Issued to: _____ _____ _____

Print Name Signature Date

# 2.3 Bobtail Operations Web Workbook


## Railroad Commission of Texas
## Alternative Fuel Safety

**2023 – Rev 4.2**

# Notice

This workbook is intended for use as a training document in conjunction with material presented by an instructor with the Railroad Commission of Texas or an authorized Railroad Commission of Texas Outside Instructor. Any other use or distribution of this workbook or use or distribution of any portion of this workbook for any purpose whatsoever is considered by the Railroad Commission of Texas to be misuse of this publication.

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# Administrative Rules

Slide #

18) . **Definitions**

**SR §9.2 (22) LP-Gas Safety Rules--**

The rules adopted by the Railroad Commission in the Texas Administrative Code, Title 16, Part 1, Chapter 9, including any NFPA or other documents adopted by reference.

19) . **LP-Gas Safety Rules**

Covers administrative codes, exceptions and enhancements to NFPA standards

Mandated by chapter 113 of the Texas Natural Resource Code

20) . **LP-Gas Safety Rules**

- Subchapter A
  - Licensing, Examination, Training
- Subchapter B
  - Installation, Containers, Equipment
- Subchapter C
  - Vehicle registration, Identification, Testing
- Subchapter D – Adoption of NFPA 54
- Subchapter E – Adoption of NFPA 58

21) . **LP-Gas Safety Rules**

**SR §9.7 (c) Applications for Licenses**

Licensees, registered manufacturers, company representatives, and operations supervisors at each outlet shall have copies of all **current** licenses and/or manufacturer registrations and certificates for employees at that location available for inspection during regular business hours.

22) . **LP-Gas Safety Rules**

**SR §9.7. Applications for Licenses - (cont.)**

In addition, licensees and registered manufacturers shall maintain a current version of the **rules** in this chapter and shall provide access to these rules for each company representative and operations supervisor.
The rules shall also be **available** to employees during business hours.

23) . **LP-Gas Safety Rules**

Revisions will occur after the date of publication.
It is your responsibility to comply with the rules in effect at the time the activities are conducted.
The current rules can be viewed online at: **www.rrc.texas.gov**.

24) . **NFPA 58 - 2017 Edition**

This is the edition currently adopted by the RRC
The safety rules, exams and study guides refer to this edition

25) . **NFPA 54 - 2018 Edition**

This is the edition currently adopted by the RRC
The safety rules, exams and study guides refer to this edition

26) . **CFR 49 - Latest Edition**

RRC exams and study guides refer to Title 49 “Transportation” typically parts 171-180

27) . **New Certificate**

**SR §9.8. Requirements & Application for New Certificate**

**(a) In addition to complying w/ NFPA 58 §4.4 & §11.2,**

- No person shall perform work,
- Directly supervise LP-gas activities, or
- Be employed in any capacity requiring contact with LP-gas unless:

28) . **New Certificate**

**SR §9.8. (a) – (cont.)**

**(1)** That individual is a **certificate holder** who is:

**(A)** In compliance with all applicable training and **continuing education** requirements in §9.51 and §9.52 of this title

**(B)** In compliance with **renewal requirements** in §9.9 of this title

**(C) Employed by a licensee**; or

**(2)** That individual is a trainee who complies with §9.12 of this title.

29) . **New Certificate**

**SR §9.8. – (cont.)**

**(c)** An applicant for a new certification shall:

**(1)** File with **AFS** a properly completed LPG **Form 16** and the applicable nonrefundable rules examination fee specified in §9.10 of this title;

**(2)** Pass the applicable rules examination with a score of at least **75%**; and

**(3)** Complete any required training and/or **AFT** in §9.51 and §9.52 of this title.

30) . **Training Requirements**

**58-§4.4 Qualification of Personnel.**

**§4.4.1** Persons whose duties fall within the scope of this code shall be provided with training that is consistent with the scope of their job activities and that includes:

- Proper handling and
- Emergency response procedures.

31) . **Training Requirements**

**58-§4.4 Qualification of Personnel. – (cont.)**

**§4.4.2** Persons whose primary duties include transporting LP-Gas, transferring liquid LP-Gas into or out of stationary containers, or making stationary installations shall complete training that includes the following components:

**(1)** Safe work practices
**(2)** The health and safety hazards of LP-Gas
**(3)** Emergency response procedures
**(4)** Supervised, on-the-job training
**(5)** An assessment of the person's ability to perform the job duties assigned

32) . **Training Requirements**

**58-§4.4 Qualification of Personnel. – (cont.)**

**§4.4.3** Refresher training shall be provided at least every **3 years**.

**§4.4.4** Initial and subsequent refresher training shall be **documented**.

33) . **Operational Safety**

**58-§4.4 Qualification of Personnel. – (cont.)**

**§7.2.2.1** Transfer of LP-gas to and from a container shall be done only by **qualified individuals -**

- Trained in proper handling and operating procedures
- Meeting the requirements of Section 4.4 and in
- Emergency response procedures.

34) . **Definitions**

**SR §9.2 (12) Company Representative--**

The individual designated to the Commission by a license applicant or a licensee as the **principal individual** in authority.

35) . **Definitions**

**SR §9.17 (b) Company Representative Requirements**

**(1)** Be an owner or employee of the licensee

**(2)** Be responsible for supervising all LP-Gas activities

**(3)** Have a working knowledge of the licensee's LP-Gas activities

**(4)** Pass the appropriate management level exam

**(5)** Complete any required training

36) . **Definitions**

**SR §9.17 (b) Company Rep. Requirements - (cont.)**

**(6)** Comply with the work experience or training requirements

**(7)** Be directly responsible for all employees performing their assigned LP-gas activities

**(8)** Submit any additional information as deemed necessary by **AFS**

37) . **Definitions**

**SR §9.2 (49) Trainee--**

An Individual who has not yet taken and passed an employee-level rules examination.

38) . **Training Requirements**

**SR §9.12. Trainees**

A licensee 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.

**(1)** The trainee shall be **directly and individually supervised at all times** by a certificate holder for the area of work being performed by the trainee.

**(4)** A trainee who has been in training for a total period of 45 calendar days, in any combination and **with any number of employers**, shall cease to perform any LP-gas activities for which he or she is not currently **certified**.

39) . **Rules Examination**

**SR §9.10. Rules Examination**

**(a)** An individual who passes the applicable rules examination with a score of at least **75%** will become a certificate holder.

**(1)** Successful completion of any examination shall be credited to and accrue to the **individual**,

**(2)** An individual who has been issued a certificate shall make the certificate readily available and shall present it to any Commission employee or agent who requests proof of certification.

40) . **Rules Examination**

**SR §9.10 (c)(4) Time Limits**

**(A)(i)** Bobtail employee-level examination shall be limited to **three hours.**

You can use:

LP Gas Safety Rules - 2022

NFPA 54 - 2018

NFPA 58 - 2017

49 CFR - 2020

41) . **Employee-Level Certification**

**SR §9.10. Rules Examination – (cont.)**

**(d)(1) Employee-Level examination:**

**(A)** The **Bobtail Driver** examination qualifies an individual to:

- Operate a Bobtail,
- Perform all activities authorized by:
  - **(1)** Transport Driver,
  - **(2)** DOT Cylinder Filler, and
  - **(3)** Motor/Mobile Fuel Filler Examinations,

42) . **Employee-Level Certification**

**SR §9.10. Rules Examination – (cont.)**

- Perform leak checks and Pressure Tests,
- Light Appliances, and
- Adjust Regulators and Thermocouples.

The Bobtail examination does **NOT** authorize an individual to **connect** or disconnect containers, except when performing a pressure test or **removing** a container from service.

43) . **Certification Card**

Annual Renewals are due by **May 31st**, each year.

44) . **Rules Examination**

**SR §9.10 (f) Failure**

Failure of any exam shall **immediately** the individual **from performing any LP-gas related activities covered by the examination** which is failed, except for activities covered by a separate exam which the individual has passed.

45) . **Certificate Renewal**

**SR §9.9. Requirements for Certificate Renewal**

**(a)** In order to maintain active status, certificate holders shall **renew** their certification/registration **annually** in accordance with (c) and (e) of this section.

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

46) . **Certificate Renewal**

**SR §9.9. Requirements for Certificate Renewal – (cont.)**

**(1)** Failure to pay the nonrefundable annual renewal fee by the deadline shall result in a **lapsed certificate**.

**(A)** To renew a lapsed certificate, the individual shall pay the nonrefundable $35 annual renewal fee plus a nonrefundable **$20 late-filing fee**. Failure to do so shall result in the expiration of the certificate.

47) . **Certificate Renewal**

**SR §9.9. Requirements for Certificate Renewal – (cont.)**

**(B)** If an individual's certificate lapses or expires, that individual shall immediately **cease** performance of any LP-gas activities authorized by the certificate.

**(C)** If an individual's certificate has been expired for more than **two years** from May 31 of the year in which the certificate lapsed, that individual shall comply with the requirements for a **new** certificate. – **(Start Over)**

48) . **Certificate Renewal**

**SR §9.52. Training and Continuing Education Courses**

**(b)** A certificate holder shall complete at least **eight hours** of continuing education every **four years** as specified by this subsection.

49) . **Certificate Renewal**

**SR §9.9. Requirements for Certificate Renewal – (cont.)**

**(d)** Certificate holders shall successfully complete the **continuing education** requirements as specified in §9.51 and §9.52 of this title to maintain active status.

**(1)** Failure to comply with the continuing education requirements by the assigned deadline shall result in a **lapsed certification**.

50) . **Vehicle Requirements**

**SR §9.201. (a) Applicability**

- Transport Containers & Tenders Constructed to MC-330 or MC-331 DOT Specifications
- Container Delivery Units
- School Buses
- Mass Transit Vehicles
- Special Transit Vehicles
- Public Transportation Vehicles

51) . **Vehicle Requirements**

**SR §9.201. Applicability**

**(c)** Licensees shall comply with;

- U.S. DOT – Title 49 CFR
- Texas Department of Public Safety
- Railroad Commission of Texas

52) . **Registration**

**SR §9.202 Registration of LP-Gas Cargo Tanks**

**(a)(1)** To register a unit previously unregistered in Texas, the operator of the unit shall:

**(A)** Pay **$270** registration fee for each bobtail truck, semitrailer, container delivery unit

**(B)** File a properly completed **LPG Form 7**.

53) . **Registration**

**SR §9.202 Registration of LP-Gas Cargo**

**(c)** When all registration or transfer requirements have been met, **AFS** will issue an **LPG Form 4** which shall be properly **affixed** in accordance with the placement instructions on the form.

54) . **Registration**

**SR §9.202 Registration of LP-Gas Cargo – (cont.)**

**(1)** A person shall not **operate** an LP-gas transport unit or container delivery unit in Texas unless the LPG Form 4 has been properly affixed or unless its operation has been specifically approved by **AFS**.

**(2)** A person shall not **introduce LP-Gas** into a transport container unless that unit bears an LPG Form 4 or unless specifically approved by **AFS**.

55) . **Registration of LP-Gas Cargo Tanks**

56) . **Registration**

**SR §9.202 Registration of LP-Gas Cargo – (cont.)**

**(6)** If an LPG Form 4 decal on a unit currently registered with **AFS** is destroyed, lost, or damaged, the operator of that vehicle shall obtain a **replacement** decal by filing LPG **Form 18B** and a **$50** replacement fee with **AFS**.

57) **.** **Poll Questions**

58) **.** # Characteristics of Propane

59) . **Characteristics of Propane**

Propane is a **L**iquefied **P**etroleum **G**as which must be stored under pressure to remain in liquid state at normal temperatures.

It is a colorless, odorless, non-toxic gas.

It is odorized for safety using a substance called **ethyl mercaptan** which produces a “rotten egg” smell.

Propane can be an inhalation hazard.
(It displaces oxygen and can cause suffocation)

60) . **Characteristics of Propane**

Propane is highly flammable

Flammability Limits
Lower: **2.15%** propane in air
Upper: **9.6%** propane in air

Ignition Temperature
960 to 1,120°F

Common sources of ignition include a pilot light, match, cigarette, electric motors, switches and static electricity.

61) . **Characteristics of Propane**

Propane at atmospheric pressure boils at -44°F
Propane vapor is heavier than air.
Specific Gravity

Propane liquid = **0.504** (water is 1.0)
Propane vapor =**1.5** (air is 1.0)

This means that propane vapor will sink to the lowest ground level.

62) . **Characteristics of Propane**

The expansion rate of propane liquid into vapor is **270x**

As it expands it absorbs heat from the surrounding atmosphere, it poses a freezing hazard to exposed skin. Always wear personal protective equipment.

63) . **Characteristics of Propane**

What is the white fog seen when it is released into the air?

The propane vapor is so cold it condenses the moisture in the air which is visible as fog.

64) . # Regulations for Operating a Bobtail

65) . **Pre-Trip Safety Inspection**

**49-§396.7 (a) Unsafe Operations**
A motor vehicle shall not be operated in such a condition as to likely cause an **accident or breakdown** of the vehicle.

66) . **Driver Vehicle Inspection Report**

**49-§396.11 (a) Equipment Provided by Motor Carrier**
**(1)** ***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:

67) . **Driver Vehicle Inspection Report**

**49-§396.11 (a) Equipment – (cont.)**

| | |
|---|---|
| Service brakes | Windshield wipers |
| Parking brake | Rear-vision mirrors |
| Steering mechanism | Coupling devices |
| Lighting & Reflectors | Wheels & Rims |
| Tires | Emergency equipment |
| Horn | |

68) . **Driver Vehicle Inspection Report**

**49-§396.11 (a)(2) Report Content**

The report must **identify the vehicle**

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.

The driver must **sign the report**.

69) . **Driver Vehicle Inspection Report**

**49-§396.13 Driver Inspection**

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 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.

70) . **Vehicles**

**49-§393.75 (a) Tires**

**(a) No vehicle** shall be operated on any tire that:

**(1)** Has **exposed** body ply or belt material

**(2)** Has any tread or sidewall **separation**

**(3)** Is **flat** or has an **audible leak**

**(4)** Has a **cut** exposing the ply or belt material

71) . **Vehicles**

**49-§393.75 Tires – (cont.)**

**(b) Front tires** shall have a tread depth of at least **4/32"** when measured at any point on a major tread groove.

72) . **Vehicles**

**49-§393.75 Tires – (cont.)**

**(c) Rear tires** shall have a tread depth of at least **2/32"** when measured in a major tread groove.

73) . **Vehicles**

**58-§9.4.7 Fire Extinguishers.**

**§9.4.7.1** Each cargo tank vehicle or tractor shall be provided with at least one approved portable fire extinguisher having a minimum capacity of **18 lb.** dry chemical.

Where fire extinguishers have more than one letter classification, they can be considered to satisfy the requirements of each letter class.

74) . **Vehicles**

**58-§4.7 Portable Fire Extinguisher**

Where portable fire extinguishers are required, they shall comply with the following:

**(1)** NFPA 10

**(2)** Have a minimum capacity of dry chemical with an **A:B:C rating**, as specified elsewhere in this code.

**(3)** Shall be permitted to have a minimum flow rate less than 1 lb./sec.

75) . **Vehicles**

**49-§393.95 (a)(B) Fire Extinguishers**

**(2) Labeling and marking**.

Each fire extinguisher required by this section must be labeled or marked by the manufacturer with its Underwriters' Laboratories rating.

**(3) Visual Indicators.**

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

76) **.** **Vehicles**

**49-§393.95 (a)(B) Fire Extinguishers – (cont.)**

**(4) Condition, location, and mounting.**

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.

77) . **Vehicles**

78) . **Vehicles**

79) . **Vehicles**

**58-§9.2 Electrical Requirements.**

**§9.2.1** Only **electrical** lighting shall be used with the vehicles covered by this chapter.

**§9.2.2** Wiring shall be insulated and protected from physical damage.

80) . **Vehicles**

**SR §9.211. Markings**

In addition to NFPA 58 §9.4.6.2, each LP-gas transport and container delivery unit in LP-gas service shall be marked on each side and the rear with:

- **Name of the licensee** operating the unit
- Lettering at least 2 inches in height
- In sharp contrast to the background

81) . **Operator Markings**

82) . **Vehicles**

**49-§178.337-1 (d) Painting**

Every cargo tank must be painted:
White
Aluminum
Or heat reflecting color
On the **upper 2/3** of the cargo tank

83) . **Vehicles**

**49-§172.504 (a) General Placarding Requirements**

Each transport vehicle must be placarded on **each side** and **each end** of container.

**§172.516 (c)**

**(4)** The placard must be located at least **3 inches** from any marking that could reduce its effectiveness.

**(6)** Be maintained in good condition

84) . **Placarding**

85) . **Placarding**

86) . **Poll Questions**
**Break**

87) **.** **Shipping Name**

**49-§172.328 (b) Required Markings**

The proper shipping name must be;
On **each side** and **each end**,
Lettering no less than **two inches**,
The common name for the material
**(LP-GAS or PROPANE)**

88) . **Shipping Name**

89) . **Hoses**

**58-§5.11.6 Hose, Quick Connectors, Hose Connections, and Flexible Connectors.**

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

**§3.3.28 Flexible Connector.**

A short [not exceeding **60 inches** overall length] fixed piping system component that is fabricated from a flexible material and equipped with connections at both ends.

90) . **Definitions**

**58-§3.3.28.1 Flexible Hose Connector.**

A component fabricated from LP-Gas **hose** that is made from a material that is compatible with LP-Gas.

91) . **Flexible Hose Connector**

92) . **Definitions**

**58-§3.3.28.2 Flexible Metallic Connector.**

A component fabricated from **metallic** material that provides liquid and vapor LP-Gas confinement and is provided with connections on both ends.

93) . **Flexible Metallic Connector**

94) . **Vehicles**

**58-§9.4.3 Piping (Incl. Hose), Fittings, and Valves**

**§9.4.3.6** Flexible connectors used in the piping system to compensate for stresses and vibration shall be limited to **3 ft.** in overall length and, when replaced, shall comply with **5.11.6**.

95) . **Vehicles**

**58-§9.4.3.7 Flexible Hose Connectors**

**(1)** Flexible hose connectors shall be permanently marked to indicate the **date of installation** of the flexible hose connector.

**(2)** The flexible **hose** portion of the connector shall be **replaced** within **10 years** of the installation of the connector and **visually inspected** before the first delivery of each day.

96) **.** **Discharge System Inspection**

**49-§180.416 (b) 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.**

97) . **Discharge System Inspection**

98) . **Discharge System Inspection**

**49-§180.416 (c) Post-delivery hose check.**

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

99) . **Discharge System Inspection**

100) . **Discharge System Inspection**

**49-§180.416 (d) Monthly Inspections and Tests.**

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

**(2)** The operator must visually inspect the piping system at least **once each month** the cargo tank is in service. The inspection must include:

- Fusible elements
- All components of the piping system
- Bolts, connections, and seals.

101) . **Discharge System Inspection**

**49-§180.416 (d) Monthly Inspections & Tests. - (cont.)**

**(3)** At least **once each 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.

102) . **Definitions**

**49-§178.337-1 (g) Emergency Discharge Control**

The ability to stop a cargo tank unloading operation in the event of an **unintentional** release.

103) . **Discharge System Inspection**

**49-§180.416 (d) Monthly Inspections & Tests. - (cont.)**

**(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 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**.

104) . **Discharge System Inspection**

**49-§180.416 (d) Monthly Inspections & Tests. - (cont.)**

**(5)** The operator must note each inspection in a record:

- Inspection date,
- Name of the person performing the inspection,
- Hose assembly identification number,
- Manufacturer of the hose assembly,
- Date the hose was assembled and tested,
- Indication that the delivery hose assembly and piping system passed or failed the tests and inspections.

105) . **Discharge System Inspection**

**49-§180.416 (d) Monthly Inspections & Tests. - (cont.)**

**(5) (cont.)** 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.

106) . **Discharge System Inspection**

**49-§180.416 (g) Rejection Criteria.**

**(1)** No operator may use a **delivery hose** assembly determined to have any condition identified below:

**(i)** Hose cover that exposes the reinforcement

**(ii)** Kinked or flattened wire braid reinforcement

**(iii)** Soft spots or bulging

**(iv)** Damaged, slipping, or worn hose couplings

**(v)** Loose or missing bolts on bolted hose couplings

107) . **Discharge System Inspection**

108) . **Discharge System Inspection**

**49-§180.416 (g) Rejection Criteria. – (cont.)**

An operator may **remove and replace** damaged sections or correct defects discovered.

Repaired hose assemblies may be placed **back in service** if retested successfully in accordance with paragraph f.

**(References pressure testing of hose)**

109) . **Discharge System Inspection**

**49-§180.416 (g) Rejection Criteria. – (cont.)**

**(2)** No operator may use a cargo tank with a **piping system** found to have any of these conditions:

**(i)** External leaks identifiable without instruments

**(ii)** Loose, missing, or severely corroded bolts

**(iii)** Manual stop valves that will not accuate

**(iv)** Damaged rubber hose connectors per (g)(1)

110) . **Discharge System Inspection**

**49-§180.416 (g) Rejection Criteria. – (cont.)**

**(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.

111) . **Maintenance**

**SR §9.204. Maintenance of Vehicles**

All LP-Gas vehicles shall be maintained in safe working order and in accordance with manufacturer's instructions and the LP-Gas Safety Rules including:

| | |
|---|---|
| Valves | Transfer Equipment |
| Dispensers | Gas Containers |
| Accessories | Gas Utilization Equipment |
| Piping | |

112) . **Testing & Inspection**

**SR §9.208. Testing Requirements**

Each transport container unit required to be registered with the **AFS** shall be tested in accordance with **49 CFR 180.407**, relating to requirements for test and inspection of cargo tanks.

Testing shall be done by a **registered** DOT Cargo Tank Inspector.

**(meeting the qualifications in §180.409)**

113) . **Test & Inspection**

**49-§180.407 Periodic Test**

**(1)** A cargo tank constructed in accordance with a DOT specification for which a test or inspection specified in this section has become due, **may not be filled** and offered for transportation or transported **until** the **test or inspection** has been successfully **completed**.

**(c)** Each cargo tank must have an **external (V)** visual inspection and **leakage (K)** test on a **one-year** interval.

114) . **Testing & Inspection**

**49-§180.407 Periodic Test – (cont.)**

**(d)(2) External visual inspection** and testing must include:

**(i)** Tank shell and heads

**(ii)** Piping, valves, and gaskets

**(iii)** Devices for tightening manhole covers

**(iv)** Emergency devices and valves including self-closing stop valves (must be operated)

115) **.** **Testing & Inspection**

**49-§180.407 Periodic Test – (cont.)**

**(v)** Missing or loose bolts & nuts, and fusible links

**(vi)** All markings on the cargo tank required by 49 CFR 172, 178, & 180 must be legible

**(vii)** All major appurtenances & structural attachments on the cargo tank

116) **.** **Testing & Inspection**

**49-§180.407 Periodic Test – (cont.)**

**(e)** *Internal visual inspection.*

**(1)** When the cargo tank is not equipped with a manhole or inspection opening, or the cargo tank design precludes an internal inspection, the tank shall be hydrostatically or pneumatically tested in accordance with 180.407(c) and (g).

117) . **Testing & Inspection**

**49-§180.407 Periodic Test – (cont.)**

(Hydrostatic) **Pressure Test (P)** and **Internal visual inspection (I):**

**MC 331** cargo tanks **less than 3,500** gallons water capacity in **dedicated propane service** constructed of nonquenched and tempered (NQT) **SA-612** steel: **10-Year Interval**

Cargo tanks constructed from **SA-202** or **SA-455** steel with **documentation** of the manufacturer's Charpy V Notch strength test: **10-Year Interval**

All other cargo tanks: **5-Year Interval**

118) . **Test & Inspection Markings**

**49-§180.415 Test and inspection markings**

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

**(b)** 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:

119) **.** **Test & Inspection Markings**

**49-§180.415 Test and inspection markings – (cont.)**

Each cargo tank is to be marked with month and year and type of test or inspection:

**(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.

120) . **Test & Inspection**

**49-§180.415 Test and inspection markings – (cont.)**

**(3)** The **type of test** or inspection may be abbreviated as follows:

**(i) V** – external Visual inspection and test
**(ii) K** – Leakage test
**(iii) P** – Pressure test
**(iv) I** – **I**nternal Visual inspection

121) . **Test & Inspection Markings**

122) . **Test & Inspection Markings**

123) . **Cargo Tank Marking**

**49-§172.328 (c) QT/NQT markings.**

Each **MC 330** and **MC 331** cargo tank must be marked near the specification plate, in letters no less than **2 inches** in height, with—

**(1)** "QT", if the cargo tank is constructed of tempered steel; or

**(2)** "NQT", if the cargo tank is constructed of other than quenched and tempered steel.

124) . **Cargo Tank Marking**

125) . **Cargo Tank Marking**

126) . **Cargo Tank Marking**

**49-§172.328 Emergency Shutoff Markings**

**(d) On-vehicle** manually-activated remote shutoff for closure of the internal self-closing stop valve must be;

- Marked **"Emergency Shutoff"**
- In letters at least **0.75 inches** in height
- In a color that contrasts with its background,
- Located in an area immediately adjacent to the means of closure

127) . **Cargo Tank Marking**

128) . **Cargo Tank Marking**

129) . **Emergency Discharge Control**

**49-§177.840 (l) 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.

130) . **Emergency Discharge Control**

131) . **Emergency Discharge Control**

**49-§177.840 (m) Cargo Tank Safety Check**

Before unloading from a cargo tank motor vehicle containing a LP-gas, the qualified person performing the function must check those components of the discharge system, including delivery hose assemblies and piping to assure they are of **sound quality**.

132) . **Emergency Discharge Control**

**49-§177.840 (n) Emergency Shutdown.**

If there is an **unintentional release** of product to the environment during unloading of a LP-gas, the qualified person unloading the cargo tank motor vehicle must:

- Promptly shut the internal self-closing stop valve and
- Shut down all motive and auxiliary power equipment.

133) . **Emergency Discharge Control**

**49-§177.840 (o) Daily test of off-truck remote shut-off activation device**.

- Operator must successfully test the activation device within **18 hours** before the **first delivery** of each day.
- Test must be at least **150 feet** from the cargo tank and may have the cargo tank in his line of sight.

134) . **Emergency Discharge Control**

**49-§177.840 (s) Off-truck remote shut-off activation device.**

For a cargo tank motor vehicle with an off-truck remote control shut-off capability, the qualified person attending the unloading operation **must be in possession of the activation device at all times** during the unloading process.

135) . **Emergency Discharge Control**

**49-§173.315 (n)(3) Remote Closure**

Cargo tank motor vehicles in metered delivery service [3,500 water gallons or less] must have an off-truck remote which:

- **Closes** the internal self-closing stop valve and **shuts off** all motive and auxiliary power equipment
- Functions reliably at a distance of **150 ft**.

136) . **Emergency Discharge Control**

137) . **Emergency Discharge Control**

138) . **Shipping Papers**

**49-§177.817 (e) Accessibility**

A driver shall ensure that the shipping paper 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 by either distinctively **tabbing it** or by having it **appear first**; and

139) . **Shipping Papers**

**49-§177.817 (e)(2)(i) Accessibility – (cont.)**

When the driver is at the **vehicle's controls** the shipping papers shall be:

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

**(B) Readily visible** to a person entering the driver's compartment

- Or -

In a **holder** on the inside of the driver’s side door.

140) . **Shipping Papers**

**49-§177.817 (e)(2)(ii) Accessibility – cont.**

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

**(A)** In a **holder** on the inside of the **driver's side door**

- Or -

**(B)** On the **driver's in the vehicle.**

141) . **Shipping Papers**

142) . **Shipping Papers**

**49-§172.202 (a) Description of Material**

Shipping description of hazardous material must include:

**(1)** The **identification number** for the material;

**(2)** The proper **shipping name** for the material;

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

143) . **Shipping Papers**

**49-§172.202 (a) Description of Material – (cont.)**

**(5)** The total quantity of hazardous materials covered by the description must be indicated and must include an indication of the applicable unit of measurement. The following provisions also apply:

**(A)** Provided some indication of the total quantity is shown, for example, **"1 cargo tank"**

144) . **Shipping Papers**

**49-§172.203 (h)(2) Additional Description for LPG**

The word **NONCORROSIVE** or **NONCOR** to indicate the suitability for shipping noncorrosive LP-gas in a cargo tank made of QT steel

**§172.201(d)** Emergency response **telephone** number

145) **. Poll Questions**

146) . **Operation of Transfer Systems**

**58-§7.2.3.2 Sources of Ignition**

Sources of ignition shall be turned off:

- During **transfer** operations,
- While **connections** or **disconnections** are made, or
- While LP-gas is being **vented** to the atmosphere.

147) . **Operation of Transfer Systems**

**58-§7.2.3.2 Sources of Ignition – (cont.)**

**(A)** Internal combustion engines within **15 ft.** of a point of transfer shall be shut down while such transfer operations are in progress.

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

148) . **Operation of Transfer Systems**

**58-§7.2.3.3 Cargo Tank Vehicles**

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

149) . **Odorization**

**49-§173.315 (b)(1) Odorization.**

All LP-Gas must be odorized to indicate the presence of gas down to a concentration not over **one fifth** the lower limit of combustibility. (**Ethyl mercaptan** at 1 pound per 10,000 gallons)

150) . **Odorization**

**58-§4.2.3 LP-Gas Odorization**

The presence of the odorant shall be verified by **sniff testing** or other means and the results documented prior to final delivery to the end-use customer.

151) . **Loading the Cargo Tank**

**49-173.315 (c)**

Loading of LP-gas into a cargo tank shall be determined by:

- Weight or
- A suitable liquid level gauging device

152) . **Loading the Cargo Tank**

**49-173.315 (e) Loading with Adjustable Level Device**

If a cargo tank is to be loaded using an adjustable liquid level device –

It shall be equipped with a **thermometer well** to determine the internal liquid temperature so the amount of liquid in the tank shall be corrected to **60°F**.

153) . **Adjustable Level Device**

154) . **Loading the Cargo Tank**

**49-173.315 (f) Loading with Fixed Length Dip Tube**

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.

155) . **Fixed Maximum Level Indicator**

156) . **Additional Gauging Devices**

**49-173.315 (h)**

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

157) . **Float Gauge**

158) . **Unloading**

**49-177.840 (p)(1) Metered Delivery Service**

For a cargo tank with a capacity of 3,500 water gallons or less, the qualified person attending the unloading operation must remain within **150 ft.** of the **cargo tank** and within **25 ft.** of the **delivery hose** and **must** observe both the cargo tank and receiving container at least **once every 5 minutes** the internal self-closing stop valve is open during unloading operations that take more than five minutes to complete.

159) . **Inlets & Outlets**

**49-§178.337-9 (c) Marking Inlets and Outlets.**

Except for gauging devices, thermometer wells, and pressure relief valves -

- Each inlet and outlet must be marked "**liquid**" or "**vapor**" depending on whether it communicates with liquid or vapor when the tank is full.
- The filling line communicating with vapor may be marked "**spray-fill**" instead of vapor.

160) . **Inlets & Outlets**

161) . **Bulk Plant Emergency Shutoff**

**SR §9.143 Piping and Valve Protection**

**(a)** LP-gas installations with individual or aggregate water capacities of 4,001 gallons or more shall:

**(1)** Install a vertical bulkhead and

**(2)** Install one of the following in all container openings **1 & 1/4 inches** or greater:

162) . **Bulk Plant Emergency Shutoff**

**SR §9.143 (a)(2) Piping and Valve Protection – (cont.)**

**(A)** pneumatically-operated emergency shutoff valves (ESV);
**(B)** pneumatically-operated internal valves;
**(C)** pneumatically-operated API 607 ball valves; or
**(D)** a backflow check valve may be installed where the flow is in one direction into the container.

163) . **Bulk Plant Emergency Shutoff**

**SR §9.143 Piping and Valve Protection – (cont.)**

**(b)** Valve protection requirements.

**(1) The pneumatic ESV** and/or backflow check valves shall be 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.

164) . **Bulk Plant Emergency Shutoff**

165) . **Bulk Plant Emergency Shutoff**
**SR §9.143 (b) Piping and Valve Protection – (cont.)**
**(2) The ESV** shall be 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.

166) . **Bulk Plant Emergency Shutoff**
**SR §9.143 (b) Piping and Valve Protection – (cont.)**
**(3) Pneumatically-operated** ESV, internal valves, and API 607 ball valves shall be equipped for automatic shutoff using thermal (fire) actuation where the thermal element is located within **five feet** of the ESV, internal valves, and/or API 607 ball valves.

167) . **Bulk Plant Emergency Shutoff**
**SR §9.143 (b)(3) Piping and Valve Protection – (cont.)**
Temperature sensitive elements **shall not be painted** nor shall they have any ornamental finishes applied after manufacture.

168) . **Bulk Plant Emergency Shutoff**
**SR §9.143 (b) Piping and Valve Protection – (cont.)**
**(4)** Internal valves, ESVs, and backflow check valves shall be **tested annually** for working order. The results of the tests shall be documented in writing and kept in a readily accessible location for one year following the performed tests.
**(5) Pneumatically operated** internal valves, ESV, and API 607 ball valves shall be interconnected and incorporated into at least one remote operating system.

169) . **Bulk Plant Emergency Shutoff**

**SR §9.143 Piping and Valve Protection – (cont.)**

**(c)** ESV's, internal valves and API 607 ball valves shall have their emergency remote controls conspicuously marked and visible from the point of transfer in block letters at least **2 inches** in height and visible from the point of transfer.

**(2)** At least one clearly identified, and easily accessible remote shutoff shall be located **25 to 100 feet** from the ESV at the bulkhead and in the path of egress.

170) . **Bulk Plant Emergency Shutoff**

171) . **Bulk Plant Emergency Shutoff**

**SR §9.143 Piping and Valve Protection – (cont.)**

**(f)** The bulkheads, internal valves, backflow check valves, and ESVs shall be kept in working order **at all times** in accordance with the manufacturer's instructions and the rules in this chapter.

172) . **Bulk Plant Emergency Shutoff**

**SR §9.143 (f) Piping and Valve Protection – (cont.)**

If the bulkheads, internal valves, backflow check valves and ESVs are **not in working order** in accordance with the manufacturer's instructions and the rules in this chapter, the licensee or operator of the installation shall **immediately remove them from LP-gas service** and shall not operate the installation until all necessary repairs have been made.

173) . **Transportation in Cargo Tank Vehicles**

**49-§177.834 (j) General Requirements.**

A person may not drive a cargo tank vehicle containing a hazardous material regardless of quantity unless:

**(1)** All **manhole closures** are closed and secured

**(General Hazmat Rule – will not happen with LP-Gas)**

**(2)** All **valves** and other closures in liquid discharge systems are closed and free of leaks.

174) . **Transportation in Cargo Tank Vehicles**

**58-§11.8.4.3 Engine Fuel Valve Access**

Main shutoff valves on a container for liquid and vapor shall be readily accessible **without** the use of tools, or other equipment.

175) . **Transportation in Cargo Tank Vehicles**

**49-§177.840 Class 2 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.

176) . **Transportation in Cargo Tank Vehicles**

**58-§9.4.10 Smoking Prohibition.**

No person shall smoke or carry lighted smoking material as follows:

**(1) On or within** 25 ft. of a vehicle that contains LP-Gas liquid or vapor

**(2)** At points of **liquid transfer**

**(3)** When **delivering or connecting** to containers

177) . **Transportation in Cargo Tank Vehicles**

178) . **Transportation in Cargo Tank Vehicles**

**58-§9.4.8 Wheel Stops for Cargo Tank Vehicles.**

Any unit registered with the Commission shall utilize a **wheel stop**, in addition to the parking or hand brake, whenever the unit is

- Loading,
- Unloading, or
- Parked

179) . **Transportation in Cargo Tank Vehicles**

180) . **Parking and Garaging Vehicles**

**58-§9.7.2.1 Attendance**

Vehicles shall not be left unattended on any **street, highway, avenue, or alley,** except for

Necessary absences from the vehicle associated with the driver's normal duties, including **stops for meals and rest stops** during the day or night.

**(1)** This shall not apply in an emergency.

181) . **Parking and Garaging Vehicles**

**58-§9.7.2.2 Congested Areas**

Vehicles **shall not** be parked in congested areas.

**58-§9.7.2.3 Uncongested Areas**

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

182) . **Parking and Garaging Vehicles**

**58-§9.7.2.4 Driver's Residence**

Where vehicles carrying portable containers or cargo tank vehicles of **3500-gallon water capacity or less** are parked on streets adjacent to the driver's residence in uncongested residential areas –

The parking locations shall be **at least 50 feet** from a building used for assembly, institutional, or multiple residential occupancy.

183) . **Parking and Garaging Vehicles**

**58-§9.7.3.1 Public Building**

Vehicles parked in any public garage or building shall have LP-Gas liquid removed from the following:

- Cargo tank
- Piping
- Pump
- Meter
- Hoses
- Related equipment

184) . **Parking and Garaging Vehicles**

**58-§9.7.3 Parking Indoors.**

**§9.7.3.3** The pressure in the delivery hose and related equipment shall be **reduced** to approximately atmospheric.

**§9.7.3.4** All valves shall be **closed** before the vehicle is moved indoors.

**§9.7.3.5** Delivery hose or valve outlets shall be plugged or capped before the vehicle is moved indoors.

185) . **Parking Indoors**

**58-§9.7.3.6 Operator Owned Building**

Parking in buildings is allowed on premises owned by the operator of the vehicle if:

**(1)** The public is excluded from the building.

**(2)** Floor level ventilation is provided.

**(3)** Leaks are repaired before being moved indoors.

186) . **Parking and Garaging Vehicles**

**58-§9.7.3.6 Operator Owned Building – (cont.)**

**(4) Primary shutoff valves** on **cargo tanks** and other LP-Gas containers on the vehicle (except engine fuel containers) shall be **closed** and delivery hose outlets shall be plugged or capped to contain system pressure **before** the vehicle is moved indoors.

**(5) Primary shutoff valves** on LP-Gas propulsion **engine fuel containers** shall be closed while the vehicle is parked.

187) . **Parking and Garaging Vehicles**

**58-§9.7.3.6 Operator Owned Building – (cont.)**

**(6)** No LP-Gas container shall be located near a source of heat or within the direct path of hot air being blown from a blower-type heater.

**(7)** LP-Gas containers shall be gauged or weighed to determine that they are **not overfilled**.

188) . **Parking and Garaging Vehicles**

**58-§9.7.3.7 Indoor Service & Repair**

**(1)** When it is necessary to move a vehicle into any building located on premises **owned or operated by the operator** of such vehicle for service on engine or chassis, the provisions of 9.7.3.6 shall apply.

**(References previous rule.)**

189) . **Parking and Garaging Vehicles**

**58-§9.7.3.7 Indoor Service & Repair – (cont.)**

**(2)** When it is necessary to move a vehicle carrying or containing LP-Gas into any **public** garage or repair facility for service on the engine or chassis, the provisions of **9.7.3.1 (References removal of all liquid) shall apply**, or

The **driver** or a **qualified representative** of an LP-Gas operator shall be **in attendance** at all times while the vehicle is indoors, and the following shall apply:

190) . **Parking and Garaging Vehicles**

**58-§9.7.3.7 (2) Indoor Service & Repair – (cont.)**

**(a) Leaks** in the vehicle LP-Gas systems **shall be repaired** before the vehicle is moved indoors.

**(b) Primary shutoff valves** on cargo tanks, portable containers, and other LP-Gas containers installed on the vehicle (other than propulsion engine fuel containers) **shall be closed**.

191) . **Parking and Garaging Vehicles**

**58-§9.7.3.7 (2) Indoor Service & Repair – (cont.)**

**(c) LP-Gas liquid shall be removed** from the piping, pump, meter, delivery hose, and related equipment and the pressure therein reduced to approximately atmospheric before the vehicle is moved inside.

**(d)** Delivery hose or valve outlets shall be plugged or capped **before** the vehicle is moved inside.

192) . **Parking and Garaging Vehicles**

**58-§9.7.3.7 (2) Indoor Service & Repair – (cont.)**

**(e)** No container shall be located near a **source of heat** or within the direct path of hot air blown from a blower or from a blower-type heater.

**(f)** LP-Gas containers shall be gauged or weighed to determine that they are **not overfilled**.

193) . **Parking and Garaging Vehicles**

**58-§9.7.3.8 Indoors**

If repair work or servicing is to be performed on a **cargo tank vehicle system**, all LP-Gas shall be removed from the cargo tank and piping, and the system shall be thoroughly purged before the vehicle is moved indoors.

194) . **Poll Questions**

**Break**

195) . # LP-Gas System Installation

196) . **Containers**

**58-§5.2.1.1 Fabrication Codes**

Containers shall be designed, fabricated, tested, and marked (or stamped) in accordance with the regulations of the

- U.S. Department of Transportation (**DOT** 49 CFR);
- Federal Aviation Administration (**FAA** 14 CFR);
- The **ASME** *Boiler and Pressure Vessel Code*, Section VIII "Rules for the Construction of Unfired Pressure Vessels"

197) . **Cylinder Rules**

**58-§5.2.1.1 Fabrication Codes**

**(C)** Where Containers fabricated to the Interstate Commerce Commission **(ICC)** prior to April 1, 1967, are used the requirements of section **1.4** shall apply.

198) . **Cylinder Rules**

**58-§1.4 Retroactivity.**

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

199) . **Container Installation**

**58-§6.8.3.1 Installation of Aboveground Containers**

Horizontal ASME containers designed for permanent installation in stationary service above ground shall be placed on masonry or other noncombustible structural supports located on **concrete or masonry foundations** with the container supports.

200) . **Container Installation**

**Table 6.4.1.1 Separation Distances Between Containers, Important Buildings, and Line of Adjoining Property That Can Be Built Upon**

| Water Capacity per Container | | Minimum Distances | | | | | |
|---|---|---|---|---|---|---|---|
| | | Mounded or Underground Containers[a] | | Aboveground Containers | | Between Containers[b] | |
| gal | $m^3$ | ft | m | ft | m | ft | m |
| <125[c] | <0.5[c] | 10 | 3 | 0[d] | 0[d] | 0 | 0 |
| 125–250 | 0.5–1.0 | 10 | 3 | 10 | 3 | 0 | 0 |
| 251–500 | >1.0–1.9 | 10 | 3 | 10 | 3 | 3 | 1 |
| 501–2,000 | >1.9–7.6 | 10 | 3 | 25[c] | 7.6 | 3 | 1 |
| 2,001–30,000 | >7.6–114 | 50 | 15 | 50 | 15 | 5 | 1.5 |
| 30,001–70,000 | >114–265 | 50 | 15 | 75 | 23 | | |
| 70,001–90,000 | >265–341 | 50 | 15 | 100 | 30 | ¼ of sum of | |
| 90,001–120,000 | >341–454 | 50 | 15 | 125 | 38 | diameters of | |
| 120,001–200,000 | >454–757 | 50 | 15 | 200 | 61 | adjacent | |
| 200,001–1,000,000 | >757–3,785 | 50 | 15 | 300 | 91 | containers | |
| >1,000,000 | >3,785 | 50 | 15 | 400 | 122 | | |

201) . **Installing Aboveground Containers**

**58-§6.4.1.3**

The **25 ft.** minimum distance from aboveground 501-2000 gal. ASME containers to a building or the 501-2000 gal. ASME containers to a building or the line of adjoining property that can be built upon shall be **reduced to 10 ft.** for a single container of **1200 gal.** or less where such container is at least 25 ft from any other LP-Gas container of more than 125 gal. water capacity.

202) . **Aboveground Installation**

203) . **Container Installation**

**58-§6.9.2.3 (1) Pressure Relief Valves**

A pressure relief device installed on an ASME container with a water capacity of **125 gallons or more** used in stationary service must be vented upward away from the container and to the open air.

204) . **Container Installation**

**58-§6.4.4.3 Pressure Relief Discharge**

The distance measured horizontally from the point of discharge of a container pressure relief valve to any building opening below the level of such discharge shall be in accordance with Table 6.4.4.3.

205) . **Container Installation**

Table 6.4.4.3 Separation Distance Between Container Pressure Relief Valve and Building Openings

| Container Type | Exchange or Filled on Site at Point of Use | Distance Horizontally from Relief Valve Discharge to Opening Below Discharge | | Discharge from Relief Valve, Vent Discharge, and Filling Connection to Exterior Source of Ignition, Openings into Direct-Vent Appliances, and Mechanical Ventilation Air Intakes | |
|---|---|---|---|---|---|
| | | ft | m | ft | m |
| Cylinder | Exchange | 3 | 0.9 | 5 | 1.5 |
| Cylinder | Filled on site at the point of use | 3 | 0.9 | 10 | 3.0 |
| ASME | Filled on site at the point of use | 5 | 1.5 | 10 | 3.0 |

206) . **Container Installation**

**58-§6.8.6.1 Underground and Mounded Containers**

ASME containers for underground installation shall be installed:

**(A) 6 inches** below grade where no vehicle traffic is expected

**(B) 18 inches** below grade where vehicle traffic is expected

207) . **Underground Installation**

208) . **Underground Installation**

209) . **Cylinders**

**58-§6.8.2 Installation of Cylinders**

**§6.8.2.1** Cylinders shall be installed only aboveground and shall be set upon a firm foundation of **concrete, masonry, or metal** and be firmly secured against displacement.

**§6.8.2.2** The cylinder shall not be in contact with the **soil**.

210) . # Installation of Cylinders

211) . **Cylinders**

**58-§6.8.2 Installation of Cylinders – (cont.)**

**§6.8.2.3** Flexibility shall be provided in the connecting piping.

**§6.8.2.4** Where flexible connectors are used, they shall comply with 6.11.6. **(References Flexible connectors)**

212) . **Container Installation**

**58-§6.5.3.3 Combustible Material**

Combustible materials shall not accumulate or be stored within **10 ft.** of a container.

213) . **Container Installation**

**58-§6.5.3.6 Other Storage Containers**

The minimum horizontal separation between aboveground LP-gas containers and aboveground tanks containing liquids having flash points **below 200°F shall be 20 ft.**

Examples: Gasoline, diesel, kerosene

214) . **Container Installation**

**58-§6.5.3.13 Electric Power Lines**

An aboveground LP-Gas container must not be located within **6 ft.** of a vertical plane beneath overhead electric power lines that are over **600 volts**.

215) . **Container Installation**

216) . **Container Installation**

217) . **Container Nameplate**

**SR §9.129 (a) Manufacturer's Nameplate**

LP-gas shall not be introduced into an ASME container unless the container is equipped with an **original nameplate or a**t least one of the nameplates defined in this subsection **permanently attached** to the container.

218) . **Container Nameplate**

**SR §9.129 (a) Manufacturer's Nameplate – (cont.)**

**(1)** Commission identification nameplate
**(water capacity of 4,001 gallons or more)**

**(2)** Duplicate nameplate
**(issued by the original manufacturer)**

**(3)** Modification nameplate
**(issued by ASME Code facility)**

**(4)** Replacement nameplate
**(issued by original manufacturer)**

219) . **Container Nameplate**

**SR §9.129 Manufacturer's Nameplate – (cont.)**

**(d)** Nameplates on stationary ASME containers built **prior** to **September 1, 1984**, shall include at least the following legible information:

**(1)** Name of container manufacturer,
**(2)** Manufacturer's serial number,
**(3)** Container's working pressure,
**(4)** Container's water capacity, and
**(5)** the ASME Code symbol.

220) . **Container Nameplate**

**SR §9.129 Manufacturer's Nameplate – (cont.)**

**(e)** Nameplates on stationary ASME containers built on or **after September 1, 1984**, shall be stainless steel and permanently attached by continuous fusion welding around the perimeter of the nameplate, and shall be stamped or etched with the following:

221) . **Container Nameplate**

**58-§5.2.8.3 (C) Container Marking**

**(1)** Service for which the container is designed (e.g., underground, aboveground, or both)
**(2)** Name and address of container supplier or trade name of container
**(3)** Water capacity of container in pounds or U.S. gallons
**(4)** MAWP in pounds per square inch
**(5)** Wording that reads "This container shall not contain a product that has a vapor pressure in excess of _XX__ psig at 100°F" *(see Table 5.2.4.2)*

222) . **Container Nameplate**

**58-§5.2.8.3 (C) Container Marking – (cont.)**

**(6)** Outside surface area in square feet
**(7)** Year of manufacture
**(8)** Shell thickness and head thickness
**(9)** OL (overall length), OD (outside diameter), and HD (head design)
**(10)** Manufacturer's serial number
**(11)** ASME Code symbol
**(12)** Minimum design metal temperature _XX_ °F at MAWP _XX_ psi
**(13)** Type of construction "W"
**(14)** Degree of radiography "RT-_XX_"

223) . **Container Nameplate**

**SR §9.129 (h) Underground Containers**

Underground containers shall have the system nameplate permanently attached and readily accessible for inspection when the container is buried.

Where the container is buried, mounded, insulated, or otherwise covered so the nameplate is obscured a **duplicate** nameplate shall be installed in a clearly visible and accessible location.

224) . **LP-Gas Installations**

**SR §9.131 200-psig Stationary Vessels**

200-psig working pressure stationary vessels in LP-Gas service **prior to Sept. 1, 1981**, may remain in service provided they are fitted with 250-psig relief valves.
This **does not** apply to LP-Gas motor fuel and mobile fuel containers.
(250-psig or 312-psig)

225) . # Container Painting

226) **Container Painting**

**SR §9.141 (a) Uniform Safety Requirements**

**(1)** ASME containers, except vaporizers, shall be painted

- White or
- Aluminum, or
- Any other **heat reflective** color

(such as light green, light blue, etc.)

227) **. Container Painting**

228) . **Container Painting**

229) . **Container Protection**

230) . **Corrosion Protection**

**SR §9.116 Corrosion Protection System**

**(a)** In addition to **NFPA 58**, steel containers and steel piping systems installed underground, partially underground, or as mounded installations on or after **March 1, 2014**, shall include a corrosion protection system.

231) . **Corrosion Protection**

**(b)** Cathodic protection systems installed on or after March 1, 2014, shall be monitored by every licensee servicing the container in accordance with NFPA 58 **§6.19.3.1.**

Licensees shall **document** the test results.

232) . **Corrosion Protection**

**58-§6.8.6.1 Underground Containers**

**(I)** A corrosion protection system shall be installed on new installations of underground steel containers, unless technical justification is provided to and is approved by the authority having jurisdiction.

The corrosion protection system shall include the following:

233) . **Corrosion Protection**

**58-§6.8.6.1 (I) Underground Containers – (cont.)**

**(1)** A container **coating** complying with **5.2.1.11**

**(2)** A **cathodic protection system** that consists of a **sacrificial anode(s)** or an impressed current anode

**(3)** A means to **test** the performance of the cathodic protection system in accordance with 6.19.3 **- - (Voltmeter & Half-Cell)**

234) . **Corrosion Protection**

**SR §9.116 Corrosion Protection System – (cont.)**

**(J)** Prior to burial, the container shall be visually examined for damage to the coating. Damaged areas shall be repaired with a coating recommended for underground service and compatible with the existing coating.

235) . **Corrosion Protection**

**58-§6.19.3.1**

Cathodic protection systems installed in accordance with this code shall be monitored by testing, the results shall be documented, and confirming tests shall be described by one of the following:

236) . **Corrosion Protection**

**58-§6.19.3.1 – (cont.)**

**(1)** Producing a voltage of **–0.85 volt or more** negative, with reference to a saturated **copper–copper sulfate** half-cell.

237) . **Corrosion Protection**

**58-§6.19.3.2 Corrosion Protection Testing**

Sacrificial anodes shall be tested in accordance with the following schedule:

**(1)** Upon **installation**

(or within 180 days if prohibited by climatic conditions)

**(2) 12 to 18 months -** after the **initial** test

**(3)** Follow-up at intervals not to exceed **36 months**.

238) . **Corrosion Protection**

**58-§6.19.3.2 Corrosion Protection Testing – (cont.)**

**(4)** Systems failing a test shall be repaired as soon as practical unless climatic conditions prohibit this action, in which case the repair shall be made in **not more than 180 days**.

**(5)** Documentation of the results of the **two most recent** tests shall be **retained**.

239) . **Corrosion Protection**

**SR §9.116 (d) Corrosion Protection Testing**

Steel containers and piping systems installed underground, partially underground, or as mounded installations on or after March 1, 2014, shall **not** be **filled** unless a cathodic protection system is installed in accordance with this section.

240) . **Sale of LP-Gas or Container**

**SR §9.132 Sales to Unlicensed Individuals**

A licensee shall not sell **LP-gas**, an **ASME** container, or a **DOT** cylinder greater than **96 pounds** to an unlicensed individual for **resale**.

A licensee shall not sell an LP-gas container to an unlicensed individual for **installation** without determining that such container will be installed by a licensee **authorized** to perform such installation.

241) . **Piping System**

**58-§5.11.3 Pipe and Tubing.**

**§5.11.3.1** Pipe shall be wrought iron or steel (black or galvanized), brass, copper, polyamide or polyethylene:

- **(1)** Wrought iron, ASTM B 36.10M
- **(2)** Steel pipe, ASTM A 53
- **(3)** Steel pipe, ASTM A 106
- **(4)** Brass pipe, ASTM B 43
- **(5)** Copper pipe, ASTM B 42
- **(6)** Polyamide / Polyethylene, ASTM D 2513

242) . **Piping System**

**58-§5.11.3 Pipe and Tubing. – (cont.)**

**§5.11.3.2** Tubing shall be steel, stainless steel, brass, copper, polyamide or polyethylene:

**(1)** Brass tubing, ASTM B 135

**(2)** Copper tubing:

**(a)** Water Tubing **Type K or L**, ASTM B88

**(b)** **Refrigeration** Tubing, ASTM B280

**(3)** Polyamide / Polyethylene, ASTM D 2513

**(4)** Corrugated Stainless Steel Tubing, ANSI 6.26

243) . **Piping System**

**58-§5.11.4 Fittings for Metallic Pipe and Tubing**

**§5.11.4.1** Fittings shall be:

- Steel
- Brass
- Copper
- Malleable Iron
- Ductile Iron

244) . **Piping System**

**58-§5.11.5 Fittings for Poly**

**§5.11.5.1** Joints in polyamide and polyethylene pipe and polyethylene tubing shall be made by:

- Heat fusion,
- Compression-type mechanical fittings
- Factory-assembled transition fittings

245) . **Piping System**

**54-§7.1.7.1**

Plastic piping shall be installed **outdoors, underground only**.

**58-§6.11.4.1**

Polyethylene and polyamide pipe, tubing and fittings shall be installed **outdoors underground only**.

246) . **Piping System**

**58-§6.11.1 Piping System Service Limitations.**

**§6.11.1.1**

The vapor or liquid state and pressure for piping systems shall be as follows:

**(A) Outdoor** LP-Gas liquid or vapor **metallic piping** systems shall have **no pressure limitations**.

247) . **Piping System**

**58-§6.11.1 Piping System Service Limitations. – (cont.)**

**(B) Outdoor underground** LP-Gas liquid or vapor **polyamide** piping systems shall be limited to the design pressure of the piping.

**(C) Polyethylene** piping systems shall be limited to:

(1) Vapor service not exceeding **30-psig**

(2) Installation **outdoors** and **underground**

248) . **Piping System**

**58-§6.11.3 Installation of Metallic Pipe, Tubing, and Fittings.**

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

**§6.11.3.11** The portion of aboveground piping in contact with a support or a corrosion-causing substance shall be protected against corrosion.

**§6.19.1** All materials and equipment installed above ground shall be of corrosion-resistant material or shall be coated or protected to minimize exterior corrosion.

249) . **Piping System**

**58-§6.11.3.12 Underground Piping**

Buried metallic pipe and tubing shall be installed underground with a minimum **12 inches** of cover.

**(A) 18 inches** minimum if external damage likely

**(B)** Installed in conduit or bridged (shielded) if a minimum 12 inches of cover cannot be maintained.

250) . **Piping System**

**54-§5.6.4.3 Anodeless Risers**

Anodeless risers shall comply with the following:

**(1)** Factory-assembled anodeless risers shall be recommended by the manufacturer for the gas and

Shall be leak tested by the manufacturer in accordance with written procedures.

251) . **Piping System**

**54-§5.6.4.3 Anodeless Risers – (cont.)**

**(2)** Service head adapters and field-assembled anodeless risers with service head adapters shall be recommended by the manufacturer for the gas and be design-certified to meet Category 1 of ASTM D 2513,

**(3)** The use of plastic pipe, tubing, and fittings in undiluted LP-gas piping systems shall be in accordance with NFPA 58.

252) . **Piping System**

**58-§6.11.4.3 Factory Assembled Anodeless Risers**

Assembled anodeless risers shall be used to terminate underground polyamide and polyethylene piping systems above ground.

253) . **Piping System**

**58-§6.11.4.4 Field Assembled Risers**

Field assembled risers shall be supplied only in kit form with all the hardware necessary for installation.

**(A)** Field-assembled risers shall be:

**(1)** Design certified

**(2)** Sealed and pressure tested by the installer

**(3)** Installed in accordance with manufacturer's instructions

254) . **Connectors**

**58-§6.11.6 Flexible Connectors.**

**§6.11.6.1** Flexible connectors shall be installed in accordance with the manufacturer's instructions.

**§6.11.6.2 Hose** shall be **prohibited** between the first-stage and second-stage regulator except during temporary use.

**§6.11.6.3** Flexible metallic connectors shall not exceed **5 ft.** in overall length when used with liquid or vapor piping on stationary containers of 2000 gal. water capacity or less.

255) . # Pressure Regulators

256) . **Pressure Regulators**

**58-§6.10 Regulator Installation.**

- **§6.10.2.1**
- **Two-stage** regulator system,
- **Integral** two-stage regulator, **or**
- **2-psi** regulator system

is required for all fixed piping systems that serve
**½-psig** appliance systems
(normally operated at **11 in. w.c.** pressure).

257) . **Definitions**

**58-§3.3.74.11 Two Stage Regulator System**

An LP-Gas vapor delivery system that combines a **first-stage** regulator and a **second-stage** regulator(s) or utilizes a separate integral two-stage regulator.

258) . **Definitions**

**58-§3.3.74.2 First-Stage Regulator.**

A pressure regulator for LP-Gas vapor service designed to reduce pressure from the container to **10-psig** or less.

259) . **Definitions**

**58-§3.3.74.7 Second-Stage Regulator.**

A pressure regulator for LP-Gas vapor service designed to **reduce first-stage regulator** outlet pressure to the pressure required at the point of delivery. **(14 inches W.C. or less)**

260) . **Definitions**

**58-§3.3.74.5 Integral Two-Stage Regulator.**

A pressure regulator for LP-Gas vapor service that combines a **high-pressure** regulator and a **second-stage** regulator into a single unit.

261) . **Definitions**

**58-§3.3.74.9 2-psi Regulator System.**

An LP-Gas vapor delivery system that combines a

- **First-stage** regulator, a
- **2-psi service** regulator, and a
- **Line pressure** regulator(s).

262) . **Definitions**

**58-§3.3.74.10 2-psi Service Regulator.**

A pressure regulator for LP-Gas vapor service designed to reduce first-stage regulator outlet pressure to a nominal **2-psig.**

263) . **Definitions**

**58-§3.3.74.6 Line Pressure Regulator**

A pressure regulator with no integral overpressure protection device for LP-Gas vapor service to reduce a nominal inlet pressure.

264) . **Pressure Regulators**

**58-§6.10 Regulator Installation. – (cont.)**

**§6.10.2.3**

**Single-stage** regulators shall **not be installed** in fixed piping systems **on or** after **February 1, 2001**. **(with changes per SR 9.403)**

265) . **Container Installation**

**58-§6.10.1.5 Regulator Pressure Relief Location**

The point of discharge from the required pressure relief device on regulated equipment installed outside of buildings or occupiable structures in fixed piping systems shall be:

- Not less than **3 ft.** horizontally from any building opening below the level of discharge, and
- Not beneath or inside any building unless this space is **not** enclosed for more than **50 percent** of its perimeter.

266) . **Pressure Regulators**

**58-§6.10.1.6 Regulator Pressure Relief Device**

The point of discharge shall also be located not less than **5 ft.** in any direction from:

- Any source of ignition,
- Openings into direct-vent (sealed combustion system) appliances, or
- Mechanical ventilation air intakes.

267) . **Pressure Regulators**

**58-§6.8.6.1 (H) Regulator Venting**

The discharge of the regulator vent on an Underground Container shall be **above** the highest probable water level.

268) . **Pressure Regulators**

**58-§5.10.3.1 Pipe for Regulator Venting**

Pipe or tubing used to vent regulators shall be:

**(1) Metal pipe** in accordance with 5.11.3

**(2) PVC** meeting the requirements of UL 651,

*Schedule 40 or 80 Rigid PVC Conduit*

**(3)** Flexible conduit meeting the requirements of UL 1660, *Standard for Liquid-Tight Flexible Nonmetallic Conduit*

**§5.10.3.2** Other PVC piping and polyethylene and polyamide pipe and tubing **shall not** be permitted to be used to vent regulators.

269) . **Poll Questions**

270) . # Placing Appliances in Operation

271) . **Piping System**

**58-§6.16 Testing New or Modified Piping Systems.**

**§6.16.1.1** After installation or modification, piping systems (including hose) shall be proven free of leaks at **not less than** the normal operating pressure.

**§6.16.3** Piping within the scope of **NFPA 54** shall be pressure tested in accordance with that code.

272) . **Inspection, Testing and Purging**

**54-§8.1 Pressure Testing and Inspection.**

**§8.1.1.1** Prior to acceptance and initial operation, all piping installations shall be **visually inspected** and **pressure tested** to determine that the materials, design, fabrication, and installation practices comply with this code.

**§8.1.1.2** Inspection shall consist of **visual examination**, during or after manufacture, fabrication, assembly, or pressure tests.

273) . **Definitions**

**58-§3.3.66 Pressure Test.**

An operation performed to verify the **gastight integrity** of gas piping following its installation or modification.

*This is **NOT** a leak check.*

274) . **Inspection, Testing and Purging**

**54-§8.1 Pressure Testing and Inspection. – (cont.)**

**§8.1.1.3** Where repairs or additions are made following the pressure test, the affected piping shall be tested.

**Minor repairs** and additions are **not** required to be pressure tested, provided that the work is inspected, and connections are tested with a **noncorrosive leak-detecting fluid** or other leak-detecting methods approved by the authority having jurisdiction.

275) . **Inspection, Testing and Purging**

276) . **Inspection, Testing and Purging**

**54-§8.1 Pressure Testing and Inspection. – (cont.)**

**§8.1.1.4** Where **new** branches are installed to **new appliance(s)**, only the **newly installed** branch(es) shall be required to be pressure tested. Connections between the new piping and the existing piping shall be tested with a **noncorrosive leak detecting fluid** or approved leak-detecting methods.

277) . **Downstream #54 Pressure Testing**

**54-§8.1 Pressure Testing and Inspection. – (cont.)**

**§8.1.1.5** A piping system shall be tested as a complete unit or in sections. Under no circumstances shall a valve in a line be used as a bulkhead between gas in one section of the piping system and test medium in an adjacent section, unless a double block and bleed valve system is installed.

278) . **Downstream #54 Pressure Testing**

279) . **Downstream #54 Pressure Testing**

**54-§8.1.1.5 – (cont.)**

A valve shall not be subjected to the test pressure unless it can be determined that the valve, **including the valve closing mechanism**, is designed to safely withstand the pressure.

**§8.1.1.7** Prior to testing, the interior of the pipe shall be cleared of all foreign material.

280) . **Inspection, Testing and Purging**

**54-§8.1 Pressure Testing and Inspection. – (cont.)**

**§8.1.2** The test medium shall be:

- **Air**
- Nitrogen
- Carbon Dioxide, or
- An Inert Gas.

Oxygen shall **not** be used as a test medium

281) . **Inspection, Testing and Purging**

**54-§8.1.3 Test Preparation.**

**§8.1.3.3** Appliances and equipment that are not to be included in the test shall be either **disconnected** from the piping or **isolated** by blanks, blind flanges or caps.

**§8.1.3.4** Where the piping system is connected to appliances or equipment designed for operating pressures of **less than** the test pressure, such appliances or equipment shall be isolated from the piping system by **disconnecting** them and **capping** the outlet(s).

282) . **Inspection and Pressure Testing**

**54-§8.1.3 Test Preparation. – (cont.)**

**§8.1.3.5** Where the piping system is connected to appliances or equipment designed for operating pressures **equal to or greater than** the test pressure, such appliances and equipment shall be **isolated** from the piping system by **closing** the individual appliance shutoff valve(s).

283) . **Inspection and Pressure Testing**

**54-§8.1.3 Test Preparation. – (cont.)**

**§8.1.3.6** All testing of piping systems shall be performed in a manner that protects the safety of **employees** and the **public** during the test.

284) . **Inspection, Testing and Purging**

**54-§8.1 Pressure Testing and Inspection. – (cont.)**

**§8.1.4.1** Test pressure shall be measured with a manometer or with a **pressure measuring device** designed and calibrated to read, record, or indicate a pressure loss due to leakage during the pressure test period.

**Mechanical gauges** used to measure test pressures shall have a range such that the highest end of the scale is not greater than **5 times** the test pressure.

285) **. Inspection, Testing and Purging**

**54-§8.1.4.2 Test Pressure – (cont.)**

The test pressure to be used shall be:

**No less than 1 1⁄2 times** the proposed maximum working pressure,

- but -

**Not less than 3-psi**, irrespective of design pressure.

286) . **Pressure Measurement**

287) . **Inspection and Pressure Testing**

**54-§8.1.4.3 Test Pressure – (cont.)**

Test duration shall be not less than 1⁄2 hour for each 500 $ft^3$ of pipe volume or fraction thereof.

When testing a system having a volume less than 10 $ft^3$ or a system in a **single-family dwelling**, the test duration shall be a minimum of **10 minutes**.

The duration of the test shall not be required to exceed 24 hours.

288) . **Inspection, Testing and Purging**

**54-8.1.5.2 Detection of Leaks and Defects.**

The leakage shall be located by means of an approved gas detector, a noncorrosive leak detection fluid, or other approved leak detection methods.

- *Matches*
- *Candles*
- *Open Flames or*
- *Other Ignition Sources*

*Shall **NOT** be used.*

289) . **Placing Appliances in Operation**

**54-§8.2 Piping System Leak Check.**

**§8.2.1 Test Gases.**

**Leak checks** using **fuel gas** shall be permitted in piping systems that have been **pressure tested** (w/ Air, an inert gas, etc.).

290) . **Definitions**

**58-§3.3.42 Leak Check.**

An operation performed on a gas piping system to verify that the system **does not leak**.

This is **NOT** a pressure test

291) . **Placing Appliances in Operation**

**54-§8.2.2 Turning Gas On.**

During the process of turning gas on into a system of **new** gas piping:

- The entire system shall be inspected to insure that there are no open fittings or ends
- All valves at unused outlets are closed and plugged or capped.

292) . **Placing Appliances in Operation**

**54-§8.2.3 Leak Check.**

Immediately after the gas is turned on into a **new system** or into a system that has been **initially restored after an interruption of service**, the piping system shall be checked for leakage.

Where leakage is indicated, the gas supply shall be **shut off** until the necessary repairs have been made.

***Bobtail drivers are NOT authorized to repair LP-gas systems***

293) . **Placing Appliances in Operation**

**54-§8.2.3 Leak Check. – (cont.)**

*This would include the following scenarios:*

- *A new or modified system placed into service*
- *Gas leakage is suspected*
- *A gas meter (or regulator) is replaced*
- *An appliance or appliance connector is replaced*
- *An out-of-gas call*

294) . **Placing Appliances in Operation**

**54-§8.2.4 Placing Appliances in Operation**

- Appliances and equipment shall not be placed in operation until after the **piping system** has been checked for leakage in accordance with 8.2.3,
- The piping system is **purged** (of air) in accordance with Section 8.3, and
- Connections to the appliance are checked for **leakage**.

295) . **Leak Testing**

**NFPA 58-Annex L** suggests a leak check on upstream gas piping can be performed by using one of the following methods:

**(1)** Inserting a gauge between the container shutoff valve and the first-stage regulator or integral two-stage regulator in the system, admitting **full container pressure** to the system and then closing the container shutoff valve.

- Enough gas should then be released from the system to lower the pressure gauge reading **by** 10-psi.

296) . **Leak Testing**

**58-Annex L**

**(4)** When testing a system that has a first-stage regulator, or an integral two-stage regulator, insert a 30-psi pressure gauge on the downstream side of the first-stage regulator or at the intermediate pressure tap of an integral two-stage regulator, admitting normal operating pressure to the system and then closing the container valve.

- Enough gas should be released from the system to lower the pressure gauge reading **by a minimum of 2-psi** so that the first-stage regulator is **unlocked.**

297) . **Leak Testing**

Leak testing piping systems:

- **Outside** a building (upstream of 2nd stage regulator) shall be in accordance with **NFPA 58**.
- **Inside** a building (downstream of 2nd stage regulator) shall be in accordance with **NFPA 54.**

Both NFPA 58 **Annex L** and NFPA 54 **Annex C** state:

- The system should then be allowed to stand for **3 minutes** without showing an increase or a decrease in the pressure gauge reading.

298) . **Connection Points For Testing**

299) **.** **Leak Testing**

The **NFPA 54 Annex C.3** suggests three methods for leak checking a gas piping system:

**(a)** Upstream of the first stage regulator using tank pressure reduced **by** 10-psi for 3 minutes.

**(b)** Between the first and second stage regulators with pressure reduced **by** 2-psi for 3 minutes.

**(c)** Downstream of the second stage regulator with pressure reduced **to 9 inches water column +/- ½ in.** for 3 minutes.

300) . **Purging Requirements**

**54-§8.3.2.1 Purging Procedure.**

**§8.3.2.1** The piping system shall be purged in accordance with one or more of the following:

**(1)** The piping shall be purged with **fuel gas** and shall discharge to the outdoors.

**(2)** The piping shall be purged with fuel gas and shall discharge to the indoors or outdoors through an appliance burner not located in a combustion chamber.

**Such burner shall be provided with a continuous source of ignition.**

301) . **Purging Requirements**

**54-§8.3.2.1 Purging Procedure. – (cont.)**

**(3)** The piping shall be purged with fuel gas and shall discharge to the indoors or outdoors through a **burner** that has a continuous source of ignition and that **is designed for such purpose**.

**(4)** The piping shall be purged with fuel gas that is discharged to the indoors or outdoors, and the point of discharge **shall be monitored with a listed combustible gas detector** in accordance with 8.3.2.2.

**Purging shall be stopped when fuel gas is detected.**

302) . **Purging Requirements**

**54-§8.3.3 Purging Appliances and Equipment.**

After the piping system has been placed in operation, appliances and equipment shall be purged before being placed into operation.

***Bobtail certification does NOT allow adjusting of appliances.***

*The following slides detail the points which must be checked for proper operation following an **out-of-gas** event.*

303) **. Placing Appliances in Operation**

**54-§11.1.1 Adjusting Burner Input.**

The input rate of the burner shall be adjusted to the **proper value** in accordance with the manufacturer's instructions.
Firing at a rate in **excess** of the nameplate rating is prohibited.

**§11.1.1.3 Overfiring** shall be prohibited.

304) **. Placing Appliances in Operation**

**54-§11.3 Safety Shutoff Devices.**

Where a safety shutoff device is provided, it must be **checked for proper operation** and adjusted in accordance with the manufacturer's instructions.
If the device does **not turn off the gas supply** in the event of pilot outage or other improper operation, it shall be **serviced or replaced** with a new device.
***Bobtail drivers will "Red Tag" the appliance.***

305) . **Placing Appliances in Operation**

**54-§11.4 Automatic Ignition.**

Appliances supplied with means for **automatic** ignition must be checked for **proper operation**.

If necessary, proper adjustments shall be made.

***Bobtail drivers will "Red Tag" the appliance.***

306) . **Placing Appliances in Operation**

**54-§11.5 Protective Devices.**

All protective devices furnished with the appliance:

- Limit control
- Fan control to blower
- Temperature and pressure relief valve
- Low-water cutoff device
- Manual operating features shall be checked for proper operation.

307) . **Placing Appliances in Operation**

**54-§11.6 Checking the Draft.**

Draft hood–equipped appliances shall be checked to verify that there is no draft hood spillage after **5 minutes** of main burner operation.

This is done by passing a lighted match or taper around the edge of the relief opening of the draft hood.

- Where the gas vent is drawing **properly**, the match flame will be drawn into the draft hood.
- Where **not**, the combustion products will tend to extinguish this flame.

308) **. Placing Appliances in Operation**

309) . **Placing Appliances in Operation**

**54-§11.6 Checking the Draft. – (cont.)**

Where the combustion products are escaping from the relief opening of the draft hood, the appliance shall **not** be operated until proper adjustments or repairs are made to provide adequate draft through the gas vent.

***Bobtail drivers will "Red Tag" the appliance.***

310) . **Placing Appliances in Operation**

**54-§11.7 Operating Instructions.**

Operating instructions shall be furnished and shall be **left** in a prominent position near the appliance for the use of the consumer.

311) . # Reported Leaks

312) . **Leak Procedure**

**SR §9.35. Written Procedure for LP-Gas Leaks**

**(a)** A licensee shall have written procedures to follow when any employee is notified of a possible leak

- All employees shall be **familiar** with the procedure
- They shall be able to implement the procedure **without** management oversight
- Shall be available to emergency response agencies

313) . **Leak Procedure**

**SR §9.35. Written Procedure for LP-Gas Leaks – (cont.)**

**(b)** Shall include the **classification** of the leak grade as defined in LP-Gas Safety Rule 9.2

**(c)** Shall include the appropriate **action** for the classification of the leak according to the table.

314) . **LP Gas Leak Classification**

**Grade 1:** Requires prompt action to protect life and property.

315) . **LP Gas Leak Classification**

**Grade 2:** Can be scheduled for repair on a normal routine basis.

316) **.** **Leak Procedure**

**58-§6.29.2 Emergency Planning**

**§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.

317) . **Poll Questions**

**Break**

318) . # Leak Testing School Facilities

319) . **Testing School Facilities**

**SR §9.41 (b) School District Requirements.**

A district shall ensure that a **leakage test** is performed on each school LP-Gas system.

Testing shall be performed by an LP-Gas licensee or an employee of the school district who has been certified by the Commission to perform the test.

320) . **Testing School Facilities**

**SR §9.41 (b) School District Requirements. – (cont.)**

**(1)** If a leak is found, the school district shall immediately **remove** the facility from LP-gas service until:

- Repairs are made and
- It passes a subsequent LP-gas leakage test.

321) . **Testing School Facilities**

**SR §9.41 (b) School District Requirements. – (cont.)**

**(2)** Each school district must provide the supplier with a copy of the most current LPG **Form 30** as proof the system has been tested.

**(3)** School district must retain LPG Form 30 for a minimum of **5 years** from the date each test was performed.

322) . **Testing School Facilities**

**SR §9.41 (c) Leakage Test Requirements.**

**(1)** The results of the leakage test for each building or structure shall be immediately **documented** on LPG Form 30.

**(2)** LP-gas shall be used as the test medium.

**(3)** Leakage test pressure shall not exceed **normal** operating pressure.

323) . **Testing School Facilities**

**SR §9.41 (c) Leakage Test Requirements. – (cont.)**

**(4)** Leakage test duration shall not be less than **30 minutes**.

**(5)** Test pressure shall be monitored with a manometer or with a pressure-measuring instrument designed and calibrated to read, record, or indicate a pressure loss caused by leakage during the test period. Mechanical gauges used to measure test pressures shall have a range such that the highest end of the scale is not greater than **5 times** the test pressure.

324) . **Testing School Facilities**

**SR §9.41 (c) Leakage Test Requirements. – (cont.)**

**(6)** The manual shutoff valve installed in the piping upstream of each appliance must be open and must supply pressure to the appliance.
To prove the integrity of the 100% pilot shutoff valve on each appliance so equipped, the manual control on 100% safety valve must be turned to the **ON** position.
Pilots **not** incorporating a 100 % safety valve and manual valves not incorporating safety shutoff systems must be in the **OFF** position

325) . **Testing School Facilities**

**SR §9.41 (d) Methods for Conducting a Leak Test.**

**(1) Upstream** of the first stage regulator

**(2) Between** the first stage and second stage regulators

**(3) Downstream** of the final stage regulator

326) . **Connection Points For Testing**

327) **.** **Testing School Facilities**

**SR §9.41 (e) Supplier Requirements.**

A supplier shall terminate service to a district if:

- Receives notification from the district, LP-Gas licensee or the person conducting the test that there is **leakage** in a school LP-gas system;
- Leak test was not performed in accordance with the requirements of this section; or
- The supplier has not received a **copy** of the LPG Form 30 from the school district.

328) . **Testing School Facilities**

**SR §9.41 (g) Compliance Deadline.**

**(1)** Each school district shall ensure leakage testing is performed at **least once every two years.**

**(3)** Testing may be performed on a two-year cycle provided that at least **one-half** of the school district's facilities are tested each year.

329) . **Poll Questions**

330) . # Filling DOT Cylinders

331) . **Containers**

**58-§5.2.4.1 Container Service Pressure.**

**§5.2.4.1** The service pressure of cylinders shall be in accordance with regulations published under **Title 49 Code of Federal Regulations**, "Transportation."

**§5.2.4.6** Cylinders shall be designed and constructed for at least a **240-psig** service pressure.

332) **.** **Inspection of Containers**

**SR §9.137. Inspection of Containers at Each Filling**

Before filling a cylinder, the individual filling the container shall conduct a **visual inspection** of the exposed, readily accessible areas of the cylinder for any obvious defects.

Where the cylinder is dented, bulged, gouged, or corroded such that its integrity is substantially reduced, such container **shall not be filled**.

333) . **Inspection of Containers**

**58-§5.2.2 Cylinders.**

**§5.2.2.1 Cylinders** shall be containers designed, constructed, tested, and marked in accordance with U.S. Department of Transportation specifications, Title 49, Code of Federal Regulations, or in accordance with a valid DOT special permit.

**§5.2.2.2** Cylinders shall be continued in service and transported in accordance with DOT regulations.

**§5.2.2.3** A cylinder with an **expired** requalification date shall not be refilled until it is **requalified** by the methods prescribed in DOT regulations.

334) . **Inspection of Containers**

**58-§5.2.3 Cylinders Filled on Site at the Point of Use.**

**§5.2.3.1** Cylinders in stationary service that are filled on site at the point of use and, therefore, are **not under the jurisdiction of DOT** shall comply with one of the following criteria:

**(1)** They shall be requalified in accordance with DOT requirements.

**(2)** They shall be visually inspected within **12 years** of the date of manufacture and within **every 5 years** thereafter, in accordance with **5.2.3.2 through 5.2.3.4**.

335) . **Inspection of Containers**

**58-§5.2.3 Cylinders Filled on Site - (cont.)**

**§5.2.3.2** Any cylinder that fails one or more of the criteria in 5.2.3.4 shall **not** be refilled or continued in service until the condition is corrected.

**§5.2.3.3** Personnel shall be trained and qualified to perform inspections.

336) . **Inspection of Containers**

**58-§5.2.3 Cylinders Filled on Site - (cont.)**

**§5.2.3.4** Visual inspection shall be performed in accordance with the following:

**(1)** The cylinder is checked for exposure to **fire, dents, cuts, digs, gouges, and corrosion** according to CGA C-6, *Standard for Visual Inspection of Steel Compressed Gas Cylinders*, except that 5.2.1.1(1) of that standard (which requires tare weight verification) shall not be part of the required inspection criteria.

337) **.** **Inspection of Containers**

**58-§5.2.3.4 Visual inspection – (cont.)**

**(2)** The cylinder protective collar (where utilized) and the foot ring are intact and are **firmly attached**.

**(3)** The cylinder is painted or coated to minimize corrosion.

**(4)** The cylinder pressure relief valve indicates no visible damage, corrosion of operating components, or obstructions.

338) . **Inspection of Containers**

**58-§5.2.3.4 Visual inspection – (cont.)**

**(5)** There is no leakage from the cylinder or its appurtenances that is detectable without the use of instruments.

**(6)** The cylinder is installed on a firm foundation and is not in contact with the soil.

339) . **Inspection of Containers**

**58-§5.2.3.4 Visual inspection – (cont.)**

**(7)** A cylinder that passes the visual examination is marked with the month and year of the examination followed by the letter **E**.

**(8)** The results of the visual inspection are documented, and a record of the inspection is retained for a **5-year period**.

340) . **Filling DOT Cylinders**

**SR §9.136. Filling of DOT Containers**

**(a)** Single-opening (portable) DOT containers of less than 101 pounds **(100 pounds or less)** LP-gas capacity shall be filled by **weight only.**

Scales at licensees' facilities shall be currently registered with the **Texas Department of Agriculture**.

The scales shall have a rated weighing capacity which exceeds the total weight of the cylinders being filled.

341) . **Filling DOT Cylinders**

**SR §9.136. Filling of DOT Containers – (cont.)**

**Scales shall be accurate during the filling of cylinders**.

The formula for filling LP-gas containers by weight under this section is as follows:

**(1)** The propane capacity in pounds is determined by **multiplying** the total water capacity in pounds by **.42**.

**(2)** The proper scale setting is the total of the tare weight of the cylinder, the propane capacity in pounds, and the weight of the hose and nozzle.

342) . **Filling DOT Cylinders**

**58-§11.13.2 Industrial Truck Cylinders.**

**§11.13.2.1** Cylinders shall be designed, constructed, or fitted for **installation and filling** in either the **vertical or horizontal** position or, if of the universal type, in **either position**.

**§11.13.2.2 Universal cylinders** intended for use in the horizontal position shall be installed with the positioning **slot** correctly positioned prior to use or filling.

343) . **Filling DOT Cylinders**

**58-§11.13.2.3**

The fixed maximum liquid level gauge shall indicate the maximum permitted filling level in **either** position.

344) . **Filling DOT Cylinders**

**58-§5.9.2 Pressure Relief Devices.**

**§5.9.2.14** All cylinders used in industrial truck service (including forklift truck cylinders) shall have the cylinder's **pressure relief valve**:
Replaced by a new or unused Valve within **12 years** of the date of manufacture of the cylinder and every **10 years** thereafter.

345) . **Filling DOT Cylinders**

**58-§7.4.3 General Provisions for Volumetric Method of Filling Containers.**

**§7.4.3.1** The volumetric method shall be limited to the following containers, where they are designed and equipped for filling by volume:

**(1)** Cylinders of **101 lb. LP-gas capacity** or more

**(2)** Cargo tanks or portable tanks

**(3)** ASME and API-ASME containers complying with 5.2.1.1 or 5.2.4.2

346) . **LP-Gas Installations**

**SR §9.135. Unsafe Containers, Cylinders, or Piping**

A licensee or the licensee's employees shall not introduce LP-gas into any container or cylinder if the licensee or employee has knowledge or reason to believe that such container, cylinder, piping, or the system or the appliance to which it is attached is **unsafe** or is not installed in accordance with the statues or the LP-Gas Safety Rules.

347) . **Reporting Unsafe Activities**

**SR §9.38. Reporting Unsafe Activities**

A person may report any unsafe or noncompliant LP-gas activities by:

- Mail
- Telephone – **512-463-6788**
- E-mail
- Fax
- When possible, make the report using LPG **Form 22 (Available on Website)**