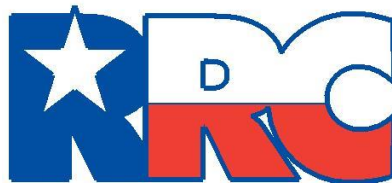


CODE OF FEDERAL REGULATIONS TITLE 49

REFERENCE MATERIAL



RAILROAD COMMISSION OF TEXAS

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LP-GAS EXAMINATION CFR 49 REFERENCE MATERIAL EMPLOYEE-LEVEL

Who should use this guide?

You should use this document as a quick reference for the standards listed in Title 49, Code of Federal Regulations. Railroad Commission’s employee-level examinations are open book.

What book do I need?



These laws and standards are found in:
Title 49, Code of Federal Regulations (CFR)

Where do I get this book?

The full current text of 49 CFR can also be viewed online. Go to <http://ecfr.gov> and select “Title 49—Transportation.”

Sections and Topics

Before you take this examination, you should know the definitions found in this reference guide and the contents of the sections of the codes and standards listed below. The actual examination questions may not cover all of the listed sections and topics.

Terms and Definitions

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.

Title 49, Code of Federal Regulations

Cargo tank means a bulk packaging that:

- (1) Is a tank intended primarily for the carriage of liquids or gases and includes appurtenances, reinforcements, fittings, and closures (for the definition of a tank
- (2) Is permanently attached to or forms a part of a motor vehicle, or is not permanently attached to a motor vehicle but which, by reason of its size, construction or attachment to a motor vehicle is loaded or unloaded without being removed from the motor vehicle; and
- (3) Is not fabricated under a specification for cylinders, intermediate bulk containers, multi-unit tank car tanks, portable tanks, or tank cars.

49 CFR §171.8

Cargo tank motor vehicle means a motor vehicle with one or more cargo tanks permanently attached to or forming an integral part of the motor vehicle.

49 CFR §171.8

Emergency Discharge Control: means the ability to stop a cargo tank unloading operation in the event of an unintentional release.

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)

Hazardous material means a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law

49 CFR §171.8

Internal self-closing stop valve means. a primary shut off 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)

Marking means a descriptive name, identification number, instructions, cautions, weight, specification, or UN marks, or combinations thereof, required by this subchapter on outer packagings of hazardous materials.

49 CFR §171.8

Metered delivery service means a cargo tank unloading operation conducted at a metered flow rate of 100 gallons per minute or less through an attached delivery hose with a nominal inside diameter of 1¼ inches or less.

49 CFR §171.8

Operator means a person who controls the use of an aircraft, vessel, or vehicle.

49 CFR §171.8

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)

Shipping paper means a shipping order, bill of lading, manifest or other shipping document serving a similar purpose.

49 CFR §171.8

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

Transportation or transport. means the movement of property and loading, unloading, or storage incidental to that movement.

49 CFR §171.8

Unintentional release means the escape of a hazardous material from a package on an occasion not anticipated or planned. This includes releases resulting from collision, package failures, human error, criminal activity, negligence, improper packing, or unusual conditions such as the operation of pressure relief devices as a result of over-pressurization, overfill or fire exposure. It does not include releases, such as venting of packages, where allowed, and the operational discharge of contents from packages.

49 CFR §171.8

Key Topics

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 key topics. When you take the examination, read each question very carefully.

Code of Federal Regulations

Driver Vehicle Inspection

A motor vehicle shall not be operated in such a condition as to likely cause an accident or a breakdown of the vehicle.

49-§396.7 (a)

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 shall be conducted only if it is less hazardous to the public than to permit the vehicle to remain on the highway.

49-§396.7 (b)

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

- (i) Service brakes including trailer brake connections;
- (ii) Parking brake;
- (iii) Steering mechanism;
- (iv) Lighting devices and reflectors;
- (v) Tires;
- (vi) Horn;
- (vii) Windshield wipers;
- (viii) Rear vision mirrors;
- (ix) Coupling devices;
- (x) Wheels and rims;
- (xi) Emergency equipment.

49-§396.11 (a)(1)

Report content.

(i) 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 a driver operates more than one vehicle during the day, a report must be prepared for each vehicle operated. Drivers are not required to prepare a report if no defect or deficiency is discovered by or reported to driver.

(ii) 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.

49-§396.11 (a)(2)

Corrective action. (i) Prior to requiring or permitting a driver to operate a vehicle, every motor carrier or its agent shall 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.

(ii) Every motor carrier or its agent shall certify on the 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.

49-§396.11 (a)(3)

Retention period for reports. Every motor carrier shall maintain the 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-§396.11 (a)(4)

Before driving a motor vehicle, the driver shall:

- (a) Be satisfied that the motor vehicle is in safe operating condition;
- (b) Review the last driver vehicle inspection report if required by §396.11(a)(2)(i); and
- (c) Sign 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-§396.13**Tires**

No motor vehicle shall be operated on any tire that—

- (1) Has body ply or belt material exposed through the tread or sidewall,
- (2) Has any tread or sidewall separation,
- (3) Is flat or has an audible leak, or
- (4) Has a cut to the extent that the ply or belt material is exposed.

49-§393.75 (a)

Any tire on the front wheels of a bus, truck, or truck tractor shall have a tread groove pattern depth of at least $\frac{4}{32}$ of an inch when measured at any point on a major tread groove. The measurements shall not be made where tie bars, humps, or fillets are located.

49-§393.75 (b)

Except as provided in paragraph (b) of this section, tires shall have a tread groove pattern depth of at least $\frac{2}{32}$ of an inch when measured in a major tread groove. The measurement shall not be made where tie bars, humps or fillets are located.

49-§393.75 (c)

Emergency Equipment

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

49-§392.8

Each fire extinguisher must be labeled or marked by the manufacturer with its UL rating.

49-§393.95 (a)(2)

The fire extinguisher must be designed, constructed, and maintained to permit visual determination of whether it is fully charged.

49-§393.95 (a)(3)

The fire extinguisher(s) must be filled and located so that it is readily accessible for use. The extinguisher(s) must be securely mounted to prevent sliding, rolling, or vertical movement relative to the motor vehicle.

49-§393.95 (a)(4)

Vehicle Markings

Required Markings: Each cargo tank transporting a Class 2 material subject to this subchapter must be marked, in lettering no less than (2.0 inches), on each side and each end with—

- (1) The proper shipping name specified for the gas
- (2) An appropriate common name for the material (e.g., “LP-GAS or Propane”).

49-§172.328 (b)

Each MC 330 and MC 331 cargo tank must be marked near the specification plate, in letters no less than 2.0 inches in height, with—

- (1) “QT”, if the cargo tank is constructed of quenched and tempered steel; or
- (2) “NQT”, if the cargo tank is constructed of other than quenched and tempered steel.

49-§172.328 (c)

Each on-vehicle manually-activated remote shutoff device for closure of the internal self-closing stop valve must be identified by marking “Emergency Shutoff” in letters at least 0.75 inches in height, in a color that contrasts with its background, and located in an area immediately adjacent to the means of closure.

49-§172.328 (d)

Reflective design. Every uninsulated cargo tank permanently attached to a cargo tank motor vehicle shall, unless covered with a jacket made of aluminum, stainless steel, or other bright nontarnishing metal, be painted a white, aluminum, or similar reflecting color on the upper two-thirds of area of the cargo tank.

49-§178.337-1(d)

Each transport vehicle containing any quantity of a hazardous material must be placarded on each side and each end of container.

49-§172.504(a)

When hazardous materials covered by table 2 of this section are transported by highway, placards are not required on a transport vehicle or freight container which contains less than 1001 pounds aggregate gross weight of hazardous materials.

49-§172.504(c)(1)

Each cargo tank transporting a Class 2 material must be marked, in lettering no less than 2.0 inches, on each side and each end with an appropriate common name for the material (e.g., “LP-Gas Gas or Propane”).

49-§172.328(b)

Marking inlets and outlets. Except for gauging devices, thermometer wells, and pressure relief valves, each cargo tank inlet and outlet must be marked “liquid” or “vapor” to designate whether it communicates with liquid or vapor when the cargo tank is filled to the maximum permitted filling density. A filling line that communicates with vapor may be marked “spray-fill” instead of “vapor.”

49-§178.337-9(c)

Discharge System Inspection

Hose identification. By July 1, 2000, the operator must assure that each delivery hose assembly is permanently marked with a unique identification number and maximum working pressure.

49-§180.416(b)

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

49-§180.416(c)

Monthly inspections and tests.

- (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. On cargo tanks equipped with a meter, the meter creep test as outlined in appendix B to this part or a test providing equivalent accuracy is acceptable.
- (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 manufacturer of the hose assembly, 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. The operator must retain a copy of each test and inspection record 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.

49-§180.416(d)

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) of this section.
- (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-§180.416(g)(2)

Testing and Inspection

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

<u>Test or Inspection</u>	<u>Interval Period</u>
External Visual Inspection	1 year
Internal Visual Inspection	5 years
Leakage Test	1 year
Pressure Test	5 years.

49-§180.407(c)

MC 331 cargo tanks less than 3,500 gallons water capacity in dedicated propane service constructed of nonquenched and tempered NQT SA-612 steel must be pressure tested on a ten year interval (see note 5)

49-§180.407(c)

(MC 331) Cargo tanks constructed from NQT SA-202, SA-455 or SA-612 steel must carry documentation of the manufacturer’s Charpy strength test, otherwise they must be tested every five years.

49-§180.407(c) note 5

All other cargo tanks must be tested every five years.

49-§180.407(c)

(MC 330, 331) cargo tanks must be tested hydrostatically or pneumatically to **1.5 times** the MAWP.

49-§180.407(g)(1)(iv)

The external visual inspection and testing must include as a minimum the following:

- (i) The tank shell and heads
- (ii) The piping, valves, and gaskets
- (iii) All devices for tightening manhole covers
- (iv) All emergency devices and valves including self-closing stop valves, excess flow valves and remote closure devices. Must be functioned to demonstrate proper operation.
- (v) Missing bolts, nuts and fusible links
- (vi) All markings on the cargo tank required by parts 172, 178 and 180 must be legible;
- (viii) All major appurtenances and structural attachments on the cargo tank

49-§180.407(d)(2)

Each cargo tank successfully completing the test and inspection requirements contained in §180.407 must be marked as specified in this section.

49-§180.415(a)

Each cargo tank must be durably and legibly marked, in English, with the date (month and year) and the type of test or inspection performed, subject to the following provisions:

- (1) The date must be readily identifiable with the applicable test or inspection.
- (2) The markings must be in letters and numbers at least 1.25 inches high, near the specification plate or anywhere on the front head.

49-§180.415(b)

The type of test or inspection may be abbreviated as follows:

- (i) V for external visual inspection and test;
- (ii) I for internal visual inspection;
- (iii) P for pressure test;
- (iv) L for lining inspection;
- (v) T for thickness test; and
- (vi) K for leakage test

49-§180.415(b)(3)

Discharge System Control

Operating procedure. Each operator of a cargo tank motor vehicle that is subject to the emergency discharge control requirements 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.

49-§177.840(1)

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 §180.416(g)(1) or with piping systems found to have any condition identified in §180.416(g)(2)

49-§177.840(m)

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-§177.840(n)

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-§173.315(n)(2)

Cargo tank motor vehicles in metered delivery service. [3,500 water gallons or less] A cargo tank motor vehicle must have an off-truck remote means to close the internal self-closing stop valve and shut off all motive and auxiliary power equipment upon activation by a qualified person attending the unloading of the cargo tank motor vehicle (off-truck remote shut-off). It must function reliably at a distance of 150 feet. The off-truck remote shut-off activation device must not be capable of reopening the internal self-closing stop valve after emergency activation.

49-§173.315(n)(3)

Daily test of off-truck remote shut-off activation device. For a cargo tank motor vehicle equipped with an off-truck remote means to close the internal self-closing stop valve and shut off all motive and auxiliary power equipment, an operator must successfully test the activation device within 18 hours prior to the first delivery of each day. For a wireless transmitter/receiver, the person conducting the test must be at least 150 feet from the cargo tank and may have the cargo tank in his line of sight.

49-§177.840(o)

Shipping Papers

A driver of a motor vehicle containing hazardous material, and each carrier using such a vehicle, shall ensure that the shipping paper required by this section is readily available to, and recognizable by, authorities in the event of accident or inspection. Specifically, the driver and the carrier shall:

(1) Clearly distinguish the shipping paper, if it is carried with other shipping papers or other papers of any kind, by either distinctively tabbing it or by having it appear first; and

(2) Store the shipping paper as follows:

When the driver is at the vehicle's controls, the shipping paper shall be:

(A) Within his immediate reach while he is restrained by the lap belt; and

(B) either readily visible to a person entering the driver's compartment or in a holder which is mounted to the inside of the door on the driver's side of the vehicle.

49-§177.817(e)

When the driver is not at the vehicle's controls, the shipping paper shall be:

(A) In a holder which is mounted to the inside of the door on the driver's side of the vehicle; or

(B) on the driver's seat in the vehicle.

49-§177.817(e)(2)(ii)

The shipping description of a hazardous material on the shipping paper must include:

(1) The identification number prescribed for the material

(2) The proper shipping name prescribed for the material

(3) The hazard class or division number prescribed for the material

49-§172.202(a)

The total quantity of hazardous materials covered by the description must be indicated (by mass or volume, or by activity for Class 7 materials) and must include an indication of the applicable unit of measurement,

49-§172.202(a)(5)

Bulk packages, provided some indication of the total quantity is shown, for example, "1 cargo tank"

49-§172.202(a)(5)(A)

Following the basic description for a hazardous material in a Specification MC 330 or MC 331 cargo tank, there must be entered for *Liquefied petroleum gas* the word "NONCORROSIVE" or "NONCOR" to indicate the suitability for shipping "Noncorrosive" liquefied petroleum gas in a cargo tank made of quenched and tempered steel.

49-§172.203(h)(2)

Emergency response telephone number. A shipping paper must contain an emergency response telephone number and, if utilizing an emergency response information telephone number service provider, identify the person (by name or contract number) who has a contractual agreement with the service provider.

49-§172.201(d)

Loading the Cargo Tank

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.

49-§177.834(i)

Odorization. All liquefied petroleum gas must be odorized as required in this paragraph to indicate positively, by a distinctive odor, the presence of gas down to a concentration in air of not over one-fifth the lower limit of combustibility; however, odorization is not required if it is harmful in the use or further processing of the liquefied petroleum gas or if it will serve no useful purpose as a warning agent in such use or further processing.

49-§173.315(b)(1)

The use of 1.0 pound of ethyl mercaptan per 10,000 gallons of liquefied petroleum gas is considered sufficient to meet the requirements of this paragraph.

49-§173.315(b)(1)(ii)

loading of a liquefied gas into a cargo tank or portable tank shall be determined by weight or by a suitable liquid level gauging device.

49-§173.315(c)

If the loading of cargo tanks and portable tank containers with liquefied gases is to be determined by adjustable liquid level device, each tank and each compartment thereof shall have a thermometer well, so that the internal liquid temperature can easily be determined, and the amount of liquid in the tank shall be corrected to a 60 °F. basis. Liquid levels shall not exceed a level corresponding to the maximum filling density permitted for the material being loaded into the tank.

49-§173.315(e)

If a cargo tank is to be loaded using a fixed maximum liquid indicator. It shall be arranged to function at a level not to exceed the maximum permitted volume. Loading shall be stopped when the device functions.

49-§173.315(f)

Additional gauging devices may be installed but may not be used as primary controls for filling of cargo tanks.

49-§173.315(h)

Transportation in Cargo Tank Vehicles

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, except external emergency self-closing valves on MC 338 cargo tanks containing the residue of cryogenic liquids may remain either open or closed during transit.

49-§177.834(j)

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.

49-§177.840(g)

Unloading the Cargo Tank

Unloading procedures for liquefied petroleum gas in metered delivery service. An operator must use the following procedures for unloading liquefied petroleum gas or anhydrous ammonia from a cargo tank motor vehicle in metered delivery service:

(1) For a cargo tank with a capacity of 3,500 water gallons or less, excluding delivery hose and piping, the qualified person attending the unloading operation must remain within 150 feet of the cargo tank and 25 feet of the delivery hose and must observe both the cargo tank and the receiving container at least once every five minutes when the internal self-closing stop valve is open during unloading operations that take more than five minutes to complete.

49-§177.840(p)(1)

(2) For a cargo tank with a capacity greater than 3,500 water gallons, excluding delivery hose and piping, the qualified person attending the unloading operation must remain within 150 feet of the cargo tank and 25 feet of the delivery hose when the internal self-closing stop valve is open.

(i) 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.

(ii) For deliveries where the qualified person attending the unloading operation cannot maintain an unobstructed view of the cargo tank, when the internal self-closing stop valve is open, the qualified person must observe both the cargo tank and the receiving container at least once every five minutes during unloading operations that take more than five minutes to complete.

49-§177.840(p)(2)

Unloading procedures for liquefied petroleum gas in other than metered delivery service. An operator must use the following procedures for 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.

49-§177.840(q)

Unloading using facility-provided hoses. A cargo tank motor vehicle equipped with a specially designed delivery hose assembly to meet the requirements of §173.315(n)(2) 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 that conforms to and is maintained to the performance standard in §173.315(n)(2), the qualified person may attend the unloading operation in accordance with the attendance requirements prescribed for the material being unloaded in 49 CFR §177.834.

49-§177.840(r)

ALTERNATIVE FUELS TRAINING CENTER

4044 Promontory Point Austin Texas 78744

