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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

Changes other than editorial are indicated by a vertical rule beside the paragraph, table, or figure in which the change occurred. These rules are included as an aid to the user in identifying changes from the previous edition. Where one or more complete paragraphs have been deleted, the deletion is indicated by a bullet (•) between the paragraphs that remain.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex B. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.
Chapter 1 Administration

1.1 Scope.
1.1.1 Applicability. This standard applies to commissioning and maintenance procedures for flammable gas piping found in electric-generating plant, industrial and commercial applications. 1.1.1.1* Coverage of piping systems shall extend from the point of delivery to the gas-consuming equipment isolation valve.

(A) For other than undiluted liquefied petroleum gas (LP-Gas) systems, the point of delivery shall be considered to be the outlet of the customer meter or at the connection to a customer’s piping, whichever is further downstream, or at the connection to customer piping if there is no meter.
(B) For undiluted LP-Gas, the point of delivery shall be considered to be the outlet of the final pressure regulator, exclusive of line gas regulators, in the system.
(C) For facilities that produce flammable gas for consumption on site, the point of delivery shall be considered to be the discharge isolation valve for the gas producing equipment.

1.1.2 Nonapplication of Standard. This code shall not apply to the following items:

(1)* Piping systems covered by NFPA 54, National Fuel Gas Code
(2)* Piping systems covered by NFPA 2, Hydrogen Technologies Code
(3)* LP-Gas (including refrigerated storage) at utility gas plants (see NFPA 59, Utility LP-Gas Plant Code)
(4)* LNG Facilities covered by NFPA 59A, Standard for the Production, Storage and Handling of Liquefied Natural Gas
(5) LP-Gas used with oxygen for cutting, welding or other hot work
(6)* Vehicle fuel dispensers
(7) Gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in distribution or transmission of gas other than undiluted LP-Gas
(8) Commissioning and maintenance of appliances or equipment

1.2 Purpose. This standard provides minimum safety requirements for the commissioning and maintaining of flammable gas piping systems, including cleaning new or repaired piping systems, placing piping systems into service, and removing piping systems from service.

1.2.1 For the purposes of this document, a piping system shall be understood to mean a complete piping system, including valves, regulators and other appurtenances, and any segment thereof that can be isolated from the system.

1.3 Retroactivity. The provisions of this standard reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this standard at the time the standard was issued.

1.3.1 Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard; where specified, the provisions of this standard shall be
1.3.2 In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate.

1.3.3 The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction and only where it is clearly evident that a reasonable degree of safety is provided.

1.4 Equivalency. The provisions of this code are not intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.4.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.4.2 The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

Chapter 2 Referenced Publications

2.1 General.
The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

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

2.3 Other Publications.
2.3.1 ASME Publications.
American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990.

2.3.2 Other Publications.

2.4 References for Extracts in Mandatory Sections.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster’s Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.4* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.3 General Definitions.

3.3.1 Bulk Gas System. A system in which compressed gas is delivered, stored, and discharged in the gaseous form to a piping system.

3.3.2* Competent Person. One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

3.3.3 Engines. Prime movers such as internal combustion engines, external combustion engines, gas turbine engines, rotary engines, and free piston engines using either gaseous fuels or liquid fuels or combinations thereof. [NFPA 37, 2010]

3.3.4 Equipment Isolation Valve. A manual shutoff valve for shutoff of the flammable gas to each piece of equipment.

3.3.5* Inert Gas. A nonreactive, nonflammable, noncorrosive gas such as argon, helium, krypton, neon, nitrogen, and xenon. [NFPA 55, 2010]

3.3.6* Line Gas Regulator. A pressure regulator placed in a gas line between the service regulator and the appliance regulator.

3.3.7 Pipeline Inspection Gauge (PIG). A scraping tool that is forced through a pipe or flow
line to clean out accumulations of dirt, scale, and debris from the walls of the pipe.

**3.3.8 Prime Mover.** An initial source of motive power used to drive machinery.

**3.3.9 Purge.** To free a gas conduit of air or gas, or a mixture of gas and air. [54, 2012]

**3.3.9.1 Purge into Service.** The act of replacing the air or inert gas in a closed system by a flammable gas.

**3.3.9.2 Purge out of Service.** The act of replacing the normal flammable content of a closed system by inert gas, air or water.

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**Chapter 4 — General Requirements**


**4.2 Notification of Hazards.** Personnel in the affected area(s), as determined by the process hazard analysis, who are not directly involved with the commissioning or maintenance of flammable gas piping systems shall be informed of the hazards associated with the activity prior to the initiation of any such activity.

**4.3* Process Hazard Analysis.** Commissioning and maintenance procedures shall include a process hazard analysis for each activity.

**4.3.1 The process hazard analysis for each commissioning or maintenance activity shall address the following, as a minimum:**

(1) Release or disposal of fluids

(2) Ignition Sources – static electricity and grounding

(3) Personnel safety and training

(4) Nonessential personnel evacuation

(5) Warnings/Alarms

(6) Emergency Response

(7) Restricted access to affected area

(8) Scope of work

(9) Notification of AHJ

(10) Well-defined responsibilities

(11) Assignment of duties

(12) Authority to shutdown

(13) Safety officers

(14) Review and compliance plans for other standards/regulations
(15) Monitoring of affected area during discharge
(16) Communication plans
(17) Management of Change
(18) Accurate Piping and Instrument Drawings
(19) Hot Work Permits
(20) Lockout/Tagout procedures
(21) Operation procedures
(22) Personal Protective Equipment
(23) Control of point of discharge
(24) Weather monitoring
(25) Air traffic
(26) Restoration of Service

Chapter 5 — Training Requirements

5.1 Persons whose duties fall within the scope of this standard shall be provided with training that is consistent with the scope of their job activities.

5.1.1 Such training shall include hazards of flammable gas, hazards of any compressed gas used for cleaning or purging, safe handling practices of flammable gas and compressed gas as applicable, emergency response procedures, and company policy.

5.1.2 Personnel training shall be supervised by a competent person and shall be documented.

5.1.3 Training records shall be maintained for a period not less than 5 years from the date of completion of the activity.

Chapter 6 Commissioning

6.1 General.

6.1.1 Commissioning of flammable gas piping shall include all pressure testing, cleaning, and flammable gas charging by the owner/operator or designated contractor(s).

6.1.2 Commissioning procedures shall be developed and implemented by a competent person.
6.1.3 Commissioning procedures shall be documented.

6.1.4 Commissioning shall occur when piping system construction is complete.

6.1.4.1 Piping system segments that can be isolated for cleaning prior to completion of the entire piping system shall be permitted to be cleaned, tested, and secured in a clean condition in accordance with Section 5.3.

6.1.4.2 Hangers, supports, or other means capable of restricting the movement of piping shall be installed prior to initiating commissioning activities in accordance with the process hazard analysis.

6.1.5* Fluid media for testing or cleaning shall not introduce a flammable atmosphere into or create a fire hazard in the piping system being tested or cleaned.

6.1.6 Where utilities such as steam, water, or compressed air are used for commissioning activities in quantities or duration that can disrupt distribution or operations internal or external to the facility, commissioning activities shall be coordinated with the managing authority of the utility.

6.1.7 Personnel not involved in the commissioning shall be evacuated from the affected area(s) as determined by the process hazard analysis.

6.1.8 Access to all parts of the piping system during commissioning activities shall be restricted in accordance with the process hazard analysis.

6.2* Pressure Testing and Inspection. Prior to cleaning or being charged with flammable gas, piping systems shall be inspected and pressure tested to determine that the materials, design, fabrication, and installation practices comply with the requirements of this standard and the intended application.

6.2.1 Pressure testing and inspection procedures shall be documented.

6.2.2 Where piping is designed and installed in accordance with NFPA 54, pressure testing and inspection shall be in accordance with NFPA 54 Chapter 8.

6.2.3 Where piping is designed and installed in accordance with ASME B31.1, pressure testing and inspection shall be in accordance with Chapter VI of ASME B31.1.

6.2.4* Where piping is designed and constructed in accordance with ASME B31.3, leak testing and inspection shall be in accordance with Chapter VI of ASME B31.3.

6.2.5* Where pneumatic testing is conducted in accordance with B31.1 or B31.3, the test medium shall be air, carbon dioxide, or an inert gas. Oxygen shall never be used.

6.2.6 Where repairs or additions are made following the pressure test, the affected piping shall be tested in accordance with NFPA 54, ASME B31.1, or ASME B31.3, as applicable.

6.2.7* A piping system shall be tested as a complete unit or in sections. Under no circumstances shall a valve in a line be used as a bulkhead between flammable gas in one section of the piping system and test medium in an adjacent section, unless a double-block-and-bleed valve system is utilized.
6.2.8* A valve, including the valve closing mechanism, or component shall not be subjected to the test pressure unless it can be determined that the valve or component is designed to safely withstand the pressure.

6.2.9 Regulator and valve assemblies fabricated independently of the piping system in which they are to be installed shall be permitted to be tested with inert gas or air at the time of fabrication. [54, 8.1.1.6]

6.3 Cleaning of Flammable Gas Piping.

6.3.1 General.

6.3.1.1 Flammable gas shall not be used for internal cleaning of piping systems except as permitted by 6.3.5.

6.3.1.2 An alarm shall precede the start of cleaning in accordance with the process hazard analysis.

6.3.2* Acceptable Fluid Media. Air, inert gas, steam, or water shall be acceptable cleaning media except as permitted by 6.3.5.

6.3.3 Temporary Power/Fuel Supply

6.3.3.1 Where electric power is used as the prime mover for the cleaning media supply system, it shall be connected in accordance with NFPA 70, National Electric Code.

6.3.3.2 Where fuel gas is used as the fuel for the cleaning media supply system, it shall be piped and connected in accordance with NFPA 54, National Fuel Gas Code or NFPA 58, Liquefied Petroleum Gas Code, as applicable.

6.3.3.3 Where fuel oil is used as the fuel for the cleaning media supply system, it shall be piped and connected in accordance with NFPA 31, Standard for the Installation of Oil-Burning Equipment.

6.3.4 Temporary Piping (Including Hose Assemblies). Temporary piping systems, including hose assemblies, used to connect cleaning media supply source to the piping system shall be in accordance with ASME B31.1 Paragraph 122.10.

6.3.5 Pipeline Inspection Gauge Cleaning. A pipeline inspection gauge (PIG) shall be permitted to be used to clean piping systems.

6.3.5.1 The fluid used to propel the PIG through the piping system shall be permitted to be water, steam, air, inert gas, or flammable gas.

6.3.5.2 PIG Cleaning using flammable gas as the propellant shall be limited to piping between the point of delivery and the plant boundary.

6.3.6 Point of Discharge During Cleaning Process.

6.3.6.1 Target. Where a target is used to indicate debris during the cleaning process, it shall be designed and secured to withstand the velocity and pressure of the exiting media and debris without breaking or failing.
6.3.6.2 The point of discharge location shall be determined based on the following criteria:

(1) personnel
(2) important buildings/building openings
(3) vehicles/vehicular traffic
(4) ignition sources
(5) atmospheric conditions
(6) design/location of target, if used
(7) topography
(8) discharge fluid characteristics
(9) Noise transmission to neighbors
(10) Management of Change
(11) Breathing air displacement/asphyxiation or toxicity hazard
(12) Location of Instrumentation and Controls

6.4 Isolation and Protection of Clean Piping Systems or Segments. Where piping systems are cleaned in stages during fabrication or field assembly, the clean piping shall be isolated and protected against infiltration of dirt or debris.

6.5 Charging Piping System with Flammable Gas.

6.5.1 Where gas piping containing air is placed in operation, the air in the piping first shall be displaced with an inert gas, which shall then be displaced with flammable gas in accordance with Section 5.5.2.

6.5.1.1 Inert gas displacement shall result in an oxygen concentration in the piping system of not more than 60 percent of the limiting oxidant concentration as determined in accordance with NFPA 69, Section 7.2.3.

6.5.2 Outdoor discharge of purged gases.

6.5.2.1 The open end of a piping system being pressure vented or purged shall discharge directly to an outdoor location.

6.5.2.2 Purging operations shall comply with the requirements in 5.5.2.2.1 through 5.5.2.2.5.

6.5.2.2.1 The point of discharge shall be controlled with a shutoff valve.

6.5.2.2.2 The point of discharge shall be located at least 10 feet from sources of ignition, at least 10 feet from building openings and at least 25 feet from mechanical air intake openings.

6.5.2.2.3 During discharge, the open point of discharge shall be continuously attended and monitored with a combustible gas indicator that complies with Section 5.5.3.

6.5.2.2.4 Purging operations introducing flammable gas shall be stopped when 90% flammable gas by volume is detected within the pipe.
6.5.2.2.5 Persons not involved in the purging operations shall be evacuated from all areas within 10 ft (3.1 m) of the point of discharge.

6.5.3 Combustible Gas Indicators.

6.5.3.1 Combustible gas indicators shall be listed and calibrated in accordance with the manufacturer’s instructions.

6.5.3.2 Combustible gas indicators shall numerically display a volume scale from 0 to 100 percent in 1 percent or smaller increments.

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Chapter 7 6 Maintenance

7.1 Isolation. Flammable gas piping shall be isolated from the flammable gas supply and downstream piping and equipment prior to maintenance.

7.2 Charging with Inert Gas. Where existing gas piping is opened, the section that is opened shall be isolated from the gas supply and the residual flammable gas in the piping shall be displaced with an inert gas.

7.2.1 Inert gas supply shall be in accordance with Section 5.3.2.2.

7.2.2 Outdoor Discharge of Residual Flammable Gas.

7.2.2.1 The open end of a piping system being pressure vented or purged shall discharge directly to an outdoor location.

7.2.2.2 Purging operations shall comply with the requirements in 6.6.2.2.1 through 6.6.2.2.5.

7.2.2.2.1 The point of discharge shall be controlled with a shutoff valve.

7.2.2.2.2 The point of discharge shall be located at least 10 feet (3.1 m) from sources of ignition, at least 10 feet from building openings and at least 25 feet from mechanical air intake openings.

7.2.2.2.3 During discharge, the open point of discharge shall be continuously attended and monitored with a combustible gas indicator that complies with Section 5.5.3.

7.2.2.2.4 Purging operations introducing inert gas shall be stopped when the fuel flammable gas level (by volume) detected within the pipe and within a 5 ft (1.5 m) radius of the point of discharge is less than 25 percent of the lower flammable limit.

7.2.2.2.5 Persons not involved in the purging operations shall be evacuated from all areas within 10 ft (3.1 m) of the point of discharge.

7.3 Inert Gas Disposal.

7.3.1 Following charging with inert gas, the piping system shall be permitted to be opened to atmosphere or charged with air.

7.3.2 Inert gas shall be permitted to be released indoors where mechanical ventilation is activated to prevent displacement of breathable air.

7.3.2.1 Where inert gas is released indoors, an oxygen monitoring system shall be installed in the area and activate audible and visual alarms if oxygen levels fall below 19.5 percent by volume.
7.4 **Hot Work Safety.** Cutting, welding and allied processes shall be in accordance with NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and other Hot Work.*

7.4.1 **Prevention of Accidental Ignition.** Where work is being performed on piping that has contained gas, the following shall apply:

7.4.1.1 Provisions for electrical continuity shall be made before alterations are made in a metallic piping system.

7.4.1.2 Smoking, open flames, lanterns, or other sources of ignition shall not be permitted.

7.4.1.3 A metallic electrical bond shall be installed around the location of cuts in metallic gas pipes made by other than cutting torches.

7.4.1.3.1 Where cutting torches, welding, or other sources of ignition are unavoidable, it shall be determined that all sources of gas or gas–air mixtures have been secured and that all flammable gas or liquids have been cleared from the area.

7.4.1.3.2 Piping shall be charged with inert gas in accordance with 6.2 before welding or cutting with a torch is attempted.

7.4.1.4 Artificial illumination shall be restricted to listed safetytype flashlights and safety lamps, and electric switches shall not be operated, on or off. [54: 4.3.1]

7.5 **Returning to Service.** Flammable gas piping shall be returned to service in accordance with Section 5.5.

7.5.1 Returning affected equipment to service shall be in accordance with the manufacturer’s instructions and good engineering practice.

### Chapter 8 Special Problems

8.1 Reserved.

### Annex A Explanatory Material

*Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.*

A.1.1.1.1 The piping system includes segments that can be located between pieces of equipment, such as gas conditioning or compressing equipment. This document does not cover the commissioning or maintaining of that equipment. This document covers the commissioning or maintaining of those piping segments and equipment as a system as it relates to the flow or displacement of flammable gas. The equipment isolation valve is intended to be the final isolation valve prior to the manufacturer’s or supplier’s equipment gas train. For some common pieces of equipment in NFPA Standards, the isolation valve is identified and referenced as follows: (1) NFPA 37, *Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines*, uses the term “shutoff valve”, referenced in section 5.4.2.

(2) NFPA 85, *Boiler and Combustion Systems Hazards Code*, uses the term manual shutoff valve referenced in Figure A.5.3.2.3 for single burner boilers, Figure A.6.6.5.1.5.4(A) and (B) for multiple burner boilers, and Figure A.8.8.5.8(A), (B), and (C) for heat recovery steam generators.

(3) NFPA 86, *Standard for Ovens and Furnaces*, uses the term equipment isolation valve, referenced in section 6.2.3.4.

(4) NFPA 87, *Recommended Practice for Fluid Heaters*, uses the term equipment isolation valve referenced in section 6.2.4.3.

**A.1.1.2(1)** The scope of NFPA 54, *National Fuel Gas Code*, is included here for the convenience of the user.

1.1 Scope.

1.1.1 Applicability.

1.1.1.1 This code is a safety code that shall apply to the installation of fuel gas piping systems, appliances, equipment, and related accessories as shown in 1.1.1.1(A) through 1.1.1.1(D).

(A) Coverage of piping systems shall extend from the point of delivery to the appliance connections. For other than undiluted liquefied petroleum gas (LP-Gas) systems, the point of delivery shall be considered to be the outlet of the service meter assembly or the outlet of the service regulator or service shutoff valve where no meter is provided. For undiluted LP-Gas, the point of delivery shall be considered to be the outlet of the final pressure regulator, exclusive of line gas regulators, in the system.

(B) The maximum operating pressure shall be 125 psi (862 kPa).

*Exception No. 1: Piping systems for gas–air mixtures within the flammable range are limited to a maximum pressure of 10 psi (69 kPa).*

*Exception No. 2: LP-Gas piping systems are limited to 20 psi (140 kPa), except as provided in 5.5.1(6).*

(C) Requirements for piping systems shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation, and maintenance.

(D) Requirements for appliances, equipment, and related accessories shall include installation, combustion, and ventilation air and venting.

**A.1.1.2(3)** The scope of NFPA 2, *Hydrogen Technologies Code*, is included here for the convenience of the user.

1.3* Application.

1.3.1 This code shall apply to the production, storage, transfer, and use of hydrogen in all occupancies and on all premises.

1.3.2 The use of hydrogen shall include stationary, portable, and vehicular infrastructure applications.

1.3.3 The fundamental requirements of Chapters 1 through 8 shall apply in addition to the use-specific requirements provided in Chapters 9 through 20, as applicable.

1.3.4 Exemptions. This code shall not apply to the following:

(1) Onboard vehicle or mobile equipment components or systems, including the onboard GH2 or LH2 fuel supply
(2) Mixtures of GH2 and other gases with a hydrogen concentration of less than 95 percent by volume when in accordance with NFPA 55, Compressed Gases and Cryogenic Fluids Code

(3) The storage, handling, use, or processing of metal hydride materials outside of metal hydride storage systems defined in Chapter 3

A.1.1.2(3) The scope of NFPA 59, Liquefied Petroleum Gas at Utility Gas Plants, is included here for the convenience of the user.

1.1 Scope.

1.1.1* This code shall apply to the design, construction, location, installation, operation, and maintenance of refrigerated and nonrefrigerated utility gas plants. Coverage of liquefied petroleum gas systems at utility gas plants shall extend to the point where LP-Gas or a mixture of LP-Gas and air is introduced into the utility distribution system.

1.1.2 When operations that involve the liquid transfer of LP-Gas from the utility gas plant storage into cylinders or portable tanks (as defined by NFPA 58, Liquefied Petroleum Gas Code) are carried out in the utility gas plant, these operations shall conform to NFPA 58, Liquefied Petroleum Gas Code.

1.1.3 Installations that have an aggregate water capacity of 4000 gal (15.14 m3) or less shall conform to NFPA58, Liquefied Petroleum Gas Code.

A.1.1.2(4) The scope of NFPA 59A, Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG), is included here for the convenience of the user.

1.1* Scope.

1.1.1 This standard shall apply to the following:

(1) Facilities that liquefy natural gas

(2) Facilities that store, vaporize, transfer, and handle liquefied natural gas (LNG)

(3) The training of all personnel involved with LNG

(4) The design, location, construction, maintenance, and operation of all LNG facilities

1.1.2 This standard shall not apply to the following:

(1) Frozen ground containers

(2) Portable storage containers stored or used in buildings

(3) All LNG vehicular applications, including fueling of LNG vehicles


A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the

listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase “authority having jurisdiction,” or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.2.4 Listed. The means for identifying listed equipment may vary for each organization concerned with product evaluation; some organizations do not recognize equipment as listed unless it is also labeled. The authority having jurisdiction should utilize the system employed by the listing organization to identify a listed product.

A.3.3.2 The definition is extracted 29CFR1926.32(f). OSHA guidance material states additionally: “by way of training and/or experience, a competent person is knowledgeable of applicable standards, is capable of identifying workplace hazards relating to the specific operation, and has the authority to correct them. Some standards add additional specific requirements which must be met by the competent person.”

A.3.3.5 Inert Gas. Inert gases do not react readily with other materials under normal temperatures and pressures. For example, nitrogen combines with some of the more active metals such as lithium and magnesium to form nitrides, and at high temperatures it will also combine with hydrogen, oxygen, and other elements. The gases neon, krypton, and xenon are considered rare due to their scarcity. Although these gases are commonly referred to as inert gases, the formation of compounds is possible. For example, xenon combines with fluorine to form various fluorides and with oxygen to form oxides; the compounds formed are crystalline solids. [NFPA 55, 2010]

A.3.3.6 The service regulator in an undiluted Liquefied Petroleum Gas system can include any one of the following:

1. The second stage regulator or integral two-stage regulator
2. A 2-psi service regulator or integral 2 psi service regulator

A.4.3 Commissioning or maintenance procedures should include, as a minimum, consideration of process safety management as described in 29 CFR part 1926.64 for construction of new facilities or 29 CFR 1910.119(e). The intent of the reference to the regulation is to direct users to the process hazard analysis; it is not intended to imply that all facilities are subject to the entire regulation. For further information on hazard analyses, users can reference AICHE Center for Chemical Process Safety Guidelines for Hazard Evaluation Procedures.

A.6.1.5 Compressors can introduce lubricating oil or other flammable constituents to the compressed gas supply. Care should be taken to insure that these flammable constituents are not introduced to the piping system in concentrations that could lead to a flammable atmosphere within the pipe. This can include the use of “100% oil-free compressors”, or filtering systems that remove residuals prior to introduction to the piping system.
A.6.2 Where pressure testing is completed before the piping system is cleaned of dirt and debris, operators should release the media and debris in a way that would not pose a risk to personnel. Operators can consider the following methods to discharge the pressure test media:

1. Releasing test media at a rate that prevents the ejection of debris or liquids at high velocity
2. Providing means to capture debris or liquids exiting the system
3. Locating the discharge point a safe distance from any person, vehicle, or structure.

A.6.2.4 ASME B31.3 requires a “leak test” wherein piping systems are subjected to pressures at least 1.5 times the design operating pressure and such pressure is held for at least 10 minutes. NFPA 54 and ASME B31.1 require a similar test procedure and parameters but refer to the test as a “pressure test.”

A.6.2.5 ASME B31.1 and B31.3 require the use of a “nonflammable and nontoxic” gas as the test medium for pneumatic testing. This document specifically limits the acceptable media further to air, carbon dioxide or inert gas. Oxygen is specifically prohibited because of the possible subsequent introduction of flammable gas and risk of developing a flammable atmosphere.

A.6.2.8 Components can be relief valves, pressure switches, sensing lines, fill lines, thermowells, gauges, orifice plates, flanges, blinds, pressure-operated releases, or other similar appurtenances.

A.6.3.2 This is not intended to exclude specialized cleaning chemicals used in solution with water in accordance with manufacturer’s instructions by competent personnel.

Annex B Informational References

B.1 Referenced Publications.
The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

B.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

B.1.2 Other Publications.

B.2 Informational References. (Reserved)

ANSI/ASSE Z690.1, Vocabulary for Risk Management

ANSI/ASSE Z690.2, Risk Management – Principles and Guidelines

ANSI/ASSE Z690.3, Risk Assessment Techniques

B.3 References for Extracts in Informational Sections. (Reserved)