2024 Changes NFPA 99 Study Guide

Key Symbols: N = New
R = Revision
E = Error
D = Deletion

All paragraphs listed are from the 2024 NFPA 99 Edition, unless specifically noted otherwise.

Key symbols are listed with each paragraph explaining the difference in the 2024 NFPA 99 Edition.

NOTES:

1. All changes are not noted in this guide. Only those changes that impact activities, systems or equipment are noted (in the opinion of the author). Minor wording changes are not noted.
2. This document is not intended to be a standalone document. A copy of the 2024 edition of NFPA 99 must be used in conjunction with this document.
3. The second number in a paragraph reference in Chapters 5 indicates the category of medical gas system that the paragraph is referring to. (i.e., Paragraph 5.***1***.1.2 applies to Category 1 medical gas systems. 5.***2*** applies to Category 2 and 5.***3*** applies to Category 3).
    a. *NOTE: there is an exception to this rule within the 2024 edition of NFPA 99. Section 5.**4** covers liquid withdrawal piping and has nothing to do with Category 4 medical gas systems.*
4. The second number in a paragraph reference in Chapters 15 indicates the category of medical gas system that the paragraph is referring to. (i.e., Paragraph 15.***3***.1 applies to Category 1 medical gas systems for dental. 15.***4*** applies to Category 2 and 15.***5*** applies to Category 3).
5. Please have a highlighter for use during study.

Chapter 3

1. (N) 3.3.7 Anesthetizing Location - For the first time ever in NFPA 99, anesthetizing location now has an official definition. The term has long been used within Chapter 5 but wasn't defined within Chapter 3 until the 2024 edition of NFPA 99.

2. (N) 3.3.14 Auxiliary Source Connection - This is another new definition that defines a term that has long been used in the NFPA 99 document. Note, this definition applies to any medical gas system, not just cryogenic/bulk systems as past code editions have treated it.

3. (N) 3.3.34 Debrief - Part of a series of new definitions (exercise, incident, planned event) meant to be used within a healthcare facility especially following an incident, exercise or planned event.

4. (N) 3.3.41 Dental-Surgical Vacuum - This is now defined with Chapter 3, and represents the deeper levels of vacuum oftentimes required for oral surgery.

5. (N) 3.3.56 Exercise - Part of a series of new definitions (debrief, incident, planned event) meant to be used within a healthcare facility especially in conjunction with a planned event.

6. (N) 3.3.89 Incident - Part of a series of new definitions (debrief, exercise, planned event), this is specifically meant to refer to an emergency event.

7. (N) 3.3.108 Manufactured Rough-In Assembly - This definition was included to support the new code language regarding how certain portions of a manufactured assembly are required to be tested prior to leaving the factory.

8. (N) 3.3.127 Non Essential Electrical Loads - This definition was added to officially define those loads on the healthcare facilities power grid that are now part of the essential electrical system. These would be what many commonly refer to as "normal power".

9. (N) 3.3.152 Planned Event - Part of a series of new definitions (debrief, exercise, incident), this is specifically an event that is not emergent in nature and brings applicable parties together at a specific time to accomplish a specific task. An example of this would be a planned medical gas shutdown to tie in a new area.

10. (N) 3.3.178 Sleep Lab - Sleep labs are now defined within Chapter 3, they have long been referred to within Chapter 5 in passing, but a formal definition wasn't established until the 2024 edition of NFPA 99.

Chapter 5

11. (D) 5.1.1.2 from NFPA 2021 edition - Deleted the requirement that general anesthesia and deep sedation may only be performed in Category 1 spaces.

12. (N) & (E) 5.1.1.4 - Statement that chapter 5 should apply to new healthcare facilities.

13. (R) 5.1.3.1.8 & 5.1.3.1.9 - Added verbiage that permits the manifold room door sign to be located adjacent to the door instead of being located directly on the door itself.

14. (N) 5.1.3.1.10 - If smoking is prohibited at a health care facility campus, the manifold room signage does not need to mention “NO SMOKING” on the manifold room door sign.

15. (N) 5.1.3.3.2.1 - The medical gas designer is now required to show some level of qualifications (two different options) to the healthcare facility. This rounds out the design and construction team qualification requirements when it comes to medical gas systems. Everyone involved in installation, inspection, testing, teaching and maintenance of medical gas systems has been required to meet a qualification standard, now so are the medical gas designers.

16. (N) 5.1.3.3.2.3 - This was added to differentiate the design and construction requirements for a room or space containing motor driven machinery as opposed to cylinder, container or other cryogenic equipment such as manifolds. This section would apply to items like medical air and vacuum central supply systems that are mechanically driven.

17. (N) 5.1.3.3.2.5* & Table 5.1.3.3.2.5 - There are now more specific requirements for the maximum quantity of oxidizers (oxygen & nitrous oxide) that may be connected and in storage indoors. The requirements change based on if the space is sprinkled or not.

18. (N) 5.1.3.3.2.6 - This clarifies that storage of small portable cylinders (such as e-cylinders) are still governed by chapter 11 of NFPA 99.

19. (N) 5.1.3.3.2.7* - This ensures that a healthcare facility has the ability to serve patients as allowed by their own risk assessment, even if it isn’t under the MAQs listed in table 5.1.3.3.2.5.

20. (R) 5.1.3.5.4 (1) - Changed the pressure requirement from 350 to 435 psi where polymeric materials are prohibited to be used in oxygen systems.

21. (R) 5.1.3.5.6.1 (7) - Added additional language specifying how relief valves can discharge to open air, and what must be protected if they discharge.

22. (N) 5.1.3.5.14* Auxiliary Connections. - New section outlining the requirements for an auxiliary source connection on all medical gas & vacuum systems.

23. (N) 5.1.3.5.14.1 - Auxiliary valve location requirement within the distribution pipeline.

24. (N) 5.1.3.5.14.2 - Auxiliary valve size requirement, same size as the main line but never larger than 2” NPS.

25. (N) 5.1.3.5.14.3 - Auxiliary valve piping configuration requirements. Tee, valve and a removable plug.

26. (N) 5.1.3.5.14.4 - Auxiliary valve labeling requirement (same as all other shut off valves).

27. (N) 5.1.3.5.14.5 - Auxiliary valve security requirement (same as all other shut off valves).

28. (R) 5.1.3.6.2* Uses of Medical Air. - Added an allowance that medical air may also be used in simulation centers for training health care professionals.

29. (R) 5.1.3.6.3.7 Medical Air Dryers. - Added a requirement that each medical air dryer must have a sample port for maintenance purposes. This is in addition to the main sample port for the med air system.

30. (R) 5.1.3.8.1.2 (2) - Added an allowance for using a combined med-surg vac / WAGD system if a facility has a high oxygen concentration alarm when the oxygen level exceeds 23.6% at the source.

31. (R) 5.1.3.8.5 (1) WAGD Exhaust - If the WAGD pump is 1 hp or less, or if WAGD is produced by a venturi, the exhaust may be in any way that allows it to escape the building and not allow re-entry to the building in any manner.

32. (R) 5.1.3.8.5 (2) WAGD Exhaust - Permits the use of anesthetic gas recovery (AGR) and anesthetic gas destruction systems.

33. (N) 5.1.3.10.2.2 - For new cryogenic fluid central supply system installations (as well as any revisions that include a breach of piping) a requirement has been added that the inspection and testing (verification) must be completed by someone holding an ASSE 6035 bulk gas verifier credential.

34. (N) 5.1.3.10.2.10 - Outdoor cryogenic fluid central supply systems are now required to have at least two means of egress from the enclosure.

35. (N) 5.1.3.10.2.11 - Outdoor cryogenic fluid central supply systems are required to comply with CGA M-1 *Standard for Medical Gas Supply Systems at Health Care Facilities.*

36. (R) 5.1.4.1.6 (10) - Seals used in medical gas shut off valves must comply with 5.1.3.5.4 and they must be replaceable.

37. (R) 5.1.4.6.2 - This section was re-written in an attempt to clear up the zone valve requirements for non-anesthetizing locations vs. anesthetizing locations. This change also removed all references to different levels of sedation that existed in the prior edition of NFPA 99.

38. (N) 5.1.6.2 - This new material specifies which tests only apply to the full manufactured assembly. The standing pressure test & operational pressure test must be completed on the full assembly.

39. (R) 5.1.6.10 (4) - Hoses utilized in manufactured assemblies must now be labeled with a recommended or required replacement date (from the date of manufacture).

40. (N) 5.1.8.1.7 - Pressure & vacuum gauges used for testing must have a rated accuracy of +/-1% of full scale or better.

41. (R) 5.1.9.2.4 - Combined med-surg vac/WAGD systems that are monitored for oxygen concentration must alarm at all master panels if the oxygen concentration exceeds 23.6%.

42. (R) 5.1.9.4.4 (1) & (2) - Reworded this section regarding the placement of area alarm sensors for Category 1 spaces and anesthetizing locations.

43. (R) 5.1.10.9.2 - Dielectric fittings are now called Fittings with Internal Seals. There were several additional requirements added for this type of fitting.

44. (N) 5.1.10.11.1.1 - This is a new requirement that the medical gas system designer must size the system so that the pressure & vacuum losses across the entire piping system do not exceed 10% starting at the source valve.

45. (N) 5.1.10.11.1.2 - This is a new requirement for the loss calculations generated in 5.1.10.11.1.1 to become part of the facility's permanent records. Expect this to be something that AOs could request in future surveys, especially in facilities that were built under the 2024 or later edition of NFPA 99.

46. (R) 5.1.10.11.5.3 (1) - The committee added verbiage (prior to backfilling) to this section regarding underground piping outside of buildings. The purpose of this revision was to prevent designers from requiring manhole covers (based on NFPA 99) or other elaborate methods that would allow joints to be inspected at any point during the future.

47. (R) Table 5.1.11 - Nitrogen & Instrument Air, both medical support gases have had their standard operating pressure ranges changed. Both now have standard gauge operating pressures of 0-300 psi. This change allows the system designer & end user to make the determination of what pressure will work best within the facility for the medical support gas needs.

48. (N) 5.1.12.1.11 - This new paragraph makes it clear that initial pressure test must be completed on any new piping prior to the new piping being connected to an existing system. Due to the higher pressure required for the initial pressure test (minimum 150 PSIG), this is meant to protect the existing piping systems from those higher pressures used during that test.

49. (R) 5.1.12.4.10.5 - Oxygen and med air outlets installed in category 1 (formally called critical care) spaces now have to flow at 6 SCFM for 3 seconds while not dropping in pressure more than 10 psig. The new requirement here is the pressure drop requirement of no more than 10 psig during the flow test.

50. (N) 5.1.14.3.6 - Healthcare facilities must now consider how they will access, protect and supply medical gas central supply systems that require delivery from outside sources. Examples listed include manifolds for cylinder or containers (dewars) and cryogenic fluid central supply systems (bulk).

51. (N) Section 5.4 Liquid Withdrawal & Piping - This is a new section that applies to facilities that draw cryogenic liquid from containers and use it in its liquid form.

Chapter 15

52. (N) 15.1.6 - Statement that chapter 15 should apply to new healthcare facilities with dental gas & vacuum systems.

53. (N) 15.3.3.4.2.3, 15.4.3.3.2.2 & 15.5.4.2.2.3 - Category 1, 2 and 3 dental air systems (allowed for use in driving tools and equipment and not allowed for respiration) now have (4) specific requirements relating to the system location and the system intake air source. Even though these systems are not allowed to be used for patient respiration, the possibility of incidental air exhausting into a patient's mouth via tools exists. These requirements are intended to prevent issues which may develop from that possibility. Some of these requirements existed in the 2012 and 2015 editions but were deleted in the 2018 and 2021 editions.

54. (N) 15.3.3.5.2.3, 15.4.3.3.3.2 (C) & 15.5.4.3.2.3 - There are now requirements for category 1, 2 and 3 dental vacuum exhausts. They must be exhausted outdoors in accordance with the manufacturer's recommendations, be filtered with a ULPA particulate filter, and discharged outdoors if used for nitrous oxide scavenging. Some of these requirements existed in the 2012 and 2015 editions but were deleted in the 2018 and 2021 editions.

55. (N) 15.3.3.5.2.4, 15.4.3.3.3.2 (D) & 15.5.4.3.2.4 - Dental vacuum system piping for category 1, 2 and 3 systems now have (6) specific requirements. Horizontal piping is required to be sloped a minimum of ¼" per 10 ft. toward the source equipment, sags or low points are prohibited, and voids that would allow buildups or obstructions are not allowed. Accessible cleanouts are permitted to be installed in the vertical downflow piping (where necessary) and are not to be installed on horizontal piping. Dental vacuum inlets shall be capable of 10 SCFM (or greater) flow capacity. Some of these requirements existed in the 2012 and 2015 editions but were deleted in the 2018 and 2021 editions.

56. (N) 15.3.3.7.3.5 - Dental gas and vacuum piping for category 1 and 2 systems shall not be installed in floor slabs. The 2021 edition listed this requirement for category 2 and 3 systems (and it still exists in the 2024 edition) but did not list it for category 1 systems.

57. (N) 15.3.3.8 - Category 1 dental air and vacuum systems testing has been rewritten to reflect many of the requirements listed for chapter 5 category 1 medical gas systems. Since plastic piping systems are prohibited in chapter 5 medical gas systems, there are additional testing requirements for those systems listed in 15.3.3.8.3.2 and 15.3.3.8.3.6. Plastic piping systems do not require an initial pressure test but do require a standing vacuum test.

58. (N) 15.3.3.8.4 - Category 1 dental gas and vacuum systems have new paragraphs for operation and management which reflect many of the requirements of chapter 5 category 1 medical gas systems, including system shutdowns, prohibited interconnections, manufacturer’s instructions, maintenance and periodic testing.