

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

220 CMR 101.00: MASSACHUSETTS NATURAL GAS PIPELINE SAFETY CODE

Section

101.01: Compliance with MFS Standards

101.02: Applications for Exceptions and Waivers from 220 CMR 101.04, 101.05, or 101.06

101.03: Definitions Based on 49 CFR Part 192 (Subpart A Section 192.3) of the MFS Standards

101.04: Notice of Proposed Construction

101.05: Preservation of Records

101.06: Additional Rules or Modifications

101.01: Compliance with MFS Standards

Every gas piping system shall be constructed, operated and maintained, except as otherwise provided in 220 CMR 101.00, in compliance with federal pipeline safety standards as set forth in 49 CFR Part 192: *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards* (MFS Standards).

101.02: Applications for Exceptions and Waivers from 220 CMR 101.04, 101.05, or 101.06

(1) A gas corporation or municipal gas department may make a written request to the Department of Public Utilities (Department) for an exception to the provisions of 220 CMR 101.04, 101.05, or 101.06. The Department may, after consideration, and the payment of the appropriate fee, issue the exception requested or modification thereof to the particular gas corporation or municipality requesting such exception. In emergencies, a verbal exception may be granted by the Department, which will then be confirmed by written request within seven days.

(2) The Department may issue a waiver to a gas corporation or municipal gas department from a provision of 49 CFR Part 192 of the federal regulations providing that the waiver pertains to an intrastate facility and the Department gives notice of such waivers to the U.S. Department of Transportation at least 60 days before the waiver becomes effective.

101.03: Definitions Based on 49 CFR Part 192 (Subpart A Section 192.3) of the MFS Standards

As used in 220 CMR 101.06, the following definitions apply:

Distribution Line means a pipeline other than a gathering or transmission line.

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

Gas means natural gas, flammable gas, or gas which is toxic or corrosive.

Gathering Line means a pipeline that transports gas from a current production facility to a transmission line or main.

High Pressure Distribution System means a distribution system in which the gas pressure in the main is higher than the pressure provided to the customer. (See 220 CMR 101.06.)

Listed Specification means a specification listed in 49 CFR Part 192, Appendix B, section I.

Low Pressure Distribution System means a distribution system in which the gas pressure in the main is substantially the same as the pressure provided the customer. (See 220 CMR 101.06.)

Main means a distribution line that serves as a common source of supply for more than one service line.

Maximum Actual Operating Pressure means the maximum pressure that occurs during normal operations over a period of one year.

Maximum Allowable Operating Pressure (MAOP) means the maximum pressure at which a pipeline or segment of a pipeline may be operated under 220 CMR 101.00.

Municipality means a city, county, or any other political subdivision of a State.

Offshore means beyond the line of ordinary low water along that portion of the coast of the United States that is in direct contact with the open seas and beyond the line marking the seaward limit of inland waters.

Operator means a person who engages in the transportation of gas.

Person means any individual, firm, joint venture, partnership, corporation, association, State, municipality, cooperative association, or joint stock association, and including any trustee, receiver, assignee, or personal representative thereof.

Pipe means any pipe or tubing used in the transportation of gas, including pipe-type holders.

Pipeline means all parts of those physical facilities through which gas moves in transportation, including pipe, valves, and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders and

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

fabricated assemblies.

Pipeline Facility means new and existing pipelines, rights-of-way, and any equipment facility, or building used in the transportation of gas or in the treatment of gas during the course of transportation.

Secretary means the U.S. Secretary of Transportation or any person to whom he or she has delegated authority in the matter concerned.

Service Line means a distribution line that transports gas from a common source of supply to:

- (a) a customer meter or the connection to a customer's piping, whichever is farther downstream, or
- (b) the connection to a customer's piping if there is no customer meter.

A customer meter is the meter that measures the transfer of gas from an operator to a consumer.

SMYS (Specified Minimum Yield Strength) is:

- (a) For steel pipe manufactured in accordance with a listed specification, the yield strength specified as a minimum in that specification; or
- (b) For steel pipe manufactured in accordance with an unknown or unlisted specification, the yield strength determined in accordance with 49 CFR 192.107(b).

State means each of the several states, the District of Columbia, and the Commonwealth of Puerto Rico.

Transmission Line means a pipeline, other than a gathering line, that:

- (a) Transports gas from a gathering line or storage facility to a distribution center or storage facility;
- (b) Operates at a hoop stress of 20% or more of SMYS; or
- (c) Transports gas within a storage field.

Transportation of Gas means the gathering, transmission, or distribution of gas by pipeline or the storage of gas in or affecting interstate or foreign commerce.

101.04: Notice of Proposed Construction

At least 48 hours prior to the start of construction of pipeline installations, notice shall be filed with the Department in accordance with the requirements listed in 220 CMR 101.04(1) through (3):

- (1) Pipeline installation projects of 5000 feet or more in length: All such projects.

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

- (2) Pipeline installation projects of 2500 feet to 5000 feet in length: 25% of such projects, or a maximum of three of the projects in a calendar year.
- (3) If no pipeline installation projects in a calendar year meet the requirements of 220 CMR 101.04(1) and (2), then there shall be reported to the Department no less than three pipeline installations irrespective of the length, provided this number or more are undertaken.

101.05: Preservation of Records

Nothing contained herein shall conflict with 220 CMR 75.00: *The Preservation of Records of Electric, Gas, and Water Utilities.*

101.06: Additional Rules or Modifications

Notwithstanding any provision of the MFS Standards which may allow less stringent requirements, the following additional rules or modifications shall apply.

- (1) Low Pressure Distribution System. (Section 192.3 MFS Standards.) For the purpose of 220 CMR 101.06, a low pressure distribution system shall be defined as any system in which the gas pressure in the main is equal to or less than two psig.
- (2) Intermediate Pressure Distribution System. (Section 192.3 MFS Standards.) For the purpose of 220 CMR 101.06, an intermediate pressure distribution system shall be defined as any system in which the gas pressure in the main is greater than two psig but equal to or less than 60 psig.
- (3) High Pressure Distribution System. (Section 192.3 MFS Standards.) For the purpose of 220 CMR 101.06, a high pressure distribution system shall be defined as a system in which the pressure in the main is greater than 60 psig, but equal to or less than 200 psig.
- (4) Class Locations. (Section 192.3 MFS Standards.)
 - (a) Gas pipelines which are to be operated at pressures in excess of 200 psig shall not be installed within 40 feet of any building intended for human occupancy unless class 4 construction design criteria are met, or such other design criteria as the Department shall require.
 - (b) For the purpose of 220 CMR 101.00, every gas piping system shall be designed, constructed, tested, operated, and maintained using a class 3 location as a minimum class location designation.

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

- (5) Design Limitations for Plastic Pipe. (Section 192.123 MFS Standards.)
- (a) The wall thickness for thermoplastic pipe may not be less than 0.090 inches.
 - (b) The Department may approve the use of reinforced thermosetting plastic pipe having a wall thickness not less than that listed in the following table:

Normal Size in Inches	Minimum Wall Thickness in Inches
2	0.060
3	0.060
4	0.070
6	0.100

- (6) Distribution Line Valves. (Section 192.181 MFS Standards.) Each high pressure and intermediate pressure distribution system must have valves spaced so as to reduce the time to shut down a section of main in an emergency. The valve spacing is determined by the operating pressure, the size of mains, and the local physical conditions.
- (7) Control of the Pressure of Gas Delivered from High Pressure Distribution System. (Section 192.197 MFS Standards.) For the purpose of 220 CMR 101.00, Section 192.197 of the MFS Standards shall be entitled: *Control of the Pressure of Gas Delivered from Mains Operating at Higher Pressures Than the Pressure Provided to the Customer.*
- (8) Required Capacity of Pressure Relieving and Limiting Stations. (Section 192.201 MFS Standards.) Relief valves or other pressure limiting devices must be installed at or near each regular station controlling the pressure to a system operating at a pressure that is substantially the same as the pressure provided to the customer, with a capacity to limit the maximum pressure in the main to a pressure that will not exceed the safe operating pressure for any connected and properly adjusted gas utilization equipment.
- (9) Inspection and Test of Welds. (Section 192.241 MFS Standards.)
- (a) Notwithstanding the requirements of 220 CMR 101.06(9)(b), not less than 10% of the welds randomly sampled over the length of at least three of the installations of which notice of construction is required under 220 CMR 101.04 shall be radiographically examined and available to the Department. If less than three installation projects are undertaken by any company, at least 10% of the welds shall be radiographically

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

examined and available to the Department.

- (b) The Department may at any time visually inspect any welding and if it is considered faulty, order the operating company to subject the weld to a destructive test as outlined in MFS Standards, Appendix C, paragraph I or to a radiographic examination.

(10) Protection from Hazards. (Section 192.317 MFS Standards.)

- (a) The method of protecting all new piping on trestles and bridges shall be subject to the approval of the Department. For each such bridge crossing, the operator shall submit a written request for approval and a detailed installation plan to the Department that includes the following items:

1. The proposed nominal pipe diameter, wall thickness, (minimum wall thickness 0.237"), and the Specified Minimum Yield Strength (SMYS).
2. The maximum operating pressure of the pipeline and the test pressure. The maximum operating pressure for new pipelines on bridges shall not exceed 200 psig.
3. For nominal pipe diameters 12" or greater, a calculation of the hoop stress (H) in accordance with the following formula:

$$H = \frac{PD}{2t}$$

H = Hoop stress in pounds per square inch

P = Maximum Operating Pressure in pounds per square inch gauge

D = The specified outer diameter in inches

t = Specified wall thickness in inches (not less than 0.237").

4. Method of providing for expansion or contraction of the bridge, if necessary.
 5. Pipe support details, number of supports, and distances between supports.
 6. The plan shall indicate that valves are provided on both sides of the bridge and their approximate location.
- (b) For bridges under the care and control of the Massachusetts Department of Transportation (MassDOT), the procedure for a MassDOT permit shall be as follows:
 1. On new bridges, a preliminary design plan will be submitted by MassDOT to the pertinent utility company notifying it of the proposed construction and suggested location of pipe on or in the bridge structure. (A copy of this letter will be forwarded to the

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

Director of the Pipeline Engineering and Safety Division of the Department).

2. The utility company will submit a plan to the Department within 30 days of the receipt of the afore described design plan if any construction is proposed on the particular bridge.
 3. No permit for the installation of gas facilities on bridges will be considered unless MassDOT has received from the Department a letter approving the design.
 4. All requests for permits for gas facilities on new bridges shall be directed to the Highway and Structures Engineer at the Highway Division of MassDOT.
 5. All requests for new gas facilities on existing bridges shall be directed to the Maintenance Engineer at the Highway Division of MassDOT.
- (11) Casing. (Section 192.323 MFS Standards.) Where a pipeline is or is to be subjected to a maximum operating pressure in excess of 200 psig, it shall not be laid or maintained (for the purpose of 220 CMR 101.06, maintained shall mean any action of moving, replacing or changing the pipeline for the purposes of upkeep, repair, renewal or replacement) under a highway pavement or under a railroad except where it is necessary to cross a highway or railroad. Whenever such crossings are required, they shall be made as nearly as practicable, to an angle of 90° to the center line of the highway or railroad. In the case of a railroad or highway crossing, the pipe shall be enclosed in a casing. Each casing used on a transmission line or main under a highway or railroad must comply with the following.
- (a) The casing must be designed to withstand the superimposed loads.
 - (b) If there is a possibility of water entering the casing, the ends must be sealed.
 - (c) If the ends of an unvented casing are sealed and the sealing is strong enough to retain the maximum allowable operating pressure of the pipe, the casing must be designed to hold this pressure at a stress level of not more than 72% of SMYS.
 - (d) If vents are installed on a casing, the vents must be protected from the weather to prevent water from entering the casing.
 - (e) In addition to 220 CMR 101.06(11)(a) through (d), casings under railroads in which the gas carrier pipe is or is to be subjected to operating pressure in excess of 200 psig shall meet the requirements of the specification in API Code No. 1102 (December 2007) issued by the American Petroleum Institute, Recommended Practice for Liquid Petroleum Pipelines Crossings Railroads and Highways.
 - (f) Casings under highways in which the gas carrier pipe is or is to be

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

subjected to operating pressures in excess of 200 psig shall be designed in accordance with 220 CMR 101.06(11)(e) except that the minimum distance from the top of the casing to the used surface of the road shall be four feet, six inches and the casing shall extend beyond the edges of the pavement or of the used surface of the road where there is no pavement, a distance of not less than 25 feet or to the line of the right of way, whichever is the lesser. (See also M.G.L. c. 164, § 72 and 220 CMR 111.00: *Construction of Streets, Places and Ways, Except Residential Driveways, Over, Along or Across High Pressure Gas Mains Operating at Pressures in Excess of 200 PSIG*).

- (12) Cover. (Section 192.327 MFS Standards.)
- (a) Except as provided in 220 CMR 101.06(12)(c) each buried transmission line must be installed with a minimum cover as follows:

TABLE I		
Location	Normal Soil Inches	Consolidated Rock Inches
Class 3 and 4 locations	36	24
Drainage and ditches of public roads and railroad crossings	36	24

- (b) Gas mains to be installed in highways under the jurisdiction and control of the MassDOT shall be laid with a minimum cover of 36 inches from the top of the main to the used surface of the road.
- (c) Except as provided in 220 CMR 101.06(12)(d) and (e), each buried main must be installed with at least 24 inches of cover.
- (d) Where an underground structure prevents the installation of a transmission line or main with the minimum cover, the transmission line or main may be installed with less cover if it is provided with additional protection to withstand anticipated external loads.
- (e) A main may be installed with less than 24 inches of cover providing:
1. Adequate measures are taken to prevent damage to the pipe by external forces.
 2. That the maximum allowable operating pressure will produce a stress level of less than 20% of SMYS.
 3. That the Department approves the installation.
- (13) Service Lines Valve Requirements. (Section 192.363 MFS Standards). Each service line valve on an intermediate pressure or high pressure service line installed above ground or in an area where the blowing of gas would be hazardous, must be designed and constructed to minimize the possibility of the removal of the core of the valve with other than specialized tools.

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

- (14) Service Lines Location of Valves. (Section 192.365 MFS Standards.) All intermediate and high pressure services and all services two inches in diameter or larger shall be equipped with an underground curb shut off located in proximity to the property line, except that whenever gas is supplied to a theatre, church, school, factory, or other buildings where large numbers of persons assemble, an outside shut off in such case will be required regardless of the size of the service or of the service pressure. All underground curb shut offs shall be readily identifiable and available for easy access by gas company personnel.
- (15) Test Requirements for Pipelines to Operate at a Hoop Stress Less than 30% of SMYS and Above 100 psig. (Section 192.507 MFS Standards.) Except for service lines and plastic pipelines, each segment of a pipeline that is to be operated at a hoop stress less than 30% of SMYS and above 100 psig must be tested in accordance with the following:
- (a) The pipeline operator must use a test procedure that will ensure discovery of all potentially hazardous leaks in the segment being tested. However, loss of pressure due to leakage during the test period is not permitted.
 - (b) If, during the test, the segment is to be stressed to 20% or more of SMYS and natural gas, inert gas, or air is the test medium:
 - 1. A leak test must be made at a pressure between 100 psig and the pressure required to produce a hoop stress of 20% of SMYS; or
 - 2. The line must be walked to check for leaks while the hoop stress is held at approximately 20% of SMYS.
 - (c) Steel gas mains to be operated at pressures from 100 psig to 150 psig shall be air or hydrostatically tested for tightness to 1.5 times the maximum allowable operating pressure for at least one hour.
 - (d) Steel gas mains to be operated at pressures in excess of 150 psig shall be air or hydrostatically tested for tightness to 1.5 times the maximum operating pressure for at least four hours and may be witnessed by the Department. Calibrated recording instruments shall be verified by dead weight instruments and the recording submitted to the Department for certification that the steel gas main as defined may be operated at a pressure which is equal to the test pressure divided by a factor of 1.5.
- (16) Test Requirements for Pipelines to Operate at or Below 100 psig. (Section 192.509 MFS Standards.) Except for service lines and plastic pipelines, each segment of a pipeline that is to be operated at or below 100 psig must be leak tested in accordance with the following:
- (a) The pipeline operator must use a test procedure that will ensure discovery of all potentially hazardous leaks in the segment being tested. However, loss of pressure due to leakage during the test period is not

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

permitted.

- (b) At a test pressure of at least 90 psig for at least one hour.
- (c) The tie-in joints to the live gas main, cast iron or steel, shall be tested using the soap bubble test.

(17) Test Requirements for Service Lines. (Section 192.511 MFS Standards.)

- (a) Each segment of a service line (other than plastic) must be leak tested in accordance with 220 CMR 101.06 before being placed in service. If feasible, the service line connection to the main must be included in the test. If not feasible, it must be given a leakage test at the operating pressure when placed in service.
- (b) Each segment of a service line (other than plastic) to operate at not more than 100 psig shall be tested after construction and before being placed into service to at least 90 psig for not less than 15 minutes. Pressure loss due to leakage during the test period is not permitted.
- (c) Each segment of a service line (other than plastic) to operate at pressures in excess of 100 psig must be tested in accordance with 49 CFR 192.507 of the MFS Standards.

(18) Test Requirements for Plastic Mains and Services. (Section 192.513 MFS Standards.)

- (a) The test procedure must ensure discovery of all potentially hazardous leaks in the segment being tested. However, loss of pressure due to leakage during the test period is not permitted.
- (b) The test pressure shall be at least 150% of the maximum operating pressure or 90 psig whichever is the greater, for at least 15 minutes for services, or one hour for mains. However, the maximum test pressure may not be more than three times the design pressure of the pipe.

(19) Maximum Allowable Operating Pressure, Intermediate Pressure and High Pressure Distribution Systems. (Section 192.621 MFS Standards.) No person may operate a segment of an intermediate pressure or high pressure distribution system at a pressure that exceeds the lowest of the applicable pressures shown in 49 CFR 192.621(a)(1) through (5) and (b) of the MFS Standards.

(20) Odorization of Gas. (Section 192.625 MFS Standards.)

- (a) A combustible gas in a distribution line shall have a distinctive odor of sufficient intensity so that a concentration of 0.15% gas in the air is readily perceptible to the normal or average olfactory senses of a person coming from fresh uncontaminated air into a closed room containing one part of the gas in 666 parts of air.
- (b) In the concentrations in which it is used, the odorant in combustible gases must comply with the following:

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

1. The odorant may not be deleterious to persons, material, or pipe.
 2. The products of combustion from the odorant may not be toxic when breathed nor may they be corrosive or harmful to those materials to which the products of combustion will be exposed.
- (c) The odorant may not be soluble in water to an extent greater than 2.5 parts to 100 parts by weight.
- (d) Equipment for odorization must introduce the odorant without wide variations in the level of odorant.
- (e) Equipment and facilities for handling the odorant shall be located so as to minimize the effect of an escape of odorant.
- (f) Each operator shall conduct periodic samplings of the combustible gases to assure the proper concentration of odorant in accordance with 220 CMR 101.06.
- (21) Distribution Systems Leakage Surveys and Procedures. (Section 192.723 MFS Standards.) Each operator having a gas distribution system shall conduct leakage surveys, as frequently as experience and technology indicates they are necessary, but in no event shall such leakage surveys be less than the following minimum standards:
- (a) Business Districts. A gas detector survey must be conducted in business districts including tests of the atmosphere in gas, electric, telephone, sewer and water system manholes, at cracks in pavement and sidewalks, and at other locations providing an opportunity for finding gas leaks, at least once in every consecutive 12 month period. In areas where an effectively prescribed and supervised survey of electric or other manholes and vaults is conducted and offers more frequent coverage than the previous, such a survey procedure may be substituted. Business districts are defined as areas with pavement from building wall to building wall and/or where the principal commercial activity of the city or town takes place. Such areas shall be outlined on a map and maintained by the operator.
 - (b) Distribution System Areas Not Included in the Principal Business District. Leakage surveys shall be made of the area not included in the principal business district at least once in every consecutive 24 month period.
 - (c) Type of Survey. Leakage surveys for 220 CMR 101.06(21)(a) and (b) shall include one or more of the following:
 1. Gas detector surveys using combustible gas indicators, flame ionization equipment, infra-red equipment or other industry accepted testing equipment;
 2. Bar tests;
 3. Vegetation surveys;
 4. Pressure drop tests.

220 CMR: DEPARTMENT OF PUBLIC UTILITIES

- (d) Other Surveys. In addition to the requirements of 220 CMR 101.06(21)(a) and (b), a survey of schools, churches, hospitals, theatres, and arenas shall be conducted at least once annually. The survey shall include tests for gas leakage and visual inspection of gas facilities in the immediate area of the service entrance.
 - (e) Hazardous Conditions Repaired. All disclosed conditions of a nature hazardous to persons or property shall be promptly made safe and permanent repairs instituted.
 - (f) Leakage Survey Records. Records of the leakage surveys required under 220 CMR 101.06 shall be maintained for a period of time not less than the interim between successive surveys.
- (22) Test Requirements for Reinstating Service Lines. (Section 192.725 MFS Standards)
- (a) For the purpose of 220 CMR 101.06(22), each service line, temporarily disconnected from the main and to be operated at a pressure not in excess of one psig, shall be tested at a pressure of at least ten psig for not less than 15 minutes. Pressure loss due to leakage during the test period is not permitted.
 - (b) The operator shall make and retain a record of each pressure test required under 49 CFR 192.725 MFS Standards.

REGULATORY AUTHORITY

220 CMR 101.00: M.G.L. c. 164, §§ 66, 76, 76C, and 105A.