First Revision No. 83-NFPA 59A-2014 [Global Input]

In every chapter, use full titles of referenced standards for first occurrence only. Revise subsequent occurrences to use identifying number only.

Submitter Information Verification

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Submittal Date: Wed Mar 12 11:32:09 EDT 2014

Committee Statement

Committee Statement: The references are revised to be consistent throughout the document.
Response Message:

First Revision No. 85-NFPA 59A-2014 [New Section after 1.5]

1.6 Pressure Measurement.

All pressures expressed in this document are gauge pressures unless specifically noted otherwise.

Submitter Information Verification

Submitter Full Name: Denise Beach
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Submittal Date: Wed Mar 12 21:03:47 EDT 2014

Committee Statement

Committee Statement: A new section is added to chapter 1 to provide clarity to the pressure units used in the standard.
Response Message:

First Revision No. 1-NFPA 59A-2014 [Section No. 2.3.1]

2.3.1 ACI Publications.

American Concrete Institute, P.O. Box 9094, Farmington Hills, MI 48333.

ACI 304R, *Guide for Measuring, Mixing, Transportation and Placing of Concrete*, 2000.

ACI 318, *Building Code Requirements for Structural Concrete and Commentary,*~~2008~~ 2011 .

ACI 350, *Code Requirements for Environmental Engineering Concrete Structures*, 2006.

ACI 376, *Code Requirements for Design and Construction of Concrete Structures for the Containment of Refrigerated Liquefied Gases,* 2010.

Submitter Information Verification

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Street Address:
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Committee Statement

Committee Statement: The referenced standards are updated to the current editions.
Response Message:
Public Input No. 65-NFPA 59A-2013 [Section No. 2.3.1]

First Revision No. 2-NFPA 59A-2014 [Section No. 2.3.2]

2.3.2 ALPEMA Publications.

Brazed Aluminum Plate-Fin Heat Exchanger Manufacturer's Association, IHS (secretariat), 321 Inverness Drive South, Englewood, CO 80112.

The Standards of the Brazed Aluminum Plate-Fin Heat Exchanger Manufacturer's Association, ~~2nd~~ 3rd Edition, ~~2000, with 2003 and 2007 revisions~~ 2012 .

Submitter Information Verification

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Committee Statement

Committee Statement: The referenced standards are updated to the current editions.
Response Message:
Public Input No. 66-NFPA 59A-2013 [Section No. 2.3.2]

First Revision No. 3-NFPA 59A-2014 [Section No. 2.3.3]

2.3.3 API Publications.

American Petroleum Institute, 1220 L Street, NW, Washington, DC 20005-4070.

API 6D, *Specification for Pipeline Valves,* 2007 with errata 1-6 (2011) and addendums 1, 2 (2011), and 3 (2012) .

API 620, *Design and Construction of Large, Welded, Low-Pressure Storage Tanks,* 2008, 11th edition, including 2009, 2010, and 2012 addendums .

API 625, *Tank Systems for Refrigerated Liquefied Gas Storage,* ~~First Edition,~~ 2010, with addendum 1, July 1, 2013

API 2510, *Design and Construction of Liquefied Petroleum Gas (LPG) Installations,* 2001.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
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Submittal Date: Tue Mar 11 20:47:23 EDT 2014

Committee Statement

Committee Statement: The referenced standards are updated to the current editions.
Response Message:
Public Input No. 67-NFPA 59A-2013 [Section No. 2.3.3]

First Revision No. 4-NFPA 59A-2014 [Section No. 2.3.5]

2.3.5 ASME Publications.

American Society of Mechanical Engineers, ~~Three~~ Two Park Avenue, New York, NY 10016-5990.

~~ASME~~ *Boiler and Pressure Vessel Code,*~~2007~~ 2013 .

ASME B 31.3, *Process Piping,*~~2008~~ 2012 .

ASME B 31.5, *Refrigeration Piping,*~~2006~~ 2013 .

ASME B 31.8, *Gas Transmission and Distribution Piping Systems,*~~2007~~ 2012 .

Submitter Information Verification

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Committee Statement

Committee Statement: The referenced standards are updated to the current editions.
Response Message:
Public Input No. 68-NFPA 59A-2013 [Section No. 2.3.5]

First Revision No. 5-NFPA 59A-2014 [Section No. 2.3.6]

2.3.6 ASTM Publications.

ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM E 84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, ~~2011~~ 2012 .

ASTM E 136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C,*~~2009~~ 2012 .

ASTM E 2652, *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750* ~~*Degrees*~~ *°C,*~~2009~~ 2012 .

Submitter Information Verification

Submitter Full Name: Denise Beach
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Street Address:
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Committee Statement

Committee Statement: The referenced standards are updated to the current editions.
Response Message:
Public Input No. 69-NFPA 59A-2013 [Section No. 2.3.6]

First Revision No. 6-NFPA 59A-2014 [Section No. 2.3.8]

2.3.8 CSA Publications.

Canadian Standards Association, 5060 Spectrum Way, Mississauga, ON, L4W 5N6, Canada.

CSA B51, *Boiler, Pressure Vessel and Pressure Piping Code,* ~~2007~~ 2009 .

CSA C22.1, *Canadian Electrical Code,* ~~2006~~ 2012 .

Submitter Information Verification

Submitter Full Name: Denise Beach
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Street Address:
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Submittal Date: Tue Mar 11 20:48:42 EDT 2014

Committee Statement

Committee Statement: The referenced standards are updated to the current editions.
Response Message:
Public Input No. 70-NFPA 59A-2013 [Section No. 2.3.8]

First Revision No. 7-NFPA 59A-2014 [Section No. 2.3.9]

2.3.9 IEEE Publications.

~~Institute of Electrical and Electronics Engineers~~ IEEE , Three Park Avenue, 17th Floor, New York, NY 10016-5997.

IEEE/ASTM SI 10, *American National Standard for Use of the International System of Units (SI): The Modern Metric System,* ~~2002~~ 2010 .

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
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Submittal Date: Tue Mar 11 20:49:05 EDT 2014

Committee Statement

Committee Statement: The referenced standards are updated to the current editions.
Response Message:
Public Input No. 71-NFPA 59A-2013 [Section No. 2.3.9]

First Revision No. 8-NFPA 59A-2014 [Section No. 2.3.12]

2.3.12 Other Publications.

American Institute of Chemical Engineers (~~AICHE~~ AIChE) Center for Chemical Process Safety (CCPS), "Guidelines for Chemical Process Quantitative Risk Analysis," G-42, 2000 edition .

ASNT SNT-TC-IA, *Personnel Qualification and Certification in Nondestructive Testing,* 2011.

European Norm Standard, BSI EN 31010:2010, "Risk Management–Risk Assessment Techniques."

Health and Safety Executive (HSE), "Risk Criteria for Land-use Planning in the Vicinity of Major Industrial Hazards, HMSO, HSE 1989" and "Fire Steps to Risk Assessment, INDC 163, rev. 1, HSE 1998," United Kingdom.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

TNO, "Guidelines for Quantitative Risk Assessment, RIVM, The Purple Book," Netherlands, 2005.

Submitter Information Verification

Submitter Full Name: Denise Beach
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City:
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Submittal Date: Tue Mar 11 20:49:32 EDT 2014

Committee Statement

Committee Statement: The referenced standards are updated to the current editions.
Response Message:
Public Input No. 72-NFPA 59A-2013 [Section No. 2.3.12]

First Revision No. 117-NFPA 59A-2014 [Section No. 2.4]

2.4 References for Extracts in Mandatory Sections.

NFPA 52, *Vehicular Gaseous Fuel Systems Code,* ~~2010~~ 2013 edition.

NFPA 54, *National Fuel Gas Code,* ~~2012~~ 2015 edition.

NFPA ~~*NFPA*~~ *101*®, *Life Safety Code*®, ~~2012~~ 2015 edition.

Submitter Information Verification

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City:
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Submittal Date: Wed Mar 19 16:20:40 EDT 2014

Committee Statement

Committee Statement: The section is updated to reflect current editions.
Response Message:

First Revision No. 14-NFPA 59A-2014 [Section No. 3.3.1]

~~**3.3.1** Barrel.~~

~~A unit of volume that is equal to 42 gal (0.159 m^3).~~

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
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Submittal Date: Tue Mar 11 20:57:43 EDT 2014

Committee Statement

Committee Statement: The definition is deleted because the term is not used in the mandatory text of the standard.

Response Message:

Public Input No. 73-NFPA 59A-2013 [Section No. 3.3.1]

First Revision No. 68-NFPA 59A-2014 [Section No. 3.3.2]

3.3.1 Bunkering.

The loading of a ship's bunker or tank with fuel ~~oil~~ for use in connection with propulsion or auxiliary equipment.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
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Submittal Date: Tue Mar 11 22:12:05 EDT 2014

Committee Statement

Committee Statement: LNG is now being considered as an engine fuel for ships, therefore the definition is revised to be more generic.

Response Message:

Public Input No. 74-NFPA 59A-2013 [Section No. 3.3.2]

First Revision No. 17-NFPA 59A-2014 [Section No. 3.3.4]

3.3.3 ~~Components.~~ Component.

A part~~,~~ or a system of parts~~,~~ that functions as a unit in an LNG ~~plant~~ facility and could include, but is not limited to, piping, processing equipment, containers, control devices, impounding systems, electrical systems, security devices, fire control equipment, and communication equipment.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:04:39 EDT 2014

Committee Statement

Committee Statement: The definition is updated to be consistent with new definition for an LNG facility. See FR 15 for additional information.

Response Message:

Public Input No. 75-NFPA 59A-2013 [Section No. 3.3.4]

First Revision No. 80-NFPA 59A-2014 [Section No. 3.3.5 [Excluding any Sub-Sections]]

~~A single-wall vessel for storing gaseous and/or liquefied natural gas.~~

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 09:22:46 EDT 2014

Committee Statement

Committee Statement: The definition is removed because it is specific to LNG containers, but other types of containers are referenced in the standard.
Response Message:

First Revision No. 70-NFPA 59A-2014 [Section No. 3.3.5.3.3]

~~**3.3.5.3.3** Membrane Tank System.~~

~~A tank system consisting of a thin metal primary container together with thermal insulation and a concrete container jointly forming an integrated, composite structure that provides liquid containment, where hydrostatic loads and other loadings on the membrane are transferred via the load-bearing insulation onto the concrete container such that the vapors are contained by the tank roof.~~

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 22:18:26 EDT 2014

Committee Statement

Committee Statement: The term is not used in the mandatory text of the document, therefore the definition is deleted.

Response Message:

Public Input No. 50-NFPA 59A-2013 [Section No. 3.3.5.3.3]

First Revision No. 71-NFPA 59A-2014 [New Section after 3.3.8]

3.3.8* Engineering Design.
Documentation governing the specification and design of components and systems within an LNG facility.

Supplemental Information

File Name	Description
3.3.9_FR_71.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 22:22:09 EDT 2014

Committee Statement

Committee Statement: The definition is provided to clarify requirements in mandatory chapters related to the engineering design. The annex material provides additional guidance on what should be included with the engineering design.

Response Message:

Public Input No. 76-NFPA 59A-2013 [New Section after 3.3.8]

A.3.3.x Engineering Design.

The engineering design conforms to regulatory requirements and includes all necessary specifications, drawings, and supporting documentation. The engineering design is developed from process, mechanical, civil, structural, fire protection, corrosion, control, and electrical requirements and other specifications.

First Revision No. 15-NFPA 59A-2014 [New Section after 3.3.15]

3.3.16* LNG Facility.
A collection of components used to produce, store, vaporize, transfer, or handle LNG.

Supplemental Information

File Name	Description
A.3.3.16_FR_15_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 20:58:55 EDT 2014

Committee Statement

Committee Statement: The committee revised several definitions to establish a hierarchy of components, facilities, and plants. The following example describes the intent of establishing the hierarchy of the terms “component,” “LNG facility,” and “LNG plant”: When a number of components (piping, flanges, fittings, valves including relief valves, gaskets, instrumentation, pumps, compressors, heat exchangers, motors engines, turbines, electrical field wiring, etc.) are installed and designed to function as a unit (storage, vaporization, liquefaction, transfer, etc.) they are referred to as an LNG facility. A collection of LNG facilities (storage, vaporization, liquefaction, transfer, etc.) that are co-located on a property is referred to as an LNG plant. Components that function as a unit for purposes of serving the whole LNG plant (such as electrical systems, fire protection systems, security systems, etc.) can be referred to as LNG plant systems.

Response Message:

Public Input No. 64-NFPA 59A-2013 [New Section after 3.3.15]

A.3.3.16 LNG Facility.

The following describes the distinctions in the terms *component*, *LNG facility*, and *LNG plant*:

Several *components* (piping, flanges, fittings, valves including relief valves, gaskets, instrumentation, pumps, compressors, heat exchangers, motors engines, turbines, electrical field wiring, etc.) installed and designed to function as one unit (storage, vaporization, liquefaction, transfer, etc.) are referred to as an *LNG facility*.

A collection of LNG facilities (storage, vaporization, liquefaction, transfer, etc.) co-located on a site is referred to as an *LNG plant*.

Components that function as a unit for purposes of serving an entire LNG plant (such as electrical systems, fire protection systems, security systems, etc.) can be referred to as LNG plant systems.

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First Revision No. 16-NFPA 59A-2014 [Section No. 3.3.16]

3.3.17 LNG Plant.

~~A facility whose components can be used to store, condition, liquefy, or vaporize natural gas.~~ An LNG facility or collection of LNG facilities functioning as a unit.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
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Submittal Date: Tue Mar 11 21:02:42 EDT 2014

Committee Statement

Committee Statement: The definition is revised to recognize the new definition for LNG facility.
Response Message:
Public Input No. 63-NFPA 59A-2013 [Section No. 3.3.16]

First Revision No. 9-NFPA 59A-2014 [Section No. 3.3.17]

3.3.18 Maximum Allowable Working Pressure (MAWP) .
The maximum gauge pressure permissible at the top of completed equipment, a container, or a vessel in its operating position for a design temperature.

Submitter Information Verification

Submitter Full Name: Denise Beach
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Street Address:
City:
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Submittal Date: Tue Mar 11 20:50:05 EDT 2014

Committee Statement

Committee Statement: The abbreviation is added to the definition to clarify subsequent uses in the mandatory text.

Response Message:

Public Input No. 181-NFPA 59A-2014 [Section No. 3.3.17]

First Revision No. 86-NFPA 59A-2014 [Section No. 3.3.29]

3.3.30* Vaporizer.

3.3.30.1 Ambient Vaporizer.

A vaporizer that derives its heat from naturally occurring heat sources, such as the atmosphere, seawater, or geothermal waters.

3.3.30.2 Heated Vaporizer.

A vaporizer that derives heat for vaporization from the combustion of fuel, electric power, or waste heat, such as from boilers or internal combustion engines. [**52,**~~2010~~ 2013]

3.3.30.2.1 Integral Heated Vaporizer.

A vaporizer, including submerged combustion vaporizers, in which the heat source is integral to the actual vaporizing exchanger. [**52,**~~2010~~ 2013]

3.3.30.2.2 Remote Heated Vaporizer.

A heated vaporizer in which the primary heat source is separated from the actual vaporizing exchanger, and an intermediate fluid (e.g., water, steam, isopentane, glycol) is used as the heat transport medium.

3.3.30.3 Process Vaporizer.

A vaporizer that derives its heat from another thermodynamic or chemical process to utilize the refrigeration of the LNG.

Supplemental Information

File Name	Description
A.3.3.29_FR_86_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
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Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 21:07:34 EDT 2014

Committee Statement

Committee Statement: It is not the intent to treat integral pressure-building coils as vaporizers subject to the requirements of chapter 8.

Response Message:

A.3.3.29 Vaporizer.

A pressure-building coil that is integral to a container is not considered a vaporizer in the context of NFPA 59A.

First Revision No. 18-NFPA 59A-2014 [Section No. 4.3.2]

4.3.2

A control center shall have the following capabilities and characteristics:

(1) It shall be located apart from or be protected from other ~~LNG facilities~~ components so that it is operational during a controllable emergency.

(2) Each remotely actuated control system and each automatic shutdown control system required by this standard shall be operable from the control center.

(3) ~~Each control center~~ It shall have personnel in attendance while any of the components under its control are in operation, unless either the control is being performed from another control center that has personnel in attendance or the facility has an automatic emergency shutdown system.

(4) If more than one ~~control center~~ is located at an LNG plant, each control center shall have more than one means of communication with every other center.

(5) ~~Each control center~~ It shall have a means of communicating a warning of hazardous conditions to other locations within the plant frequented by personnel.

Submitter Information Verification

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Submittal Date: Tue Mar 11 21:07:45 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 77-NFPA 59A-2013 [Section No. 4.3.2]

First Revision No. 113-NFPA 59A-2014 [Section No. 4.4.2]

4.4.2

Where auxiliary generators are used as a second source of electrical power, the following shall apply:

(1) They shall be located apart from or be protected from components so that they are not unusable during a controllable emergency.

(2) The fuel supply shall be protected from hazards.

(3) Where installed, emergency and/or standby power systems shall be installed in accordance with NFPA 110 .

Submitter Information Verification

Submitter Full Name: Denise Beach
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Street Address:
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Submittal Date: Wed Mar 12 23:16:25 EDT 2014

Committee Statement

Committee Statement: The new subparagraph provides minimum safety requirements for the installation of emergency and standby power systems.
Response Message:

First Revision No. 112-NFPA 59A-2014 [New Section after 4.6]

4.7 Ignition Source Control.

4.7.1

Smoking shall be permitted only in designated and sign-posted areas.

4.7.2

Welding, cutting, and hot work shall be conducted in accordance with the provisions of NFPA 51B .

4.7.3

Portable electric tools and extension lights capable of igniting LNG or other flammable fluids shall not be permitted within classified areas except where the area has been identified as free of flammable fluids.

4.7.4

Vehicles and other mobile equipment that constitute potential ignition sources shall be prohibited within diked areas or within 50 ft (15 m) of containers that contain LNG or other flammable fluids, except where authorized and at loading or unloading at facilities specifically designed for the purpose.

Submitter Information Verification

Submitter Full Name: Denise Beach
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Street Address:
City:
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Submittal Date: Wed Mar 12 23:12:57 EDT 2014

Committee Statement

Committee Statement: A new section is added to address ignition source control and hot work safety.
Response Message:

First Revision No. 67-NFPA 59A-2014 [Section No. 4.6]

4.6* Noncombustible Material.

A material that complies with any of the following shall be considered a noncombustible material: ~~.~~ ~~[***101,*** 4.6.13.1]~~

(1)* ~~A material that, in~~ In the form in which it is used and under the conditions anticipated, it will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat. ~~[***101,*** 4.6.13.1(1)]~~

(2) ~~A material that is reported as passing~~ It passes the noncombustible criterion of ASTM E 136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 ~~Degrees~~ ° C*. ~~[***101,*** 4.6.13.1(2)]~~

(3) ~~A material that is reported as complying with the pass/fail criteria of~~ It passes the noncombustible criterion of ASTM E 136 when tested in accordance with the test method and procedure in ASTM E 2652, *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 ~~Degrees~~ ° C*. ~~[***101,*** 4.6.13.1(3)]~~

~~**4.6.1**~~

~~A material that complies with any of the following shall be considered a noncombustible material. [***101,*** 4.6.13.1]~~

~~*~~ ~~A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat. [***101,*** 4.6.13.1(1)]~~

~~A material that is reported as passing ASTM E 136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C* . [***101,*** 4.6.13.1(2)]~~

~~A material that is reported as complying with the pass/fail criteria of ASTM E 136 when tested in accordance with the test method and procedure in ASTM E 2652, *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 Degrees C* . [***101,*** 4.6.13.1(3)]~~

Submitter Information Verification

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Submittal Date: Tue Mar 11 22:08:19 EDT 2014

Committee Statement

Committee Statement: Editorial revisions were made for clarity. The editorial changes result in the text no longer being an extract from NFPA 101.

First Revision No. 74-NFPA 59A-2014 [Section No. 5.3.3.4]

5.3.3.4*

The distances to the radiant heat flux levels of Table 5.3.3.2 shall be calculated in accordance with a model that complies with all of the following :

(1) Takes into account the physical phenomena observed in, and has been validated with the data obtained from, available LNG fire experimental data, published in peer-reviewed scientific literature applicable to the physical situation considered

(2) Has been published in peer-reviewed scientific literature

(3) Has a scientific assessment verifying the details of the physics, analysis, and execution process

(4) Has been approved

Submitter Information Verification

Submitter Full Name: Denise Beach
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Submittal Date: Tue Mar 11 22:30:07 EDT 2014

Committee Statement

Committee Statement: The requirement is revised to clarify that the all criteria must be met.
Response Message:

First Revision No. 76-NFPA 59A-2014 [Section No. 5.4.1]

5.4.1 Buildings and Structures Design ~~Category~~ Classification .

Buildings and structures shall be classified in accordance with the following:

(1)* Classification ~~I~~ A — Buildings and structures as defined in 7.4.4.6(3)

(2) Classification ~~II~~ B . — Buildings and structures supporting or enclosing equipment and piping that contain flammable or toxic materials

(3) Classification ~~III~~ C — All other buildings and structures

Submitter Information Verification

Submitter Full Name: Denise Beach
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Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 22:38:09 EDT 2014

Committee Statement

Committee Statement: While the classification system and the reference to the ASCE risk category system filled a void for the definition of design standards for the different elements of an LNG plant, the use of Roman numerals for both the design classification and the risk category used by ASCE-7 for design has created confusion. The classification uses increasing Roman numerals for reducing hazard, while the ASCE-7 uses decreasing numerals for reducing the hazard.

Response Message:

Public Input No. 56-NFPA 59A-2013 [Section No. 5.4.1]

First Revision No. 77-NFPA 59A-2014 [Sections 5.4.2.1, 5.4.2.2, 5.4.2.3]

5.4.2.1 Classification ~~I~~ A .

Seismic design shall use the operating basis earthquake (OBE), ~~and~~ safe shutdown earthquake (SSE) ~~ground~~ , and aftershock level earthquake (ALE) ground motions as defined in 7.4.4.3 ~~and~~ through 7.4.4.5 for determination of loads to be used per ASCE 7, *Minimum Design Loads for Buildings and Other Structures*; wind, ice, and snow design shall use an occupancy category of IV per ASCE 7.

5.4.2.2 Classification ~~II~~ B .

Seismic, wind, ice, and snow design shall use ~~an occupancy~~ a risk category of III per ASCE 7.

5.4.2.3 Classification ~~III~~ C .

Seismic, wind, ice, and snow design shall use ~~an occupancy~~ a risk category of II per ASCE 7.

Submitter Information Verification

Submitter Full Name: Denise Beach
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Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 22:40:55 EDT 2014

Committee Statement

Committee Statement: Classification A includes design to the OBE and SSE, but mistakenly omitted reference to ALE (Aftershock Level Earthquake). This reference is added, and the cross-reference is corrected to 7.4.4.5. In addition, the occupancy category is revised to "risk category" to be consistent with recent changes to the ASCE standard.

Response Message:

Public Input No. 53-NFPA 59A-2013 [Section No. 5.4.2]
Public Input No. 57-NFPA 59A-2013 [Sections 5.4.2.1, 5.4.2.2, 5.4.2.3]

First Revision No. 78-NFPA 59A-2014 [Section No. 5.4.4]

5.4.4

~~If rooms~~ Rooms containing LNG and flammable fluids, ~~are~~ if located within or attached to buildings in which such fluids are not handled (e.g., control centers, shops), ~~the common walls shall be limited to no more than two, shall be designed to withstand a static pressure of at least 100 psf (4.8 kPa),~~ shall be designed for fire and explosion control in accordance with the following: ~~shall have no doors or other communicating openings, and shall have a fire resistance rating of at least 1 hour.~~

(1) Deflagration venting shall be provided in accordance with NFPA 68 .

(2) Common walls shall have no doors or other communicating openings

(3) Common walls shall have a fire-resistance rating of at least 1 hour.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 22:44:37 EDT 2014

Committee Statement

Committee Statement: The subsection is revised to recognize that NFPA 68 provides a more complete assessment of the hazards associated with co-locating LNG handling with other processes. The committee recognizes that there may be other methodology available, that must be approved by the authority having jurisdiction.

Response Message:

Public Input No. 182-NFPA 59A-2014 [Section No. 5.4.4]

First Revision No. 75-NFPA 59A-2014 [New Section after 5.4.6]

5.4.7*

Buildings or structural enclosures not covered by 5.4.3 through 5.4.5 shall be designed, constructed, and installed to protect occupants against explosion, fire, and toxic material releases.

Supplemental Information

File Name	Description
A_5_4_7_FR_75_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 22:32:34 EDT 2014

Committee Statement

Committee Statement: The new subsection addresses a perceived gap in requirements for location of occupied buildings at LNG plants.
Response Message:

Public Input No. 11-NFPA 59A-2013 [Section No. 5.3.7.3]

A.5.4.7

When considering spacing and construction methods related to occupied permanent and portable buildings at an LNG plant, each proposed building should be analyzed independently. API RP 752, *Management of Hazards Associated with Location of Process Plant Permanent Buildings,* and API RP 753, *Management of Hazards Associated with Location of Process Plant Portable Buildings*, should be referenced.

FIrst Revision No. 79
5.9.1

Where portable LNG equipment is used for temporary use, for service maintenance during gas systems repair or alteration, or for other short-term applications, the following requirements shall be met:

(1) Temporary portable LNG equipment shall not remain in service more than 180 days at the portable equipment installation. Portable installations in service more than 180 days shall meet one of the following requirements:

(a) Approval by the AHJ to remain for a period exceeding 180 days

(b) Compliance with all the applicable requirements of Chapter 13 for stationary applications using ASME containers and with the security requirements in Section 12.9

(2) LNG transport vehicles complying with U.S. Department of Transportation (DOT) requirements shall be used as the supply container.

(3) All portable LNG equipment shall be operated by at least one person qualified by experience and training in the safe operation of these systems in accordance with requirements in 14.9.3 and 14.9.4 , based on the written training plan requirements in 14.9.1 and 14.9.2 .

(4) All other operating personnel, at a minimum, shall be qualified by training in accordance with requirements in 14.9.3 and 14.9.4 , based on the written training plan requirements in 14.9.1 and 14.9.2 .

(5) All personnel requiring training in 5.9.1(2) and 5.9.1(3) shall receive refresher training in accordance with requirements in 14.9.6.1 .

(6) All personnel training shall be documented in accordance with records requirements in 14.10.4 .

(7) Each operator shall provide and implement a written plan of initial training in accordance with requirements in 14.9.1 and 14.9.2 to instruct all designated operating and supervisory personnel ~~in the characteristics and hazards of LNG used or handled at the site, including low LNG temperature, flammability of mixtures with air, odorless vapor, boil-off characteristics, and reaction to water and water spray; the potential hazards involved in operating activities; and how to carry out the emergency procedures that relate to personnel functions and to provide detailed instructions on mobile LNG operations~~ .

(8) Provisions shall be made to minimize the possibility of accidental discharge of LNG at containers endangering adjoining property or important process equipment and structures or reaching surface water drainage.

(9) Portable or temporary containment means shall be permitted to be used.

(10) ~~Vaporizer~~ Vaporizers and controls shall comply with Section 8.3 , 8.4.1, 8.4.2, ~~and~~ 8.4.3.1 , 8.4.6.1(1) , 8.4.6.1(2) , 8.4.7 , and Section 8.5.

(11) Each heated vaporizer shall be provided with a means to shut off the fuel source remotely and at the installed location.

(12) Equipment and ~~operations shall comply with 14.6.1 , 14.6.2 , Section 11.8 , 11.9.1 , 12.2.1 , Section 12.3 , 12.3.3 , 12.3.4 , 12.3.5 , and 5.9.1 (4), with the exception of the clearance distance provisions.~~ process design including piping, piping components, instrumentation and electrical systems, and transfer systems shall comply with Sections 4.5 , 5.5 ; 6.3.1 , 6.3.3 , 6.3.4 , 6.3.5 , 6.5.1 , 6.5.2 , 6.5.4 , 6.5.5 , 9.2.1 , 9.2.1.1 , 9.2.1.2 , 9.3.1.1 , 9.3.1.2(3) , 9.3.2.1 through 9.3.2.4 , 9.3.3 , 9.3.4 ; Sections 9.4 through 9.9 ; and if utilized, cryogenic pipe-in-pipe systems shall comply with Section 9.11 , 10.7.1 , 10.7.2 , 10.7.6 , 10.8.1 , 11.4.1 , 11.6.1 , 11.6.2 , 11.8.1 , 11.8.2 , 11.8.3 , 11.8.6 , 11.9.1 , 11.9.2 , 12.2.1 , Section 12.3 , and 12.3.3 .

(13) The LNG facility spacing specified in Table 5.3.4.1 shall be maintained~~,~~ except where necessary to provide temporary service on a public right-of-way or on property where clearances specified in Table 5.3.4.1 are not feasible and where the following additional requirements are met:

(a) Traffic barriers shall be erected on all sides of the facility subject to passing vehicular traffic.

(b) The operation shall be continuously attended to monitor the operation whenever LNG is present at the facility.

(c) If the facility or the operation causes any restriction to the normal flow of vehicular traffic, in addition to the monitoring personnel required in 5.9.1(10), flag persons shall be continuously on duty to direct such traffic.

(14) Provision shall be made to minimize the possibility of accidental ignition in the event of a leak.

(15) Fire protection systems shall comply with 12.2.1 , 12.3.1 through 12.3.6 , 12.4.1 , 12.4.2.2 , 12.6.1 , Section 12.7 , 12.8.1 , 12.9.1 , and 12.9.2 .

(16) Portable or wheeled fire extinguishers recommended by their manufacturer for gas fires shall be available at strategic locations and shall be provided and maintained in accordance with NFPA 10, ~~*Standard for Portable Fire Extinguishers*~~ .

(17) Operating and maintenance activities shall comply with Sections 13.17 , 14.1 through 14.4 , 14.6.1 , 14.6.2 , 14.6.4 , 14.6.5 , 14.6.6.5 through 14.6.6.8 , 14.6.6.8.3 , 14.6.6.8.4 , 14.6.6.8.5 , Section 14.7 , 14.8.1 , 14.8.2 , 14.8.6 , 14.8.8 , 14.8.9 , 14.8.10.1 , 14.8.10.2 , 14.8.10.3 , 14.8.10.7 , 14.8.13.1 , 14.8.13.4 , and 14.8.13.13 .

(18) The site shall be continuously attended, and provisions shall be made to restrict public access to the site whenever LNG is present.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 22:46:09 EDT 2014

Committee Statement

Committee Statement: The utilization of the temporary, portable facilities is an expanding area of activity in the LNG industry. The requirements associated with temporary portable LNG facilities are updated and further clarified to identify those requirements which are important for the safety of general public near these facilities and the operating personnel charged with the safety of these facilities. The section is revised to clearly associate existing design, construction, testing, locating, operating, maintenance, fire protection, and personnel training requirements already located throughout the standard with a temporary portable LNG facility. The committee added a new sub-paragraph to identify a limit on how long a temporary portable facility can be located at any one site, beyond which the owner/operator must obtain approval from the local AHJ or apply all the requirements of a Chapter 13 permanent installation.

Response Message:

Public Input No. 180-NFPA 59A-2013 [Section No. 5.9.1]

First Revision No. 81-NFPA 59A-2014 [Section No. 6.3]

6.3* Pumps and Compressors.

6.3.1

Pumps and compressors shall be constructed of materials selected for compatibility with the design temperature and pressure conditions.

6.3.2

Valving shall be installed so that each pump or compressor can be isolated for maintenance.

6.3.3

Where pumps or centrifugal compressors are installed for operation in parallel, each discharge line shall be equipped with a check valve.

6.3.4

Pumps and compressors shall be provided with a pressure-relieving device on the discharge to limit the pressure to the maximum design pressure of the casing and downstream piping and equipment, unless they are designed for the maximum discharge pressure of the pumps and compressors.

6.3.5

Each pump shall be provided with a vent, relief valve, or both that will prevent overpressuring of the pump case during the maximum possible rate of cooldown.

6.3.6

Compression equipment that handles flammable gases shall be provided with vents from all points where gases normally can escape. Vents shall be piped outside of buildings to a point of safe disposal.

Supplemental Information

File Name	Description
A_6_3._FR_81_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 11:09:14 EDT 2014

Committee Statement

Committee Statement: New annex material identifies well known industry standards on compressors to aid operators in the selection and specification of this equipment.

Response Message:

Public Input No. 80-NFPA 59A-2013 [Section No. 6.3]
Public Input No. 150-NFPA 59A-2013 [New Section after A.5.8.5]

A.6.3

API 617, *Centrifugal Compressors for Petroleum, Chemical, and Gas Industry Services*; API 618, *Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services*; and API 619 *Rotary-Type Positive Displacement Compressors for Petroleum, Chemical, and Gas Industry Services* provide guidance when selecting and specifying these types of compressors.

First Revision No. 82-NFPA 59A-2014 [Section No. 7.2.2]

7.2.2 ASME Containers.
ASME containers shall comply with the requirements of Section 7.5.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 11:13:06 EDT 2014

Committee Statement

Committee Statement: A title is added to clearly delineate ASME containers from other tank systems.
Response Message:

First Revision No. 97-NFPA 59A-2014 [Section No. 7.3.1.2(A)]

(A)
Tank system piping shall include all piping internal to the container, within insulation spaces and within void spaces, external piping attached or connected to the container up to the first circumferential external joint of the piping, and external piping serving only tank instrumentation (including tank pressure relief valves). All liquid piping with a source of external line pressure shall be designed for the external line relief valve setting but not less than 50 ~~psig~~ psi (345 kPa). Double and full containment tank systems shall have no pipe penetrations below the liquid level.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 22:09:49 EDT 2014

Committee Statement

Committee Statement: "Psig" is changed to "psi" to be consistent with new 1.6.
Response Message:

First Revision No. 89-NFPA 59A-2014 [Section No. 7.3.5]

7.3.5 Container Drying, Purging, and Cooldown.

Before an LNG tank system is put into service, it shall be dried, purged , and cooled in accordance with 14.3.5 and 14.5.5 and tank systems shall include the provisions within API 625 and/or ACI 376, as applicable to the type of tank construction.

~~**7.3.5.1**~~

~~Before an LNG tank system is put into service, it shall be purged and cooled in accordance with 14.3.5 and 14.5.5 and tank systems shall include the provisions within API 625 and/or ACI 376, *Code Requirements for Design and Construction of Concrete Structures for the Containment of Refrigerated Liquefied Gases* , as applicable to the type of tank construction.~~

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 21:24:50 EDT 2014

Committee Statement

Committee Statement: API 625 now includes end point criteria for drying of tanks, so text is added to draw attention to the new standard.

Response Message:

Public Input No. 83-NFPA 59A-2013 [Section No. 7.3.5]

A.8.1

A pressure-building coil that is integral to an LNG container is not considered to be a vaporizer in the context of NFPA 59A.

First Revision No. 87-NFPA 59A-2014 [Section No. 8.1]

8.1* Scope.
This chapter presents the design, construction, and installation requirements for LNG vaporizers.

Supplemental Information

File Name	Description
A_8_1_FR_87_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 21:10:27 EDT 2014

Committee Statement

Committee Statement: It is not the intent to treat a pressure-building coil as a vaporizer subject to the requirements of chapter 8.
Response Message:

A.8.1

A pressure-building coil that is integral to an LNG container is not considered to be a vaporizer in the context of NFPA 59A.

First Revision No. 84-NFPA 59A-2014 [Section No. 8.4]

8.4 Vaporizer Piping, Intermediate Fluid Piping, and Storage Valves.

8.4.1

Manifolded vaporizers shall have both inlet and discharge block valves at each vaporizer.

8.4.2

The discharge valve of each vaporizer and the piping components and relief valves installed upstream of each vaporizer discharge valve shall be designed for operation at LNG temperatures [- – 260°F (- – 162°C)].

8.4.3

Isolation of an idle manifolded vaporizer shall be by two inlet valves.

8.4.3.1

The LNG or gas that can accumulate between the valves or other double-block-and-bleed systems shall be piped to an area having no source of ignition and where people are not present.

8.4.4

A shutoff valve shall be installed on the LNG line to a ~~heated~~ vaporizer at least 50 ft (15 m) from the vaporizer.

8.4.4.1

If the ~~heated~~ vaporizer is installed in a building, the shutoff valve shall be installed at least 50 ft (15 m) from the building.

8.4.4.2

The shutoff valve shall be either the container shutoff valve or another valve.

8.4.5

Each heated or process vaporizer shall be provided with a local and a remote device to shut off the heat source.

8.4.5.1

Where the heated or process vaporizer is located 50 ft (15 m) or more from the heat source, the remote shutoff location shall be at least 50 ft (15 m) from the vaporizer.

8.4.5.2*

Where the heated vaporizer is located less than 50 ft (15 m) from the heat source, it shall have an automatic, fire-safe shutoff valve in the LNG liquid line ~~located at least 10 ft (3 m) from the vaporizer and shall close~~ that closes when any of the following occurs:

(1) Loss of line pressure (excess flow)

(2) Fire in the immediate vicinity of the vaporizer or shutoff valve

(3) Low temperature in the vaporizer discharge line

8.4.5.3

If the ~~facility~~ LNG plant is attended, manual operation of the automatic shutoff valve shall be from a point at least 50 ft (15 m) from the vaporizer, in addition to the requirements in 8.4.5.2.

8.4.6*

Any ~~ambient~~ vaporizer ~~or a heated vaporizer~~ installed within 50 ft (15 m) of an LNG container shall be equipped with an automatic, fire-safe shutoff valve in the LNG liquid line.

8.4.6.1

The automatic shutoff valve shall ~~be located at least 10 ft (3 m) from the ambient or heated vaporizer and shall~~ close in any one of the following situations:

(1) Loss of line pressure (excess flow)

(2) Fire in the immediate vicinity of the vaporizer or shutoff valve

(3) Low temperature in the vaporizer discharge line

8.4.6.2

If the ~~facility~~ LNG plant is attended, manual operation of the automatic shutoff valve shall be from a point at least 50 ft (15 m) from the vaporizer, in addition to the requirements of 8.4.6.1.

8.4.7

Automatic equipment shall be provided to prevent the discharge of either LNG or vaporized gas into a piping system at a temperature either above or below the design temperatures of the system.

8.4.7.1

Automatic equipment shall be independent of all other flow control systems.

8.4.7.2

Automatic equipment shall incorporate a line valve for emergency purposes.

8.4.8

Where a flammable intermediate fluid is used with a remote heated or process vaporizer, shutoff valves shall be in accordance with the following:

(1) Shutoff valves shall be provided on both the hot and the cold lines of the intermediate fluid system.

(2) Shutoff valve controls shall be located at least 50 ft (15 m) from the vaporizer.

Supplemental Information

File Name	Description
A_8_4_x_FR_84_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 20:51:41 EDT 2014

Committee Statement

Committee Statement: The section was revised to apply requirements for shutoff valves to all vaporizers, not just heated vaporizers. In addition, 8.4.5.2 and 8.4.6 was revised to recognize that the use of fire-safe valves precludes the need for a 10 ft separation. API 6FA was added to the annex material because it address more than soft-seated valves.

Response Message:

Public Input No. 58-NFPA 59A-2013 [Section No. 3.3.29.3]
Public Input No. 60-NFPA 59A-2013 [Section No. 3.3.29.2 [Excluding any Sub-Sections]]
Public Input No. 86-NFPA 59A-2013 [Section No. 8.4.5.3]
Public Input No. 87-NFPA 59A-2013 [Section No. 8.4.6.2]

A.8.4.5.2
Valves meeting this requirement should meet the testing requirements of API 607, *Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats;* API 6FA, *Fire Test for Valves*; or a similar test.

A.8.4.6
Valves meeting this requirement should meet the testing requirements of API 607, API 6FA, or a similar test.

First Revision No. 21-NFPA 59A-2014 [Section No. 9.2.2.1]

9.2.2.1

For purposes of design, all piping of the LNG ~~facility~~ plant shall be classified into one of the following three seismic categories:

(1) Category I — All piping supported by the LNG container and piping up to the emergency shutdown valve(s) and firewater piping

(2) Category II — All flammable gas or LNG process piping

(3) Category III — All other piping not included in Categories I and II

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:11:11 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 88-NFPA 59A-2013 [Section No. 9.2.2.1]

First Revision No. 116-NFPA 59A-2014 [Section No. 9.3.1.2]

9.3.1.2

Piping, including gasketed joints, that can be exposed to the low temperature of an LNG or refrigerant spill or the heat of an ignited spill during an emergency where such exposure could result in a failure of the piping that would increase the emergency shall be one of the following:

(1) Made of material(s) that can withstand both the normal operating temperature and the extreme temperature to which the piping might be subjected during the emergency

(2) Protected by insulation or other means to delay failure due to such extreme temperatures until corrective action can be taken by the operator

(3) Capable of being isolated and having the flow stopped where piping is exposed only to the heat of an ignited spill during the emergency

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 23:22:35 EDT 2014

Committee Statement

Committee Statement: The revision recognizes that not every gasket within the plant must be resistant to fire, but must be protected in accordance with the requirements of this paragraph.

Response Message:

Public Input No. 89-NFPA 59A-2013 [Section No. 9.3.1.2]

First Revision No. 10-NFPA 59A-2014 [Section No. 9.4.1.4]

9.4.1.4

The following pipe joints are prohibited:

(1) Expanded joints per ASME B 31.3, paragraph 313~~.~~

(2) Caulked joints per ASME ~~B 31~~ B 31.3 , paragraph ~~3.316~~ 316 .

(3) Special joints per ASME B 31.3, paragraph 318~~.~~

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 20:51:55 EDT 2014

Committee Statement

Committee Statement: The reference to code and code section are corrected.
Response Message:
Public Input No. 90-NFPA 59A-2013 [Section No. 9.4.1.4]

First Revision No. 11-NFPA 59A-2014 [Section No. 9.4.1.5]

9.4.1.5

Special components that are unlisted per ASME B 31.3 paragraph 304.7.2~~,~~ shall be based on design calculations consistent with the design criteria of ASME B 31.3. Calculations shall be substantiated by one or both of the means stated in ASME B ~~paragraphs~~ 31.3, paragraph 304.7.2 (a), paragraph 304.7.2(b), or both.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 20:52:39 EDT 2014

Committee Statement

Committee Statement: The ASME standard title are corrected.
Response Message:
Public Input No. 91-NFPA 59A-2013 [Section No. 9.4.1.5]

First Revision No. 12-NFPA 59A-2014 [Section No. 9.4.3.5]

9.4.3.5

Brazing and brazed connections shall be in accordance with subsections 317.2~~, 333.1, 333.2, 333.3,~~ and ~~333.4~~ 333 of ASME B 31.3.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 20:53:19 EDT 2014

Committee Statement

Committee Statement: The paragraph numbers are updated to be consistent with section 33 of ASME B31.3, 2012 edition.

Response Message:

Public Input No. 92-NFPA 59A-2013 [Section No. 9.4.3.5]

First Revision No. 91-NFPA 59A-2014 [Section No. 9.4.4]

9.4.4* Pipe Marking.

Markings on pipe shall comply with the following:

(1) Markings shall be made with a material compatible with the pipe material.

(2) Materials less than ¼ in. (6.4 mm) in thickness shall not be die stamped.

(3) Marking materials that are corrosive to the pipe material shall not be used.

Supplemental Information

File Name	Description
A_9_4_4_FR_91.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 21:39:20 EDT 2014

Committee Statement

Committee Statement: The annex material in A9.4.4(2) is more appropriately applied to all of 9.4.4.

Response Message:

Public Input No. 93-NFPA 59A-2013 [Section No. 9.4.4]
Public Input No. 156-NFPA 59A-2013 [Section No. A.9.4.4(2)]

A.9.4.4

Under some conditions, marking materials that contain carbon or heavy metals can corrode aluminum. Marking materials that contain chloride or sulfur compounds can corrode some stainless steels.

First Revision No. 93-NFPA 59A-2014 [Section No. 9.8.1]

~~9.8.1~~

~~Systems shall be purged of air or gas.~~

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 21:47:49 EDT 2014

Committee Statement

Committee Statement: This is an operating/maintenance function and is already addressed in 14.8.1.and should not reside in a design/engineering requirement.

Response Message:

Public Input No. 94-NFPA 59A-2013 [Section No. 9.8.1]

First Revision No. 95
10.7.2

Fixed electrical equipment and wiring installed within the classified areas specified in Table 10.7.2 shall comply with Table 10.7.2 and Figure 10.7.2(a) through Figure 10.7.2(f) and shall be installed in accordance with *NFPA 70*, ~~, *National Electrical Code* , for hazardous locations.~~

Table 10.7.2 Electrical Area Classification

Part	Location	Group D, Division[a]	Extent of Classified Area
A	**LNG storage containers with vacuum breakers**		
	Inside containers	2	Entire container interior
B	**LNG storage container area**		
	Indoors	1	Entire room
	Outdoor aboveground containers (other than small containers)[b]	1	Open area between a high-type dike and the container wall where dike wall height exceeds distance between dike and container walls *[See Figure 10.7.2(c).]*
		2	Within 15 ft (4.5 m) in all directions from container walls and roof plus area inside a low-type diked or impounding area up to the height of the dike impoundment wall *[See Figure 10.7.2(b).]*
	Outdoor belowground containers	1	Within any open space between container walls and surrounding grade or dike *[See Figure 10.7.2(d).]*
		2	Within 15 ft (4.5 m) in all directions from roof and sides *[See Figure 10.7.2(d).]*
C	**Nonfired LNG process areas containing pumps, compressors, heat exchangers, pipelines, connections, small containers, and so forth**		
	Indoors with adequate ventilation[c]	2	Entire room and any adjacent room not separated by a gastight partition and 15 ft (4.5 m) beyond any wall or roof ventilation discharge vent or louver
	Outdoors in open air at or above grade	2	Within 15 ft (4.5 m) in all directions from this equipment and within the cylindrical volume between the horizontal equator of the sphere and grade *[See Figure 10.7.2(a).]*
D	**Pits, trenches, or sumps located in or adjacent to Division 1 or 2 areas**	1	Entire pit, trench, or sump
E	**Discharge from relief valves**	1	Within 5 ft (1.5 m) in all directions from point of discharge
		2	Beyond 5 ft (1.5 m) but within 15 ft (4.5 m) in all directions from point of discharge
F	**Operational bleeds, drips, vents, or drains**		
	Indoors with adequate ventilation[c]	1	Within 5 ft (1.5 m) in all directions from point of discharge
		2	Beyond 5 ft (1.5 m) and entire room and 15 ft (4.5 m) beyond any wall or roof ventilation discharge vent or louver
	Outdoors in open air at or above grade	1	Within 5 ft (1.5 m) in all directions from point of discharge

Part	Location	Group D, Division[a]	Extent of Classified Area
		2	Beyond 5 ft (1.5 m) but within 15 ft (4.5 m) in all directions from point of discharge
G	**Tank car, tank vehicle, and container loading and unloading**		
	Indoors with adequate ventilation[c]	1	Within 5 ft (1.5 m) in all directions from connections regularly made or disconnected for product transfer
		2	Beyond 5 ft (1.5 m) and entire room and 15 ft (4.5 m) beyond any wall or roof ventilation discharge vent or louver
	Outdoors in open air at or above grade	1	Within 5 ft (1.5 m) in all directions from connections regularly made or disconnected for product transfer
		2	Beyond 5 ft (1.5 m) but within 15 ft (4.5 m) in all directions from a point where connections are regularly made or disconnected and within the cylindrical volume between the horizontal equator of the sphere and grade *[See Figure 10.7.2(a).]*
H	**Electrical seals and vents specified in 10.7.5 through 10.7.7**	2	Within 15 ft (4.5 m) in all directions from the equipment and within the cylindrical volume between the horizontal equator of the sphere and grade
I	**Marine terminal unloading areas** *[See Figure 10.7.2(f).]*		

[a]See Article 500 in *NFPA 70*, ~~*National Electrical Code*~~ , for definitions of classes, groups, and divisions. Article 505 may be used as an alternate to Article 500 for classification of hazardous areas using an equivalent zone classification to the division classifications specified in Table 10.7.2. Most of the flammable vapors and gases found within the facilities covered by NFPA 59A are classified as Group D. Ethylene is classified as Group C. Much available electrical equipment for hazardous locations is suitable for both groups.

[b]Small containers are ~~those that are~~ portable and of less than 200 gal (760 L) capacity.

[c]Ventilation is considered adequate where provided in accordance with the provisions of this standard.

Figure 10.7.2(a) Extent of Classified Area Around Containers.

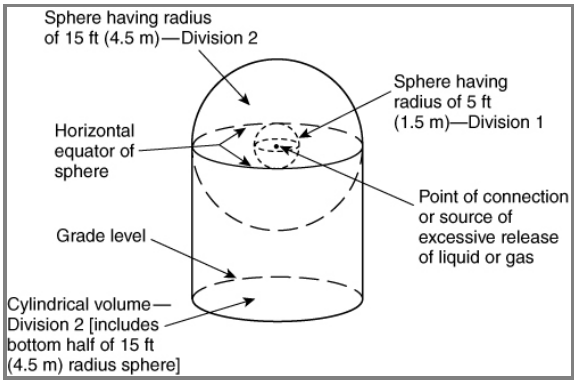


Figure 10.7.2(b) Dike Height Less Than Distance from Container to Dike (*H* < *x*).

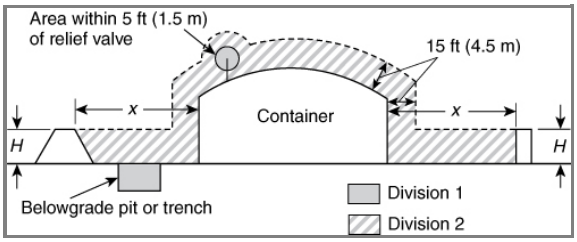


Figure 10.7.2(c) Dike Height Greater Than Distance from Container to Dike (*H* > *x*).

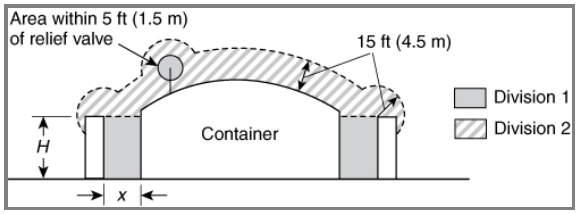


Figure 10.7.2(d) Container with Liquid Level Below Grade or Below Top of Dike.

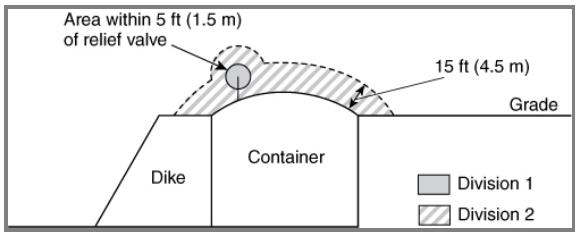


Figure 10.7.2(e) Full Containment Container.

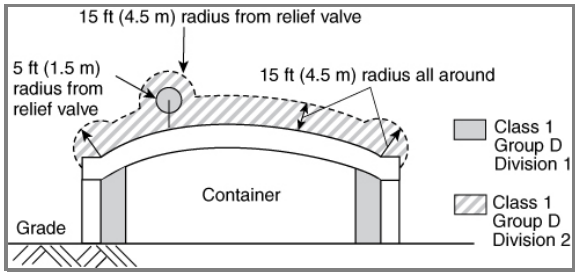
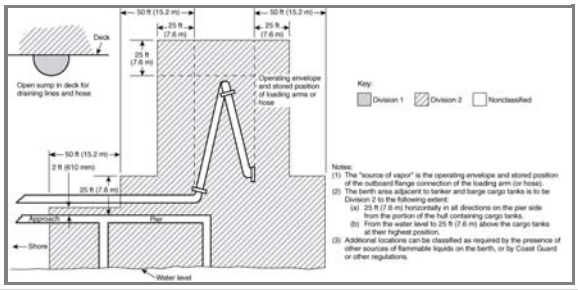


Figure 10.7.2(f) Classification of a Marine Terminal Handling LNG.



Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 21:57:38 EDT 2014

Committee Statement

Committee Statement: The paragraph refers only to hazardous locations, therefore the additional language is unnecessary.
Response Message:

Public Input No. 95-NFPA 59A-2013 [Section No. 10.7.2]

First Revision No. 114-NFPA 59A-2014 [New Section after 10.7.3]

10.7.4

When electrical equipment is installed with enclosures residing in electrically classified areas per 10.7.2 , the enclosures either shall be rated for that area classification or shall be in accordance with NFPA 496 .

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 23:18:21 EDT 2014

Committee Statement

Committee Statement: A new paragraph was added to provide minimum safety requirements for enclosures within classified areas based on existing requirements in NFPA 70.
Response Message:

First Revision No. 13-NFPA 59A-2014 [Section No. 12.2.2]

12.2.2*

The evaluation shall determine the following:

(1) The type, quantity, and location of equipment necessary for the detection and control of fires, leaks, and spills of LNG, flammable refrigerants, or flammable gases

(2) The type, quantity, and location of equipment necessary for the detection and control of potential nonprocess and electrical fires

(3) The methods necessary for protection of the equipment and structures from the effects of fire exposure

(4) Requirements for fire protection water systems

(5)* Requirements for fire-extinguishing and other fire control equipment

(6) The equipment and processes to be incorporated within the ~~ESD~~ emergency shutdown (ESD) system, including analysis of subsystems, if any, and the need for depressurizing specific vessels or equipment during a fire emergency

(7) The type and location of sensors necessary to initiate automatic operation of the ESD system or its subsystems

(8) The availability and duties of individual plant personnel and the availability of external response personnel during an emergency

(9)* The personal protective equipment, special training, and qualification needed by individual plant personnel ~~as specified by~~ NFPA 600 ~~,~~ ~~*Standard on Industrial Fire Brigades*~~ ~~,~~ for their respective emergency duties as specified by NFPA 600

(10) Requirements for other fire protection equipment and systems

Supplemental Information

File Name	Description
A_12_2_2_9_FR_13.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 20:54:17 EDT 2014

Committee Statement

Committee Statement: The reference to the protective equipment mentioned in 12.2.2 (9) is specified as personal protective equipment and not physical fire protection equipment such as fire trucks, fires hoses, etc. The related annex material is updated to be consistent with new definitions for components, LNG facility,,and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 97-NFPA 59A-2013 [Section No. 12.2.2]

A.12.2.2(9)

Plant fire brigades are not required by this standard. Where the ~~facility~~ LNG plant elects to have a fire brigade, NFPA 600 is required for personal protective equipment and training.

First Revision No. 115-NFPA 59A-2014 [New Section after 12.5.2]

12.5.3

Where provided, fire protection water systems shall be designed in accordance with NFPA 13 , NFPA 14 , NFPA 15 , NFPA 20 , NFPA 22 , NFPA 24 , NFPA 750 , or NFPA 1961 as applicable.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 23:20:01 EDT 2014

Committee Statement

Committee Statement: A new subsection is added to mirror maintenance requirements in chapter 14 that applies to the design of fire protection systems.

Response Message:

First Revision No. 22-NFPA 59A-2014 [Section No. 12.6.1.4]

12.6.1.4

For ~~facility~~ LNG plant hazard areas where minimal ~~class "A"~~ Class A fire hazards are present, the selection of potassium bicarbonate–based dry chemical extinguishers is recommended.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:11:55 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 98-NFPA 59A-2013 [Section No. 12.6.1.4]

First Revision No. 111-NFPA 59A-2014 [Section No. 12.7]

12.7 Maintenance of Fire Protection Equipment.

~~Facility operators~~ Plant operators shall prepare and implement a maintenance program for all plant fire protection equipment.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 23:07:35 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 99-NFPA 59A-2013 [Section No. 12.7]

First Revision No. 23-NFPA 59A-2014 [Section No. 12.8.1]

12.8.1*

Protective clothing that will provide protection against the effects of exposure to LNG shall be available and readily accessible at the ~~facility~~ LNG plant .

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:13:28 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 100-NFPA 59A-2013 [Section No. 12.8.1]

First Revision No. 96-NFPA 59A-2014 [Section No. 12.8.2]

12.8.2*

Employees who are involved in emergency response activities beyond the incipient stage shall be equipped with protective clothing and equipment and trained in accordance with NFPA 600. ~~, *Standard on Industrial Fire Brigades* .~~

Supplemental Information

File Name	Description
A_12_8_2._FR_96_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 22:05:31 EDT 2014

Committee Statement

Committee Statement: The revision and related annex material provides clarification that NFPA 600 is applicable to emergency activities above incipient level fire response.

Response Message:

Public Input No. 101-NFPA 59A-2013 [Section No. 12.8.2]

A.12.8.2

The incipient stage is the early stage of a fire, in which the progression has not developed beyond that which can be extinguished using either portable fire extinguishers or handlines flowing up to 473 L/min (125 gpm).

First Revision No. 24-NFPA 59A-2014 [Section No. 12.9.1.1]

12.9.1.1*

A security assessment covering hazards, threats, vulnerabilities, and consequences shall be prepared for the LNG ~~facility~~ plant .

Supplemental Information

File Name	Description
A_12_9_1_1_FR_24_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:14:16 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information. The related annex material provides guidance for the types of threats that should be considered in a security assessment.

Response Message:

Public Input No. 102-NFPA 59A-2013 [Section No. 12.9.1.1]
Public Input No. 163-NFPA 59A-2013 [New Section after A.12.8.4]

A.12.9.1.1

The security assessment should include physical and cyber security threats and vulnerabilities.

First Revision No. 25-NFPA 59A-2014 [Section No. 12.9.2]

12.9.2

The ~~facility~~ LNG plant operator shall provide a security system with controlled access that is designed to prevent entry by unauthorized persons.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:15:04 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 103-NFPA 59A-2013 [Section No. 12.9.2]

First Revision No. 26-NFPA 59A-2014 [Section No. 12.9.3 [Excluding any Sub-Sections]]

At LNG ~~facilities~~ plants , there shall be a protective enclosure, including a peripheral fence, building wall, or natural barrier enclosing major facility components~~,~~ such as the following:

(1) LNG storage containers
(2) Flammable refrigerant storage tanks
(3) Flammable liquid storage tanks
(4) Other hazardous materials storage areas
(5) Outdoor process equipment areas
(6) Buildings housing process or control equipment
(7) Onshore loading and unloading facilities

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:15:49 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 104-NFPA 59A-2013 [Section No. 12.9.3 [Excluding any Sub-Sections]]
Public Input No. 105-NFPA 59A-2013 [Section No. 12.9.3]

First Revision No. 66-NFPA 59A-2014 [Section No. 12.9.3.1]

12.9.3.1

The LNG ~~facility~~ plant shall be ~~enclosed~~ secured either by a single continuous enclosure or by multiple independent enclosures or approved barrier(s) .

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 22:01:29 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information. The option of approved barriers is added to provide flexibility for facility layout.

Response Message:

Public Input No. 106-NFPA 59A-2013 [Section No. 12.9.3.1]

First Revision No. 27-NFPA 59A-2014 [Section No. 12.9.4]

12.9.4

LNG ~~facilities~~ plants shall be illuminated in the vicinity of protective enclosures and in other areas as necessary to promote security of the ~~facility~~ LNG plant .

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:18:15 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 107-NFPA 59A-2013 [Section No. 12.9.4]

First Revision No. 98-NFPA 59A-2014 [Section No. 13.17]

13.17 Gas Detection.

~~An operating~~ A portable flammable gas indicator shall be readily available.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 22:12:21 EDT 2014

Committee Statement

Committee Statement: The word operating is removed because it could imply that the portable flammable gas detector is operating at all times.

Response Message:

Public Input No. 110-NFPA 59A-2013 [Section No. 13.17]

First Revision No. 28-NFPA 59A-2014 [Section No. 13.18.1]

13.18.1 Basic Operations Requirements.

Each LNG facility shall meet the following requirements:

(1) Have written procedures covering operation, maintenance, and training

(2) Keep up-to-date drawings of ~~plant equipment, showing~~ LNG facility equipment showing all revisions made after installation

(3) Revise the plans and procedures as operating conditions or facility equipment require

(4) Establish a written emergency plan

(5) Establish liaison with appropriate local authorities such as police, fire department, or municipal works and inform them of the emergency plans and their role in emergency situations

(6) Analyze and document all safety-related malfunctions and incidents for the purpose of determining their causes and preventing the possibility of recurrence

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:20:51 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 111-NFPA 59A-2013 [Section No. 13.18.1]

First Revision No. 29-NFPA 59A-2014 [Section No. 13.18.2.5]

13.18.2.5

Each operations manual shall include purging procedures that, when implemented, minimize the presence of a combustible mixture in ~~plant~~ LNG facility piping or equipment when a system is being placed into or taken out of operation.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:21:48 EDT 2014

Committee Statement

Committee Statement: The subsection is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 112-NFPA 59A-2013 [Section No. 13.18.2.5]

First Revision No. 30-NFPA 59A-2014 [Section No. 13.18.3.1]

13.18.3.1

Each LNG facility shall have a written manual of emergency procedures that shall include the types of emergencies that are anticipated from an operating malfunction, structural collapse of part of the LNG facility, personnel error, forces of nature, and activities carried on adjacent to the LNG facility, including the following:

(1) Procedures for responding to controllable emergencies, including notification of personnel and the use of equipment that is appropriate for ~~handling of the~~ handling the emergency and the shutdown or isolation of various portions of the equipment and other applicable steps to ensure that the escape of gas or liquid is promptly cut off or reduced as much as possible

(2) Procedures for recognizing an uncontrollable emergency and for taking action to ensure that harm to the personnel at the LNG facility and to the public is minimized

(3) Procedures for the prompt notification of the emergency to the appropriate local officials, including the possible need to evacuate persons from the vicinity of the ~~facility~~ LNG plant

(4) Procedures for coordinating with local officials in the preparation of an emergency evacuation plan that sets forth the steps necessary to protect the public in the event of an emergency

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:22:50 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 113-NFPA 59A-2013 [Section No. 13.18.3.1]

First Revision No. 31-NFPA 59A-2014 [Section No. 13.18.3.2]

13.18.3.2*

When local officials are contacted in an emergency, procedures shall include the method of notification of the following:

(1) The quantity and location of fire equipment throughout the ~~facility~~ LNG plant

(2) Potential hazards at the ~~facility~~ LNG plant

(3) Communication and emergency control capabilities of the ~~facility~~ LNG plant

(4) The status of each emergency

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:24:40 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 114-NFPA 59A-2013 [Section No. 13.18.3.2]

First Revision No. 32-NFPA 59A-2014 [Section No. 13.18.4.1]

13.18.4.1

Each LNG facility operator shall carry out periodic inspection, tests, or both on a schedule that is included in the maintenance plan on identified components and its support system in service in the LNG facility, to verify that the components are maintained in accordance with the equipment manufacturer's recommendations and the following:

(1) The support system or foundation of each component shall be inspected at least annually to ensure that the support system or foundation is sound.

(2) Each emergency power source at the ~~facility~~ LNG plant shall be tested monthly to ensure that it is operational and tested annually to ensure that it is capable of performing at its intended operating capacity.

(3) When a safety device serving a single component is taken out of service for maintenance or repair, the component shall also be taken out of service, except where the safety function is provided by an alternative means.

(4) Where the operation of a component that is taken out of service could cause a hazardous condition, a tag bearing the words “Do Not Operate,” or equivalent, shall be attached to the controls of the component, or the component shall be locked out.

(5) Stop valves for isolating pressure or vacuum-relief valves shall be locked or sealed open and shall be operated only by an authorized person.

(6) No more than one pressure or vacuum relief valve stop valve shall be closed at one time on an LNG container.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:25:35 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 115-NFPA 59A-2013 [Section No. 13.18.4.1]

First Revision No. 33-NFPA 59A-2014 [Section No. 13.18.4.5(C)]

(C)

Control systems that are used as part of the fire protection system at the ~~facility~~ LNG plant shall be inspected and tested in accordance with the applicable fire codes and standards and conform to the following criteria:

(1) Monitoring equipment shall be maintained in accordance with *NFPA 72*, ~~*National Fire Alarm and Signaling Code*~~ , and NFPA 1221, ~~*Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*~~ .

(2) Fire protection water systems, if required, shall be maintained in accordance with NFPA 13, ~~*Standard for the Installation of Sprinkler Systems*~~ , NFPA 14, ~~*Standard for the Installation of Standpipe and Hose Systems*~~ , NFPA 15, ~~*Standard for Water Spray Fixed Systems for Fire Protection*~~ , NFPA 20, ~~*Standard for the Installation of Stationary Pumps for Fire Protection*~~ , NFPA 22, ~~*Standard for Water Tanks for Private Fire Protection*~~ , NFPA 24, ~~*Standard for the Installation of Private Fire Service Mains and Their Appurtenances*~~ ; and NFPA 25, ~~*Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*~~ .

(3) Portable or wheeled fire extinguishers suitable for gas fires, preferably of the dry-chemical type, shall be available at strategic locations, as determined in accordance with Chapter 12, within an LNG facility and on tank vehicles, and shall be maintained in accordance with NFPA 10, ~~*Standard for Portable Fire Extinguishers*~~ .

(4) Fixed fire extinguishers and other fire-control systems that are installed shall be maintained in accordance with NFPA 11, ~~*Standard for Low-, Medium-, and High-Expansion Foam*~~ , NFPA 12, ~~*Standard on Carbon Dioxide Extinguishing Systems*~~ , NFPA 12A, ~~*Standard on Halon 1301 Fire Extinguishing Systems*~~ , NFPA 16, ~~*Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*~~ , and NFPA 17, ~~*Standard for Dry Chemical Extinguishing Systems*~~ .

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:26:54 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 116-NFPA 59A-2013 [Section No. 13.18.4.5(C)]

First Revision No. 34-NFPA 59A-2014 [Section No. 13.18.4.5(F)]

(F)

LNG storage ~~plants~~ facilities and, in particular, the storage container and its foundation shall be externally inspected after each major meteorological disturbance to ensure that the structural integrity of the ~~plant~~ LNG facility is intact.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:27:54 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 117-NFPA 59A-2013 [Section No. 13.18.4.5(F)]

First Revision No. 35-NFPA 59A-2014 [Section No. 13.18.5.2]

13.18.5.2

Each ~~facility~~ LNG plant operator shall develop, implement, and maintain a written plan to keep the personnel at the ~~facility~~ LNG plant up to date on the function of the systems, fire prevention, and security at the LNG facility.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:30:19 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 118-NFPA 59A-2013 [Section No. 13.18.5.2]

First Revision No. 36-NFPA 59A-2014 [Section No. 14.2.1]

14.2.1

Each operating company shall develop documented operating, maintenance, and training procedures, based on experience and conditions under which the LNG ~~plant~~ facility is operated.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:31:51 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 119-NFPA 59A-2013 [Section No. 14.2.1]

First Revision No. 37-NFPA 59A-2014 [Section No. 14.2.2]

14.2.2

The operating company shall meet the following requirements:

(1) Document procedures covering operation, maintenance, and training

(2) Maintain up-to-date drawings, charts, and records of ~~plant~~ LNG facility equipment

(3) Revise plans and procedures when operating conditions or ~~plant~~ LNG facility equipment are revised

(4) Ensure cooldown of components in accordance with 14.3.5~~.~~

(5) Establish a documented emergency plan

(6) Establish ~~liaison~~ liaisons with local authorities such as police, fire department, or municipal works to inform them of the emergency plans and their ~~role~~ roles in emergency situations

(7)* Analyze and document all safety-related conditions for the purpose of determining their causes and preventing the possibility of recurrence

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:32:43 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 120-NFPA 59A-2013 [Section No. 14.2.2]

First Revision No. 38-NFPA 59A-2014 [Section No. 14.3.1]

14.3.1
All LNG ~~plant~~ facility components shall be operated in accordance with the operating procedures manual.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:33:48 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.
Response Message:

Public Input No. 121-NFPA 59A-2013 [Section No. 14.3.1]

First Revision No. 39-NFPA 59A-2014 [Section No. 14.3.2]

14.3.2

The operating procedures manual shall be accessible to all ~~plant~~ LNG facility personnel and shall be kept readily available in the operating control center.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:34:28 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 122-NFPA 59A-2013 [Section No. 14.3.2]

First Revision No. 40-NFPA 59A-2014 [Section No. 14.3.4]

14.3.4

The operating manual shall include procedures for the startup and shutdown of all components of the ~~plant~~ LNG facility, including those for initial startup of the LNG ~~plant~~ facility, to ensure that all components operate satisfactorily.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:35:29 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 123-NFPA 59A-2013 [Section No. 14.3.4]

First Revision No. 41-NFPA 59A-2014 [Section No. 14.3.8]

14.3.8

The operating manual shall include procedures for the following:

(1) Maintaining the vaporization rate, temperature, and pressure so that the resultant gas is within the design tolerance of the vaporizer and the downstream piping

(2) Determining the existence of any abnormal conditions and the response to those conditions in the ~~plant~~ LNG facility

(3) The safe transfer of LNG and hazardous fluids, including prevention of overfilling of containers

(4) Security

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:36:12 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 124-NFPA 59A-2013 [Section No. 14.3.8]

First Revision No. 42-NFPA 59A-2014 [Section No. 14.4.2]

14.4.2

The emergency procedures shall include, at a minimum, emergencies that are anticipated from an operating malfunction, structural collapse of part of the LNG ~~plant~~ facility , personnel error, forces of nature, and activities carried on adjacent to the plant.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:37:03 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 127-NFPA 59A-2013 [Section No. 14.4.2]

First Revision No. 99-NFPA 59A-2014 [Section No. 14.5.5.4]

14.5.5.4* Container Purging, Drying, and Cooldown Procedures.

14.5.5.4.1

Taking an LNG container out of service shall not be regarded as a normal operation.

14.5.5.4.2

The activities of 14.5.5 shall require the preparation of detailed procedures.

14.5.5.4.3

Only experienced, trained personnel shall dry, purge, or cool down LNG containers.

14.5.5.4.4

Before an LNG container is put into service, the air shall be displaced by an inert gas, ~~by~~ following a written purging procedure.

14.5.5.4.5*

Before a container is taken out of service, the natural gas in the container shall be purged from the container with an inert gas, ~~using~~ following a written purging procedure.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 22:16:39 EDT 2014

Committee Statement

Committee Statement: The paragraph is revised to include drying and cooldown in the requirements for experienced personnel.

Response Message:

Public Input No. 128-NFPA 59A-2013 [Section No. 14.5.5.4]
Public Input No. 130-NFPA 59A-2013 [Section No. 14.5.5.4.3]

First Revision No. 69-NFPA 59A-2014 [Section No. 14.6.7.5]

14.6.7.5 Bunkering Operations.

14.6.7.5.1

Bunkering operations shall be in accordance with any requirements established by the authority having jurisdiction over vessels or terminals.

14.6.7.5.2

During bunkering operations, the following shall apply:

(1) Personnel ~~involved in~~ performing bunkering operations shall not have simultaneous responsibility ~~involved in~~ for the transfer of LNG as cargo .

(2) No vessels shall be moored alongside the LNG vessel without the permission of the authority having jurisdiction.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 22:13:10 EDT 2014

Committee Statement

Committee Statement: LNG can now be used as a propulsion fuel on ships. The revision clarifies that different personnel may be required to transfer LNG cargo during bunkering where LNG is the ship fuel.

Response Message:

First Revision No. 43-NFPA 59A-2014 [Section No. 14.7.1]

14.7.1*

Each operating company shall have a documented plan that sets out inspection and maintenance program requirements for each component used in its LNG ~~plant~~ facility that is identified as requiring inspection and maintenance.

Supplemental Information

File Name	Description
A_14_7_1_FR_43_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:38:02 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information. The new annex material identifies additional resources when developing maintenance plans related to electrical systems.

Response Message:

Public Input No. 131-NFPA 59A-2013 [Section No. 14.7.1]
Public Input No. 165-NFPA 59A-2013 [New Section after A.14.6.7.4.3]

A.14.7.1

NFPA 70B provides recommended maintenance to electrical systems that are not already addressed by this standard.

First Revision No. 44-NFPA 59A-2014 [Section No. 14.7.2]

14.7.2

Each maintenance program shall be conducted in accordance with its documented plan for LNG ~~plant~~ facility components identified in the plan as requiring inspection and maintenance.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:38:41 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 132-NFPA 59A-2013 [Section No. 14.7.2]

First Revision No. 45-NFPA 59A-2014 [Section No. 14.7.3]

14.7.3

Each operating company shall perform the periodic inspections, tests, or both, on a schedule that is included in the maintenance plan on identified components and its support system identified as requiring inspection and maintenance that is in service in its LNG ~~plant~~ facility .

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
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Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 133-NFPA 59A-2013 [Section No. 14.7.3]

First Revision No. 46-NFPA 59A-2014 [Section No. 14.7.5]

14.7.5

The maintenance manual shall include the following for LNG ~~plant~~ facility components:

(1) The manner of carrying out and the frequency of inspections and tests

(2) A description of any other action, in addition to those referred to in 14.7.5, that is necessary to maintain the LNG ~~plant~~ facility in accordance with this standard

(3) All procedures to be followed during repairs on a component that is operating while it is being repaired, to ensure the safety of persons and property at the LNG plant

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:39:59 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 134-NFPA 59A-2013 [Section No. 14.7.5]

First Revision No. 47-NFPA 59A-2014 [Section No. 14.8.1]

14.8.1*

Each operating company shall ensure that components in its LNG ~~plant~~ facility that could accumulate combustible mixtures are purged after being taken out of service and before being returned to service.

Supplemental Information

File Name	Description
A_14_8_1_FR_47_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:40:41 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information. Current annex text related to 9.8.1 is more appropriate for chapter 14 related to operating/maintenance activities. A reference to NFPA 56 is added to inform users that NFPA 56 contains additional guidance for prevention of fire and explosion during purging of flammable gas piping.

Response Message:

Public Input No. 135-NFPA 59A-2013 [Section No. 14.8.1]

A.14.8.1

The AGA publication *Purging Principles and Practice* can be used as a guide. NFPA 56, while not mandatory for LNG facilities, contains additional guidance for purging activities.

First Revision No. 48-NFPA 59A-2014 [Section No. 14.8.8]

14.8.8 Repairs.

Repairs that are carried out on components of an LNG ~~plant~~ facility shall be carried out in a manner that ensures the following:

(1) That the integrity of the components is maintained, in accordance with this standard

(2) That components operate in a safe manner

(3) That the safety of personnel and property during a repair activity is maintained

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:41:17 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 136-NFPA 59A-2013 [Section No. 14.8.8]

First Revision No. 49-NFPA 59A-2014 [Section No. 14.8.9]

14.8.9 Site Housekeeping.

Each operating company shall do the following:

(1) Keep the grounds of its LNG plant free from rubbish, debris, and other materials that could present a fire hazard

(2) Ensure that the presence of foreign material contaminants or ice is avoided or controlled to maintain the operational safety of each LNG ~~plant~~ facility component

(3) Maintain the grassed area of its LNG plant so that it does not create a fire hazard.

(4) Ensure that fire control access routes within its LNG plant are unobstructed and reasonably maintained in all weather conditions

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:41:50 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 137-NFPA 59A-2013 [Section No. 14.8.9]

First Revision No. 100-NFPA 59A-2014 [Section No. 14.8.10.4]

14.8.10.4

Control systems that are used as part of the fire protection system at the LNG ~~plant~~ facility shall be inspected and tested in accordance with the applicable fire code and conform to the following:

(1) Monitoring equipment shall be maintained in accordance with *NFPA 72*, ~~*National Fire Alarm and Signaling Code*~~ , and NFPA 1221, ~~*Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*~~ .

(2) Fire protection water systems shall be maintained in accordance with NFPA 13, ~~*Standard for the Installation of Sprinkler Systems*~~ , NFPA 14, ~~*Standard for the Installation of Standpipe and Hose Systems*~~ , NFPA 15, ~~*Standard for Water Spray Fixed Systems for Fire Protection*~~ , NFPA 20, ~~*Standard for the Installation of Stationary Pumps for Fire Protection*~~ , NFPA 22, ~~*Standard for Water Tanks for Private Fire Protection*~~ , NFPA 24, ~~*Standard for the Installation of Private Fire Service Mains and Their Appurtenances*~~ , and NFPA 25, ~~*Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*~~ , NFPA 750 , and NFPA 1962 .

(3)* Portable or wheeled fire extinguishers suitable for gas fires shall be available at strategic locations, as determined in accordance with Chapter 12, within an LNG facility and on tank vehicles and shall be maintained in accordance with NFPA 10, ~~*Standard for Portable Fire Extinguishers*~~ .

(4) Fixed fire extinguishers and other fire control equipment shall be maintained in accordance with NFPA 11, ~~*Standard for Low-, Medium-, and High-Expansion Foam*~~ , NFPA 12, ~~*Standard on Carbon Dioxide Extinguishing Systems*~~ , NFPA 12A, ~~*Standard on Halon 1301 Fire Extinguishing Systems*~~ , NFPA 16, ~~*Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*~~ , NFPA 17, ~~*Standard for Dry Chemical Extinguishing Systems*~~ , and NFPA 2001, ~~*Standard on Clean Agent Fire Extinguishing Systems*~~ .

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 22:21:49 EDT 2014

Committee Statement

Committee Statement: The revision identifies standards that have maintenance requirements which should be included as part of the fire system maintenance plan.

Response Message:

Public Input No. 138-NFPA 59A-2013 [Section No. 14.8.10.4]

First Revision No. 90-NFPA 59A-2014 [Section No. 14.8.10.9]

14.8.10.9*
Stop valves shall not be operated except by an authorized person.

Supplemental Information

File Name	Description
A_14_8_10_9._FR_90_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 21:30:19 EDT 2014

Committee Statement

Committee Statement: The new annex material identifies code/standard guidance on application of management/administrative controls for isolation valve beneath pressure and vacuum relief valves during maintenance to help ensure the system the valve is protecting is in the appropriate position.

Response Message:

Public Input No. 84-NFPA 59A-2013 [Section No. 7.3.6.4]
Public Input No. 154-NFPA 59A-2013 [New Section after A.7.3.1.7]

A.14.8.10.9

The operation of stop valves beneath pressure relief valves should be managed to minimize the risk of a stop valve not returning to the appropriate position after valves are cycled for relief valve maintenance or any other purposes. See ASME *Boiler Pressure Vessel Code*, Section VIII, Division I, UG-135, and the nonmandatory Appendix M-5.

First Revision No. 50-NFPA 59A-2014 [Section No. 14.8.12.1]

14.8.12.1

LNG storage ~~plants~~ facilities and, in particular, the storage container and its foundation shall be externally inspected after each major meteorological disturbance to ensure that the structural integrity of the ~~plant~~ LNG facility is intact.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:42:30 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 139-NFPA 59A-2013 [Section No. 14.8.12.1]

First Revision No. 51-NFPA 59A-2014 [Section No. 14.8.13.1]

14.8.13.1

Each operating company shall ensure the following for metallic components of its LNG ~~plant~~ facility that could be adversely affected with respect to integrity or reliability by corrosion during their service life:

(1) Protection from corrosion in accordance with Section 9.10

(2) Inspection and replacement or repair under a program of scheduled maintenance in accordance with the manual referred to under Section 14.3

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:43:29 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 140-NFPA 59A-2013 [Section No. 14.8.13.1]

First Revision No. 52-NFPA 59A-2014 [Section No. 14.8.13.2]

14.8.13.2

Each operating company shall ensure that each component of its LNG ~~plant~~ facilities that is subject to interference from an electrical current is protected so that the electrical interference is minimized.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:44:09 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 141-NFPA 59A-2013 [Section No. 14.8.13.2]

First Revision No. 101-NFPA 59A-2014 [New Section after 14.8.13.8]

14.8.13.9*

Components covered by insulation that are subject to external corrosion shall be periodically monitored based upon a written corrosion control program.

Supplemental Information

File Name	Description
A_14_8_13_9_FR_101_changes_accepted.docx	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 22:23:55 EDT 2014

Committee Statement

Committee Statement: The new text clarifies expectations for managing atmospheric corrosion under insulated components (piping, valves, vessels, etc.). The annex material aids the LNG facility operator in managing corrosion under insulation and can be used in the development of the written plan required by new proposed 14.8.13.9.

Response Message:

Public Input No. 142-NFPA 59A-2013 [New Section after 14.8.13.8]
Public Input No. 164-NFPA 59A-2013 [New Section after A.14.8.13.4]

A.14.8.13.9

NACE SP-0198, *Control of Corrosion Under Thermal Insulation and Fireproofing Materials – A Systems Approach,* provides guidance for establishing a corrosion control monitoring program.

First Revision No. 53-NFPA 59A-2014 [Section No. 14.8.13.11]

14.8.13.12

Components that will not be adversely affected by internal corrosion during the time that the component will be in use in ~~the~~ LNG ~~plant~~ facilities shall be exempt from the requirements of 14.8.13.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
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Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 143-NFPA 59A-2013 [Section No. 14.8.13.11]

First Revision No. 54-NFPA 59A-2014 [Section No. 14.8.13.12]

14.8.13.13

If it is discovered by inspection or otherwise that corrosion is not being controlled at the LNG ~~plant~~ facilities , necessary actions to control or monitor the corrosion shall be taken.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:45:34 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 144-NFPA 59A-2013 [Section No. 14.8.13.12]

First Revision No. 55-NFPA 59A-2014 [Section No. 14.9.2]

14.9.2

The training plan shall include training of permanent maintenance, operating, and supervisory personnel with respect to the following:

(1) The basic operations carried out at the LNG ~~plant~~ facility

(2) The characteristics and potential hazards of LNG and other hazardous fluids involved in operating and maintaining the LNG ~~plant~~ facility , including the serious danger from frostbite that can result from contact with LNG or cold refrigerants

(3) Methods of carrying out the duties of maintaining and operating the LNG ~~plant~~ facility as set out in the manual of operating and maintenance procedures referred to in ~~Sections~~ Section 14.3 and Section 14.7

(4) LNG transfer procedures

(5) Fire prevention, including familiarization with the fire control plan of the LNG plant, fire fighting, the potential causes of fire in an LNG plant, and the types, sizes, and likely consequences of a fire at an LNG plant

(6) Recognition of situations when it would be necessary to obtain assistance in order to maintain the security of the LNG plant

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:46:07 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 145-NFPA 59A-2013 [Section No. 14.9.2]

First Revision No. 56-NFPA 59A-2014 [Section No. 14.10.1]

14.10.1

Each operating company shall maintain for a period of not less than 5 years a record of the date and type of each maintenance activity performed on each component of the LNG ~~plant~~ facility , including a record of the date that a component is taken out of or placed into service.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:46:48 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 146-NFPA 59A-2013 [Section No. 14.10.1]

First Revision No. 57-NFPA 59A-2014 [Section No. 14.10.3]

14.10.3

For the life of the LNG facility, each LNG ~~plant~~ facility operator shall maintain records of each test, survey, or inspection required by this standard in detail sufficient to demonstrate the adequacy of corrosion control measures.

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:47:26 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 147-NFPA 59A-2013 [Section No. 14.10.3]

First Revision No. 58-NFPA 59A-2014 [Section No. 14.10.4]

14.10.4

A record of all training shall be maintained for each employee of an LNG ~~plant~~ facility , and the records shall be maintained for at least 2 years after the date that the employee ceases to be employed at the LNG ~~plant~~ facility .

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Tue Mar 11 21:48:01 EDT 2014

Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 148-NFPA 59A-2013 [Section No. 14.10.4]

First Revision No. 102-NFPA 59A-2014 [Section No. 15.6.1]

15.6.1*

The annual probability of LNG and other hazardous material releases from various equipment, for scenarios identified in ~~Sections~~ 15.4.1 and 15.4.2, shall be based on Table 15.6.1.

Table 15.6.1 Example Component Failure Database

Component	Annual Probability of Failure
Atmospheric ~~Cryogenic Tanks~~ cryogenic tanks	
(1) Instantaneous failure of primary container and outer shell, release of entire contents (single containment tank)	5E-07
(2) Instantaneous failure of primary container and outer shell, release of entire contents (double containment tank)	1.25E-08
(3) Instantaneous failure of primary and secondary container, release of entire contents (full containment tank)	1E-08
Pressurized ~~Storage~~ storage (Containers) — instantaneous release of entire contents	5E-07
Pressure relief valves — outflow at the maximum rate	2E-05
Process equipment	
(1) Pumps — catastrophic failure	1E-04
(2) Compressors with gasket — catastrophic failure	1E-04
(3) Heat exchanger — instantaneous release of entire contents from plate heat exchanger	5E-05
Transfer equipment — rupture of loading/unloading arm	3E-08
Piping — aboveground	**Annual probability of failure per meter**
(1) Rupture for nominal diameter <75 mm	1E-06
(2) Rupture for 75 mm < nominal diameter <150 mm	3E-07
(3) Rupture for nominal diameter >150 mm	1E-07

Supplemental Information

File Name	Description
TIA_59A-13-1.pdf	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 22:32:52 EDT 2014

Committee Statement

Committee Note: This Proposal originates from Tentative Interim Amendment 59A-13-1 (TIA 1090) issued by

Statement:	the Standards Council on March 7, 2013. The lack of proper units for probability of failure of aboveground piping makes the risk-based siting analysis impossible. The additional formatting changes clarify that the units of annual probability per meter apply only to piping. The units in Table 15.8.4.1, as approved by the committee, are technically incorrect.
Response Message:	

Public Input No. 5-NFPA 59A-2013 [Section No. 15.6.1]

First Revision No. 103-NFPA 59A-2014 [Section No. 15.8.4.1]

15.8.4.1

Distances to safe levels of radiant heat fluxes and modified thermal dosage values specified in Table 15.8.4.1 and Table 15.8.4.2 shall be calculated with a model that meets the following criteria:

(1) Takes into account the physical phenomena observed, and has been validated with available experimental data, including applicable experimental LNG fire published in the literature

(2) Has been published in an archival, peer-reviewed scientific journal in the related scientific/engineering disciplines, including, but not limited to, fluid dynamics, heat transfer, combustion, or fire science

(3) Has been verified to accurately represent the physics

(4) Has a scientific assessment of the details of the physics, analysis, and execution process

(5) Has been approved by the AHJ

Table 15.8.4.1 Radiant Heat Flux and Thermal Dosage Outside the Plant Boundary

Maximum Heat Flux Level (kW/m^2)	Maximum Modified Dosage Unit ($[kW/m^2]^{4/3}$ s)	Consequences
5.0	500	At least 10 persons would suffer ~~2nd~~ second- degree skin burns on at least 10% of their bodies within 30 seconds of exposure to the fire.
5.0	300	At least one person inside the building would suffer ~~2nd~~ second-degree skin burns on at least 10% of the body within 30 seconds of exposure to the fire.
32	N/A	Loss of strength of structural steel exposed to the fire to an extent that its primary load-bearing capacity is reduced significantly over the duration of LNG fire being analyzed.

Supplemental Information

File Name	Description
TIA_59A-13-1.pdf	

Submitter Information Verification

Submitter Full Name: Denise Beach
Organization: National Fire Protection Assoc
Street Address:
City:
State:
Zip:
Submittal Date: Wed Mar 12 22:34:56 EDT 2014

Committee Statement

Committee Statement: Note: This Proposal originates from Tentative Interim Amendment 59A-13-1 (TIA 1090) issued by the Standards Council on March 7, 2013.

The lack of proper units for probability of failure of aboveground piping makes the risk-based siting analysis impossible. The additional formatting changes clarify that the units of annual probability per meter apply only to piping.

The units in Table 15.8.4.1, as approved by the committee, are technically incorrect.

Response Message:

Public Input No. 6-NFPA 59A-2013 [Section No. 15.8.4.1]

First Revision No. 104-NFPA 59A-2014 [Section No. 15.8.4.2]

15.8.4.2*

Distances to vapor dispersion to concentrations equal to the lower flammability limit (LFL) (volume concentration value 5 percent) shall be calculated using a model that is acceptable for use by the AHJ or a model that has been evaluated by an independent body using the Model Evaluation Protocol facilities published ~~by~~ in the Fire Protection Research Foundation report "Evaluating Vapor Dispersion Models for Safety Analysis of LNG Facilities~~,~~ . " ~~2007.~~ Alternatively, distances to the occurrences of ignition of a vapor cloud shall be calculated using a methodology that is acceptable ~~by~~ to the AHJ.

Table 15.8.4.2 Criteria for Property Damage Due to Radiant Heat from Fires

Exposed ~~structure~~ Structure	Type of ~~construction~~ ~~/~~ ~~occupancy~~ Construction /Occupancy	Threshold ~~damage criteria~~ Damage Criteria
Adjacent LNG container	Reinforced concrete	(1) Temperature of no part of the exposed concrete outer surface of the container structure shall exceed ~~570°F~~ 1000°F (~~300°C~~ 540°C) over the duration of the fire. (2) Temperature of steel reinforcements in pre-stressed concrete shall not exceed ~~1000°F~~ 570°F (~~540°C~~ 300°C) over the duration of the fire.
Steel structures		Temperature shall not exceed ~~1000°F~~ 570°F (~~540°C~~ 300°C) over the duration of the fire.
Wooden structures		Net heat flux into the structure shall not exceed 8115 Btu/hr-ft^2 (26,500 w/m^2) for unpiloted ignition or 4660 Btu/hr-ft^2 (14,700 w/m^2) for piloted ignition.

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Committee Statement

Committee Statement: Adjacent LNG concrete containers defined by this standard are generally stressed at a low level in normal operation. Liquid retention is satisfied by the primary liquid container. Under these conditions, about 50% of the material strength levels is considered adequate to minimize damage.

At 1000F, steel reinforcing has less than 40% of its useful strength in concrete and prestress has less than 7% of its strength. Whereas at 1000F, concrete has about 50% of its strtength. At 570F, rteinforcing steel has about 60% of its strength and prestress tendons have about 32% of their

strength. Reversing the values in the table for the adjacent container section will limit stength values to about 50% of their normal ambient values.

Generally, materials used for steel structures such as A36 and A516-70 will have over 50% of their yield and tensile properties at 1000F. However, steel structures are designed for general membrane stress levels above 50% of yield. Stress levels at connections and other areas are designed for much higher values. Therefore, resistance to permanent distortion requires a higher strength than 50%. Strength values start dropping off above 500F. Therefore, a threshold damage temperature of 570F is a reasonable value for table 15.8.4.2.

Response Message:

Public Input No. 54-NFPA 59A-2013 [Section No. 15.8.4.2]

First Revision No. 59-NFPA 59A-2014 [Section No. A.5.2]

A.5.2

The following factors should be considered in the selection of plant site locations:

(1) Provision for minimum clearances as stated in this standard between LNG containers, flammable refrigerant storage tanks, flammable liquid storage tanks, structures, and plant equipment, with respect to both plant property lines and each other

(2) The degree that the LNG plant can, within limits of practicality, be protected against forces of nature

(3) Other factors applicable to the specific site that have a bearing on the safety of LNG plant personnel and the surrounding public

The review of such factors should include an evaluation of potential incidents and safety measures incorporated in the design or operation of the ~~facility~~ LNG plant .

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Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 149-NFPA 59A-2013 [Section No. A.5.2]

First Revision No. 88-NFPA 59A-2014 [Section No. A.7.3.1.3]

A.7.3.1.3

Operating requirements for prevention of stratification are located in Section 14.6. Additional details on rollover and rollover prevention can be found in the AGA publication *Introduction to LNG for Personnel Safety* .

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Committee Statement

Committee Statement: New proposed text recognizes additional information on the conditions which contribute to rollover and actions to mitigate the risk.

Response Message:

Public Input No. 152-NFPA 59A-2013 [Section No. A.7.3.1.3]

First Revision No. 105-NFPA 59A-2014 [Section No. A.7.3.1.7]

A.7.3.1.7

~~ACI 376, *Code Requirements for Design and Construction of Concrete Structures for the Containment of Refrigerated Liquefied Gases,* contains further information regarding decomissioning of concrete containment tanks. Additional consideration for continued outgasing of concrete should be considered in decomissioning procedures.~~ API 620 (Appendix Q), API 625, and ACI 376 contain design requirements to allow the tank systems to be purged into or out of service during tank commissioning or decommissioning. Continued outgasing should be considered in the decommissioning procedures.

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Committee Statement

Committee Statement: The existing annex material was not inclusive of all tanks. API 620 and API 625 were added to provide guidance on metal tanks and tank systems. Outgasing is not limited to concrete, but can also be from insulating materials.

Response Message:

Public Input No. 153-NFPA 59A-2013 [Section No. A.7.3.1.7]

First Revision No. 60-NFPA 59A-2014 [Section No. A.7.3.7.5(3)]

A.7.3.7.5(3)

It might not be practical to add a cathodic protection system to an existing tank's outer tank bottom because of integral electrical conductivity of the bottom to the tank or ~~plant~~ LNG facility ground and lightning protection system. Grounding can make a cathodic protection system ineffective.

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Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 155-NFPA 59A-2013 [Section No. A.7.3.7.5(3)]

First Revision No. 94-NFPA 59A-2014 [Section No. A.9.8.1]

A.14.5.5.3

The AGA publication *Purging, Principles and ~~Practices~~ Practice* can be used as a guide.NFPA 56 , while not mandatory for LNG facilities, contains additional guidance for purging activities.

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Submittal Date: Wed Mar 12 21:49:58 EDT 2014

Committee Statement

Committee Statement: Paragraph 9.8.1 was deleted, and the annex text is relocated to A.14.5.5.3. Current annex text related to 9.8.1 is more appropriate for chapter 14 related to operating/maintenance activities. A reference to NFPA 56 is added to inform users that NFPA 56 contains additional guidance for prevention of fire and explosion during purging of flammable gas piping.

Response Message:

Public Input No. 126-NFPA 59A-2013 [Section No. A.9.8.1]
Public Input No. 157-NFPA 59A-2013 [Section No. A.9.8.1]

First Revision No. 106-NFPA 59A-2014 [Section No. A.9.11.8]

A.9.11.8

Consideration ~~shall~~ should be given to the installation of “witness” pieces to monitor the installed condition of material associated with “buried” pipe.

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Committee Statement

Committee Statement: The NFPA Manual of Style prohibits including a requirement in the annex.
Response Message:
Public Input No. 158-NFPA 59A-2013 [Section No. A.9.11.8]

First Revision No. 107-NFPA 59A-2014 [New Section after A.12.4.4]

A.12.4.4

When installed as determined by the evaluation required in 12.2.1 , the following detection system components should be designed, installed, documented, tested, and maintained in accordance with *NFPA 72*, ~~*National Fire Alarm and Signaling Code*~~ , or as approved by the AHJ:

(1) Initiating devices (detectors – smoke, flame, heat, etc.)

(2) Fire system controllers and monitoring panels

(3) Notification appliances (strobes, sirens, etc)

(4) Fire system activation devices on installed extinguishment/suppression systems (water deluge, fixed dry chemical systems, etc.)

(5) Field wiring between initiating, notification components activation/suppression system, controllers, and monitoring panels

(6) Power supply and backup power equipment for fire alarm system

(7) Any additional devices covered by *NFPA 72* that are determined necessary in the evaluation required by 12.2.1

(8) Where fire protection systems are installed in accordance with NFPA 72 and are planned to be integrated with other systems, the integrated systems should be tested in accordance with NFPA 3 .

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Committee Statement

Committee Statement: The additional annex material identifying NFPA 3 provides additional guidance when integrating and commissioning various fire protection and life safety systems with other systems.

Response Message:

Public Input No. 162-NFPA 59A-2013 [New Section after A.12.4.4]

First Revision No. 62-NFPA 59A-2014 [Section No. A.15.11.1]

A.15.11.1

When mitigation measures are being chosen, the application of the principles of inherent safety have been proved to be the most effective means of reducing risk to persons outside the boundary of the ~~facility~~ LNG plant . Inherent safety is the use of mitigations that avoid the hazard rather than attempt to control the hazardous event or process. ~~Kletz in *Plant Design for Safety: A User friendly Approach* (New York: Hemisphere Publishing, 1991) states the~~ The following basic principles of inherent safety ~~as follows: These principles are based upon~~ (Kletz, 1991) are based on a hierarchy starting with intensification and ending with administrative controls and ~~procedures. This hierarchy is explained further below.~~ procedures:

(1) *Intensification.* Small inventories of hazardous substances reduces the consequences of hazardous events associated with those substances.

(2) *Substitution.* Using safer material in place of a hazardous one will decrease the need for added protective equipment.

(3) *Attenuation.* : Carry out hazardous reactions or processes in less hazardous conditions.

(4) *Limitation of effects.* The effects of failures should be reduced through the reduction of inventory sizes and process conditions. This should be accomplished through equipment design rather than by adding protective equipment

(5) *Simplification.* Complexities provide the potential for error; , simplification of LNG facility design reduces the potential for failure.

(6) *Change early.* Identification of hazards and hazardous scenarios early in the design process minimizes the need for changes after the design is complete and minimizes the potential for sometimes complicated integration of changes late in the design cycle.

(7) *Avoid knock-on effects.* Care should be taken to ensure that, as far as reasonably practical, failure should not initiate additional hazardous scenarios and subsequent escalation of effects.

(8) *Making status clear.* Equipment in the facility should be located so that observation of the equipment is easy and convenient; additionally the design of equipment should allow for the status of the equipment to be easily observed~~, for example,~~ (e.g., valves open or closed, pump running or secured) .

(9) *Making incorrect assembly impossible.* As far as possible, components should be selected so that improper installation or construction cannot occur.

(10) *Tolerance.* The design of the process should be such that it will tolerate some amount of improper operation, installation, or process upset.

(11) *Ease of control.* The use of added-on protective equipment to manage risks should be avoided.

(12) *Administrative controls/procedures.* Human error is one the most common initiators of hazardous events; accordingly, the use of procedural controls to manage risk should be the last option and only when other options are not possible.

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Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 166-NFPA 59A-2013 [Section No. A.15.11.1]

First Revision No. 63-NFPA 59A-2014 [Section No. A.15.11.2]

A.15.11.2

With regard to the reduction of risk to persons outside the boundaries of the ~~facility~~ LNG plant , the basic principles ~~illustrated~~ listed in A.15.11.1 can be simplified into the three-tier hierarchy as follows.

(1) *Tier 1: Remove the hazard.* This first tier of mitigation should focus on providing additional separation distance between the LNG- or gas-containing portions of the LNG facility. Revision of the LNG plant layout and orientation should be considered to increase the separation distance. When changes to the LNG plant layout are being considered, the potential effect of prevailing winds and topography should be evaluated. Care should be given to avoiding the potential for dense clouds to form in valleys and troughs — such clouds will remain in place for longer periods of time, thereby increasing the risk of ignition.

(2) *Tier 2: Reduce the amount of hazardous substance/prevent the release.* Consideration also should be given to reducing the amount of LNG or gas that can be released during an event. The effect of reducing inventory sizes is that the size of the liquid pool or the length and duration of the jet plume will be reduced and the effects of the ignited pool/ignited jet will be reduced. In this regard, the use of multiple process trains and smaller tanks ~~are~~ is an effective way to reduce the impact ~~to~~ on the general public from the ~~facility~~ LNG plant .

(3) *Tier 3: Additional procedures or controls to mitigate the risk.* Where it is not possible to remove the hazard or to prevent or reduce the hazardous effects of a release, additional procedures or controls can be used to mitigate the risk. Human error and failure of control devices are the initiators of the majority of hazardous scenarios; accordingly, these elements should be the last choice when selecting mitigation measures to reduce risk.

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Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 167-NFPA 59A-2013 [Section No. A.15.11.2]

First Revision No. 64-NFPA 59A-2014 [Section No. A.15.11.3]

A.15.11.3

~~Some~~ Following are some examples of mitigation measures ~~are provided below~~ :

(1) *Tier 1: Remove the hazard.*

(a) ~~Plant~~ LNG facility spacing and layout

(b) Spill containment

(2) *Tier 2: Reduce the amount of hazardous substance/prevent the release.*

(a) Design of equipment, including relief valve design, redundancy, and so forth

(b) Valve arrangements

(c) Safety instrumented systems, including changes to safety integrity levels, emergency shutdown (ESD) logic, alarm management, and so forth

(d) Fire and gas (F&G) systems, including system reliability, ~~F & G~~ F&G logic, response time, detector coverage, and alarm management

(e) Fire protection equipment, including passive and active mitigation techniques

(3) *Tier 3: Additional procedures or controls to mitigate the risk.*

(a) Maintenance and operating procedures

(b) Security procedures and equipment

(c) Emergency response actions

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Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 168-NFPA 59A-2013 [Section No. A.15.11.3]

First Revision No. 65-NFPA 59A-2014 [Section No. B.3.1]

B.3.1

The SSE ground motion is the "risk-adjusted maximum considered earthquake (MCE_R) ground motion," per the definition in ASCE 7, *Minimum Design Loads for Buildings and Other Structures*. For most locations, except possibly those near active faults, the MCE_R is determined by adjustment from ground motion that has a 2 percent probability of exceedance in a 50-year period to ground motion that achieves targeted risk requirements. The ASCE 7 adjustment establishes a uniform probability of failure ~~criteria~~ criterion (1 percent chance of collapse in 50 years) for structures designed in accordance with the seismic provisions of ASCE 7. In NFPA 59A, the LNG ~~facility~~ plant is designed to contain the LNG and prevent catastrophic failure of critical facilities under an SSE event. This more onerous performance criterion is achieved through design requirements of API 625, API 620 (Appendix L), and ACI 376, which ~~have~~ contain established response reduction factors to prevent collapse at the design level ground motion.

ASCE 7 requires the base design level earthquake to be two-thirds of MCE_R. Setting the importance factor, I, equal to 1.5 (corresponding to structures containing extra hazardous materials) results in a design level equal to MCE_R. Thus, SSE = MCE_R, as required by this standard, is consistent with ASCE 7 provisions for the design level ground motion. Design of critical facilities to this standard exceeds the design performance requirements of ASCE 7. The LNG facility is not required to remain operational following the SSE event.

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Committee Statement

Committee Statement: The paragraph is updated to be consistent with new definitions for components, LNG facility, and LNG plant. See FR 15 for additional information.

Response Message:

Public Input No. 169-NFPA 59A-2013 [Section No. B.3.1]

First Revision No. 109-NFPA 59A-2014 [New Section after C.1]

C.2 Additional Security Guidance

In addition to Annex C security requirements from 49 CFR 193 and the security assessment requirements in 12.9.1 of this standard, the security of an LNG plant should consider physical and cyber security threats and vulnerabilities and ways to mitigate both. Guidance for both physical security and cyber security can be found in the U.S. Department of Homeland Security, Transportation Security Administration's *Pipeline Security Guidelines* . Facilities included in the U.S. Department of Homeland Security's Chemical Facility Anti-Terrorism Standards are required to meet the intent of the *Risk-Based Performance Standards Guidance* .

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Submittal Date: Wed Mar 12 23:04:49 EDT 2014

Committee Statement

Committee Statement: Proposed additional annex material identifies additional guidance to further enhance security of LNG facilities.

Response Message:

Public Input No. 170-NFPA 59A-2013 [New Section after C.1]

First Revision No. 110-NFPA 59A-2014 [Section No. D.1]

D.1 General.

~~This~~ The text in this annex is reprinted from Title 49 of the Code of Federal Regulations, Part 193, Liquified Natural Gas Facilities: Federal Safety Standards, Subpart H, ~~. The references herein are found in~~ Personnel Qualifications and Training. 49 CFR 193~~, "Transportation." It~~ is applicable to LNG plants in the United States under the jurisdiction of the Pipeline and Hazardous Materials Safety Administration, Department of Transportation.

Sec. 193.2701 Scope. This subpart prescribes requirements for personnel qualifications and training.

Sec. 193.2703 Design and fabrication. For the design and fabrication of components, each operator shall use —

(1) With respect to design, persons who have demonstrated competence by training or experience in the design of comparable components.

(2) With respect to fabrication, persons who have demonstrated competence by training or experience in the fabrication of comparable components.

Sec. 193.2705 Construction, installation, inspection, and testing.

(1) Supervisors and other personnel utilized for construction, installation, inspection, or testing must have demonstrated their capability to perform satisfactorily the assigned function by appropriate training in the methods and equipment to be used or related experience and accomplishments.

(2) Each operator must periodically determine whether inspectors performing duties under Sec. 193.2307 are satisfactorily performing their assigned function.

Sec. 193.2707 Operations and maintenance.

(1) Each operator shall utilize for operation or maintenance of components only those personnel who have demonstrated their capability to perform their assigned functions by —

(a) Successful completion of the training required by Secs. 193.2713 and 193.2717; and

(b) Experience related to the assigned operation or maintenance function; and

(c) Acceptable performance on a proficiency test relevant to the assigned function.

(2) A person who does not meet the requirements of paragraph (a) of this section may operate or maintain a component when accompanied and directed by an individual who meets the requirements.

(3) Corrosion control procedures under Sec. 193.2605(b), including those for the design, installation, operation, and maintenance of cathodic protection systems, must be carried out by, or under the direction of, a person qualified by experience and training in corrosion control technology.

Sec. 193.2709 Security. Personnel having security duties must be qualified to perform their assigned duties by successful completion of the training required under Sec. 193.2715.

Sec. 193.2711 Personnel health. Each operator shall follow a written plan to verify that personnel assigned operating, maintenance, security, or fire protection duties at the LNG plant do not have any physical condition that would impair performance of their assigned duties. The plan must be designed to detect both readily observable disorders, such as physical handicaps or injury, and conditions requiring professional examination for discovery.

Sec. 193.2713 Training: operations and maintenance.

(1) Each operator shall provide and implement a written plan of initial training to instruct —

(a) All permanent maintenance, operating, and supervisory personnel —

i. About the characteristics and hazards of LNG and other flammable fluids used or handled at the facility, including, with regard to LNG, low temperatures, flammability of mixtures with air, odorless vapor, boiloff characteristics, and reaction to water and water spray;

ii. About the potential hazards involved in operating and maintenance activities; and

iii. To carry out aspects of the operating and maintenance procedures under Secs. 193.2503 and 193.2605 that relate to their assigned functions; and

(b) All personnel —

i. To carry out the emergency procedures under Sec. 193.2509 that relate to their assigned

functions; and

ii. To give first-aid; and

(c) All operating and appropriate supervisory personnel —

i. To understand detailed instructions on the facility operations, including controls, functions, and operating procedures; and

ii. To understand the LNG transfer procedures provided under Sec. 193.2513.

(2) A written plan of continuing instruction must be conducted at intervals of not more than two years to keep all personnel current on the knowledge and skills they gained in the program of initial instruction.

Sec. 193.2715 Training: security.

(1) Personnel responsible for security at an LNG plant must be trained in accordance with a written plan of initial instruction to:

(a) Recognize breaches of security;

(b) Carry out the security procedures under Sec. 193.2903 that relate to their assigned duties;

(c) Be familiar with basic plant operations and emergency procedures, as necessary to effectively perform their assigned duties; and

(d) Recognize conditions where security assistance is needed.

(2) A written plan of continuing instruction must be conducted at intervals of not more than two years to keep all personnel having security duties current on the knowledge and skills they gained in the program of initial instruction.

Sec. 193.2717 Training: fire protection.

(1) All personnel involved in maintenance and operations of an LNG plant, including their immediate supervisors, must be trained in accordance with a written plan of initial instruction, including plant fire drills, to:

~~Know and follow the fire prevention procedures under Sec. 193.2805(b);~~

(a) Know the potential causes and areas of fire; ~~determined under Sec. 193.2805(a);~~

(b) Know the types, sizes, and predictable consequences of fire; ~~determined under Sec. 193.2817(a);~~ and

(c) Know and be able to perform their assigned fire control duties according to the procedures established under ~~Sec.~~ 193.2509 and by proper use of equipment provided under ~~Sec.~~ 193.~~2817~~ 2801 .

(2) A written plan of continuing instruction, including plant fire drills, must be conducted at intervals of not more than two years to keep personnel current on the knowledge and skills they gained in the instruction under paragraph (a) of the section.

(3) Plant fire drills must provide personnel hands-on experience in carrying out their duties under the fire emergency procedures required by ~~Sec.~~ 193.2509.

Sec. 193.2719 Training: records.

(1) Each operator shall maintain a system of records which —

(a) Provide evidence that the training programs required by this subpart have been implemented; and

(b) Provide evidence that personnel have undergone and satisfactorily completed the required training programs.

(c) Records must be maintained for one year after personnel are no longer assigned duties at the LNG plant.

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Committee Statement

Committee Statement: The annex is updated to be consistent with the current text of 49 CFR 193.

Note: online public input version does not allow for proper renumbering: 193.2717 (1) (a) should read "(a) Know the potential causes and areas of fire;"

Response Message:

Public Input No. 171-NFPA 59A-2013 [Section No. D.1]