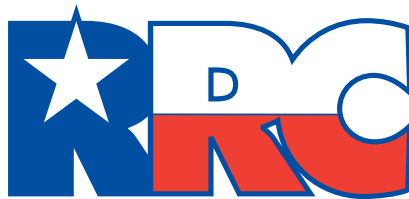


# **TEXAS LP-GAS EXAMINATION STUDY GUIDE**

Category C Carrier  
Management Level



**RAILROAD COMMISSION OF TEXAS**

September 2012

## **NOTICE**

This publication is intended for use in its entirety as a guide for persons preparing to take a Railroad Commission LP-gas qualifying examination. Any other use or distribution of this publication or use or distribution of any portion of this publication for any purpose whatsoever is considered by the Railroad Commission of Texas to be misuse of this publication.

This publication is not intended to be an exhaustive treatment of the subjects covered and should not be interpreted as precluding the use of other safety programs or procedures that comply with (1) applicable federal, state, and/or local code provisions, statutes, ordinances, and/or other regulations, including, but not limited to, the Railroad Commission of Texas' LP-Gas Safety Rules and codes adopted by the Railroad Commission of Texas, and/or (2) other industry standards and/or practices.

Every effort was made to ensure that this publication was accurate and up-to-date as of the date of publication. The reader is cautioned, however, about reliance on this publication or any portion thereof at any time thereafter, particularly because changes in technology are likely to occur that might make portions of this publication inaccurate and out-of-date. The Railroad Commission of Texas assumes no liability, under any circumstances, for any actions taken or omissions made in reliance of the contents of this publication, from whatever source, or any other consequences of any such reliance.

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## Exam administration

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### Taking an examination in Austin

You may take any Railroad Commission qualifying examination in Austin without pre-registering (“walk-in”) on any business day, excluding holidays, from 8:00 a.m. to 12:00 noon at the Commission’s Alternative Fuels Training Center. The training center is located at 6506 Bolm Road, on the northwest corner of the intersection of Bolm Road and U.S. Highway 183.

Tuesdays and Thursdays are the preferred days for walk-in examinations.

(See map to Training Center on page 26.)

### Taking an examination outside of Austin

You may also take any Railroad Commission qualifying examination at more than two dozen other locations statewide. Exam dates, times and locations are listed three months in advance on the Commission’s web site. To view a complete schedule, go to [www.rrc.state.tx.us](http://www.rrc.state.tx.us). From the drop-down menu under “Education and Training,” choose “Training Classes & Qualifying Exams” and click on “Class/Exam Schedule.” The online schedule has links to maps showing each class and exam location.

You must register at least two business days in advance to take an examination outside of Austin. To register online, go to [www.rrc.state.tx.us](http://www.rrc.state.tx.us). From the drop-down menu under “Education and Training,” choose “Training Classes & Qualifying Exams” and click on “Register Now.” The web site allows you to register up to four people for an examination.

When you register online, you will receive a return e-mail confirming the registration and the dates and locations of the exams. Registering online also ensures that you will receive advance notification of any changes in the examination date, time or location.

### Payment for exams; LPG Form 16; ID required

The fee is \$40.00 for each employee-level exam and \$70.00 for each management-level exam. Fees are non-refundable by state law, and cash cannot be accepted.

You may pay the required examination fee at any exam location by check or money order payable to the Railroad Commission of Texas. LPG Form 16, “Application for Examination,” may also be completed at the examination site. Examinees must also present an official state-issued driver’s license or photo ID at the exam site.

You may also pay your examination fee by credit card in advance online. To pay by credit card, go to [www.rrc.state.tx.us](http://www.rrc.state.tx.us). From the drop-down menu under “Education and Training,” choose “Training Classes & Qualifying Exams” and click on “Pay Online.” Be sure to print out the confirmation page in Step 6. Make a copy of the confirmation page for your records and bring a copy with you to the examination site.

### Closed-book examinations

All Railroad Commission management-level qualifying examinations are closed book. This study guide may not be used during any management-level examination.

Examinees should prepare for the Category C Carrier management-level examination by studying the applicable sections of the Railroad Commission’s LP-Gas Safety Rules (16 *Texas Administrative Code*, Chapter 9); National Fire Protection Association 58, *Liquefied Petroleum Gas Code* (2008 edition); and the Railroad Commission’s *Texas Study Guide Supplement for LP-Gas Transport Drivers*.

**Examination time limit**

The Category C (Carrier) management-level qualifying examination must be completed within two hours after the examination is given to you, including any breaks you elect to take. The examination proctor is the official timekeeper. You must submit both the examination itself and your answer sheet to the proctor within the two-hour limit.

**Grades, reports and retakes**

The minimum passing grade is 75 percent on all Railroad Commission qualifying examinations.

Examinations administered at the Training Center in Austin are graded on-site, and examinees are immediately informed of the results. If you fail an examination that you took in Austin, you may retake that same examination only one additional time during a business day. Any subsequent examination must be taken on another business day, unless approved by the Commission.

Exams taken outside of Austin are graded as soon as possible, and the results of the examination are reported within 10 working days.

If you pass an examination, the Railroad Commission will issue you a blue certification card within 10 working days. You will be notified by letter if you fail an examination.

**Contacts**

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# LP-GAS EXAMINATION STUDY GUIDE MANAGEMENT-LEVEL CATEGORY C CARRIER

## Who should use this guide?

You should use this guide to prepare for the Railroad Commission's management-level qualifying examination to be a company representative or operations supervisor for an active Category C (Carrier) licensee. Activities covered by a management-level Category C (Carrier) certification are the transportation of LPG by transport, including the operation an LP-gas trailer or semi-trailer equipped with a container of more than 5,000 gallons water capacity; loading and unloading LP-gas; and connecting and disconnecting transfer hoses.

## What books do I need?

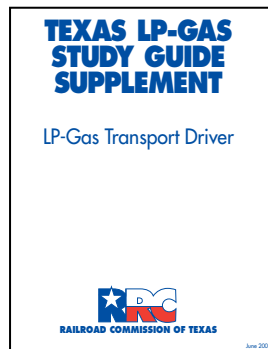
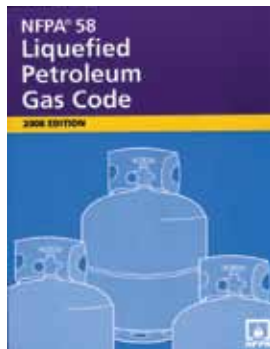
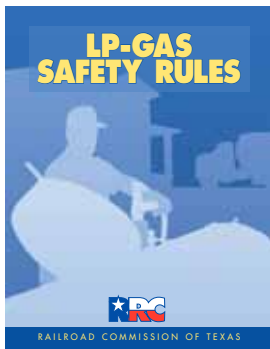
This examination tests your knowledge of the laws and standards that apply to transport operations in Texas. These laws and standards are found in three books:

*LP-Gas Safety Rules* (Texas Railroad Commission)

NFPA 58: *Liquefied Petroleum Gas Code* (National Fire Protection Association, 2008)

*Texas LP-Gas Study Guide Supplement: LP-Gas Transport Driver*

## Where do I get the books?



You may download the current edition of the Railroad Commission's *LP-Gas Safety Rules* free online at [www.propane.tx.gov](http://www.propane.tx.gov). Click on "Training and Examinations," select "Examinations and Certification" from the drop-down menu, and scroll down to "LPG Safety Rules (PDF)." You may also buy a printed copy of the book for \$10.00, tax included, by calling the Railroad Commission's publications office at (512) 463-7309.

Printed copies of NFPA 58 are available for purchase from the Texas Propane Gas Association by calling (800) 392-0023. You may also order NFPA manuals online at [www.nfpa.org](http://www.nfpa.org); click on "Codes and Standards."

Key parts of 49 CFR are available free online from the Railroad Commission in *Texas LP-Gas Study Guide Supplement: LP-Gas Transport Driver*. Go to [www.propane.tx.gov](http://www.propane.tx.gov), click on "Training and Examinations," select "Study Guides (LPG, CNG and LNG)," and scroll down to "CFR Supplement (PDF)." The full current text of 49 CFR can also be viewed online. Go to <http://ecfr.gpoaccess.gov> and select "Title 49—Transportation."

## Sections and topics

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Before you take this examination you should know the definitions on pages 7-9 of this study guide and the contents of the following sections of the codes and standards.

NOTE: Section (§) 9.402(c) of the LP-Gas Safety Rules states, “Container capacity, piping system, and appliance exceptions. The Commission does not adopt language in any NFPA rule, chart, figure, or table pertaining to any LP-gas container having a water capacity of one gallon (4.2 pounds LP-gas capacity) or less, or to any LP-gas piping system or appliance attached or connected to such a container.”

The actual examination may not cover all of the listed sections and topics.

### **Title 49, Code of Federal Regulations (CFR)**

49 CFR §171.8	Definitions and Abbreviations
49 CFR §172.203	Additional Description Requirements
49 CFR §172.504	General Placarding Requirements
49 CFR §173.315	Compressed Gases in Cargo Tanks and portable tanks
49 CFR §177.834	Loading and Unloading (general requirements)
49 CFR §177.840	Loading and Unloading (Class 2 (gases) materials)
49 CFR §178.337	Specification MC 331 (general requirements)
49 CFR §180.407	Requirements for test and inspection of cargo tanks
49 CFR §180.416	Discharge system inspection and maintenance for cargo tanks
49 CFR §392.8	Emergency equipment, inspection and use
49 CFR §396.7	Inspection, repair, and maintenance.
49 CFR §396.11	Driver Vehicle Inspection Report
49 CFR §396.13	Driver Inspection Report

### **Railroad Commission LP-Gas Safety Rules**

Unless otherwise stated, a transport is defined in §9.2(52) as “Any bobtail or semitrailer equipped with one or more containers.”

§9.6	Licenses and Fees
§9.7	Application for License and License Renewal Requirements
§9.8	Application for a New Certificate
§9.9	Requirements for Certificate Renewal
§9.10	Rules Examination
§9.11	Previously Certified Individuals
§9.12	Trainees
§9.17	Designation and Responsibilities of Company Representatives and Operations Supervisors
§9.18	Reciprocal Examination Agreements with Other States
§9.36	Report of LP-Gas Incident/ Accident
§9.113	Maintenance
§9.129	Manufacturer’s Nameplate and Markings on ASME Containers
§9.135	Unsafe or Unapproved Containers
§9.140	Uniform Protection Standards

§9.141	Uniform Safety Requirements
§9.143	Bulkhead, Internal Valve
§9.201	Applicability
§9.202	Registration and Transfer
§9.211	Markings
§9.212	Manifests
§9.403	Sections in NFPA 58 Not Adopted by Reference, and Adopted With Changes or Additional Requirements: §§5.7.4.1, 5.7.4.2, 6.1.1.4 and 6.6.3.1

**NFPA 58 (2008)**

§3.3	General Definitions
§4.2	LP-Gas Odorization
§5.9	Piping (Including Hose), Fittings, and Valves
§6.3	Container Separation Distances
§6.4	Other Container Location Requirements
§6.6	Installation of Containers
§6.25	Fire Protection
§7.2	Operational Safety
§9.2	Electrical Requirements
§9.4	Transportation in Cargo Tank Vehicles
§9.7	Parking and Garaging Vehicles Used To Carry LP-Gas Cargo

**Terms and definitions**

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**NOTE:** The list below is not exhaustive. You are responsible for knowing all the terms and definitions that apply to the LP-gas activities you will perform, as well as the rules and standards highlighted in this guide.

**NFPA 58 (2008)**

**NOTE:** Informal terms that are sometimes used in the propane industry instead of formal technical terms are given in brackets.

A **container** is any vessel, including cylinders, tanks, portable tanks, and cargo tanks, used for the transporting or storage of LP-gases.

**NFPA 58, §3.3.13**

**Container appurtenances** are devices installed in container openings for safety, control, or operating purposes.

**NFPA 58, §3.3.14**

**DOT** means the U.S. Department of Transportation.

**NFPA 58, §3.3.21**

A **fixed liquid level gauge** is a liquid level indicator that uses a positive shutoff vent valve to indicate that the liquid level in a container being filled has reached the point at which the indicator communicates with the liquid level in the container.

**NFPA 58, §3.3.29.1**

A **flexible connector** is a short [60 in. maximum length] component of a piping system that is made of flexible material (such as hose) and equipped with suitable connections on both ends.

**NFPA 58, §3.3.25**

A **fixed maximum liquid level gauge** [“outage gauge,” “spitter valve,” “spew gauge”] is a fixed gauge that indicates the liquid level at which the container is filled to its maximum permitted filling limit.

**NFPA 58, §3.3.29.2**

**Liquefied petroleum gas** [“LP-Gas, LPG”] is any material having a vapor pressure not exceeding that allowed for commercial propane that is composed predominantly of the following hydrocarbons, either by themselves or as mixtures: propane, propylene, butane (normal butane or isobutane), and butylenes.

**NFPA 58, §3.3.36**

The **point of transfer** is the location where connections and disconnections are made or where LP-gas is vented to the atmosphere during transfer operations.

**NFPA 58, §3.3.54**

**Water capacity is** the amount of water at 60°F required to fill a container.

**NFPA 58, §3.3.79**

## **TITLE 49, CODE OF FEDERAL REGULATIONS**

**Emergency discharge control** means the ability to stop a cargo tank unloading operation in the event of an unintentional release. Emergency discharge control can utilize passive or off-truck remote means to stop the unloading operation. A passive means of emergency discharge control automatically shuts off the flow of product without the need for human intervention within 20 seconds of an unintentional release caused by a complete separation of the liquid delivery hose. An off-truck remote means of emergency discharge control permits a qualified person attending the unloading operation to close the cargo tank’s internal self-closing stop valve and shut off all motive and auxiliary power equipment at a distance from the cargo tank motor vehicle.

**49 CFR §178.337-1(g)**

**Excess flow valve, integral excess flow valve, or excess flow feature** means a component that will close automatically if the flow rate of a gas or liquid through the component reaches or exceeds the rated flow of gas or liquid specified by the original valve manufacturer when piping mounted directly on the valve is sheared off before the first valve, pump, or fitting downstream from the valve.

**49 CFR §178.337-1(g)**

**Internal self-closing stop valve** means a primary shutoff valve installed in a product discharge outlet of a cargo tank and designed to be kept closed by self-stored energy.

**49 CFR §178.337-1(g)**

**Passive means of emergency discharge control** is an automatic means to shut off the flow of product without the need for human intervention within 20 seconds of an unintentional release caused by a complete separation of the liquid delivery hose.

**49 CFR 178.337-1(g)**

**Primary discharge control system** means a primary shut-off installed at a product discharge outlet of a cargo tank consisting of an internal self-closing stop valve that may include an integral excess flow valve or an excess flow feature,



together with linkages that must be installed between the valve and remote actuator to provide manual and thermal on-truck remote means of closure.

**49 CFR §178.337-1(g)**

**Transport vehicle** means a cargo-carrying vehicle such as an automobile, van, tractor, truck, semitrailer, tank car or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (trailer, rail car, etc.) is a separate transport vehicle.

**49 CFR §171.8**

## Key topics

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**NOTE:** The list below is not exhaustive. You are responsible for knowing all the facts, rules, standards and procedures that apply to the LP-gas activities you will perform, as well as the rules and standards highlighted in this guide.

As you study the applicable codes and standards, pay special attention to the facts, rules and procedures related to the following topics. Then when you take the examination, read each question very carefully.

# GENERAL REQUIREMENTS ADMINISTRATIVE

## LP-GAS SAFETY RULES

### Application for License and License Renewal Requirements

(a) No person, except a trainee as defined in the LP-Gas Safety Rules, may perform work, directly supervise LP-gas activities, or be employed in any capacity requiring contact until he or she has passed an applicable rules examination.

(e) LP-gas licenses expire one year after issuance at midnight on the last day of the month prior to the month in which they are issued.

(h) If a person's license expires, that person must immediately cease performance of any LP-gas activities authorized by the license. After verification, if the licensee has met all other requirements for licensing, the Commission must renew the license and the person may resume LP-gas activities.

***LP-Gas Safety Rules, §9.7***

### Application for a New Certificate

(a) An applicant for a new certificate must:

- (1) file a properly completed LPG Form 16 and the applicable nonrefundable rules examination fee;
- (2) pass the applicable rules examination with a score of at least 75%

(b) An individual who holds an employee-level certificate who wishes to obtain a management-level certificate must comply with the requirements of the LP-Gas Safety Rules.

***LP-Gas Safety Rules, §9.8***

### Requirements for Certificate Renewal

(c) Certificate holders must remit the nonrefundable \$35 annual certificate renewal fee to AFRED on or before May 31 of each year. Individuals who hold more than one certificate must pay only one annual renewal fee.

(1) Failure to pay the nonrefundable annual renewal fee by the deadline will result in a lapsed certification.

To renew a lapsed certification, the individual must pay the nonrefundable \$35 annual renewal fee plus a nonrefundable \$20 late-filing fee.

If a person's certification expires, that person must immediately cease performance of any LP-gas activities authorized by the certification.

If an individual's certificate has been expired for more than two years from May 31 of the year in which certification lapsed, that individual must comply with the requirements for a new certificate.

***LP-Gas Safety Rules, §9.9***

## **Rules Examination**

(d) Failure of any LP-gas qualifying examination immediately disqualifies the examinee from performing any LP-gas related activities covered by the failed examination, except activities that are covered by a separate examination the individual has passed.

***LP-Gas Safety Rules, §9.10***

## **§9.12 Trainees**

(a) A licensee or ultimate consumer may employ an individual as a trainee for a period not to exceed 45 calendar days without that individual having successfully completed the rules examination.

A trainee must be directly and individually supervised at all times by an individual who has successfully completed the Commission's rules examination for the areas of work being performed by the trainee.

***LP-Gas Safety Rules, §9.12***

## **Designation and Responsibilities of Company Representatives and Operations Supervisors**

(a) Each licensee must have at least one company representative for the license.

(2) A licensee may have more than one company representative.

(3) An individual may be operations supervisor at more than one outlet provided that:

(A) each outlet has a designated LP-gas certified employee responsible for the LP-gas activities at that outlet;

(B) the certified employee's and/or operations supervisor's telephone number is posted at the outlet on a sign with lettering at least 3/4-inch high, visible and legible at all times; and

(C) the certified employee and/or the operations supervisor monitors the telephone number and responds to calls during normal business hours.

(a)(5)(A) A licensee must cease all LP-gas activities if, at the termination of its company representative, there is no other qualified company representative of the licensee who has complied with the Commission's requirements.

***LP-Gas Safety Rules, §9.17***

## **Reciprocal Examination Agreements with Other States**

(a) The Railroad Commission may accept the examination requirements for LP-Gas transport drivers from other states provided that the qualifying state has entered into a reciprocal agreement with Texas.

(c) Individuals who apply for a reciprocal examination exemption must pay the applicable fees required by each state in exchange for exemption from examination requirements.

***LP-Gas Safety Rules, §9.18***

### **Report of LP-Gas Incident/Accident**

(a) At the earliest practical moment or within two hours following discovery, a licensee owning, operating, or servicing the equipment of an installation must notify the Railroad Commission by telephone of any accident involving a LP-Gas installation.

***LP-Gas Safety Rules, §9.36***

## **CARGO TANK MOTOR VEHICLES (CTMV)**

### **LP-GAS SAFETY RULES**

#### **Registration and Transfer of LP-Gas Transports or Container Delivery Units**

(a) Before an LP-gas transport or container delivery vehicle is used in LP-gas service, the vehicle must be registered with the Railroad Commission in the name under which the operator conducts business in Texas.

(a)(1) Before a bobtail truck, semitrailer, or container delivery unit that has not been previously registered in Texas is placed in service, the unit must have a properly completed LPG Form 7 filed and pay a \$270 registration fee.

(c)(2) A person must not introduce LP-gas into a transport container unless that unit bears a current Railroad Commission LPG Form 4 decal

(c)(5)(C) The Railroad Commission may not issue an LPG Form 4 decal for a transport if a Commission representative has not inspected the transport unit at least once within a four-year cycle

***LP-Gas Safety Rules, §9.202***

#### **Marking Requirements**

Each LP-gas transport and container delivery unit in LP-gas service must be marked with lettering at least two inches in height, in sharp contrast to the background, on each side and the rear with the name of the licensee or the ultimate consumer operating the unit.

***LP-Gas Safety Rules, §9.211***

## **NFPA 58**

### **Painting and Marking Cargo Tank Vehicles**

Vehicles transporting more 1000 lb., total weight of LP-Gas and LP-Gas cylinders must placarded including.

***NFPA 58, §9.3.3.7***

Painting of cargo tank vehicles must comply with 49 CFR.

***NFPA 58, §9.4.6.1***

Placarding and marking must comply with 49 CFR.

***NFPA 58, §9.4.6.2***

## **TITLE 49, CODE OF FEDERAL REGULATIONS**

### **Placarding and Painting Requirements**

(a) Each bulk packaging, freight container, unit load device, transport vehicle or rail car containing any quantity of a hazardous material must be placarded on each side and each end.

**49 CFR, §172.504**

(c)(1) Vehicles transporting more than 1,000 lbs. total weight of LP-gas must be placarded.

**49 CFR, §172.504**

1(d) Every uninsulated cargo tank permanently attached to a cargo tank motor vehicle must be painted a white, aluminum or similar reflecting color on the upper two-thirds of area of the cargo tank.

**49 CFR, §178.337**

## **NFPA 58**

### **Electrical Requirements**

Electrical wiring on cargo tank motor vehicles must be insulated and protected from physical damage.

**NFPA 58, §9.2**

### **Transportation in Cargo Tank Vehicles**

All LP-gas cargo tank vehicles used in interstate or intrastate commerce must comply with the applicable portion of the U.S. Department of Transportation Hazardous Materials Regulations of the DOT Federal Motor Carrier Safety Regulations (Title 49, *Code of Federal Regulations*).

**NFPA 58, §9.4.1.3**

### **Fire Extinguishers**

The minimum fire extinguisher requirement for each cargo tank motor vehicle is 18 pounds B:C rating.

**NFPA 58, §9.4.7**

### **Smoking Prohibition**

No person may smoke or carry lighted smoking materials:

- (1) on or within 25 feet of a vehicle containing LP-gas liquid or vapor,
- (2) at points of liquid transfer, or
- (3) when delivering or connecting to containers.

**NFPA 58, §9.4.10**

### **Parking Outdoors**

Vehicles must not be left unattended on any street, highway, avenue, or alley, except for necessary absences from the vehicle associated with drivers' normal duties, including stops for meals and rest stops during the day or night, except as follows:

- (1) This requirement does not apply in an emergency.
- (2) This requirement does not apply to vehicles parked in accordance with 9.7.2.3 and 9.7.2.4.

**NFPA 58, §9.7.2.1**

Vehicles must not be parked in congested areas.

**NFPA 58, §9.7.2.2**

Where vehicles are parked off the street in an uncongested area, they must be at least 50 feet from any building used for assembly, institutional, or multiple residential occupancy.

**NFPA 58, §9.7.2.3**

Cargo tank vehicles parked in any public garage or building must have LP-gas liquid removed from the following:

- (1) Cargo tank
- (2) Piping
- (3) Pump
- (4) Meter
- (5) Hoses
- (6) Related equipment

**NFPA 58, §9.7.3.1**

## **TITLE 49, CODE OF FEDERAL REGULATIONS**

### **Additional Description Requirements**

*(h) Transportation by highway.* Following the basic description for a hazardous material in a Specification MC 330 or MC 331 cargo tank, there must be entered for—

*(2) Liquefied petroleum gas*

(i) To indicate the suitability for shipping liquefied petroleum gas in a cargo tank made of quenched and tempered steel; the word “NONCORROSIVE” or “NONCOR” must be indicated on the shipping papers.

**49 CFR §172.203**

### **Compressed Gases in Cargo Tanks and Portable Tanks**

(n)(2) A cargo tank motor vehicle in other than metered delivery service must have a means to automatically shut off the flow of product without the need for human intervention within 20 seconds of an unintentional release caused by a complete separation of a liquid delivery hose (passive shut-down capability).

**49 CFR §173.315**

### **Unsafe Operations Forbidden**

*(a) General.* A motor vehicle must not be operated in such a condition as to likely cause an accident or a breakdown of the vehicle.

*(b) Exemption.* Any motor vehicle discovered to be in an unsafe condition while being operated on the highway may be continued in operation only to the nearest place where repairs can safely be effected. Such operation must be conducted only if it is less hazardous to the public than to permit the vehicle to remain on the highway.

**49 CFR §396.7**

**SAMPLE QUESTION**

Each cargo tank motor vehicle must be provided with at least one approved portable fire extinguisher having a minimum of \_\_\_\_\_ dry chemical with a B:C rating.

- A. 25 lb.
- B. 20 lb.
- C. 18 lb.
- D. 15 lb.

*Answer: C*

## **LOADING AND UNLOADING**

### **NFPA 58**

#### **Transfer Personnel**

At least one qualified person must remain in attendance at the transfer operation from the time connections are made until the transfer is completed, shutoff valves are closed, and lines are disconnected.

*NFPA 58, § 7.2.1.2*

Only qualified personnel trained in proper handling and operating procedures may transfer LP-gas to and from a container.

*NFPA 58, § 7.2.2.1*

#### **Arrangement and Operation of Transfer Systems**

Sources of ignition must be turned off during transfer operations and while connections or disconnections are being made or while LP-gas is being vented to the atmosphere.

(A) (1) Internal-combustion engines on an LP-gas cargo tank vehicle may be used to drive transfer pumps or compressors to load containers.

(B) Smoking, open flame, portable electrical tools, and extension lights capable of igniting LP-gas are not permitted within 25 feet of a point of transfer while filling operations are in progress.

*NFPA 58, § 7.2.3.2*

Cargo tank vehicles unloading into storage containers must be at least 10 feet from the container and so positioned that the shutoff valves on both the truck and the container are readily accessible.

*NFPA 58, § 7.2.3.3*

#### **Transportation in Cargo Tank Vehicles**

The transfer operation of an LP-gas cargo tank vehicle must be made by a transfer means at the delivery point or by pump or compressor mounted on the vehicle.

*NFPA 58, § 9.4.1.2*

Each cargo tank vehicle and trailer must carry chock blocks, which must be used to prevent rolling of the vehicle whenever it is being loaded, being unloaded or is parked.

**NFPA 58, §9.4.8**

## **TITLE 49, CODE OF FEDERAL REGULATIONS**

### **Loading and Unloading Requirements**

(i) *Attendance Requirements*

- (1) *Loading.* A cargo tank must be attended by a qualified person at all times when it is being loaded. The person who is responsible for loading the cargo tank is also responsible for ensuring that it is so attended.
- (2) *Unloading.* A motor carrier who transports hazardous materials by a cargo tank must ensure that the cargo tank is attended by a qualified person at all times during unloading.

**49 CFR §177.834**

(j) *Manhole and valves closed.* A person may not drive a cargo tank motor vehicle containing a hazardous material regardless of quantity unless:

- (1) All manhole closures are closed and secured; and
- (2) All valves and other closures in liquid discharge systems are closed and free of leaks.

**49 CFR §177.834**

### **Class 2 Materials [Gases]**

(g) *Each liquid discharge valve on a cargo tank motor vehicle,* other than an engine fuel line valve, must be closed during transportation except during loading and unloading.

(l) *Operating procedure.* Each operator of a cargo tank motor vehicle that is subject to the emergency discharge control requirements in §173.315(n) must carry on or within the cargo tank motor vehicle written emergency discharge control procedures for all delivery operations. The procedures must describe the cargo tank motor vehicle's emergency discharge control features and, for a passive shut-down capability, the parameters within which they are designed to function. The procedures must describe the process to be followed if a facility-provided hose is used for unloading when the cargo tank motor vehicle has a specially equipped delivery hose assembly.

(m) *Cargo tank motor vehicle safety check.* Before unloading from a cargo tank motor vehicle containing a liquefied compressed gas, the qualified person performing the function must check those components of the discharge system, including delivery hose assemblies and piping, that are readily observed during the normal course of unloading to assure that they are of sound quality, without obvious defects detectable through visual observation and audio awareness, and that connections are secure. This check must be made after the pressure in the discharge system has reached at least equilibrium with the pressure in the cargo tank. Operators need not use instruments or take extraordinary actions to check components not readily visible. No operator may unload liquefied compressed gases from a cargo tank motor vehicle with a delivery hose assembly found to have any condition identified in Sec. 180.416(g)(1) or with piping systems found to have any condition identified in §180.416(g)(2).

(n) *Emergency shutdown.* If there is an unintentional release of product to the environment during unloading of a liquefied compressed gas, the qualified person unloading the cargo tank motor vehicle must promptly shut the internal self-closing stop valve or other primary means of closure and shut down all motive and auxiliary power equipment.

**49 CFR §177.840**

(q) *Unloading liquefied petroleum gas from a cargo tank motor vehicle in other than metered delivery service:*

- (1) The qualified person attending the unloading operation must remain within 25 feet of the cargo tank when the internal self-closing stop valve is open.
- (2) The qualified person attending the unloading operation must have an unobstructed view of the cargo tank and delivery hose to the maximum extent practicable, except during short periods when it is necessary to activate controls or monitor the receiving container.

*Unloading using facility-provided hoses.* A cargo tank motor vehicle equipped with a specially designed delivery hose assembly may be unloaded using a delivery hose assembly provided by the receiving facility under the following conditions:

- (1) The qualified person monitoring unloading must visually examine the facility hose assembly for obvious defects prior to its use in the unloading operation.
- (2) The qualified person monitoring unloading must remain within arm's reach of the mechanical means of closure for the internal self-closing stop valve when the internal self-closing stop valve is open except for short periods when it is necessary to activate controls or monitor the receiving container.
- (3) If the facility hose is equipped with a passive means to shut off the flow of product, the qualified person may attend the unloading operation in accordance with the attendance requirements prescribed for the material being unloaded in §177.834.

**49 CFR §177.840**

**SAMPLE QUESTION**

Certificate holders must pay the nonrefundable \_\_\_\_\_ annual certificate renewal fee to the Commission on or before \_\_\_\_\_ of each year.

- A. \$70 / March 31
- B. \$35 / May 31
- C. \$70 / May 31
- D. \$35 / March 31

***Answer: B***



# **PIPING, HOSES, FITTINGS, VALVES, INSPECTIONS AND MAINTENANCE**

## **LP-GAS SAFETY RULES**

### **Maintenance of Vehicles**

All LP-gas vehicles and vehicle containers, valves, dispensers, accessories, piping, transfer equipment, gas container, gas utilization equipment, and appliances must be maintained in safe working order and in accordance with the manufacturer's instructions and the LP-Gas Safety Rules.

If any of the LP-gas vehicles and vehicle containers, valves, dispensers, accessories, piping, transfer equipment, gas containers, gas utilization equipment, or appliances is not in safe working order, the Safety Division may require that the vehicle be immediately removed from LP-gas service and not be operated until the necessary repairs have been made.

*LP-Gas Safety Rules, §9.204*

## **NFPA 58**

### **Piping (Including Hoses, Fittings and Valves)**

Hose, hose connections, and flexible connectors must be fabricated of materials that are resistant to the action of LP-gas, both liquid and vapor.

*NFPA 58, §§5.9.6.1 and 9.4.3.5*

An LP-gas hose, hose connection, or flexible connector used for conveying liquid or vapor in excess of 5 psig must have a minimum working pressure of 350 psig with a safety factor of 5 to 1, continuously marked with LP-Gas or Propane, 350 psi working pressure and the manufacturer's name or trademark.

*NFPA 58, §§5.9.6.4 and 9.4.3.5*

(2) The flexible hose portion of the connector must be replaced with an unused connector within 10 years of the indicated date of installation.

(2) A flexible connector on a cargo tank vehicle must be visually inspected before the first delivery of each day.

*NFPA 58, §9.4.3.7*

All threaded primary valves and fittings used in liquid filling or vapor equalization directly on the cargo tank of transportation equipment must be of steel, malleable iron, or ductile iron construction.

*NFPA 58, §9.4.3.8*

### **Protection of Cargo Tank Appurtenances, Piping System, and Equipment**

Container appurtenances, piping, and equipment comprising the complete LP-gas system on a cargo tank vehicle must be mounted in position, must be protected against damage, and must be in accordance with DOT regulations.

*NFPA 58, §9.4.5*

## **TITLE 49, CODE OF FEDERAL REGULATIONS**

### **Discharge system inspection and maintenance program for cargo tanks transporting liquefied compressed gases**

*(b) Hose identification.* The operator must assure that each delivery hose assembly is permanently marked with a unique identification number and maximum working pressure.

*(c) Post-delivery hose check.* After each unloading, the operator must visually check that portion of the delivery hose assembly deployed during the unloading.

*(d) Monthly Inspection and Testing.*

(1) The operator must visually inspect each delivery hose assembly at least once each calendar month the delivery hose assembly is in service.

(2) The operator must visually inspect the piping system at least once each calendar month the cargo tank is in service. The inspection must include fusible elements and all components of the piping system, including bolts, connections, and seals.

(3) At least once each calendar month a cargo tank is in service, the operator must actuate all emergency discharge control devices designed to close the internal self-closing stop valve to assure that all linkages operate as designed.

(4) The operator of a cargo tank must check the internal self-closing stop valve in the liquid discharge opening for leakage through the valve at least once each calendar month the cargo tank is in service.

(5) The operator must note each inspection in a record. That record must include the inspection date, the name of the person performing the inspection, the hose assembly identification number, the company name, the date the hose was assembled and tested, and an indication that the delivery hose assembly and piping system passed or failed the tests and inspections. A copy of each test and inspection record must be retained by the operator at its principal place of business or where the vehicle is housed or maintained until the next test of the same type is successfully completed.

*(e) Annual hose leakage test.* The owner of a delivery hose assembly that is not permanently attached to a cargo tank motor vehicle must ensure that the hose assembly is annually tested.

*(g) Rejection Criteria* (1) No operator may use a delivery hose assembly determined to have any condition identified below for unloading liquefied compressed gases. An operator may remove and replace damaged sections or correct defects discovered. Repaired hose assemblies may be placed back in service if retested successfully

(i) Damage to the hose cover that exposes the reinforcement.

(ii) Wire braid reinforcement that has been kinked or flattened so as to permanently deform the wire braid.

(iii) Soft spots when not under pressure, bulging under pressure, or loose outer covering.

(iv) Damaged, slipping, or excessively worn hose couplings.

(v) Loose or missing bolts or fastenings on bolted hose coupling assemblies.

(2) No operator may use a cargo tank with a piping system found to have any condition identified in this paragraph (g)(2) for unloading liquefied compressed gases.

(i) Any external leak identifiable without the use of instruments.

(ii) Bolts that are loose, missing, or severely corroded.

- (iii) Manual stop valves that will not actuate.
- (iv) Rubber hose flexible connectors with any condition outlined in paragraph (g)(1).
- (v) Stainless steel flexible connectors with damaged reinforcement braid.
- (vi) Internal self-closing stop valves that fail to close or that permit leakage through the valve detectable without the use of instruments.
- (vii) Pipes or joints that are severely corroded.

**49 CFR §180.416**

### SAMPLE QUESTION

Trainees must be directly and individually supervised at least 50 percent of their working hours by an individual who is certified by the Railroad Commission to perform the LP-gas activities being performed by the trainee.

- A. True
- B. False
- C. \$70 / May 31
- D. \$35 / March 31

**Answer: B**

## **BULK PLANT, STATIONARY STORAGE, INSPECTION AND SAFETY REQUIREMENTS**

### **LP-GAS SAFETY RULES**

#### **Maintenance**

All LP-gas storage containers, valves, dispensers, accessories, piping, and transfer equipment must be maintained in safe working order and in accordance with the manufacturer's instructions and the LP Gas Safety Rules. The Safety Division may require the installation to be immediately removed from LP-gas service and not operated until the necessary repairs have been made if any one of the LP-gas storage containers, valves, dispensers, accessories, piping, and transfer equipment is not in safe working order.

***LP-Gas Safety Rules, §9.113***

#### **Manufacturer's Nameplate and Marking on ASME containers**

(a) LP-gas must not be introduced into an ASME container unless the container is equipped with an original nameplate or at least one of the following nameplates: Commission identification nameplate, duplicate, modification (or alteration), or replacement, permanently attached to the container.

(b) Nameplates on containers built prior to September 1, 1984, must include at least:

- (1) the name of container manufacturer,
- (2) the manufacturer's serial number,
- (3) the container's working pressure and
- (4) the container's water capacity.

(e) Nameplates on containers built on or after September 1, 1984, must be stainless steel and permanently attached to the container by continuous fusion welding around the perimeter of the nameplate.

***LP-Gas Safety Rules, §9.129***

### **Unsafe or Unapproved Containers, Cylinders, or Piping**

A licensee or a licensee's employee may not legally introduce LP-gas into any container or cylinder if he or she knows or has reason to believe that the container, piping, or the system or the appliance is unsafe or was not installed in accordance with Texas statutes or LP-Gas Safety Rules.

***LP-Gas Safety Rules, §9.135***

### **Uniform Protection Standards**

(a) LP-gas transfer systems and storage containers must be protected from tampering and/or vehicular traffic by fencing, guard railing or a combination of guard railing and fencing.

(b)(6) Fencing located more than 25 feet from any point of an LP-gas transfer system or container must be designated as perimeter fencing. If an LP-gas transfer system or container is located inside perimeter fencing and is subject to vehicular traffic, it must be protected against damage according to the guardrail requirements.

(g) Table 1, No.8 When unodorized LP-gas is stored in a container, the container must be marked NOT ODORIZED in four-inch high letters on both ends or both sides.

***LP-Gas Safety Rules, §9.140***

### **Uniform Safety Requirements**

(a) (1) ASME containers, except vaporizers, must be painted white or aluminum, or any other heat-reflective color (such as light green or light blue). Darker, heat-absorbing colors (such as black or navy blue) are not permitted.

***LP-Gas Safety Rules, §9.141***

### **Bulkhead Requirements**

(d) Bulkheads, whether horizontal or vertical, must comply with the following requirements:

- (1) Bulkheads must be installed for both liquid and vapor return piping.
- (2) No more than two transfer hoses must be attached to a pipe riser. If two hoses are simultaneously connected to one or two transports, the use of the two hoses must not prevent the activation of the ESV in the event of a pullaway.
- (3) Both liquid and vapor transfer hoses must be plugged or capped.
- (4) Bulkheads must be located at least 10 feet from any aboveground container or containers and a minimum of 10 feet horizontally from any portion of a container or valve exposed aboveground on any underground or mounded container.
- (5) Horizontal bulkheads must not be converted to vertical bulkheads. §9.143(d)(1)-(5)

Stationary LP-gas installations with individual or aggregate water capacities of 4,001 gallons or more are exempt from bulkhead and ESV requirements, if:

- (i) Stationary LP-gas installations with individual or aggregate water capacities of 4,001 gallons or more are exempt from subsections (a) and (b) of this section provided:
- (1) Each container is filled solely through a 1 3/4 inch double back check filler valve installed directly into the container; and
  - (2) At least one clearly identified and easily accessible manually operated remote emergency shutoff device must be located between 25 and 100 feet from the point of transfer in the path of egress to close the primary discharge valves in the containers; and
  - (3) The LP-gas installation is not used to fill an LP-gas transport.

***LP-Gas Safety Rules, §9.143***

## **Manifest Requirements**

- (a) All manifests or bills of lading must indicate:
- The amount and type of odorant per gross gallons,
  - The vapor pressure of the product at 100 degrees Fahrenheit,
  - The net gallons,
  - The loading temperature,
  - The specific gravity at 60 degrees Fahrenheit,
  - The type of product, and
  - The United Nations number with verification by the loading entity and loader.

A copy of the manifest or bill of lading must be given to the entity receiving the shipment.

***LP-Gas Safety Rules, §9.212***

## **Container Valves and Other Appurtenances**

ASME containers over 4,000 gallons water capacity with a container opening 1 ¼ inch or greater can be equipped with a pneumatically operated internal valve equipped for remote closure and automatic shutoff using thermal (fire) actuation where the thermal element is located within 5 feet of the internal valve.

***LP-Gas Safety Rules, §9.403; NFPA 58, §5.7.4.2***

## **Installation of Horizontal Aboveground ASME Containers**

Horizontal ASME containers designed for permanent installation in stationary service above ground must be placed on masonry or other noncombustible structural supports installed on concrete or masonry foundations. Containers must not be in contact with the soil.

***LP-Gas Safety Rules, §9.403; NFPA 58, §6.6.3.1***

## **Remote Shutdown Station**

At least one remote shutdown station for internal valves in liquid and/or vapor service must be installed not less than 25 ft. or more than 100 ft. from the liquid transfer point.

***LP-Gas Safety Rules, §9.403; NFPA 58, §6.11.4***

## **NFPA 58**

### **LP-Gas Odorization**

Prior to delivery to a bulk plant, LP-gases must be odorized so that they are detectable, by a distinct odor, to a concentration in air of not over one-fifth of the lower limit of flammability.

***NFPA 58, §4.2.1***

### **Container Separation Distances**

An aboveground LP-gas container with an individual water capacity of 2,001–30,000 gallons must be separated from important buildings and lines of adjoining property that can be built upon by a minimum distance of 50 feet.

***NFPA 58, §6.3.1***

### **Other Container Location Requirements**

Loose or piled combustible material and weeds and long dry grass must be separated from containers by a minimum of 10 feet.

***NFPA 58, §6.4.5.2***

LP-gas containers must be located at least 10 feet from the centerline of the wall of diked areas containing flammable or combustible liquids.

***NFPA 58, §6.4.5.4***

The minimum horizontal separation between aboveground LP-gas containers and aboveground tanks containing liquids having flash points below 200°F is 20 feet.

***NFPA 58, §6.4.5.5***

An aboveground container and any of its parts must not be located within 6 feet of a vertical plane beneath overhead electric power lines that are over 600 volts, nominal.

***NFPA 58, §6.4.5.12***

### **Fire Protection and Other Protection Requirements**

LP-gas fires must not be extinguished until the source of the burning gas has been shut off.

***NFPA 58, §6.25.4.3***

#### **SAMPLE QUESTION**

Which of the following is not required information on the ASME nameplate of a stationary storage container constructed prior to September 1, 1984?

- A. The name of the manufacturer
- B. The ASME code symbol
- C. The manufacturer's serial number
- D. The container's water capacity

***Answer: B***

# PIPING SYSTEM, INSPECTION AND TESTING

## NFPA 58

### Installation of Metallic Pipe, Tubing and fittings

Aboveground piping must be supported and protected against physical damage by vehicles.

**NFPA 58, §6.9.3.10**

The portion of aboveground piping in contact with a support or a corrosion-causing substance must be protected against corrosion.

**NFPA 58, §6.9.3.11**

## TITLE 49, CODE OF FEDERAL REGULATIONS

### Periodic Test and Inspection of Specification Cargo Tanks

(c) *Periodic test and inspection.* Each specification cargo tank must be tested and inspected by an inspector meeting the qualifications. The retest date must be determined from the specified interval identified from the most recent inspection or the CTMV certification date.

Test or Inspection Interval Period:

- External Visual Inspection: 1 year
- Internal Visual Inspection: 5 years
- Leakage Test: 1 year
- Pressure Test 5 years

### External Visual Inspection and Testing

(d)(2) The external visual inspection and testing must include as a minimum the following:

(i) The tank shell and heads must be inspected for corroded or abraded areas, dents, distortions, defects in welds and any other conditions, including leakage, that might render the tank unsafe for transportation service;

(ii) The piping, valves, and gaskets must be carefully inspected for corroded areas, defects in welds, and other conditions, including leakage, that might render the tank unsafe for transportation service;

(iii) All devices for tightening manhole covers must be operative and there must be no evidence of leakage at manhole covers or gaskets;

(iv) All emergency devices and valves including self-closing stop valves, excess flow valves and remote closure devices must be free from corrosion, distortion, erosion and any external damage that will prevent safe operation. Remote closure devices and self-closing stop valves must be functioned to demonstrate proper operation;

(v) Missing bolts, nuts and fusible links or elements must be replaced, and loose bolts and nuts must be tightened;

(vi) All markings on the cargo tank must be legible;

(vii) [Reserved]

(viii) All major appurtenances and structural attachments on the cargo tank including, but not limited to, suspension system attachments, connecting structures, and those elements of the upper coupler (fifth wheel) assembly that can be inspected without dismantling the upper coupler (fifth wheel) assembly must be inspected for any corrosion or damage which might prevent safe operation.

**49 CFR §180.407**

## Pressure Test Procedures

(g) As part of the pressure test, the inspector must perform an external and internal visual inspection, except that on a cargo tank not equipped with a manhole or inspection opening, an internal inspection is not required.

**49 CFR §180.407**

## Emergency Equipment Inspection and Use

No commercial motor vehicle may be driven unless the driver is satisfied that the emergency equipment is in place and ready for use; nor must any driver fails to use or make use of such equipment when and as needed.

**49 CFR §392.8**

## Driver Vehicle Inspection Report (DVIR)

(a) *Report required.* Every motor carrier must require its drivers to report, and every driver must prepare a report in writing at the completion of each day's work on each vehicle operated and the report must cover at least the following parts and accessories:

Service brakes, including trailer brake connections; parking (hand) brake; steering mechanism; lighting devices and reflectors; tires; horn; windshield wipers; rear vision mirrors; coupling devices; wheels and rims; and emergency equipment.

(b) *Report content.* The report must identify the vehicle and list any defect or deficiency discovered by or reported to the driver which would affect the safety of operation of the vehicle or result in its mechanical breakdown. If no defect or deficiency is discovered by or reported to the driver, the report must so indicate. In all instances, the driver must sign the report. On two-driver operations, only one driver needs to sign the driver vehicle inspection report, provided both drivers agree as to the defects or deficiencies identified. If a driver operates more than one vehicle during the day, a report must be prepared for each vehicle operated.

(c) *Corrective action.* Prior to requiring or permitting a driver to operate a vehicle, every motor carrier or its agent must repair any defect or deficiency listed on the driver vehicle inspection report which would be likely to affect the safety of operation of the vehicle.

(1) Every motor carrier or its agent must certify on the original driver vehicle inspection report which lists any defect or deficiency that the defect or deficiency has been repaired or that repair is unnecessary before the vehicle is operated again.

(2) Every motor carrier must maintain the original driver vehicle inspection report, the certification of repairs, and the certification of the driver's review for three months from the date the written report was prepared.

**49 CFR §396.11**



## Driver Inspection

Before driving a commercial motor vehicle, the driver must:

- (a) Be satisfied that the motor vehicle is in safe operating condition;
- (b) Review the last driver vehicle inspection report; and
- (c) Sign the report, only if defects or deficiencies were noted by the driver who prepared the report, to acknowledge that the driver has reviewed it and that there is a certification that the required repairs have been performed.

The signature requirement does not apply to listed defects on a towed unit which is no longer part of the vehicle combination.

**49 CFR §396.13**

### SAMPLE QUESTION

If the metallic piping between a propane container and a building is exposed aboveground, is it acceptable for a transport driver to fill the container?

- A. Yes, if the piping is supported
- B. Yes, if the piping is protected against physical damage
- C. Yes, if the portion of aboveground piping in contact with a support or corrosion causing substance is protected against corrosion
- D. No; all piping between a propane container and a building must be buried

***Answer: D***

# RRC ALTERNATIVE FUELS TRAINING CENTER 4044 PROMONTORY POINT DR., AUSTIN

