



MAINTENANCE FOR NATURAL GAS SYSTEMS

**PART 192
SUBPART "M"**

192.703 GENERAL

- ✘ Each segment must be maintained in accordance with this Subpart.
- ✘ Each unsafe segment must be repaired, replaced or removed.
- ✘ Hazardous leaks must be repaired promptly.



TRANSMISSION LINES: PATROLLING

192.705 (a)

- ✘ Must look for;
 - + Leaks,
 - + construction activity,
 - + and other factors affecting safety.



TRANSMISSION LINES: PATROLLING

192.705 (b)

- ✘ When establishing frequencies, must consider;
 - + Operating pressures,
 - + Class location,
 - + Terrain,
 - + Weather,
 - + Other relevant factors.



TRANSMISSION LINES: PATROLLING

192.705 (c)

Maximum interval between patrols:

Class 1,2
Hwy & RR

At least twice each calendar year,
not to exceed 7 1/2 months.

All Other Locations

At least once each calendar year,
not to exceed 15 months.



TRANSMISSION LINES: PATROLLING

192.705 (c)

Maximum interval between patrols:

Class 3

Hwy & RR

At least four times each calendar year, not to exceed 4 ½ months.

All Other Locations

At least twice each calendar year, not to exceed 7 ½ months.

Class 4

Hwy & RR

At least four times each calendar year, not to exceed 4 ½ months.

All Other Locations

At least four times each calendar year, not to exceed 4 ½ months.

TRANSMISSION LINES: PATROLLING



TRANSMISSION LINES LEAKAGE SURVEYS

192.706

- ✘ Transmission lines must be leak surveyed once each calendar year, not to exceed fifteen months.
- ✘ Except class 3 & 4 areas transporting un-odorized gas, must use leak detection equipment.
 - + Class 3 = Twice each calendar year not to exceed 7 ½ months.
 - + Class 4 = Four times each calendar year not to exceed 4 ½ months.



TRANSMISSION LEAKAGE SURVEYS

R14-5-202. Construction and Safety Standards for Gas, LNG, and Hazardous Liquid Pipeline Systems

Q - An operator of an intrastate pipeline transporting gas shall survey and grade all detected leakage according to the standards provided below, which modify 49 CFR 192.706 and 192.723:

1. All gas except LPG, leakage surveys and grading shall be performed pursuant to ASME Guide for Gas Transmission and Distribution Pipeline System, Guide Material, Appendix G-11-1983

TRANSMISSION LEAKAGE SURVEYS

R14-5-202. Construction and Safety Standards for Gas, LNG, and Hazardous Liquid Pipeline Systems

2. In the case of LPG, leakage surveys and grading shall be performed pursuant to ASME Guide for Gas Transmission and Distribution Pipeline System, Guide Material, Appendix G-11A-1983
3. Leakage survey records shall identify in some manner each pipeline surveyed and shall be maintained to demonstrate that each required leakage survey has been conducted. This modifies 49 CFR 192.706 and 192.723.

TRANSMISSION LEAKAGE SURVEYS

R14-5-202. Construction and Safety Standards for Gas, LNG, and Hazardous Liquid Pipeline Systems

R - An operator of an intrastate transmission pipeline transporting gas shall conduct a leakage survey at least twice each calendar year, at an interval not exceeding 7 1/2 months, independent of class location, and shall repair each underground leak classified as grade two or three either upon discovery or within one year after discovery. This modifies 49 CFR 192.706 and 192.711.

LINE MARKERS FOR MAINS AND TRANSMISSION LINES

192.707 (a)

- ✘ Marker must be Placed & Maintained as close as practical;
 - + At each crossing of public road & railroad; and



LINE MARKERS FOR MAINS AND TRANSMISSION LINES

192.707 (a)

- ✘ Wherever necessary to identify the location of the transmission line or main to reduce possibility of damage or interference.

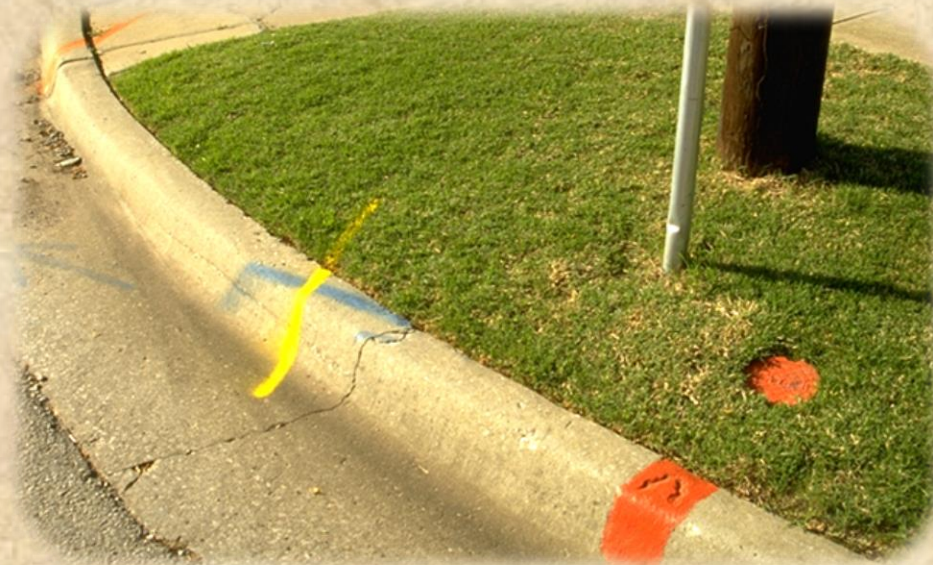


LINE MARKERS FOR MAINS AND TRANSMISSION LINES

192.707 (b)

✘ Exceptions:

- + Mains and transmission lines located offshore, at crossings of or under waterways or bodies of water.
- + Mains in class 3 & 4 locations where a damage prevention program is in effect;



LINE MARKERS FOR MAINS AND TRANSMISSION LINES

192.707 (b)

- ✘ Exceptions continued;
 - + Transmission lines in class 3 & 4 areas where placement of a line marker is impractical.



LINE MARKERS FOR MAINS AND TRANSMISSION LINES

192.707 (c)

- ✘ Pipelines Above ground
 - + Markers must be installed and maintained in areas accessible to the public.



LINE MARKERS FOR MAINS AND TRANSMISSION LINES

192.707 (d)

- ✘ Must Have the word Warning, Caution, or Danger
- ✘ Followed by “Gas (or name of gas) Pipeline”
- ✘ Letters must be at least 1” high with ¼” stroke.
- ✘ Must have Operator name and 24 hr. phone number.

*Pipeline
Co.*

**CAUTION
BURIED PIPELINE
BEFORE DIGGING CALL
1-800-555-1234**



TRANSMISSION LINE RECORDKEEPING

192.709

- ✘ The date, location, and description of each repair to pipe or pipe-to-pipe connections must be retained for as long as the pipe remains in service.



TRANSMISSION LINE RECORDKEEPING

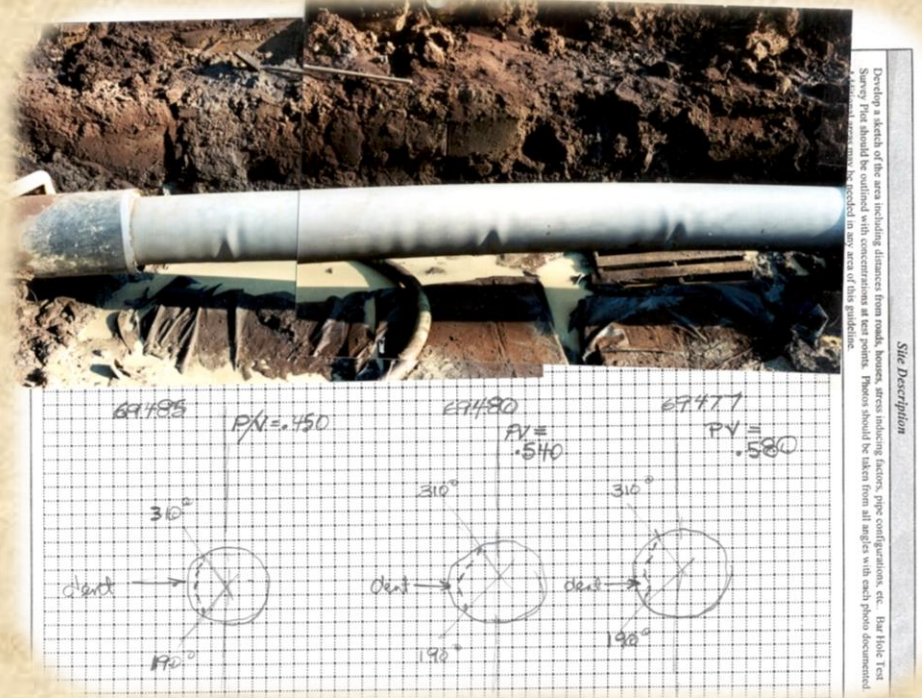
192.709

- ✘ Records for the following must be retained for 5 years or until the next survey, inspection, or test is completed, whichever is longer:
 - + Repairs to parts of the pipeline other than pipe
 - + Leakage Surveys
 - + Patrols
 - + Inspections & tests required by Subparts L & M

TRANSMISSION LINES: REPAIR PROCEDURES

192.711 (a)(1)

- ✘ Immediate temporary measures to protect public when a line operating at 40% SMYS or greater has a leak, imperfection, or damage that impairs serviceability: and



TRANSMISSION LINES: REPAIR PROCEDURES

192.711 (a)(2)(b)

- ✘ If it is not feasible to make permanent repairs at the time.
- ✘ An operator shall make permanent repairs as soon as feasible.
- ✘ Conditions covered by Subpart O, Gas IM, must be remediated as prescribed in 192.933 (d)
- ✘ Welded patches are not allowed except as provided by 192.717 (b)(3).

TRANSMISSION LINES: PERMANENT REPAIRS

192.713 (a)

- ✘ Imperfections or damage on a line operating at $\geq 40\%$ SMYS must be:
 - ✘ (1) Removed by cutting out and replacing a cylindrical piece of pipe; or
 - ✘ (2) Repaired by a method that reliable engineering tests and analyses show can permanently restore the serviceability of the pipe.



TRANSMISSION LINES: REPAIR PROCEDURES

192.713 (b)

Operating pressure must be at a safe level during repair operations.



TRANSMISSION LINES: REPAIR PROCEDURES

192.717

- ✘ (a) Removing the leak by cutting out and replacing a cylindrical piece of pipe; or
- ✘ (b) Repairing the leak by one of the following methods:



TRANSMISSION LINES: REPAIR PROCEDURES

192.717 (b)

- ✘ (1) Install a full encirclement welded split sleeve of appropriate design, unless the transmission line is joined by mechanical couplings and operates at less than 40 percent of SMYS.
- ✘ (2) If the leak is due to a corrosion pit, install a properly designed bolt-on-leak clamp.

TRANSMISSION LINES: REPAIR PROCEDURES

192.717 (b)

- ✘ (3) If the leak is due to a corrosion pit and on pipe of not more than 40,000 psi (267 Mpa) SMYS, fillet weld over the pitted area a steel plate patch with rounded corners, of the same or greater thickness than the pipe, and not more than one-half of the diameter of the pipe in size.



TRANSMISSION LINES: REPAIR PROCEDURES

192.717 (b)

- ✘ (4) If the leak is on a submerged offshore pipeline or submerged pipeline in inland navigable waters, mechanically apply a full encirclement split sleeve of appropriate design.



TRANSMISSION LINES: REPAIR PROCEDURES

192.717 (b)

- ✘ (5) Apply a method that reliable engineering tests and analyses show can permanently restore the serviceability of the pipe.



TRANSMISSION LINES: TESTING OF REPAIRS

192.719 (a)

- ✘ Replacement pipe must be tested to the pressure required for a new line in the same location.



TRANSMISSION LINES: TESTING OF REPAIRS

192.719 (b)

- ✘ Each repair made by welding must be examined in accordance with 192.241.



TRANSMISSION LINES: TESTING OF REPAIRS

R14-5-202. Construction and Safety Standards for Gas, LNG, and Hazardous Liquid Pipeline Systems

S. An operator of an intrastate transmission pipeline transporting gas and operating at or above 20 percent of Specified Minimum Yield Strength shall ensure that nondestructive testing is completed for each weld performed on newly installed, replaced, or repaired pipeline or an appurtenance. The nondestructive testing shall be completed before the newly welded area of the pipeline or appurtenance is used for service. This modifies 49 CFR 192.241.

DISTRIBUTION: PATROLLING

192.721

- ✘ The frequency of patrolling mains is determined by the severity of conditions which could cause a hazard to public safety.
- ✘ Areas subject to physical movement or external loading where failure could result must be patrolled at least:
 - + At least 4 times each calendar year not to exceed 4 ½ mo. in business districts.
 - + At least 2 times each calendar year not to exceed 7 ½ mo. outside business districts.

DISTRIBUTION LEAK SURVEYS

192.723 (b)

- ✘ Type and scope of leakage control program must be determined by local conditions, but must meet the following minimums:



DISTRIBUTION LEAK SURVEYS

192.723 (b)(1)

- ✘ **Business Districts – Once each calendar year not to exceed 15 months.**

Must check:

- + **Manholes**
- + **Pavement & sidewalk cracks; and**
- + **Other potential venting locations.**
- ✘ **Must use leak detection equipment.**



DISTRIBUTION LEAK SURVEYS

192.723 (b)(2)

- ✘ Outside of business district as frequent as necessary, but at least once every 5 calendar years at intervals not to exceed 63 months; or
- ✘ Pipe that is not cathodically protected and subject to 192.465 (e) must be surveyed at least once every 3 calendar years at intervals not to exceed 39 months



DISTRIBUTION LEAKAGE SURVEYS

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DISTRIBUTION LEAKAGE SURVEYS

R14-5-202. Construction and Safety Standards for Gas, LNG, and Hazardous Liquid Pipeline Systems

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3. Leakage survey records shall identify in some manner each pipeline surveyed and shall be maintained to demonstrate that each required leakage survey has been conducted. This modifies 49 CFR 192.706 and 192.723.

TEST REQUIREMENTS FOR RE-INSTATING SERVICE LINES

192.725

- ✘ Each disconnected service must be tested in the same manner as a new service.
- ✘ Each temporarily disconnected service must be tested from the point of disconnection to the service line valve.



ABANDONMENT

192.727 (b)

- ✘ Each pipeline abandoned in place must be;
 - + Disconnected from all sources of gas, purged, and sealed.
 - + Offshore must be filled with water or inert materials and sealed at the ends.
 - + Purging is not required if the volume of gas is so small that it does not present a hazard.



ABANDONMENT

192.727 (d)(e)

- ✘ When service to a customer is disconnected, the operator must do one of the following;
 - + Close and lock the valve.
 - + Install a mechanical device or fitting in the service line or meter to prevent the flow of gas.
 - + The customers piping must be physically disconnect from the gas supply and the ends sealed.
 - + If purged with air, insure a combustibile mixture is not present after purging.

ABANDONMENT

R14-5-202. Construction and Safety Standards for Gas, LNG, and Hazardous Liquid Pipeline Systems

H. An operator of an intrastate pipeline transporting gas that has regulators, meters, or regulation meter sets that have been out of service for 36 months shall disconnect the pipeline from all sources and supplies of gas or hazardous liquids, purge the gas or hazardous liquids from the pipeline being disconnected, and cap all ends within six months after the 36 months have passed. This modifies 49 CFR 192.727.

ABANDONMENT

192.727 (f)

- ✘ Each abandoned vault must be filled with compacted materials.



COMPRESSOR STATIONS: INSPECTION AND TESTING OF RELIEF DEVICES.

192.731 (a)

- ✘ Except for rupture discs, each pressure relieving device in a compressor station must be inspected and tested in accordance with §§192.739 and 192.743, and must be operated periodically to determine that it opens at the correct set pressure.



COMPRESSOR STATIONS: INSPECTION AND TESTING OF RELIEF DEVICES.

192.731 (b)(c)

- ✘ Any defective or inadequate equipment found must be promptly repaired or replaced.
- ✘ Each remote control shutdown device must be inspected and tested at least once each calendar year, at intervals not exceeding 15 months to determine that it functions properly.

COMPRESSOR STATIONS: STORAGE OF COMBUSTIBLE MATERIALS.

192.735

- ✘ Flammable or combustible materials in quantities beyond those required for everyday use, must be stored a safe distance from the compressor building.
- ✘ Above ground oil or gasoline storage tanks must be protected in accordance with National Fire Protection Association Standard No. 30.



COMPRESSOR STATIONS: GAS DETECTION.

192.736 (a)

- ✘ Each compressor building in a compressor station must have a fixed gas detection and alarm system, unless the building is-
 - + Constructed so that at least 50 percent of it's upright side area is permanently open; or
 - + Located in an unattended field compressor station of 1,000 horsepower or less.

COMPRESSOR STATIONS: GAS DETECTION.

192.736 (b)

- ✘ Except when shutdown of the system is necessary for maintenance under paragraph (c), each gas detection and alarm system must-
 - + Continuously monitor the compressor building for a concentration of gas in air of not more than 25 percent of the lower explosive limit; and
 - + If that concentration of gas is detected, warn persons about to enter the building and persons inside the building of the danger.

COMPRESSOR STATIONS: GAS DETECTION.

192.736 (c)

- ✘ Each gas detection and alarm system required by this section must be maintained to function properly. The maintenance must include performance tests.

PRESSURE LIMITING AND REGULATING STATIONS: INSPECTION AND TESTING.

192.739 (a)

- ✘ Each pressure limiting station, relief device (except rupture discs), and Pressure regulating station and its equipment must be inspected and tested at least once each calendar year at intervals not exceeding 15 months to determine that it is—
 - + In good mechanical condition.
 - + Adequate from the standpoint of capacity and reliability of operation.

PRESSURE LIMITING AND REGULATING STATIONS: INSPECTION AND TESTING.

192.739 (a)

- + Except as provided in paragraph (b), set to control or relieve at the correct pressure consistent with the pressure limits of §192.201(a).
- + Properly installed and protected from dirt, liquids, or other conditions that might prevent proper operation.



PRESSURE LIMITING AND REGULATING STATIONS: INSPECTION AND TESTING.

192.739 (b)

- + For steel pipelines whose MAOP is determined under §192.619(c), if the MAOP is 60 psi gage or more, the control or relief pressure limit is as follows:

MAOP Hoop Stress	Pressure Limit
Greater than 72% SMYS	MAOP plus 4%
Less than 72% SMYS	MAOP plus 10% (192.201 (a)(2))
Unknown % SMYS	Pressure that will prevent unsafe operation considering MAOP, operation, & Maintenance History.

PRESSURE LIMITING AND REGULATING STATIONS: TELEMETERING OR RECORDING GAGES.

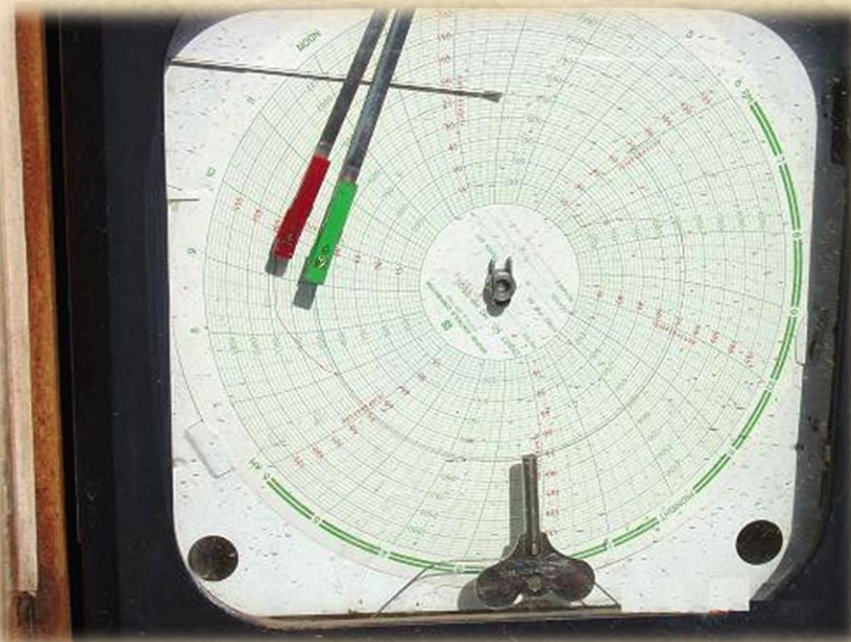
192.741 (a)(b)

- + Each distribution system supplied by more than one district pressure regulating station must be equipped with telemetering or recording pressure gages to indicate the gas pressure in the district.
- + On distribution systems supplied by a single pressure regulating station, the operator shall determine the necessity of telemetering or recording gages, considering the number of customers supplied, operating pressures, capacity of the installation, and other operating conditions.

PRESSURE LIMITING AND REGULATING STATIONS: TELEMETERING OR RECORDING GAGES.

192.741 (c)

- + If there are indications of abnormally high- or low-pressure, the regulator and auxiliary equipment must be inspected and the necessary measures employed to correct any unsatisfactory operating conditions.



PRESSURE LIMITING AND REGULATING STATIONS: CAPACITY OF RELIEF DEVICES

192.743 (a)

- + Pressure relief devices at pressure limiting stations and pressure regulating stations must have sufficient capacity to protect the facilities to which they are connected.
- + Except as provided in §192.739(b), the capacity must be consistent with the pressure limits of §192.201(a), and must be determined at least once each calendar year not to exceed 15 months, by testing the devices in place or by review and calculations.

PRESSURE LIMITING AND REGULATING STATIONS: CAPACITY OF RELIEF DEVICES

192.743 (b)(c)

- + If review and calculations are used, the calculated capacity must be compared with the rated or experimentally determined relieving capacity of the device for the conditions under which it operates.
- + After the initial calculations, subsequent calculations need not be made if the annual review documents that parameters have not changed.
- + If a relief device is of insufficient capacity, a new or additional device must be installed to provide the capacity required by paragraph (a) of this section.

VALVE MAINTENANCE: TRANSMISSION LINES

192.745 (a)

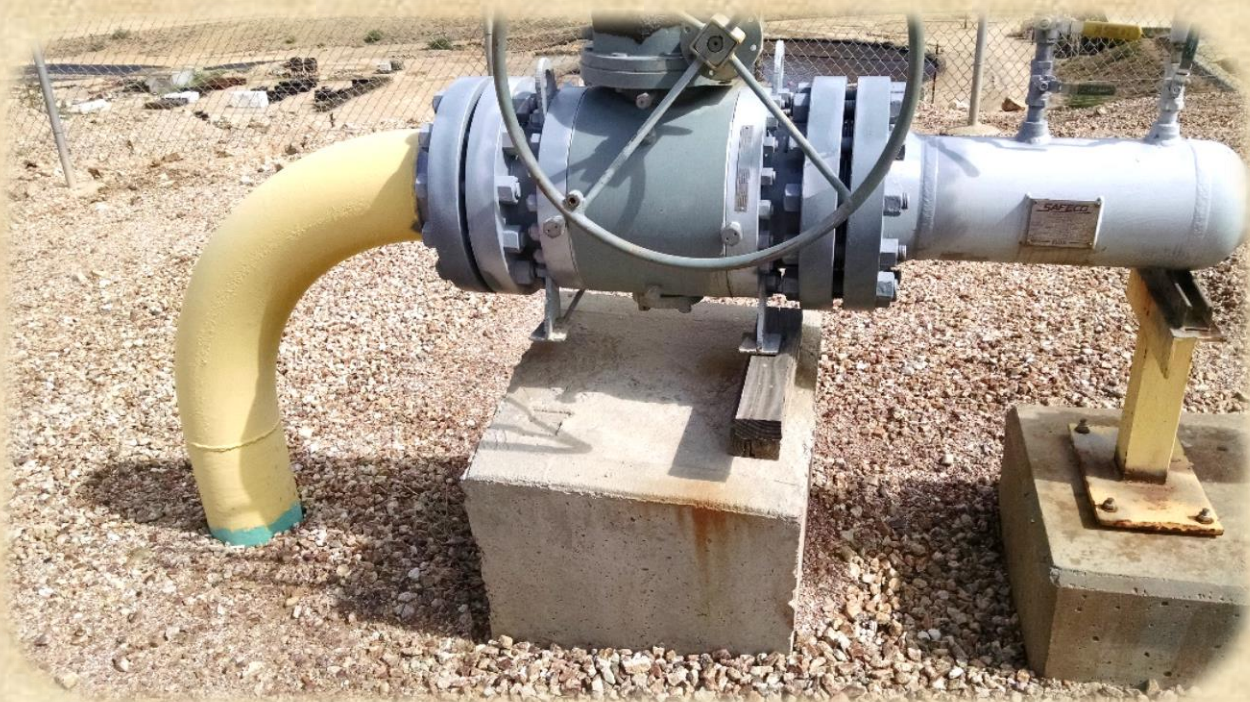


- ✘ Each valve that might be required during an emergency must be inspected and partially operated at least once each calendar year not to exceed 15 months.

VALVE MAINTENANCE: TRANSMISSION LINES

192.745 (b)

- ✘ Prompt remedial action is required to correct any valve found inoperable, unless an alternative valve is designated.



VALVE MAINTENANCE: DISTRIBUTION SYSTEMS

192.747 (a)



- ✘ Each valve, necessary for safe operation of a distribution system, must be checked and serviced once each calendar year, not to exceed 15 months.

VALVE MAINTENANCE: DISTRIBUTION SYSTEMS

192.747 (b)

- ✘ Each valve, necessary for safe operation of a distribution system, must be checked and serviced:
 - + At least once each calendar year not to exceed 15 months.
 - + Prompt remedial action is required to correct any valve found inoperable, unless an alternative valve is designated.

VAULT MAINTENANCE

192.749 (a)

- ✘ Vaults containing pressure regulating or limiting equipment, greater than 200 cubic ft. must be inspected each calendar year not to exceed 15 months for physical condition and ventilation.



VAULT MAINTENANCE

192.749 (b)(c)(d)

- ✘ If gas is detected, inspect for and repair leaks.
- ✘ Inspect ventilating equipment.
- ✘ Inspect integrity of vault covers.



PREVENTION OF ACCIDENTAL IGNITION

192.751

- ✘ Each operator must minimize danger of accidental ignition.
 - + Remove ignition sources
 - + Provide fire extinguishers
 - + Post Warnings
 - + Don't weld around combustible mixtures.



INFORMATION WEBSITES

ACC Pipeline Safety

<http://www.azcc.gov/divisions/safety/pipeline.asp>

PHMSA Pipeline Safety Regulations

<https://www.phmsa.dot.gov/standards-rulemaking/pipeline/standards-and-rulemaking-overview>