522 CMR 1.00: GENERAL PROVISIONS

Section

1.01: Scope and Authority

(1) Pursuant to M.G.L. c. 146, § 2, the Board shall formulate or adopt rules formulated by a recognized engineering organization for the construction, installation, and inspection of steam Boilers and power reactor vessels and piping as used in atomic energy installations and for ascertaining the safe working pressure to be carried therein; prescribe tests, if it deems it necessary, to ascertain the qualities of materials used in the construction of Boilers, power reactor vessels, and piping; formulate rules regulating the construction and sizes of safety valves for Boilers of different sizes and pressures, appliances for indicating the pressure of steam and the level of water in the Boiler or power reactor vessel, and such other appliances as the Board may deem necessary to safety in operating steam Boilers or power reactor vessels; and make a standard form of Certificate.

(2) Pursuant to M.G.L. c. 146, § 35, the Board shall prescribe regulations conforming to recognized standards of engineering practice for the size, shape, construction, gauges, operation, maximum pressure, safety devices, use of oil, and other appurtenances necessary for the safe operation of tanks or other receptacles used for the storing of compressed air.

(3) Pursuant to M.G.L. c. 146, §§ 43 and 45A, the Board shall adopt rules for the size, design, location, and piping of safety valves on ammonia compressors, refrigeration and air conditioning systems.

(4) Pursuant to M.G.L. c. 146, §§ 70 and 71, the Board shall adopt rules for the construction, installation, and inspection of all hot water Low Pressure/Heating Boilers.

(5) All reconstruction shall conform to the original stamped code of construction for all Boilers and Pressure Vessels covered by 522 CMR.

(6) The Board shall hold public hearings annually on the first Thursday in May and November, and at such other times as it may determine, on petitions for changes in the rules formulated by it. If, after any such hearing, it shall deem it advisable to make changes in said rules, it shall appoint a day for a further hearing, and shall give notice thereof and of the changes proposed by advertising in at least one newspaper in each of the cities of Boston, Worcester, Springfield, Fall River, Lowell, and Lynn, at least ten days before said hearing. If the Board on its own initiative contemplates changes in said rules, like notice and a hearing shall be given and held before the adoption thereof. Pursuant to M.G.L. c. 146, § 4, changes in the rules which affect the construction of new Boilers shall take effect six months after their filing as provided in M.G.L. c. 146, § 2; provided, that the Board may, upon request, permit the application of such change in rules to Boilers manufactured or installed during said six months. When a person desires to manufacture a special type of Boiler the design of which is not covered by the rules formulated by the Board, he or she shall submit drawings and specifications of such Boiler to said Board, which, if it approves, shall permit the construction thereof.

(Mass. Register #1539, 1/17/2025)

1.02: Definitions

The following words and terms, when used in 522 CMR, shall have the following meanings:

Alteration. A change in the item described on the original Manufacturer's Data Report which affects the pressure containing capability of the pressure-retaining item. Nonphysical changes such as an increase in the maximum allowable working pressure (internal or external), increase in design temperature, or a reduction in minimum temperature of a pressure-retaining item shall be considered an alteration pursuant to the NBIC.

ANSI. American National Standards Institute.

Approved Nationally Recognized Testing Laboratory. A laboratory that is acceptable to the Board and provides uniform testing and examination procedures and standards for meeting design, manufacturing, and factory testing requirements of ANSI/ASHRAE 15; is organized, equipped, and qualified for testing; and has a follow-up inspection service for the current production of the listed products.

Appurtenance. A component or piping added to a Boiler/Pressure Vessel necessary for its proper operation.

ASHRAE. American Society of Heating, Refrigerating, and Air Conditioning Engineers.

ASME. American Society of Mechanical Engineers.

ASNT. The American Society for Nondestructive Testing.

Authorized Inspection Agency. An insurance company authorized to insure Boilers and Pressure Vessels in the Commonwealth that holds a valid National Board certificate of accreditation, or certificate of acceptance, for employing National Board Commissioned Inspectors to perform inspection activities.

Authorized Inspector. An employee of an Authorized Inspection Agency holding a valid National Board AI Commission and endorsements, who is authorized to perform shop inspections, field assembly inspections, alterations, and repairs of boilers and pressure vessels.

Authorized Inservice Inspector. An employee of an Authorized Inspection Agency holding a Certificate of Competency as a Boiler inspector, issued to them by the Department to perform Inservice Inspections of Boilers and Pressure Vessels within the Commonwealth. All Inservice Inspectors shall also hold a valid National Board Commission and appropriate endorsement.

Authorized Manufacturer (Heating Boilers). A Boiler manufacturer which holds a certificate of authorization to use the ASME certification mark and "H" or "U" designator.

Authorized Manufacturer (Refrigeration and Air Conditioning Systems). A manufacturer which holds a certificate of authorization to use the appropriate ASME certification mark to build Pressure Vessels for use in the Commonwealth of Massachusetts.

Authorized Manufacturer (Steam and Hot Water Boilers and Heat Storage Sources). A Boiler manufacturer which holds a certificate of authorization to use the ASME certification mark and "H", "S", or "U" designator.

Authorized Nuclear Inspector. An employee of an Authorized Inspection Agency holding a valid National Board Commission with a nuclear endorsement (N).

Authorized Nuclear Inspector (Concrete). An employee of an Authorized Inspection Agency holding a valid National Board Commission with a nuclear endorsement (C).

Board. The Board of Boiler Rules appointed under M.G.L. c. 22, § 10.

1.02: continued

Boiler. A closed Pressure Vessel in which water is heated, steam is generated, steam is superheated or any combination thereof, under pressure or vacuum for use externally to itself by the direct application of heat from the combustion of fuel, or from electricity or nuclear energy. "Boiler" shall include fired units for heating or vaporizing liquids other than water where these units are separate from processing systems and are complete within themselves.

Boiler External Inspection. An examination of a Boiler and Appurtenances while the unit is operating, during which, pursuant to M.G.L. c. 146, § 11, the inspector shall observe the pressure of steam carried and the general condition of each Boiler, and shall ascertain if the safety valve and the appliances for indicating the pressure of steam and level of the water in the Boiler are in proper working order. Boilers pursuant to M.G.L. c. 146, § 70 may be externally inspected when the unit is not in operation by the inspector reviewing evidence provided by the owner or user of which tests have been completed.

Boiler Internal Inspection. A thorough inspection that is performed on a Boiler, water and fireside, when the Boiler is not operating and is open, in accordance with the NBIC.

Certificate. A certificate of inspection issued by the Department.

Certificate of Competency. A certificate issued to individuals pursuant to M.G.L. c. 146, § 62.

Chief. The Chief of Engineering Inspections for the Division of Inspections of the Department of Fire Services.

CPS. Covered Piping System.

Deaerator. A Pressure Vessel classified as a Heat Storage Source that uses steam to remove oxygen and carbon dioxide from Boiler feed water.

Decommission. The process in which a Boiler or Pressure Vessel is made inoperable or dismantled, and removed from service.

Department. The Department of Fire Services.

District Engineering Inspector. An inspector of the Division.

Division. The Division of Inspections of the Department of Fire Services.

Engineer in Charge. A person who holds a valid and current Massachusetts Engineer or Fireman license issued by the Department, is designated by the Owner/User as the "Engineer in Charge", and is invested by the Owner/User with the actual authority for:

(a) The daily operation, maintenance, and repair of the Boilers, Pressure Vessels, engines, and Appurtenances specified; and;

(b) All persons operating, maintaining, or repairing these Boilers, Pressure Vessels, engines, and Appurtenances.

First Inspection. An inspection of a Boiler, Pressure Vessel, Heat Storage Source, Refrigeration or Air Conditioning System, Air Tank that has, regardless of its age or installation date, never before been inspected by a District Engineering Inspector or an Authorized Inspector in the Commonwealth. The First Inspection of all steam Boilers and Pressure Vessels shall be performed by a District Engineering Inspector.

Heat Storage Source. A potable water heater or water storage tank, deaerator or steam accumulator constructed to *ASME Boiler and Pressure Vessel Code*, Section IV and/or Section VIII, respectively.

High Pressure/Power Boiler. A Boiler having hot water at pressures exceeding 160 PSIG, or temperatures exceeding 250°F, or steam at pressures exceeding 15 PSIG.

1.02: continued

Low Pressure/Heating Boiler. A Boiler having steam pressures not exceeding 15 PSIG, or hot water at pressures not exceeding 160 PSIG, or temperatures not exceeding 250°F.

Marshal. The State Fire Marshal, appointed in accordance with the provisions of M.G.L. c. 6, § 165B.

Massachusetts Heat Boiler. A steel plate Boiler built by an authorized manufacturer in accordance with *ASME Boiler and Pressure Vessel Code* Section IV, *Rules for Construction of Heating Boilers*, but not stamped with the Code symbol.

Mass Tag. A noncorrosive metal tag attached to the vessel with a noncorrosive metal wire.

MAWP. Maximum Allowable Working Pressure.

Minimum Allowable Thickness. The minimum thickness permitted in accordance with the provisions of the applicable section of the original code of construction.

National Board. The National Board of Boiler and Pressure Vessel Inspectors.

National Board Commissioned Inspector. An inspector employed by an Authorized Inspection Agency who holds a valid National Board Commission, or such other individuals who hold a valid National Board Commission.

NBIC. *National Board Inspection Code*.

NFPA. National Fire Protection Agency.

Operator. A person who operates a Boiler, Pressure Vessel, steam engine, and their Appurtenances.

Owner/User. Any person, firm or corporation legally responsible for the safe operation and maintenance of any pressure-retaining item, steam engine or their Appurtenances pursuant to M.G.L. c. 146, and 522 CMR.

Pressure Vessel. A vessel in which the pressure is obtained from an external source or by the application of heat from an indirect source or from a direct source, other than a Boiler.

"R" Certificate Holder. An organization in possession of a valid "R" Certificate of Authorization issued by the National Board pursuant to the NBIC.

R-1 Forms. Report of repair form provided in accordance with the NBIC.

R-2 Forms. Report of alteration form provided in accordance with the NBIC.

Refrigeration System. A combination of interconnected parts forming a closed circuit in which refrigerant is circulated for the purpose of extracting, then rejecting, heat.

(a) Absorption System. A refrigerating system in which the gas evolved in the evaporator is taken up by an absorber or adsorber.

(b) Sealed Absorption System. A unit system or Group 2 refrigerants only, in which all refrigerant-containing parts are made permanently tight by welding or brazing against refrigerant loss.

(c) Self-contained System. A complete, factory-assembled and factory-tested system that is shipped in one or more sections, and has no refrigerant-containing parts that are joined in the field by other than companion or block valves.

(d) Unit System. A self-contained system which has been assembled and tested prior to its installation, and which is installed without connecting any refrigerant-containing parts. A unit system may include factory-assembled companion or block valves.

Repair. The work necessary to restore pressure-retaining items to a safe and satisfactory operating condition pursuant to the NBIC.

1.02: continued

Reportable Accidents/Incidents. Accidents or incidents that result in Serious Injury/Illness, or damage that results in the Boiler or Pressure Vessel being removed from service for work other than routine or scheduled maintenance, or Routine Repair work in accordance with the NBIC Part 3.

Routine Repair. Repairs for which the requirement for in-process involvement by the District Engineering Inspector or Authorized Inspector and stamping by the "R" Certificate Holder may be waived as determined by the Chief and the District Engineering Inspector or Authorized Inspector in accordance with the NBIC and documented on an R-1 Form as a "Routine Repair" under the Remarks section.

Serious Injury/Illness. A personal injury/illness that results in death, dismemberment, significant disfigurement, permanent loss of the use of a body organ, member, function or system, a compound fracture or other significant injury/illness that requires immediate admission and overnight hospitalization and observation by a licensed physician.

Temporary Use Boiler. A portable Boiler which is installed for not more than one year.

Ton of Refrigeration. The removal of heat at a rate of 12,000 Btu/hr.

1.03: Standards Adopted

The standards listed in 522 CMR 1.03 are adopted and hereby incorporated as part of 522 CMR. Boilers and Pressure Vessels subject to 522 CMR shall be constructed in accordance with the ASME standards, or other recognized engineering standards in effect at the time of the manufacture. References to the external standards throughout 522 CMR shall be to the specific external standards adopted in 522 CMR 1.03, unless otherwise clearly stated.

ANSI/ASHRAE

15-2022 *Safety Standard for Refrigeration Systems*
34-2022 *Designation and Safety Classification of Refrigerants*

ANSI/IIAR

1-2022 *Standards for Definitions and Terminology Used in IIAR Standards*
2-2021 *Standard for Design of Safe Closed-Circuit Ammonia Refrigeration Systems*
4-2020 *Installation of Closed-Circuit Ammonia Refrigeration Systems*
6-2019 *Standards for Inspection, Testing, and Maintenance of Closed-Circuit Ammonia Refrigeration Systems*
9-2020 *Standard for Minimum System Safety Requirements for Existing Closed-Circuit Ammonia Refrigeration Systems*

ASME *Code for Pressure Piping*, B31

B31.1-2020 *Power Piping*
B31.3-2020 *Process Piping*
B31.5-2019 *Refrigeration Piping and Heat Transfer Components*
B31.9-2020 *Building Service Piping*

ASME *Boiler and Pressure Vessel Code*, 2021

Section I – Rules for Construction of Power Boilers
Section II – Materials
- Part A – Ferrous Materials Specifications
- Part B – Nonferrous Materials Specifications
- Part C – Specifications for Welding Rods Electrodes and Filler Metals
- Part D – Properties

Section III – Rules for Construction of Nuclear Facility Components
Section IV – Rules for Construction of Heating Boilers
Section VIII – Rules for Construction of Pressure Vessels

1.03: continued

Section IX – Welding, Brazing and Fusing Qualifications
Section X – Fiber-reinforced Plastic Pressure Vessels
Section XI – Division 1 Rules for In-service Inspection of Nuclear Power Plant Components
Section XIII – Rules for Overpressure Protection

ASME CSD-1-2021 *Controls and Safety Devices for Automatically Fired Boilers*

Part CG: General
Part CM: Testing and Maintenance
Part CW: Steam and Waterside Control

National Board Inspection Code, 2021 Edition

- Part 1 – Installation
- Part 2 – Inspection
- Part 3 – Repairs and Alterations
- Part 4 – Pressure Relief Devices

NFPA 85 *Boiler and Combustion Systems Hazards Code* – 2019 Edition

1.04: Department Jurisdiction

(1) Enforcement. Pursuant to M.G.L. c. 146, § 5, the Division shall enforce M.G.L. 146, and 522 CMR, except when otherwise provided.

(2) District Engineering Inspectors may enter any premises pursuant to M.G.L. c. 146, § 5.

(3) Inspection. A District Engineering Inspector shall perform the First Inspection of a Boiler or Pressure Vessel as required by M.G.L. c. 146, § 6.

(a) Boilers. All Boilers and their Appurtenances shall be thoroughly inspected externally and internally under the specifications of 522 CMR 2.00: *Power Boilers* and 4.00: *Heating Boilers and Other Heat Storage Sources*, except those specified in M.G.L. c. 146, § 7, which includes:

1. Boilers of railroad locomotives, motor vehicles or steam fire engines brought into the Commonwealth for temporary use in times of emergency;
2. Boilers used in private residences;
3. Boilers used for heating purposes which carry pressures not exceeding 15 pounds to the square inch and have less than four square feet of grate surface;
4. Boilers of not more than three horsepower;
5. Boilers under the jurisdiction of the United States; and
6. Boilers used exclusively for horticultural or agricultural purposes.

(b) Air Tanks. All Air Tanks and their Appurtenances, except those specified in M.G.L. c. 146, § 34, shall be thoroughly inspected externally or internally consistent with the specifications set forth in 522 CMR 7.00: *Air Tanks* at least once every two years when the following criteria are met:

1. design MAWP greater than 50 PSI; and
2. greater than six inches internal diameter; and
3. internal volume greater than one cubic foot.

(c) Massachusetts Tag Number.

1. Every Boiler, Pressure Vessel, and Refrigeration and Air Conditioning System which has been inspected by the Division shall be given a registration number upon a nonferrous metal tag authorized by the Board. The tag shall be held by nonferrous wire in a conspicuous place on the unit and no person, except a District Engineering Inspector, shall remove the tag.
2. Authorized Inspection Agencies shall be furnished tag numbers by the Chief for Refrigeration and Air Conditioning systems, or hot water Boiler systems. The Authorized Inspection Agencies shall furnish tags, authorized by the Board, upon which shall be the tag number. The tag shall be made of non-ferrous metal and attached in a conspicuous place on the unit.

1.05: Variance Procedure

(1) Application. An Owner/User or an Engineer in Charge may apply to the Board for a variance from 522 CMR. In order for the Board to approve a variance, the applicant shall demonstrate that such approval would not compromise public safety or otherwise undermine the purpose of 522 CMR. Application for a variance shall be made on a form approved by the Board for this purpose with supporting documentation and shall be signed by the applicant.

(2) Upon receipt of an application for variance, the Board shall review the application with supporting documentation. The Board may either:

(a) Grant the variance as requested or with conditions that the Board deems appropriate;

(b) Deny the variance request;

(c) Request additional information/clarification from the applicant; or

(d) Commence an adjudicatory hearing to further review the variance request. Hearings will be held in accordance with the provisions of M.G.L. c. 30A, and 801 CMR 1.02: *Informal/Fair Hearing Rules*.

(3) Appeals. Any person aggrieved by the Board's decision made after an adjudicatory hearing may appeal to the Superior Court in accordance with M.G.L. c. 30A, § 14.

1.06: Inspection Extension Request Procedure

(1) Application. Pursuant to M.G.L. c. 146, § 6, an Owner/User or Engineer in Charge may apply to the Chief for an extension of a Certificate prior to its expiration. The extension period shall not exceed six months.

(a) Application for an inspection extension shall be made on a form approved by the Board for this purpose, shall be signed by the applicant, and shall include a letter from an Authorized Inspector or, if not insured, a letter from a District Engineering Inspector. The letter shall provide guidance to the Chief on the condition of the Boiler.

(b) Upon receipt of an application, the Chief shall review the request as soon as practicable and make a decision to either:

1. Grant the extension as requested;
2. Grant the extension with conditions;
3. Deny the extension request; or
4. Request additional information.

(2) Any person aggrieved by the Chief's decision may file a request for review by the Board.

(3) Board Action. Upon receipt of an appeal, the Board shall review the request as soon as practicable and make a decision to either:

(a) Grant the extension as requested;

(b) Grant the extension with conditions;

(c) Deny the extension request;

(d) Request additional information; or

(e) Commence an adjudicatory hearing to further review the extension request. Hearings will be held in accordance with the provisions of M.G.L. c. 30A, and 801 CMR 1.02: *Informal/Fair Hearing Rules*.

(4) Any person aggrieved by the Board's decision made after an adjudicatory hearing may appeal to the Superior Court in accordance with M.G.L. c. 30A, § 14.

(5) All petitions and inquiries to the Board shall be submitted in writing.

(6) All requests for extension of the inspectional requirement approved or disapproved by the Chief shall bee reviewed and entered into record bu the Board.

1.07: Decommissioning

(1) Whenever a Boiler or Pressure Vessel is determined to be detrimental to public safety by either a District Engineering Inspector or Authorized Inservice Inspector, said Boiler or Pressure Vessel shall be removed from service and Decommissioned. The District Engineering Inspector or Authorized Inservice Inspector shall remove the Certificate of the unsafe or dangerous Boiler or Pressure Vessel. The Authorized Inservice Inspector shall notify the Chief within 14 days after the removal from service of the Boiler or Pressure Vessel, on a form approved by the Chief, the name of the Owner/User, location where the Boiler or Pressure Vessel was removed from service and Decommissioned, and the Mass Tag number of the Decommissioned Boiler or Pressure Vessel.

(2) Whenever a Boiler or Pressure Vessel has been removed from service and decommissioned it shall have had the fuel source, power, outlet and supply piping permanently disconnected from the Boiler or Pressure Vessel so that it is rendered inoperable.

1.08: Manufacturers' Data Reports

All new Boilers, Pressure Vessels, or other pressure-retaining items installed, unless otherwise exempted, shall be designed and constructed in accordance with the ASME Code or a nationally recognized Code of Construction adopted in 522 CMR. All new pressure-retaining items installed in this jurisdiction shall be marked in accordance with the Code of Construction and shall be registered with the National Board in accordance with NB-264, *Criteria for Registration of Boilers, Pressure Vessels and Other Pressure-retaining Items*. Pressure-relieving devices shall be constructed to the ASME Code and certified by the National Board in accordance with NB-500, Criteria for Certification of Pressure Relief Devices. These registration documents shall be kept on file at the location of the Boiler or Pressure Vessel, and shall be always accessible to the Division and Authorized Inspection Agencies.

1.09: Existing Installations

Unless specifically provided otherwise in this regulation, any existing Boiler, Pressure Vessel or Refrigeration or Air Conditioning System having met the provisions of the applicable laws, codes, rules or regulations in effect at the time such Boiler, Pressure Vessel or Refrigeration or Air Conditioning System was installed, shall be allowed to continue to be operated pursuant to its designated service, provided that the Boiler, Pressure Vessel or Refrigeration or Air Conditioning System has been maintained by the owner in accordance with applicable laws, codes, rules, regulations and manufacturers' requirements.

REGULATORY AUTHORITY

522 CMR 1.00: M.G.L. c. 146, §§ 1 through 51, 56 through 64 and 66 through 80.