

FIRE SAFETY ANALYSIS FOR LP-GAS STORAGE FACILITIES

A manual for developing the written fire safety analysis (FSA) specifying the modes of fire protection required by NFPA 58, 2017 Edition, §6.29.3.2.

An FSA is required for installations that have an aggregate water capacity of 10,000 gallons or more per changes adopted in the *LP-Gas Safety Rules* Table §9.403(a).



RAILROAD COMMISSION OF TEXAS

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Fire Safety Analysis Manual For LP-Gas Storage Facilities

Based on the 2017 Edition of NFPA 58 Liquefied Petroleum Gas Code

The procedures and information in this document are intended to assist in implementing the standards set forth in NFPA 58 as adopted in Texas Administrative Code, Title 16, Chapter 9, LP-Gas Safety Rules §9.403(a) with capabilities of the personnel and equipment available.

This written fire safety analysis is for the following installation:

Licensee/Owner Name: _____

RRC License Number: _____

Emergency Number: _____

Facility Name: _____

Geographical Location: _____

City: _____

County: _____

GPS Coordinates: N _____

W _____

Contact Name: _____

Office Number: _____

Email: _____

Facility Type: _____

	Manufacturer	Serial Number	Water Capacity
Container 1:	_____	_____	_____
Container 2:	_____	_____	_____
Container 3:	_____	_____	_____
Container 4:	_____	_____	_____
Container 5:	_____	_____	_____
Container 6:	_____	_____	_____
Container 7:	_____	_____	_____

If additional containers are installed list separately.

NFPA 58, 2017 Edition, §6.29 as amended by Table 9.403

§6.29.1 Section 6.29 shall apply to fire protection for industrial plants, bulk plants and dispensing systems with an aggregate water capacity greater than 4,000 gallons.

6.29.2.1 The planning for the response to incidents including the inadvertent release of LP-Gas, fire, or security breach shall be coordinated with local emergency response agencies.

6.29.2.2 Planning shall include consideration of the safety of emergency personnel, workers, and the public.

List local emergency response agencies and response plan(s) in Appendix A.

6.29.3.1 Fire protection shall be provided for installations with an aggregate water capacity of 10,000 gallons or more and for ASME containers on roofs.

6.29.3.2 The modes of fire protection shall be specified in a written fire safety analysis for new installations, for existing installations that have an aggregate water capacity of 10,000 gallons or more, and for ASME containers on roofs. Installations shall comply with this requirement by September 1, 2022.

This completed manual meets the written fire safety analysis requirement.

6.29.3.3 The fire safety analysis shall be submitted by the owner, operator, or their designee to the authority having jurisdiction, upon request, and local emergency responders.

Be prepared to provide a copy of the installation's FSA during the RRC final construction approval inspection.

6.29.3.4 The fire safety analysis shall be updated when the storage capacity or transfer system is modified.

Be prepared to provide a copy of the updated installation's FSA during the RRC final construction approval inspection.

6.29.3.5 The fire safety analysis shall be an evaluation of the total product control system, such as the emergency shutoff and internal valves equipped for remote closure and automatic shutoff using thermal (fire) actuation, pullaway protection where installed, and the optional requirements of Section 6.30.

See Appendix B for valves defined in NFPA 58.

See Appendix C for product control requirements list, including 6.30 requirements.

See Appendix D for appurtenances and equipment specific requirements

See Appendix E for sign and lettering specific requirements

6.29.4.1 Roadways or other means of access for emergency equipment, such as fire department apparatus, shall be provided.

List means of access for emergency equipment in Appendix A.

6.29.4.2 Each industrial plant, bulk plant, and distributing point shall be provided with at least one portable fire extinguisher in accordance with Section 4.7 having a minimum capacity of 18 lb (8.2 kg) of dry chemical.

List the location of all fire extinguishers in Appendix A.

6.29.4.4 Emergency controls shall be conspicuously marked, and the controls shall be located so as to be readily accessible in emergencies.

In addition to markings on or near the controls, list the location of all emergency controls in Appendix A.

Appendix A – Response Incident Planning

The planning for the response to incidents including the inadvertent release of LP-Gas, fire, or security breach shall be coordinated with local emergency response agencies.

List each emergency response agency that will potentially respond to the location this written FSA has been developed for:

Agency	Contact Person	Contact Number
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

If additional agencies may respond list separately

Means of access for emergency equipment:

Location of all fire extinguishers at this location:

Location of all emergency controls at this location:

Summary of emergency response plan which includes consideration of the safety of emergency personnel, workers, and the public.

Appendix B

Valves Defined per NFPA 58, 2017 Edition, §3.3.85

- 3.3.85.1 Actuated Liquid Withdrawal Excess-Flow Valve. A container valve that is opened and closed by an adapter, incorporates an internal excess-flow valve, and is used to withdraw liquid from the container.
- 3.3.85.2 Emergency Shutoff Valve. A shutoff valve incorporating thermal and manual means of closing that also provides for remote means of closing.
- 3.3.85.3 Excess-Flow Valve (or Excess-Flow Check Valve). A valve designed to close when the liquid or vapor passing through it exceeds a prescribed flow rate.
- 3.3.85.4 Filler Valve. A valve that is designed to allow liquid flow only into a container.
- 3.3.85.5 Internal Excess-Flow Valve. An excess-flow valve constructed and installed so that damage to valve parts exterior to the container does not prevent closing of the valve.
- 3.3.85.6 Internal Valve. A container primary shutoff valve that can be closed remotely, which incorporates an internal excess flow valve with the seat and seat disc located within the container so that they remain in place should external damage occur to the valve.
- 3.3.85.7 Positive Shutoff Valve. A shutoff valve that, in the closed position, does not allow the flow of product in either direction.
- 3.3.85.8 Pressure Relief Valve. A type of pressure relief device designed to both open and close to maintain internal fluid pressure.
- 3.3.85.8.1 External Pressure Relief Valve. A pressure relief valve where all the working parts are located entirely outside the container or piping.
 - 3.3.85.8.2 Flush-Type Full Internal Pressure Relief Valve. An internal pressure relief valve in which the wrenching section is also within the container connection, not including a small portion due to pipe thread tolerances on makeup.
 - 3.3.85.8.3 Full Internal Pressure Relief Valve. A pressure relief valve in which all working parts are recessed within a threaded connection of the valve, and the spring and guiding mechanism are not exposed to the atmosphere.
 - 3.3.85.8.4 Internal Spring-Type Pressure Relief Valve. A pressure relief valve that is similar to a full internal relief valve except the wrenching pads and seating section are above the container connection in which the adjusting spring and the stem are below the seat and are not exposed to the atmosphere.

Appendix C

Piping and Valve Protection for Stationary LP-Gas Installations With Individual or Aggregate Water Capacities of 4,001 Gallons or More

Rule Reference	Requirement	Installed in the facility?		
		Yes	No	N/A
LPG Rules §9.143(a)(2)	One of the following valves in all container openings 1 1/4 inches or greater: <ul style="list-style-type: none"> • pneumatically-actuated or electrically-actuated emergency shutoff valves (ESV); • pneumatically-actuated or electrically-actuated internal valves; • pneumatically-actuated or electrically-actuated API 607 ball valves; or • backflow check valve installed only where the flow is in one direction into the container. 			
LPG Rules §9.143(b)(1)	The pneumatic ESV and/or backflow check valves installed in the fixed piping of the transfer system upstream of the bulkhead and within four feet of the bulkhead with a stainless steel flexible wire-braided hose not more than 36 inches long installed between the ESV and the bulkhead.			
LPG Rules §9.143(b)(2)	The ESV installed in the piping so that any break resulting from a pull away will occur on the hose or swivel-type piping side of the connection while retaining intact the valves and piping on the storage side of the connection and will activate the ESV at the bulkhead and the internal valves, ESV, and API 607 ball valves at the container or containers.			
LPG Rules §9.143(b)(2)	Provisions for anchorage and breakaway provided on the cargo tank side for transfer from a railroad tank car directly into a cargo tank. Such anchorage shall not be required from the tank car side.			
LPG Rules §9.143(b)(3)	Pneumatically-actuated or electrically-actuated ESV, internal valves, and API 607 ball valves equipped for automatic shutoff using thermal (fire) actuation where the thermal element is located within five feet (1.5 meters) of the ESV, internal valves, and/or API 607 ball valves. Temperature sensitive elements shall not be painted nor shall they have any ornamental finishes applied after manufacture.			
LPG Rules §9.143(b)(5)	Pneumatically-actuated or electrically-actuated internal valves, ESV, and API 607 ball valves shall be interconnected and incorporated into at least one remote operating system.			
LPG Rules §9.143(c)	At least one clearly identified and easily accessible manually operated remote emergency shutoff device located between 25 and 100 feet from the ESV internal valves, and/or API 607 ball valves at the bulkhead and in the path of egress from the ESV internal valves, and/or API 607 ball valves.			
LPG Rules §9.143(e)(1)	Vertical bulkheads installed for both liquid and vapor return piping			
LPG Rules §9.143(e)(2)	No more than two transfer hoses attached to a pipe riser.			
LPG Rules §9.143(e)(3)	Both liquid and vapor transfer hoses plugged or capped when not in use.			
LPG Rules §9.143(e)(4)	Bulkheads located at least 10 feet from any aboveground container and a minimum of 10 feet horizontally from any portion of a container or valve exposed aboveground on any underground or mounded container.			
LPG Rules §9.143(e)(6)	Bulkheads anchored in reinforced concrete to prevent displacement of the bulkhead, piping, and fittings in the event of a pullaway.			
LPG Rules §9.143(e)(7)	Bulkheads constructed by welding using the following materials or materials with equal or greater strength. (See Figure §9.143(e)(7) for proper construction.)			
	Six-inch steel channel iron.			

Rule Reference	Requirement	Installed in the facility?		
		Yes	No	N/A
LPG Rules §9.143(e)(7), cont.	Legs shall be four-inch schedule 80 piping			
	The top crossmember of a vertical bulkhead shall be six-inch standard weight steel channel iron. The channel iron shall be installed so the channel portion is pointing downward to prevent accumulation of water or other debris. The height of the top crossmember above ground shall not result in torsional stress on the vertical supports of the bulkhead in the event of a pullaway.			
	The kick plate shall be at least 1/4 inch steel plate installed at least 10 inches from the top of the bulkhead crossmember. A kick plate is not required if the crossmember is constructed to prevent torsional stress from being placed on the piping to the pipe risers.			
	Pipe sleeves or couplings complying with (1) or (2) below			
	(1) Either a schedule 40 pipe sleeve or a 3,000-pound coupling shall be welded between the top crossmember and the kick plate; Pipe sleeves shall have a clearance of 1/4 inch or less for the piping to the pipe riser, and the piping shall terminate through the bulkhead with a schedule 80 pipe collar, a minimum 12-inch schedule 80 threaded (not welded) pipe riser (nipple), and an elbow or other fitting between the bulkhead and hose coupling; If a 3,000-pound coupling is used, no collar is required; however, the minimum 12-inch length of schedule 80 threaded pipe riser and an elbow or other fitting between the bulkhead and hose coupling are required; Elbows or other fittings shall comply with NFPA 58, §5.11.4 and shall direct the transfer hose from vertical to prevent binding or kinking of the hose;			
	(2) A pre-manufactured riser pipe break-away coupler shall be designed with an engineered break point located between two swing check valves. The riser pipe break-away coupler shall be designed so that the device used in the loading or unloading operations is able to stop the flow of product from both the source and the receiving tank within 20 seconds without human intervention in the event of a pullaway; and The riser pipe break-away shall be designed to direct the transfer hose from vertical to prevent binding or kinking of the hose.			
	LPG Rules §9.143(g)	Stainless steel flexible connectors 60 inches in length or less		
NFPA 58, 2017, §5.9.4.4	Appurtenances shall comply with the following: (1) Manual shutoff valves shall be designed to provide positive closure under service conditions.			
	(2) Excess-flow valves shall be designed to close automatically at the rated flows of vapor or liquid specified by the manufacturer.			
	(3) Excess-flow valves shall be designed with a bypass that shall not exceed a No. 60 drill size opening to allow equalization of pressure.			
	(4) Excess-flow valves of less than 1/2 in. NPT (13 mm) shall have a bypass that limits propane vapor flow to 10 scf/hr at 100 psig (690 kPag).			
	(5) Backflow check valves shall be of the spring-loaded or weight-loaded type with in-line or swing operation and shall close when the flow is either stopped or reversed.			
	(6) Internal valves (see 3.3.85.6, Internal Valve), either manually or remotely operated and designed to remain closed except during operating periods, shall be considered positive shutoff valves.			

Rule Reference	Requirement	Installed in the facility?		
		Yes	No	N/A
NFPA 58, 2017, §5.9.7.1	Other container openings shall be equipped with any of the following: (1) Positive shutoff valve in combination with either an excess-flow check valve or a backflow check valve			
	(2) Internal valve			
	(3) Backflow check valve			
	(4) Actuated liquid withdrawal excess-flow valve, normally closed and plugged, with provision to allow for external actuation			
	(5) Plug, blind flange, or plugged companion flange			
	(6) For reducing the size of a container opening, only one bushing with a minimum pressure rating in accordance with Table 5.11.4.1 shall be installed. <i>RRC additional requirement</i>			
NFPA 58, 2017, §5.9.8.1	All container openings except those used for pressure relief devices, liquid level gauging devices, pressure gauges, filler valves, combination backflow check and excess-flow vapor return valves, actuated liquid withdrawal excess-flow valves, and plugged openings shall be equipped with internal valves or with positive shutoff valves and either excess-flow or backflow check valves.			
	(A) Valves in ASME containers, where excess-flow or backflow check valves are installed between the LP-Gas in the container and the shutoff valves, shall be installed either inside the container or at a point immediately outside where the line enters or leaves the container.			
	(B) If excess-flow and backflow check valves are installed outside the container, installation shall be made so that any strain beyond the excess-flow or backflow check valves will not cause breakage between the container and the valve.			
	(C) All connections that are listed in the ASME Manufacturers' Data Report for the container shall be considered part of the container.			
NFPA 58, 2017, §5.9.8.1	(D) If an excess-flow valve is required for cylinders other than for mobile or engine fuel service, it shall be permitted to be located at the outlet of the cylinder shutoff valve.			
	(E) Shutoff valves shall be located as close to the container as practical.			
	(F) Shutoff valves shall be readily accessible for operation and maintenance under normal and emergency conditions.			
	(G) Shutoff valves either shall be located in a readily accessible position less than 6 ft (1.8 m) above ground level; shall have extension handles, stairs, ladders, or platforms for access; or shall be equipped for remote operation.			
	(H) The connection or line that leads to or from any individual opening shall have a flow capacity greater than the rated flow of the excess-flow valve protecting the opening.			
NFPA 58, 2017, §6.13.1	The requirements of 6.13.2 through 6.13.5 shall be required for internal valves in liquid and/or vapor service installed in containers over 4000-gal (15.2-m ³) water capacity by July 1, 2003. <i>As amended by Table 9.403</i>			

Rule Reference	Requirement	Installed in the facility?		
		Yes	No	N/A
NFPA 58, 2017, §6.13.2	Internal valves shall be installed in accordance with Commission rule §9.126(d) [5.9.4.2 and Table 5.9.4.2] on containers over 4000 gal (15.2 m3) water capacity. <i>As amended by Table 9.403</i>			
NFPA 58, 2017, §6.13.3.1	Automatic shutdown of internal valves in liquid and/or vapor service shall be provided using thermal (fire) actuation. <i>As amended by Table 9.403</i>			
NFPA 58, 2017, §6.13.3.2	The thermal sensing element of the internal valve shall be within 5 ft (1.5 m) of the internal valve.			
NFPA 58, 2017, §6.13.4.1	At least one remote shutdown station for internal valves in liquid and/or vapor service shall be installed in accordance with the following: (1) Not less than 25 ft (7.6 m) or more than 100 ft (30 m) from the liquid transfer point (2) Not less than 25 ft (7.6 m) from the internal valves that are being controlled (3) Along a path of egress from the liquid transfer point <i>As amended by Table 9.403</i>			
NFPA 58, 2017, §6.13.4.2	This requirement shall be retroactive to all internal valves required by the code.			
NFPA 58, 2017, §6.21.2.5	Liquid inlet piping is designed or equipped to prevent debris and foreign material from entering the system.			
NFPA 58, 2017, §6.21.2.6 (3)	Flow-through facility hose used to transfer LP-Gas from non-metered cargo tank vehicle into containers will stop within 20 seconds of a complete hose separation without human intervention.			
NFPA 58, 2017, §6.29.6.1	6.29.6.1 If water spray fixed systems and monitors are used, they shall comply with NFPA 15.			
NFPA 58, 2017, §6.29.6.	6.29.6.2 Where water spray fixed systems and monitors are used, they shall be automatically actuated by fire-responsive devices and shall also have a capability for manual actuation.			
NFPA 58, 2017, §6.29.6.	6.29.6.3 Where monitor nozzles are used, they shall be located and arranged so that all container surfaces that can be exposed to fire are wetted.			
NFPA 58, 2017, §6.30	Alternate Provisions for Installation of Underground and Mounded ASME Containers. <i>As amended by Table 9.403</i>			
NFPA 58, 2017, §6.30.1	Section 6.30 shall apply to alternate provisions for the location and installation of ASME containers that incorporate the use of redundant fail-safe product control measures and low-emission transfer concepts for the purpose of enhancing safety and to mitigate distance and special protection requirements.			
NFPA 58, 2017, §6.30.2.1	Where all the provisions of Section 6.30 are complied with, the minimum distances from important buildings and the line of adjoining property that can be built upon to underground and mounded ASME containers of 2001 gal through 30,000 gal (7.6 m3 through 114 m3) water capacity shall be reduced to 10 ft (3 m).			
NFPA 58, 2017, §6.30.2.2	Distances for all underground and mounded ASME containers shall be measured from the container surface.			

Rule Reference	Requirement	Installed in the facility?		
		Yes	No	N/A
NFPA 58, 2017, §6.30.2.3	No part of an underground or mounded ASME container shall be less than 10 ft (3 m) from a building or line of adjoining property that can be built upon.			
NFPA 58, 2017, §6.30.3	The provisions in 6.30.3.1 through 6.30.3.5 shall be required for ASME containers of 2001 gal through 30,000 gal (7.6 m ³ through 114 m ³) water capacity referenced in Section 6.30.			
NFPA 58, 2017, §6.30.3.1	All liquid withdrawal openings and all vapor withdrawal openings that are 1 1/4 in. (32 mm) or larger shall be equipped with an internal valve.			
NFPA 58, 2017, §6.30.3.2	The internal valves shall remain closed except during periods of operation.			
NFPA 58, 2017, §6.30.3.3	Internal valves shall be equipped for remote closure and automatic shutoff through thermal (fire) actuation.			
NFPA 58, 2017, §6.30.3.4	A positive manual shutoff valve shall be installed as close as practical to each internal valve.			
NFPA 58, 2017, §6.30.3.5	All liquid and vapor inlet openings shall be equipped in accordance with 6.30.3.1 through 6.30.3.4 or shall be equipped with a backflow check valve that is designed for the intended application and a positive manual shutoff valve installed as close as practical to the backflow check valve.			
NFPA 58, 2017, §6.30.4.1	At cargo tank vehicle and railroad tank car transfer points, protection shall be provided in accordance with Section 6.14 using approved emergency shutoff valves or backflow check valves or a combination of the two.			
NFPA 58, 2017, §6.30.4.2	Automatic system shutdown of all primary valves (internal valves and emergency shutoff valves) shall be provided through thermal (fire) actuation and in the event of a hose pull-away.			
NFPA 58, 2017, §6.30.4.3	Remote shutdown capability, including power supply for the transfer equipment and all primary valves (internal and emergency shutoff), shall be provided.			
	(A) A remote shutdown station shall be installed within 15 ft (4.6 m) of the point of transfer.			
	(B) At least one additional remote shutdown station shall be installed not less than 25 ft (7.6 m), or more than 100 ft (30 m), from the transfer point.			
	(C) Emergency remote shutdown stations shall be identified as such by a sign incorporating the words "Propane" and "Emergency Shutoff" in block letters not less than 2 in. (51 mm) in height on a background of contrasting color to the letters. The sign shall be visible from the point of transfer.			
NFPA 58, 2017, §6.30.5	Low Emission Transfer			
NFPA 58, 2017, §6.30.5.1	The transfer distance requirements of Table 6.7.2.1 and 6.27.4.3(1) shall be reduced by one-half where the installation is in accordance with 6.30.5.			
NFPA 58, 2017, §6.30.5.2	The transfer site shall be identified as "Low Emission Transfer Site" by having a sign or other marking posted in the area.			
NFPA 58, 2017, §6.30.5.3	Transfer into permanently mounted ASME engine fuel containers on vehicles shall meet the provisions of 6.30.5.3(A) through 6.30.5.3(D).			
	(A) The delivery valve and nozzle combination shall mate with the filler valve in the receiving container in such a manner that, when they are uncoupled following a transfer of product, not more than 0.24 in. ³ (4 cm ³) of product (liquid equivalent) is released to the atmosphere.			

Rule Reference	Requirement	Installed in the facility?		
		Yes	No	N/A
	(B) Fixed maximum liquid level gauges that are installed on engine fuel and mobile containers in accordance with Table 5.9.4.1(B) shall not be used to determine the maximum permitted filling limit at a low emission transfer site.			
	(C) The maximum permitted filling limit shall be in accordance with Section 11.5 and shall be determined by an overfilling prevention device or other approved means.			
	(D) A label shall be placed near the fixed maximum liquid level gauge providing the following instructions: "Do not use this fixed maximum liquid level gauge at low emission transfer stations."			
NFPA 58, 2017, §6.30.5.4	Transfer into a stationary ASME container shall meet the provisions of 6.30.5.4(A) through 6.30.5.4(F).			
	(A) Where transfer is made through a hose of nominal 1 in. (25 mm) size or smaller, the delivery valve and nozzle combination shall not contain an interstitial volume greater than 0.24 in.3 (4 cm3).			
	(B) Where transfer is made through hose larger than 1 in. (25 mm) nominal size, no more than 0.91 in.3 (15 cm3) of LP-Gas (liquid equivalent) shall be released to the atmosphere during the transfer operation, including the uncoupling of the transfer hose.			
	(C) Fixed maximum liquid level gauges on low emission transfer systems shall be installed and used to verify the (function) accuracy of liquid level gauges or other liquid level gauging devices.			
	(D) Fixed maximum liquid level gauges shall not be used in the routine filling of low emission transfer systems.			
	(E) The use of a float gauge or other approved nonventing device for containers of 2001 gal (7.6 m3) or larger water capacity shall be the only means for determining the maximum filling limit.			
	(F) The maximum filling limit for containers of less than 2001 gal (7.6 m3) water capacity in low emission transfer systems shall be controlled through the use of an overfilling prevention device or other device approved for this service.			

Appendix D

Appurtenances and Equipment

In lieu of the requirements of NFPA 58, 2017 edition, §5.9.4.2, and Table 5.9.4.2 the following requirements must be met:

Rule Reference	Requirement	Installed in the facility?		
		Yes	No	N/A
LPG Rules §9.126(d)	ASME containers with an individual water capacity over 4,000 gallons shall comply with (1) or (2) below:			
	1. For container openings 1 1/4-inch or greater in size, the container shall be equipped with: <ul style="list-style-type: none"> • a pneumatically-actuated or electrically-actuated internal valve equipped for remote closure and automatic shutoff using thermal (fire) actuation where the thermal element is located within five feet (1.5 meters) of the internal valve; • a double back flow check filler valve: or • a positive shutoff valve in combination with a back flow check valve: Exceptions: <ol style="list-style-type: none"> I. Any vapor or liquid withdrawal opening 1 1/4-inch or larger with piping attached that exclusively provides service to stationary appliances or equipment and which is not part of a transfer system may be equipped with an excess flow valve and a shutoff valve installed as close as practical to the container in lieu of an internal valve or emergency shutoff valve; II. Container openings that are not compatible with internal valves shall be permitted to utilize both an excess-flow valve installed in the container and an emergency shutoff valve or an API 607 ball valve, which shall be pneumatically actuated and shall fail in the closed position. 			
	2. For container openings less than 1 1/4-inch in size, the container shall be equipped with: <ul style="list-style-type: none"> • a positive shutoff valve that is located as close to the container as practical in combination with either an excess-flow valve or a back flow check valve installed in the container; • a pneumatically-actuated or electrically-actuated internal valve with an integral excess-flow valve or excess-flow protection; or • a double back flow check filler valve. 			

Appendix E

Sign and Lettering

Rule Reference	Requirement	Installed at the facility?		
		Yes	No	N/A
LPG Rules §9.140(f)	Red letters at least 2" high (or at least 1 1/4" high for storage racks for DOT portable or forklift cylinders) on white or aluminum background: NO SMOKING			
	Red letters at least 4" high on white or aluminum background: WARNING FLAMMABLE GAS			
	Black letters at least 4" high: NO TRESPASSING AUTHORIZED PERSONNEL ONLY			
	Block letters at least 2" high on a background of contrasting color to the letters, including instructions on activation and visible from the point of transfer: PROPANE (or LP-GAS) EMERGENCY SHUTOFF			
	Letters at least 4" high on container or 1 1/4" high on cylinder exchange or storage rack indicating contents: LP-GAS or BUTANE or PROPANE and FLAMMABLE			
	Letters at least 4" high on a background of contrasting color to the letters, marked on both sides or both ends of any container holding unodorized gas: NOT ODORIZED			
	Letters at least 4" high: Name of Licensee (not required for non- licensee installations)			
	Letters at least 2" high on operating end of container: W.P. ____, WORKING PRESSURE ____, or WORK PRESS. ____			
	If more than one container, letters at least 2" high on operating end of each container: CONTAINER NO. ____ or TANK NO. ____			
	Letters at least 2" high on a background of contrasting color, readily visible to the public, stating: 24-Hour Emergency Number ____ (not required at non-licensee installations)			
Lettering at least 3/4" high with the telephone number of the certified employee responsible for the outlet, and/or the operations supervisor, on a background of contrasting color, readily visible to the public (not required at non- licensee installations)				
NFPA 58, 2017, §6.29.4.4	Emergency controls shall be conspicuously marked, and the controls shall be located so as to be readily accessible in emergencies.			