

# NATURAL GAS MAINTENANCE

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**Part 192**  
**Subpart "M"**

# CONTACT INFORMATION

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**Pamela West**

**Pipeline Safety Specialist**

**U.S. Department of Transportation**

**PHMSA Inspector Training and Qualifications**

**Main: (405) 686-2310**

**My Office: (405) 686-2328**

**Email: [pamela.west@dot.gov](mailto:pamela.west@dot.gov)**



**Pipeline and  
Hazardous Materials  
Safety Administration**



## 192.703 GENERAL

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- ✖ 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

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**192.705 (a)**

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





# TRANSMISSION LINES: PATROLLING

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**192.705 (b)**

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



# TRANSMISSION LINES: PATROLLING

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**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

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## 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

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# 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.



# 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

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**192.707 (a)**

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





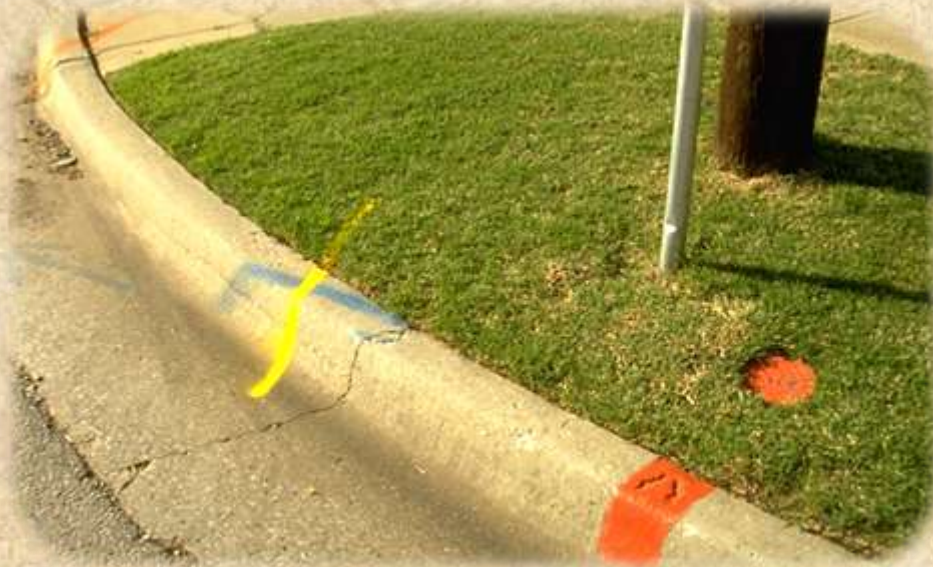
# LINE MARKERS FOR MAINS AND TRANSMISSION LINES

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**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

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**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

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**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.

***TQ Pipeline  
Co.***

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



# TRANSMISSION LINE RECORDKEEPING

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**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

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**192.709**

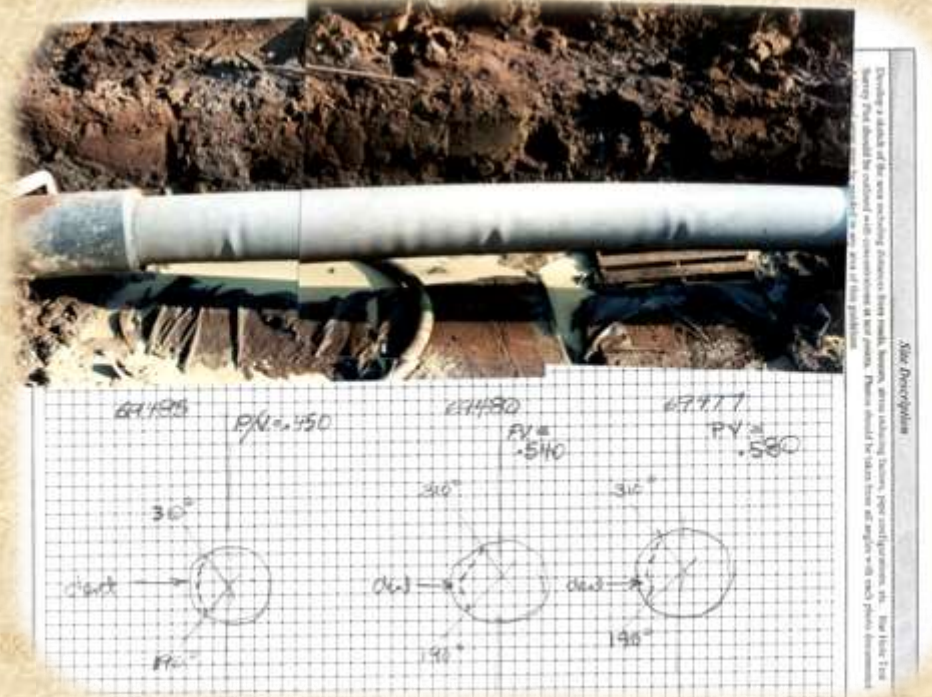
- ✕ Records for the following must be retained for 5 years or until the next survey, inspection, or test is completed, whichever is longer:
  - + Repairs to parts of the pipeline other than pipe
  - + Leakage Surveys
  - + Patrols
  - + Inspections & tests required by Subparts L & M



# 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

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## 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

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**192.713 (b)**

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





# TRANSMISSION LINES: REPAIR PROCEDURES

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**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

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## 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.

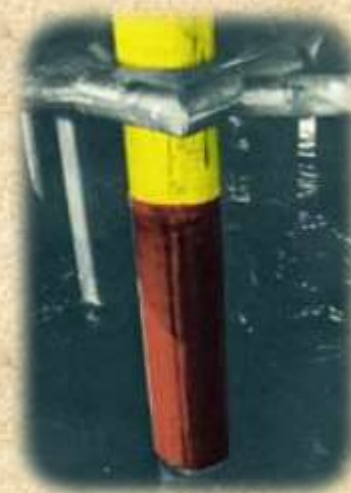


# TRANSMISSION LINES: REPAIR PROCEDURES

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**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

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**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

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## 192.719 (b)

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



# DISTRIBUTION: PATROLLING

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**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

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## 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



# TEST REQUIREMENTS FOR RE-INSTATING SERVICE LINES

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**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

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## 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

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## 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 combustible mixture is not present after purging.



# ABANDONMENT

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## 192.727 (f)

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



# COMPRESSOR STATIONS: INSPECTION AND TESTING OF RELIEF DEVICES.

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## 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.

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## 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.

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**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.

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## 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.

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## 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.

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## 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.

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## 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.

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## 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.

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## 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, & Maint. History.



# **PRESSURE LIMITING AND REGULATING STATIONS: TELEMETERING OR RECORDING GAGES.**

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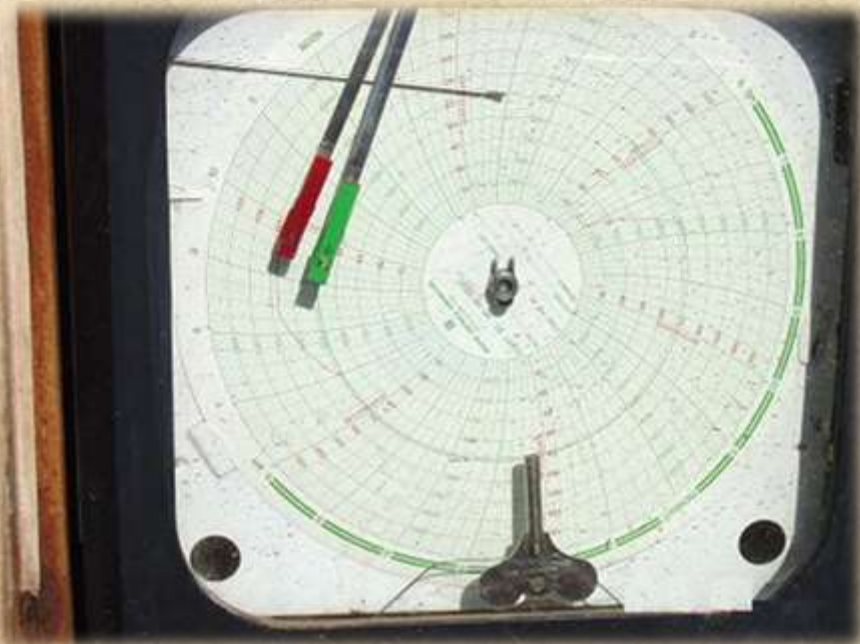
## **192.741 (a)(b)**

- + 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**

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## **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

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## 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

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**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

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## 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.





# CAST IRON: CAULKED BELL AND SPIGOT JOINTS

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## 192.753 (a)

- ✖ Each cast iron caulked bell and spigot joint that is subject to pressures of more than 25 psi gage must be sealed with:
  - ✖ A mechanical leak clamp; or
  - ✖ A material or device which:
    - ✖ Does not reduce the flexibility of the joint;
    - ✖ Permanently bonds, either chemically or mechanically, or both, with the bell and spigot metal surfaces or adjacent pipe metal surfaces; and,

# CAST IRON: CAULKED BELL AND SPIGOT JOINTS

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## 192.753 (a)(b)

- ✖ Seals and bonds in a manner that meets the strength, environmental, and chemical compatibility requirements of §§192.53(a) and (b) and 192.143.
- ✖ Each cast iron caulked bell and spigot joint that is subject to pressures of 25 psi gage or less and is exposed for any reason must be sealed by a means other than caulking.



# PROTECTING CAST IRON PIPELINES

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## 192.755 (a)

- ✘ When an operator has knowledge that the support for a segment of a buried cast-iron pipeline is disturbed:
  - ✘ That segment of the pipeline must be protected, as necessary, against damage during the disturbance by:
    - ✘ Vibrations from heavy construction equipment, trains, trucks, buses, or blasting;
    - ✘ Impact forces by vehicles;

# PROTECTING CAST IRON PIPELINES

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## 192.755 (a)(b)

- ✖ Earth movement;
  - ✖ Apparent future excavations near the pipeline; or
  - ✖ Other foreseeable outside forces which may subject that segment of the pipeline to bending stress.
- ✖ As soon as feasible, appropriate steps must be taken to provide permanent protection for the disturbed segment from damage that might result from external loads, including compliance with applicable requirements of §§192.317(a), 192.319, and 192.361(b)-(d).

# INFORMATION WEBSITES

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PHMSA Training and Qualification

<http://www.phmsa.dot.gov/pipeline/tq>

PHMSA Pipeline Safety Regulations

<http://www.phmsa.dot.gov/pipeline/tq/regs>