

220 CMR 113.00: OPERATION, MAINTENANCE, REPLACEMENT, AND ABANDONMENT OF CAST-IRON PIPELINES

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113.01: Applicability and Scope

- (1) 220 CMR 113.00 regulates the operation, maintenance, replacement and abandonment of cast-iron pipelines that are used to distribute gas.
- (2) 220 CMR 113.00 applies to every gas company, municipal gas department or other person engaged in the distribution of gas within the Commonwealth of Massachusetts.

113.02: Definitions

Except as otherwise specified in 220 CMR 113.00, all words are as defined in 49 CFR Part 192 – *Transportation of Natural and Other Gas By Pipeline: Minimum Federal Safety Standards*.

Angle of Influence. A 45° angle above the horizontal starting from the bottom edge of the trench nearest to the main.

Deep Trench. An excavation that is more than five feet in depth.

Department. Department of Public Utilities, Commonwealth of Massachusetts.

Determine. To make appropriate investigation using scientific or other definitive methods, reach a decision based on sound engineering judgment, and be able to demonstrate, substantiate, and document the basis of the decision.

Division. Pipeline Safety Division of the Department.

High-pressure Cast-iron Pipe. A distribution line in which the gas pressure in the pipe is higher than the pressure provided to the customer.

Immediately. Except in the case of a gas-related emergency, the first regular workday that the operator can gain access to its facilities after the necessary State, City, or Town permits are expeditiously obtained and the statutory notification requirements have been met.

Low-pressure Cast-iron Pipe. A distribution line in which the gas pressure in the pipe is substantially the same as the pressure provided to the customer.

Person. Any individual, firm, joint venture, partnership, corporation, association, state agency, municipality, municipal department, cooperative association, or joint stock association, and includes any trustee, receiver, assignee, or personal representative thereof.

Shallow Trench. An excavation that is five feet or less in depth.

Sheeting. A bracing or shoring used to support the sides of an excavation to prevent its collapse during an excavation project.

Soft Clay. Earth that is easily molded by hand, or that has an unconfined compressive strength of 0.5 to 1.0 kips per square foot.

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Strain. The physical deformation of a body caused by the application of an external force. It is usually expressed as a percentage.

113.03: Application for Exceptions from Provisions of 220 CMR 113.00

Any person engaged in the operation of a cast-iron pipeline may make a written request to the Department for an exception to the provisions of 220 CMR 113.00, in whole or in part. The request shall justify why the exception should be granted and shall demonstrate why the exception sought does not derogate from the safety objectives of 220 CMR 113.00. The request shall include details on the need for the exception, specific information on the circumstances surrounding the requested exception, the provisions of the regulations from which exception is sought, and a description of any safety consequences that might result from the exception. Documentation in support of the request shall also be submitted.

The Department may, after consideration and the payment of the appropriate fee, issue a written decision denying the exception or granting the exception as requested or as modified by the Department and subject to conditions. An exception may be granted or denied in writing by the Director of the Pipeline Safety Division, or by the Director's functional successor in the event of an internal reorganization of the Department. Any person aggrieved by a decision of the Director may appeal the decision to the Department. Any appeal shall be in writing and shall be made not later than ten business days following issuance of the written decision.

In an emergency, a verbal request for an exception may be granted by the Department or the Director, provided that the verbal request is subsequently confirmed in writing within seven days of the exception being granted.

113.04: General

- (1) Cast-iron pipe shall not be installed for the distribution of gas after April 12, 1991.
- (2) Any written program and procedures required by 220 CMR 113.00 shall be included in the operator's operating and maintenance plan required by 49 CFR 192.605. This inclusion in the operating and maintenance plan shall be completed within 180 days of April 12, 1991.
- (3) Any written program and procedures shall be reviewed and modified by the operator as necessary, provided that a review shall be conducted at least once each calendar year.
- (4) Each operator shall maintain accurate and readily accessible records to administer and verify the implementation of 220 CMR 113.00. The records shall be maintained at a minimum for five consecutive years after the calendar year to which the records apply.
- (5) Cast-iron pipe replacements required by 220 CMR 113.06 and 113.07 are not applicable to normal gas operations and maintenance activities such as repair of joint leaks and breaks, service installations or abandonments, main extensions or branch connections. The provisions of 220 CMR 113.05 pertaining to the development and implementation of a program and procedures regarding the replacement and abandonment of cast-iron pipelines shall apply to normal gas operations and maintenance activities.

113.05: Replacement and Abandonment Program and Procedures

- (1) Each operator of buried cast-iron pipelines shall develop and implement, in accordance with 220 CMR 113.05, a written, comprehensive program and procedures regarding the replacement and abandonment of cast-iron pipelines. The program and procedures shall include, but not be limited to:
  - (a) categorizing pipe by size and age;
  - (b) determining the methodology for selecting and prioritizing pipeline segments for replacement or abandonment; and
  - (c) replacing or abandoning within ten years of April 12, 1991, all cast-iron pipe with a nominal diameter of eight inches or less that is known, or has been determined, to have been installed before the year 1860.

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(2) Each operator, to meet the requirements of 220 CMR 113.05(1)(b), shall consider, but not be limited by, the following criteria. In considering these criteria, each operator shall give reasonable regard to incorporating each criterion into the operator's program and procedures required by 220 CMR 113.05(1)(b). If any criterion is not included in the program and procedures, the operator shall make a detailed explanation of the consideration given the excluded criterion and the reason for the exclusion.

- (a) mechanical properties of the pipe, including the extent that graphitic corrosion (graphitization) has occurred and affected those properties;
- (b) chemical properties and corrosiveness of the soil in which the pipe is buried;
- (c) external loads to which the pipe is subjected;
- (d) operating pressure of the pipe;
- (e) location and/or depth of the pipe;
- (f) leak history of pipe segments;
- (g) repair and maintenance history of pipe segments;
- (h) the probability and consequences of pipe rupture and gas leakage;
- (i) the existence of redundant gas mains in a street;
- (j) repavement or reconstruction of streets in which pipelines are buried;
- (k) capacity of a pipeline to meet gas supply requirements; and
- (l) any known abnormal condition to which a pipe segment has been, or will be, subjected.

(3) Each operator shall establish a written time schedule for replacement or abandonment of cast-iron pipe. The schedule may be updated at any time during each year by the operator and shall include, as practicable, the size, length and location of pipe segments to be replaced or abandoned for each of the next three consecutive calendar years.

113.06: Replacement of Cast-iron Pipe at Trench Crossings

(1) Cast-iron pipe, eight inches or less in nominal diameter, that is exposed and undermined by a trench crossing the pipeline shall be replaced immediately:

- (a) When there is less than 24 inches of cover; or
- (b) When there is 24 inches or more of cover and the trench widths set forth in Table 1 are exceeded.

Table 1  
Maximum Allowable Trench Width

Depth of Cover:	<u>2 to 4 feet</u>	<u>4 feet or more</u>
<u>Nominal Pipe Diameter</u>		
4 inches or less	3 feet	4 feet
6 inches	4 feet	6 feet
8 inches	5.5 feet	8 feet

The trench width shall be determined by the distance along the centerline of the exposed pipe.

(2) The minimum length of the replacement shall be equal to the trench width plus twice the distance from the top of the pipe to the bottom of the crossing trench, extending equally on both sides of the crossing trench.

(3) When cast-iron pipe is intersected by a trench and the pipe must be replaced in accordance with 220 CMR 113.06, the pipe shall be surveyed daily for gas leakage and monitored daily until the pipe is replaced.

(4) At the operator's discretion, cast-iron pipe does not have to be replaced to comply with 220 CMR 113.06(1)(b) when a pipe segment is exposed and undermined in a shallow trench crossing, provided that:

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- (a) the backfill supporting and surrounding the pipe shall be thoroughly compacted for the full trench width and for a distance equal to  $\frac{1}{2}$  of the trench width on both sides of the centerline of the pipe;
- (b) the backfill shall be free of objectionable material or debris, such as, but not limited to, pavement, frozen soil, trash and rocks; and
- (c) The backfilling techniques used to comply with 220 CMR 113.06(4)(a) and (b) shall be included in the operator's operating and maintenance plan.

113.07: Replacement of Cast-iron Pipe Adjacent to Parallel Excavations

- (1) Cast-iron pipe, eight inches or less in nominal diameter, that is adjacent to parallel excavation shall be replaced immediately, provided that the excavation exceeds eight feet in length and a condition exists as set forth in 220 CMR 113.07(2), (3) or (4).
- (2) A low-pressure cast-iron pipe that is parallel to a shallow trench excavation shall be replaced if:
  - (a) the pipe is exposed and undermined; or
  - (b) at least  $\frac{1}{2}$  of the pipe diameter lies within the angle of influence; and
    - 1. the bottom of the excavation is below the water table; or
    - 2. the excavation is in soft clay.
- (3) A low-pressure cast-iron pipe that is parallel to a deep trench excavation and lies within the angle of influence shall be replaced if:
  - (a) the pipe is exposed and undermined;
  - (b) the pipe is totally, or in part, within three feet of the edge of the trench and sheeting that may have been used is not left in place; or
  - (c) the operator determines that the strain on the pipe caused by, but not limited to, excessive ground movement or inadequate pipe support shall exceed 0.05% (500 microstrain).
- (4) A high-pressure cast-iron pipe that is parallel to a shallow or deep trench excavation shall be replaced if:
  - (a) the pipe is exposed and undermined; or
  - (b) at least  $\frac{1}{2}$  of the pipe diameter lies within the angle of influence and sheeting that may have been used is not left in place.
- (5) When cast-iron pipe is adjacent to a parallel excavation and must be replaced in accordance with 220 CMR 113.07, the pipe shall be surveyed daily for gas leakage and monitored daily until the pipe is replaced.
- (6) Any pipe that replaces cast-iron pipe shall extend a safe distance, determined by the operator, beyond the point where parallel excavation terminates.

113.08: Training

- (1) Each operator shall provide and implement a written plan of initial training to instruct all appropriate operating, maintenance, supervisory, and engineering personnel about:
  - (a) the requirements of 220 CMR 113.00;
  - (b) the programs and procedures that are developed to comply with 220 CMR 113.00;
  - (c) the methodology for selecting, prioritizing, and scheduling cast-iron pipe for replacement or abandonment; and
  - (d) any operating and maintenance plans or procedures adopted to meet the requirements of 49 CFR Part 192 pertaining to cast-iron pipe.The initial training shall be completed within 210 days of April 12, 1991.

113.08: continued

(2) A written plan of continuing instruction shall be developed and carried out at intervals of not more than two years to keep all appropriate personnel current on the knowledge and skills they have gained in the initial program and any modifications that have occurred as a result of the operator's annual review of any program and procedures.

REGULATORY AUTHORITY

220 CMR 113.00: M.G.L. c. 164, §§ 66, 76, 76C and 105A.