gas and Vacuum Systems Installation Handbook

- NFPA will release a new Medical Gas and Vacuum Systems Installation Handbook in October 2012 to provide a comprehensive all-in-one resource to help users clearly understand the medical gas and vacuum systems requirements covered in NFPA 99-2012.
- Will combine all relevant information on gas and vacuum systems found in Chapters 1-5 of NFPA 99-2012, with additional full-color photos, illustrations and commentary, written by industry experts, to provide further explanation and clarity on the intent behind the requirements.
- In addition, 3 supplements will cover qualifications for personnel and general brazing procedures, cleaning for oxygen service and preparing joints for brazing, and installation testing and documentation.



Testing of Articulating Medical Booms

- 18 month (or as determined by risk assessment) testing of articulating medical booms in OR
 - Details are in “5.1.14.2.3.2 Manufactured Assemblies Employing Flexible Connection(s) Between the User Terminal and the Piping System.”
 - Changes reflect “concerns over reports of fires in articulating booms, which appear to be correlated to leaks in the gas lines. Since these units employ hoses internally, and the hoses can wear against the sides, the bearing housings, and one another, they need to be inspected frequently and replaced whenever wear is evident.” – *from 99 Handbook*
- I suggest you consider this now – not 2014.

Some other changes

- Prohibits use of plug-in connections to piped oxygen systems
 - Such as ozone sterilizers
- 5.1.3.5.12* Bulk Cryogenic Liquid Systems.
 - Most text removed, refers to NFPA 55 instead
- Testing for Cryogenic Systems
 - Tested for proper function; purity; alarm sensors; operation of control sensors
- 5.1.3.3.2* Outdoor central supply systems locations
 - Fencing to have 2 entry/exits

5.1.14.2 Maintenance of Medical Gas, Vacuum, WAGD, and Medical Support Gas Systems. **[CAT.1]**

“5.1.14.2.2.5 Qualifications. Persons maintaining these systems shall be qualified to perform these operations. Appropriate qualification shall be demonstrated by **any of** the following:

- (1) Training and certification through the health care facility by which such persons are employed to work with specific equipment as installed in that facility
- (2) Credentialing to the requirements of ASSE 6040, *Professional Qualification Standard for Medical Gas Maintenance Personnel*
- (3) Credentialing to the requirements of ASSE 6030, *Professional Qualification Standard for Medical Gas Systems Verifiers*”

MedGas maintenance

- Facility shall develop and document PM
- Program shall include an inventory of:
 - All source subsystems, control valves, alarms, manufactured assemblies, and outlets
- Inspection schedule established through a risk assessment
- Inspection procedure established by Org
- PM schedule established through a risk assessment
- “*Mandatory*” MedGas testing frequencies

Medical gas testing frequencies – partial examples from 5.1.14* Category 1 O&M

- **5.1.14.2.2* Inspection Schedules.** Scheduled inspections for equipment and procedures shall be established through the risk assessment of the facility and developed with consideration of the original equipment manufacturer recommendations and other recommendations as required by the authority having jurisdiction.
- **A.5.1.14.2.2.2** In addition to the minimum inspection and testing in 5.1.14, facilities should consider **annually** inspecting equipment and procedures and correcting any deficiencies.
- **5.1.14.2.2.4 Maintenance Schedules.** Scheduled maintenance for equipment and procedures shall be established through the risk assessment of the facility and developed with consideration of the original equipment manufacturer recommendations and other recommendations as required by the authority having jurisdiction.
- **B.5.2 Retesting and Maintenance of Nonflammable Medical Piped Gas Systems (Level 1 Systems).**
- **B.5.2.1 [5.1.3.5.10]** These systems **should** be checked **daily** to ensure that proper pressure is maintained and that the changeover signal has not malfunctioned. Periodic retesting of the routine changeover signal is not necessary, as it will normally be activated on a regular basis.
- **B.5.2.2 [5.1.3.5.12]** These systems **should** be checked **daily** to ensure that proper pressure is maintained and that the changeover signal has not malfunctioned. Periodic retesting of the routine changeover signal is not required. **Annual** retesting of the operation of the reserve and activation of the reserve-in-use signal **should** be performed.
- **B.5.2.3 [5.1.3.5.12]** If the system has an actuating switch and signal to monitor the contents of the reserve, it **should** be retested **annually**.

Medical gas testing frequencies – partial examples from 5.1.14* Category 1 O&M

- 5.1.14.4.4 Central supply systems for nonflammable medical gases shall conform to the following:**
- (1) They **shall** be inspected annually.
- 5.1.14.4.5 A periodic testing procedure** for nonflammable medical gas and vacuum and related alarm systems **shall** be implemented.
- 5.1.14.4.7 Procedures, as specified, shall be established for the following:**
- (1) Maintenance program for the medical air compressor supply system in accordance with the **manufacturer's recommendations**
 - (2) Facility testing and calibration procedure that ensures carbon monoxide monitors are **calibrated at least annually** or more often if recommended by the manufacturer
- 5.1.15* Category 1 Maintenance.** Facilities **shall** have a routine maintenance program for their piped medical gas and vacuum systems.
- A.5.1.15** Medical gas and vacuum systems **should** be **surveyed at least annually** for the items that follow and deficient items corrected. Survey of medical air and instrument air sources **should** include, but not be limited to, the following:

Ch. 8 Annex: SAMPLE Approach to Plumbing Category Designations

TABLE A.8.2.1 Category Designation by Function — Plumbing

Function	Potable	Nonpotable	Special Use	Water Conditioning	Water Heating	Process Air	Fuel
Airborne infection isolation room	2	NA	NA	NA	3	NA	NA
Burn patient care rooms	2	NA	NA	NA	3	NA	NA
Business offices/administration	4	4	4	4	4	4	4
Central sterile room	2	NA	NA	NA	3	2	NA
Class A surgical procedures	2	NA	NA	NA	3	NA	NA
Class B surgical procedures	2	NA	NA	NA	3	NA	NA
Class C surgical procedures	2	NA	NA	NA	3	NA	NA
Critical care rooms (Category 1 room)	2	NA	NA	NA	3	NA	NA
Emergency department trauma room	2	NA	NA	NA	3	NA	NA
Hemodialysis	2	NA	2	NA	3	NA	NA
Intensive care	2	NA	NA	NA	3	NA	NA
Medical records	4	4	4	4	4	4	4
Morgue	2	NA	NA	NA	3	NA	NA
PACU	2	NA	NA	NA	3	NA	NA
Patient education	4	4	4	4	4	4	4
Pharmacy	2	NA	NA	NA	3	NA	NA
Protective environment room	2	NA	NA	NA	3	NA	NA
Radiology	2	NA	NA	NA	3	NA	NA
Speech therapy	4	4	4	4	4	4	4
Waiting rooms	4	4	4	4	4	4	4

NA: Not applicable

Note: This is a sample table. The numbers represented in this table might not be consistent with the health care facility scenario.

Ch. 9 Annex: SAMPLE Approach to HVAC Category Designations

TABLE A.9.2 Category Designation by Function — Heating

Function	Category			
	Heating	Cooling	Ventilating	Process
Airborne infection isolation room	2	2	2	NA
Ambulance garage	NA	NA	3	NA
Biomedical waste holding	2	3	2	2
Bone marrow transplants	2	2	1	NA
Burn patient care rooms	2	2	2	NA
Business office/administration	4	4	4	4
Central sterile room	3	2	2	2
Class A surgical procedures	3	3	2	3
Class B surgical procedures	2	2	2	2
Class C surgical procedures	1	1	1	1
Critical care rooms (Category 1 room)	2	2	2	2
Emergency department trauma room	2	2	2	2
Intensive care	2	2	2	2
Medical-gas storage room	2	2	2	NA
Medical records	4	4	4	4
Morgue	3	3	2	NA
Occupation therapy	4	4	4	4
Oxygen transfilling	2	2	2	NA
PACU	2	2	2	2
Patient education	4	4	4	4
Pharmacy	2	2	2	2
Physical therapy	4	4	4	4
Protective environment room	2	2	2	NA
Radiology	2	2	2	2
Speech therapy	4	4	4	4
Waiting rooms	4	4	4	4

NA: Not applicable

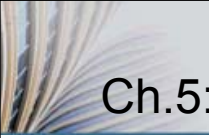
Note: This is a sample table. The numbers represented in this table might not be consistent with the health care facility scenario.

Partial example of significant changes listed in Handbook Supplement 5

Section or Paragraph Number	Notes on Code Change
5.1.14.2 Maintenance of Medical Gas, Vacuum, WAGD, and Medical Support Gas Systems. 5.1.14.2.1* General. 5.1.14.2.2 Maintenance Programs. 5.1.14.2.3 Inspection and Testing Operations.	A new section on maintenance was added. All the maintenance, inspection, and testing requirements are now found in one section.
5.1.14.4 Medical Gas and Vacuum Systems Maintenance and Record Keeping.	A new section on maintenance was added. All the maintenance, inspection, and testing requirements are now found in one section.
5.1.15* Category 1 Maintenance.	A new section on maintenance was added. All the maintenance, inspection, and testing requirements are now found in one section.
5.2.1.1 Section 5.2 through 5.2.12 shall apply to new health care facilities or facilities making changes that alter the piping. 5.2.1.2 Subsection 5.2.13 through 5.2.14 shall apply to existing health care facilities. 5.2.1.3 Subsection 5.2.11 through 5.2.12 shall apply to new and existing health care facilities.	A new section on maintenance was added. All the maintenance, inspection, and testing requirements are now found in one section.


Partial example of significant changes listed in Handbook Supplement 5

Section or Paragraph Number	Notes on Code Change
6.4.2.2.3.2(3)* Hospital communications systems, where used for issuing instruction during emergency conditions	Alarms were modified and generalized to be broader.
6.4.2.2.3.2(6) Electrically powered doors used for building Egress	This section was revised. Electrically powered doors can include the motion sensor and pressure switch type. The AHJ determines what is acceptable for activation of the electrically powered door.
6.4.2.2.3.3 Alarm and alerting systems (other than fire alarm systems) shall be connected to the life safety branch or critical branch.	Medical gas alarms are allowed to be on the life safety branch. This section was changed to allow that change.
6.4.2.2.3.4 Loads dedicated to a specific generator, including the fuel transfer pump(s), ventilation fans, electrically operated louvers, controls, cooling system, and other generator accessories essential for generator operation, shall be connected to the life safety branch or the output terminals of the generator with overcurrent protective devices.	Generator accessories were added.
6.4.2.2.3.3 Alarm and alerting systems (other than fire alarm systems) shall be connected to the life safety branch or critical branch.	Medical gas alarms are allowed to be on the life safety branch. This section was changed to allow that change.




Applicability to existing systems? Ch.5: Piped Gas and Vacuum Systems

- 5.1.1.4 An existing system that is not in strict compliance with the provisions of this code shall be permitted to be continued in use as long as the authority having jurisdiction has determined that such use does not constitute a distinct hazard to life.
- 5.1.1.5 Subsection 5.1.2 through 5.1.12.3.14.5 and 5.1.14.4.2 shall apply to new health care facilities or facilities making changes that alter the piping.
- 5.1.1.6 Paragraph 5.1.14.4.3 through 5.1.14.4.9 and 5.1.13 through 5.1.15 shall apply to existing health care facilities.
- 5.1.1.7 Paragraph 5.1.14.3 and 5.1.14.4.1 shall apply to new and existing health care facilities.



Applicability to existing systems? Ch. 6: Electrical Systems


- 6.1.1 This chapter shall apply to new health care facilities as specified in Section 1.3.**
- 6.1.2 The following paragraphs of this chapter shall apply to new and existing health care facilities:**
 - (1) 6.3.2.2.4.2;
 - (2) 6.3.2.2.6.1
 - (3) 6.3.2.2.6.2(F)
 - (4) 6.3.2.2.8.5(B)(2), (3), and (4)
 - (5) 6.3.2.2.8.7
 - (6) 6.3.4
 - (7) 6.4.1.1.17.5
 - (8) 6.4.2.2.6.2(C)
 - (9) 6.4.2.2.6.3
 - (10) 6.4.4
 - (11) 6.5.4
 - (12) 6.6.2.2.3. 2
 - (13) 6.6.3.1
 - (14) 6.6.4
- 6.1.3 Paragraph 6.3.2.2.2.3 shall apply only to existing facilities.**



Applicability to existing systems? Ch. 7: IT & Communications

7.1* Applicability

This chapter shall apply to information technology and communications systems in all health care facilities that provide services to human beings.




Applicability to existing systems? Ch. 8: Plumbing

8.1 Applicability

8.1.1 This chapter shall apply to construction of new health care facilities, except as noted in 8.1.2 and 8.1.3.

8.1.2 This chapter shall also apply to the altered, renovated, or modernized portions of existing systems or individual components.

8.1.3 Existing construction or equipment shall be permitted to be continued in use when such use does not constitute a distinct hazard to life.



Applicability to existing systems? Ch. 9: HVAC

9.1 Applicability

9.1.1 This chapter shall apply to construction of new health care facilities, except as noted in 9.1.2 and 9.1.3.

9.1.2 This chapter shall also apply to the altered, renovated, or modernized portions of existing systems or individual components.

9.1.3 Existing construction or equipment shall be permitted to be continued in use when such use does not constitute a distinct hazard to life.



Thank You!

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