522 CMR Proposed Amendments for Hearing on February 1, 2024

522 CMR: BOARD OF BOILER RULES

General Edits

- CHAPTER 1.00: GENERAL PROVISIONS
- CHAPTER 2.00: POWER BOILERS
- CHAPTER 3.00: POWER REACTOR VESSELS AND PIPING AND UNFIRED PRESSURE VESSELS AS USED IN ATOMIC ENERGY INSTALLATIONS
- CHAPTER 4.00: HEATING BOILERS AND OTHER HEAT STORAGE SOURCES
- CHAPTER 5.00: RESERVED
- CHAPTER 6.00: RESERVED
- CHAPTER 7.00: AIR TANKS
- CHAPTER 8.00: RESERVED
- CHAPTER 9.00: REFRIGERATION AND AIR CONDITIONING SYSTEMS
- CHAPTER 10.00: MATERIAL SPECIFICATIONS
- CHAPTER 11.00: WELDING SPECIFICATIONS
- CHAPTER 12.00: FIBERGLASS-REINFORCED PLASTIC PRESSURE VESSELS
- CHAPTER 13.00: RESERVED
- CHAPTER 14.00: RESERVED
- CHAPTER 15.00: NATIONAL BOARD INSPECTION CODE
- CHAPTER 16.00: CONTROLS AND SAFETY DEVICES FOR AUTOMATICALLY FIRED BOILERS (ASME CODE CSD-1), PART CG: GENERAL, PART CM: MAINTENANCE AND TESTING, PART CW: STEAM AND WATERSIDE CONTROL
- CHAPTER 17.00: PIPING
- CHAPTER 18.00: CONTINUING EDUCATION
- CHAPTER 19.00: PORTABLE BOILERS

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 shall submit drawings and specifications of such Boiler to said Board, which, if it approves, shall permit the construction thereof.

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 of 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 insurance company holding a Certificate of Competency as a Boiler inspector, issued to them by the Department to perform shop inspections, alterations, repair inspections, and field inspection of Boilers within the Commonwealth. All Authorized Inspectors shall also hold a valid National Board Commission~~ 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 ~~Holds NBIC~~ Commission with a nuclear endorsement (N).

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

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

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.

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 250˚F.

Marshal. The State Fire Marshal, appointed in accordance with the provisions of M.G.L. c. 6, s. 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 insurance company~~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. Chapter 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.

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~~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 this section, 522 CMR 1.03, unless otherwise clearly stated.

ANSI/ASHRAE

15-~~2019~~2022 *Safety Standard for Refrigeration Systems*
34-~~2019~~2022 *Designation and Safety Classification of Refrigerants*

ANSI/IIAR

1-~~2017~~2022 ~~–~~*Standard for Definitions and Terminology Used in IIAR Standards*
2-2021 ~~*American National*~~ *Standard for Design of Safe Closed-Circuit Ammonia Refrigeration Systems*
4-2020 ~~*American National Standard for I*~~*Installation of Closed-Circuit Ammonia Refrigeration Systems*
6-2019 ~~–~~*Standard 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-~~2018~~2020 *Process Piping*
B31.5-2019 *Refrigeration Piping and Heat Transfer Components*
B31.9-2020 *Building Service Piping*

ASME *Boiler and Pressure Vessel Code, ~~2019~~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
Section IX Welding~~,~~ ~~and~~ 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-~~2018~~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, ~~2019~~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. ~~those specified in M.G.L. c. 146, § 7, which includes~~ 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. ~~those~~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; ~~and~~
4. Boilers of not more than three ~~horse power~~horsepower.;
5. Boilers under the jurisdiction of the United States; and
6. Boilers used exclusively for horticultural or agricultural purposes.

Upon written application made to it by the Owner/User of a Boiler or Pressure Vessel, the Board may, when the public interest and convenience require, extend the time for the making of such inspection for a period not to exceed six months as the Board may determine.

(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 ~~System or~~and Air Conditioning System which has been inspected by the Division shall be given a registration number upon a non-ferrous metal tag authorized by the Board. The tag shall be held by non-ferrous wire in a conspicuous place on the unit and no person except a District Engineering Inspector shall remove the tag.

2. ~~Authorized insurance companies~~Authorized Inspection Agencies shall be furnished tag numbers by the Chief for Refrigeration and Air Conditioning systems, or hot water Boiler systems. The ~~authorized insurance companies~~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 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 be reviewed and entered into record by 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 ~~Authorized Inspector or~~ 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 d~~D~~ecommissioned 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 Inspectors~~ 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 to 51, 56 to 64, 66 to 80

522 CMR 2:00: POWER BOILERS

Section

2.01: Scope and Application

In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts by reference the 2021 *ASME Boiler and Pressure Vessel Code Section I, Rules for Construction of Power Boilers*.

2.02: Records

To ensure the proper daily inspection of steam Boilers, the following shall apply:

(1) When an engineer or fireman is operating steam Boilers or steam engines, he or she is actually engaged as an assistant to the person in charge, and during his or her hours on duty, he or she is held responsible for the proper operation of the Boilers and engines specified, and their Appurtenances. Operators of steam Boilers shall sign the Operator's ~~Record~~Log Book, as provided for in M.G.L. c. 146, § 46A, each time they assume responsibility as the licensed operator, and make necessary entries to the Operator's ~~Record~~Log Book during the shift. These records shall be made available to the Chief or any District Engineering Inspector upon request.

(2) In the event of a Reportable Accident/Incident, the Owner/User or the Engineer in Charge shall notify the Massachusetts Emergency Management Agency at 508-820-2000 within 24 hours of the event.

(3) All Engineers and Firemen in charge of steam Boilers and/or engines shall notify the ~~Department~~Division in ~~writing~~ a format approved by the Chief~~,~~ within seven days of their appointment, of the location of the Boilers and/or engines of which they are in charge. When accepting a position, the Engineer or Fireman must include a letter of designation as the engineer in charge, signed by the owner or owner's representative. When ~~accepting or~~ leaving a position as an Engineer or Fireman in charge, the Engineer or Fireman shall notify the ~~Department~~Division within seven days ~~on a form~~ in a format approved by the Chief~~Department~~. ~~When accepting a position, the Engineer or Fireman must include a letter of designation as the engineer in charge, signed by the owner or owner's representative.~~

(4) The Engineer in Charge is the actual authority for the operation, maintenance, and repair of the Boilers, Pressure Vessels, engines, and their Appurtenances specified. All persons operating, repairing or maintaining these Boilers, Pressure Vessels, engines, and their Appurtenances do so under the direct authority of the Engineer in Charge. In order to effectively perform his or her duties, the Engineer in Charge shall make daily visits to the plant, unless an alternative schedule has been approved by the Chief. It is reasonable for the Engineer in Charge to perform their duties at the facility five working days per week. Individuals performing duties as the Engineer in Charge will leave ~~daily~~ written instructions as necessary to the operating personnel; ~~and~~ those instructions will be made available to the District Engineering Inspector upon request. The Engineer in Charge shall sign the Engineer's Record Book, as provided for in M.G.L. c. 146 § 51 on a daily basis, and shall review the Operator's Log Book as provided for in M.G.L. c. 146 § 46A ~~-~~on a daily basis.

(5) It shall be the responsibility of the Engineers in Charge to ensure that the~~The~~ Engineer's Record Books and the Operator's Log Books are~~shall be~~ maintained and kept at the location of the Boiler(s), and are~~shall be~~ retained for a minimum of seven (7) years.~~.~~

2.03: Construction

(1) Heat Recovery Steam Generators (HRSGs). All heat recovery steam generators built after May 1, 2000, shall be built to the *ASME Boiler and Pressure Vessel Code Section I, Rules for Construction of Power Boilers* adopted at the time of installation.

(2) Restrictions, Dual Pressure Controls, Bypass Switches.

(a) Steam Boilers under 522 CMR 2.03 are prohibited from having any device that enables the Boiler to operate at a pressure less than 10% of its normal operating pressure. Dual pressure controls or any similar device are prohibited from use on all steam Boilers operating above 15 PSIG.

(b) Manual devices and switches that allow the bypass of any safety control are prohibited unless such device or switch is provided with a "dead-man" capability that ensures that the Operator is present and responsible when the device or switch is in use. No such device or switch shall have the capability to fail in the closed position.

(3) Remote Monitoring Systems. When remote monitoring systems on Steam Boilers are in use, they shall monitor, but not be limited to: steam pressure and water level, and include a remote shut down switch. All remote monitoring systems must be installed with uninterruptable system signals, and include visible alarms and annunciators.

2.04: Repairs and Alterations

(1) Welded Repairs and Alterations: All welded repairs and alterations performed to the High Pressure/Power Boiler proper and the High Pressure/Power Boiler External Piping (BEP) shall be done in accordance with the provisions of M.G.L. c. 146 §2 and NBIC Part 3 *Repairs and Alterations*, and shall be performed by an accredited~~-~~ "R" Certificate Holder. It is the responsibility of the Owner/User or Engineer in Charge to ensure that all repairs and

alterations are performed in accordance with 522 CMR 2.00. Signed copies of completed Form R-1 and Form R-2, together with attachments, shall be submitted to the Division, in a format approved by the Chief~~, to the Department~~. Copies~~, and~~ shall be made available to the Division or an Authorized Inspection Agency upon request~~ to the Division and Authorized Inspectors of the Boiler~~. Distribution of Form R-1 and Form R-2 and attachments shall be the responsibility of the organization performing the repair.

(2) Mechanical Repairs to Boiler External Piping Systems (BEP). All ~~M~~mechanical repairs to Boiler External Piping of High Pressure/Power Boilers shall~~may~~ be performed under the supervision of the Engineer in Charge. The Engineer in Charge shall record all work performed on ~~it~~the Boiler upon forms to be obtained from the Division~~epartment~~. These records shall be kept on file at the location of the Boiler(s), and shall be always accessible to the Division and Authorized ~~Inspectors~~Inspection Agencies. Design requirements for mechanical repairs are to meet the original code of construction. Legible signed copies of such reports together with attachments shall be made on a form, and submitted to the Division, in a format approved by the Chief, within seven days of completion of the repair.

2.05: Installation

In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts the ~~2019~~2021 NBIC Part 1 *Installation*.

2.06: Inspection

In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts the ~~2019~~2021 NBIC Part 2 *Inspection*.

(1) Application. Whoever owns or uses or causes to be used a High Pressure/Power Boiler that comes within the scope of M.G.L. c. 146, § 6, shall make application for inspection prior to installation and operation to the ~~Chief~~Division in a format approved by the ~~Department~~Chief.

(2) Field Inspection. All High Pressure/Power Boilers shall be thoroughly inspected internally and externally while under pressure at least once annually in accordance with the NBIC. The annual external inspection shall be within six months after the annual internal inspection. A District Engineering Inspector shall perform the First Inspection as required by M.G.L. c. 146, § 6. Subsequent annual inspections shall be performed by a District Engineering Inspector or an Authorized Inservice Inspector. A thorough Internal Inspection requires the following:

(a) Each space, including but not limited to, fireside and waterside spaces provided with a handhole, manhole, or other points of access such as doorways and openings into fireside and waterside spaces, shall be opened and cleaned for a visual inspection.
(b) Pre-inspection and post-inspection activities as provided for in the NBIC shall be performed.

(3) Certificate to be Posted.

(a) The Department shall issue to the Owner/User of a Boiler compliant with 522 CMR a Certificate, on the condition that the appropriate fees have been paid. The Certificate shall be protected from dirt, moisture, and contamination and shall be posted in a conspicuous place near where the Boiler specified therein is located, ~~and~~ shall be kept with said Boiler, and shall be always accessible to the District Engineering Inspector or Authorized Inservice Inspector.

(b) The Certificate shall include the name of the ~~insurance company~~Authorized Inspection Agency, the National Board number, the Mass Tag number, the name of the manufacturer, the name of the owner or user, the location, size and number of the Boiler, the date of inspection and the maximum pressure at which it may be operated, with the signature of the inspector, and shall contain such extracts from the statutes as shall be deemed necessary by the board.

(c) The Certificate shall remain posted while the Certificate is in force, unless a District Engineering Inspector or an Authorized Inservice Inspector deems the Boiler or its Appurtenances unsafe or dangerous. If a Boiler is determined to be unsafe or dangerous, the District Engineering Inspector or Authorized Inservice Inspector shall remove the Certificate, and submit such certificate to the Chief, and the Boiler or Pressure Vessel shall not be operated until such time that a valid Certificate is re-issued.

(4) Preparation of Inspection. The Boiler shall be prepared for inspection in accordance with the NBIC. The Engineer in Charge is responsible to ensure the Boiler is properly prepared for inspection.

(5) Inspection Reporting. Pursuant to M.G.L. c. 146, § 10, whoever owns, or uses or causes to be used, any Power Boiler, shall report in writing to the Chief the location of such Boiler before the work of installation of such Boiler, and annually thereafter; provided that the Owner/User of an insured Boiler shall report immediately in writing to the Chief whenever the ~~insurance company~~Authorized Inspection Agency ceases for any cause to inspect the Boiler.

(6) Reporting by ~~Insurance Companies~~Authorized Inspection Agencies.

(a) Pursuant to M.G.L. c. 146, § 18, every ~~insurance company~~Authorized Inspection Agency shall forward to the Chief, within 14 days after each inspection, reports of all Boilers inspected by the ~~Authorized Inspectors~~Authorized Inservice Inspectors. Such reports shall be made on a form, and submitted in a format approved by the Chief, and shall contain all orders made by the company regarding such Boilers.

(b) All ~~insurance companies~~Authorized Inspection Agencies shall notify the Chief, within 14 days, on a form and submitted in a format approved by the Chief, of all Boiler new business or discontinuation of business. All ~~insurance companies~~Authorized Inspection Agencies shall report immediately to the Chief in writing the name of the Owner/User and the location of every Boiler required to be inspected by M.G.L. c. 146, § 19, upon which they have cancelled or refused insurance, giving the reasons therefor.

(c) The Authorized Inservice Inspector shall notify the Chief or his/or her designee immediately in writing if the ~~Authorized~~ Authorized Inservice Inspector finds that an unsafe and dangerous condition exists resulting in the removal of the Certificate.

(7) Boiler Horsepower.

(a) Pursuant to M.G.L. c. 146, § 48, when liquid or gaseous fuel, electric or atomic energy or any other source of heat is used, the horsepower of a Boiler shall be determined by either the manufacturer's ~~factory tag~~nameplate affixed to the Boiler or burner denoting horsepower, or calculated by one of the following formulae: the steam output capacity as listed on the manufacturer's ~~tag~~nameplate divided by 34.5; the ~~BTU/hr~~Btu/hr input listed on the manufacturer's ~~tag~~nameplate divided by 41,840; or the ~~BTU/hr~~Btu/hr output listed on the manufacturer's ~~tag~~nameplate divided by 33,475.
(b) If a ~~tag~~manufacturer's nameplate is missing, damaged or unclear, the licensed Engineer-in-Charge or on duty at the time shall notify the Owner/User of the ~~steam~~ Boiler. The Owner/User shall obtain a notarized letter, signed by an officer of the manufacturer of the Boiler or burner, listing the maximum capacity of the ~~steam~~ Boiler in ~~BTU/hr~~Btu/hr. Such letter shall be an acceptable basis for calculating the horsepower of that particular ~~steam~~ Boiler.
(c) The minimum safety valve relieving capacity shall be determined in accordance with the ASME Code.

2.07: General Requirements

Pressure Tests. When it is unclear as to the extent of a defect or condition found in a High Pressure/Power Boiler, the District Engineering Inspector or the Authorized Inservice Inspector may require a pressure test at any time. Such tests shall be performed in accordance with the NBIC, and the Engineer in Charge shall notify the Chief in writing of the date that such pressure test will be performed.

REGULATORY AUTHORITY

522 CMR 2.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

522 CMR 3:00: POWER REACTOR VESSELS AND PIPING AND UNFIRED PRESSURE VESSELS AS USED IN ATOMIC ENERGY INSTALLATIONS

Section

3.01: Scope and Application

522 CMR 3.00 applies to all nuclear power reactor vessels and piping as well as unfired vessels used in atomic energy installations.

3.02: Construction

(1) In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts by reference the *ASME Boiler and Pressure Vessel Code Section III, Rules for the Construction of Nuclear Facility Components*.

(2) 522 CMR 3.00 shall be applicable to the construction, installation, and inspection of steam Boilers, power reactor vessels, containment vessels, piping, reactor plant Appurtenances, and unfired Pressure Vessels as used in atomic energy installations subject to the provisions of M.G.L. c. 146.

3.03: Installation

In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts the ~~2019~~2021 *NBIC Part 1 Installation*.

3.04: Inspection, Repairs, and Alterations

In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts the ~~2015~~2021 *ASME Boiler and Pressure Vessel Code Section XI - Division 1, Rules for In-service Inspection of Nuclear Power Plant Components*, in addition to the ~~2019~~2021 *NBIC Part 2 Inspection, and Part 3 Repairs and Alterations*.

3.05: Inspector and Records

(1) An Authorized Nuclear Inspector and Authorized Nuclear Inspector (Concrete) shall be on the site during the mechanical construction and testing phases of every nuclear reactor installation, its components, Appurtenances, containment vessel, and piping

systems. The District Engineering Inspector may make such inspections as deemed appropriate.

(2) The Owner/User shall keep permanent records to maintain complete traceability of all material used in the construction of any nuclear reactor plant. These records shall include certificates of chemical and physical properties.

(a) Permanent records shall be kept at the plant site to maintain complete traceability of all welds that fall within the limits of the 2021 *ASME Boiler and Pressure Vessel Code Section III, Rules for Construction of Nuclear Facility Components*.
(b) Permanent records shall be maintained identifying all welders, and their qualifications, performing welds covered in 522 CMR 3.05(2)(a).

3.06: Miscellaneous Provisions

(1) The owner of a nuclear power plant shall provide a procedure by which all agency reports and data sheets shall be coordinated to the satisfaction of the Chief or his designee.

(2) Pressure Tests.

(a) An Authorized Nuclear Inspector may require a pressure test to determine the extent of a defect or detrimental condition found in a Pressure Vessel. Such test shall be performed in accordance with the ~~2019~~2021- *NBIC Part 2 Inspections,* and ~~2015~~2021 *ASME Nuclear Vessels, Section III, Rules for Construction of Nuclear Vessels*.
(b) The maximum metal temperature is not to be more than 120°F unless the Authorized Nuclear Inspector agrees to a temperature higher than 120°F.
(c) When the contents of the vessel prohibit contamination by any other medium or when a hydrostatic test is not possible, other testing media may be required by the Authorized Nuclear Inspector provided that the precautionary requirements in the NBIC are followed.

REGULATORY AUTHORITY

522 CMR 3.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

522 CMR 4.00: HEATING BOILERS AND OTHER HEAT STORAGE SOURCES

Section

4.01: Scope and Application

(1) In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section IV, Rules for Construction of Heating Boilers*.

(2) Requirements. 522 CMR 4.00 shall apply to Boilers exceeding three horsepower and restricted to the following services:

(a) Steam Low Pressure/Heating Boilers having a minimum safety relief valve capacity greater than 200 pounds per hour for operation at pressures not exceeding 15 PSIG (100 kPa).
(b) Hot ~~w~~Water Low Pressure/Heating Boilers and hot water supply Boilers having a minimum safety relief valve capacity greater than 200,000 ~~BTU/hr~~Btu/hr for operation at pressures not exceeding 160 PSIG (1,100 kPa).
(c) Hot ~~w~~Water Low Pressure/Heating Boilers and hot water supply Boilers having a minimum safety relief valve capacity greater than 200,000 ~~BTU/hr~~Btu/hr for operation at temperatures not exceeding 250˚F (120˚C), at or near the Boiler outlet, except that when some of the wrought materials permitted by ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section IV*, *Rules for Construction of Heating Boilers* are used, a lower temperature is specified.
(d) Potable water heaters and water storage tanks for operation at pressures not exceeding 160 PSIG (1,100 kPa) and water temperatures not exceeding 210ºF (99ºC).

522 CMR 4.01 (2)(d) shall not apply to units in this category when none of the following limitations is exceeded:

1. Heat input of 200,000 ~~BTU/hr~~Btu/hr;
2. A water temperature of 210°F (99°C);
3. ~~-~~A nominal water-containing capacity of 120 gallons, except that they shall be equipped with safety devices in accordance with the requirements of the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section IV*, *Rules for Construction of Heating Boilers,* paragraph HLW-100.

The minimum safety valve relieving capacity for Low Pressure/Heating Boilers and other heat storage sources shall be determined in accordance with ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section IV*, *Rules for Construction of Heating Boilers.*

4.02: Construction

All Low Pressure/Heating Boilers under the scope of 522 CMR 4.02 shall be initially constructed in accordance with the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section IV, Rules for Construction of Heating Boilers*.

4.03: Reconstruction Including Welded Repairs, Major Repairs, Alterations

(1) All reconstruction, including Repairs and Alterations performed to bring the vessel to the original code of construction as stamped on the Boiler, shall be done in accordance with the provisions of M.G.L. c. 146, § 2, ~~2019~~2021 *NBIC Part 3 Repairs and Alterations*, and the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section IV, Rules for Construction of Heating Boilers*.

(2) All welded repairs and alterations performed to the Boiler proper shall be done in accordance with the provisions of M.G.L. c. 146 §2 and NBIC Part 3 *Repairs and Alterations*, and shall be performed by an accredited "R" Certificate Holder. It is the responsibility of the Owner/User to ensure that all repairs and alterations are performed in accordance with 522 CMR 4.00. Signed copies of completed Form R-1 and Form R-2, together with attachments, shall be submitted, in a format approved by the Chief, to the Division. Copies shall be made available to the Division or an Authorized Inspection Agency upon request. Distribution of Form R-1 and Form R-2 and attachments shall be the responsibility of the organization performing the repair.

4.04: Installation

In accordance with the provisions of M.G.L. c. 146, §2, the Board adopts ~~2019~~2021 *NBIC Part 1 Installation*.

4.05: Inspection

In accordance with the provisions of M.G.L. c. 146, §2, the Board adopts ~~2019~~2021 *NBIC Part 2 Inspection*.

(1) Field Inspection. All Low Pressure/Heating Boilers and heat storage sources constructed with manholes or hand holes under 522 CMR 4.05, except those listed as exempt in section 4.05(2), shall be thoroughly inspected externally at least once a year, and as follows:

(a) Hot Water - Low Pressure/Heating Boilers constructed with manholes or hand holes shall be inspected internally at least once every three years;

(b) Steam - Low Pressure/Heating Boilers constructed with manholes and hand holes shall be inspected internally at least once a year.

The First Inspection for the installation of a Hot Water – Low Pressure/Heating Boiler or heat storage source covered by 522 CMR 4.05 may be made by either a District Engineering Inspector, or by an ~~Authorized~~Authorized Inservice Inspector. The first part of the inspection on steel field-erected Boilers shall be completed before the system is filled with the fluid to be heated.

The First Inspection for the installation of a steam Boiler covered by 522 CMR 4.05 shall be made by a District Engineering Inspector.

(2) Exempt from Inspection. The following Low Pressure/Heating Boilers shall be constructed in accordance with this regulation, but are exempt from required inspections:

(a) Boilers of railroad locomotives, motor vehicles or steam fire engines brought into the Commonwealth for temporary use in times of emergency;
(b) Boilers used in private residences;
(c) Boilers used for heating purposes which carry pressures not exceeding 15 PSI and have less than four square feet of grate surface;
(d) Boilers of not more than three horsepower (100,425 ~~BTU/hr~~Btu/hr) used for heating purposes;
(e) Boilers under the jurisdiction of the United States;
(f) Boilers used exclusively for horticultural or agricultural purposes.

(3) Certificate to be Posted.

(a) The Department shall issue to the Owner/User of a Boiler compliant with 522 CMR a Certificate, on the condition that the appropriate fees have been paid. The Certificate shall be protected from dirt, moisture, and contamination and shall be posted in a conspicuous place near where the Boiler specified therein is located and shall be kept with said Boiler and shall be always accessible to the District Engineering Inspector or Authorized Inspector.
(b) The Certificate shall include the name of the ~~insurance company~~Authorized Inspection Agency, the National Board number, the ~~Mass~~Massachusetts Tag number, the name of the manufacturer, the name of the owner or user, the location, size and number of the Boiler, the date of inspection and the maximum pressure at which it may be operated, with the signature of the inspector, and shall contain such extracts from the statutes as shall be deemed necessary by the ~~b~~Board.
(c) The Certificate shall remain posted while the Certificate is in force, unless a District Engineering Inspector or an Authorized Inspector deems the Boiler or its Appurtenances unsafe or dangerous. If a Boiler is determined to be unsafe or dangerous, the District Engineering Inspector or ~~Authorized Inspector~~Authorized Inservice Inspector shall remove the Certificate, and submit such certificate to the Chief, and the Boiler or Pressure Vessel shall not be operated until such time that a valid Certificate is re-issued.

(4) Application. Whoever owns or uses or causes to be used a Low Pressure/Heating Boiler that comes within the scope of M.G.L. c. 146, § 6, shall make application for inspection prior to installation and operation to the Chief in a format approved by the ~~Department~~Division.

(5) Preparation of Inspection. The Owner/User of a Boiler which requires an Internal Inspection by a District Engineering Inspector or an ~~Authorized Inspector~~Authorized Inservice Inspector shall prepare the Boiler for inspection by cooling (blanking off connections to adjacent Boilers, if necessary); removing all soot and ashes from tubes, heads, shell, furnace, and combustion chamber; drawing off the water; removing the handhole and manhole plates; removing grate bars from internally fired Boilers; and removing the steam gauge for testing as well as following ~~2019~~2021 *NBIC Part 2 Inspection*.

If a Boiler has not been properly cooled or otherwise prepared for inspection, the District Engineering Inspector or ~~Authorized Inspector~~Authorized Inservice Inspector shall decline to inspect the Boiler until the Boiler has been properly prepared.

(6) Inspection Reporting. Pursuant to M.G.L. c. 146, § 10, whoever owns, or uses or causes to be used, any Low-Pressure Heating Boiler, shall report in writing to the Chief the location of such Boiler, before the work of installation of such Boiler, and annually thereafter; provided, that the Owner/User of an insured Boiler shall report immediately in writing to the Chief whenever the ~~insurance company~~Authorized Inspection Agency ceases for any cause to inspect the Boiler.

(7) Reporting by ~~Insurance Companies~~Authorized Inspection Agency.

(a) Pursuant to M.G.L. c. 146, § 18, every ~~insurance company~~Authorized Inspection Agency shall forward to the Chief, within 14 days after each inspection, reports of all Boilers inspected by the ~~Authorized Inspectors~~Authorized Inservice Inspectors. Such reports shall be made on a form and submitted in a format approved by the Chief, and shall contain all orders made by the company regarding such Boilers.

(b) All ~~insurance companies~~Authorize Inspection Agencies shall notify the Chief, within 14 days, on a form and submitted in a format approved by the Chief, of all Boiler new business or discontinuation of business. All ~~insurance companies~~Authorized Inspection Agencies shall report immediately to the Chief, in writing, the name of the Owner/User and the location of every Boiler required to be inspected ~~by~~in accordance with M.G.L. c. 146, § 70, upon which they have cancelled or refused insurance, giving the reasons therefor.

(c) The ~~Authorized Inspector~~Authorized Inservice Inspector shall notify the Chief or his designee immediately in writing if the ~~Authorized Inspector~~Authorized Inservice Inspector finds that an unsafe and dangerous condition exists resulting in the removal of the Certificate.

(8) Massachusetts Heat Boilers. Massachusetts Heat Boilers, Inspection and Stamping. Mass. Heat Boilers shall be inspected during construction by an ~~National Board Commissioned~~ Authorized Inspector. Each Boiler shall be stamped MASS. HEAT and shall display the following data:

(a) Manufacturer's name;
(b) Maximum allowable working pressure;
(c) Safety valve relieving capacity (minimum) in pounds per hour;
(d) MASS. HEAT number; and
(e) Year built.

(9) Installation of Used Boilers in the Commonwealth. Whoever owns and operates a Boiler not in the Commonwealth which was not shop inspected and stamped in accordance with the *ASME Boiler and Pressure Vessel Code Section IV, Rules for Construction of Heating Boilers*, but bears the stamping of another state or political subdivision which has adopted a standard of construction equivalent to that of Massachusetts, and wishes to operate said steam Boiler within the Commonwealth, may petition the Board for permission to do so. Such petition shall be accompanied by the following:

(a) a copy of the original data report of the manufacturer of the Boiler, signed by an inspector with the appropriate commission who made the original shop inspection; and
(b) the field inspection data sheet and report covering the inspection of the Boiler, signed by an inspector with the appropriate commission.

If upon review of this information, the Board finds that the Boiler is in compliance with the Massachusetts requirements with regard to material, construction, and workmanship, and further finds that the Boiler is in safe working condition and equipped with all necessary appendages, the Board shall issue a Certificate establishing the safe working pressure.

(10) Atmospheric Boilers. Boilers that are vented directly to the atmosphere, where it is not possible for the Boiler to build up any pressure above atmospheric pressure, shall be exempt from 522 CMR 4.00 provided they do not have any valves, flaps, louvers or dampers in the vent line which could have the capacity to freeze in place, thereby causing the Boiler to build pressure. Any atmospheric Boiler that has such valve, flap, louvers, dampers or any Appurtenance that can result in a blockage of the vent line shall be constructed in accordance with the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section IV, Rules for Construction Heating Boilers*.

(11) Shutdown Switches and Circuit Breakers. A manually operated remote heating plant automatic shutdown device, including but not limited to, a shutdown switch or circuit breaker, shall be located adjacent to the boiler room door, marked for easy identification. Consideration should also be given to the type and location of the switch to safeguard against tampering. In the event that the boiler room door is located on the building exterior, the shutdown device shall be located adjacent to the interior of the door. Where entrance

may be gained to the boiler room through two or more separate doors, each door shall be outfitted with a shutdown device adjacent to the door. Alternate locations of remote emergency switch(es) may be approved by the Board through the variance process in 522 CMR 1.05: ~~*Department Jurisdiction*~~*Variance Procedure*.

REGULATORY AUTHORITY

522 CMR 4.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

(522 CMR 5.00 AND 6.00: RESERVED)

522 CMR 7.00: AIR TANKS

Section

7.01: Scope

In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts by reference the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section VIII, Rules for Construction of Pressure Vessels*.

(1) 522 CMR 7.00 shall apply to all Air Tanks enumerated in M.G.L. c. 146, § 34 including the following:

(a) Air Tanks that meet the following criteria:

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

Note: The exemption of Air Tanks containing less than one cubic foot of air applies to each single vessel and not to an assembly of vessels.

(2) 522 CMR 7.00 shall not apply to the exceptions enumerated in M.G.L. c. 146, § 34 including the following:

(a) Air Tanks subject to Federal control.
(b) Air Tanks attached to locomotives, street cars, railway cars, trackless trolley vehicles, or to motor vehicles for use in operating such vehicles or their brakes or body lifting apparatus.
(c) Air Tanks in which air is used solely for cushioning systems containing water or other liquids.
(d) Air Tanks containing air and liquids in which the pressure is maintained by ~~pumps;~~pumps, for example, hydraulic elevator tanks.
(e) An Air Tank or other receptacle used by divers if such Air Tank or other receptacle is inspected by the refilling agency.
(f) Portable tanks and bottles containing compressed air as used for breathing purposes while combating fires or used in rescue operations in contaminated areas; and storage

tanks and mechanical filling systems used to fill such portable tanks and bottles.

(g) Air Tanks used in and as part of electrical substations owned and operated by an electric company, as defined M.G.L. c. 164, § 1.

7.02: Construction

All Air Tanks under the scope of this section shall be initially constructed in accordance with the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section VIII, Rules for Construction of Pressure Vessels*.

7.03: Installation

(1) All Air Tanks shall be available for complete External Inspection, and shall be so installed that there will be not less than 12 inches between the Air Tank and any floor, wall, ceiling or other obstruction, except where an Air Tank is attached to a portable compressor by means of straps and is removable for complete inspection. The 12-inch clearance may be waived by the District Engineering Inspector who shall document in their report that there was not a clearance of 12 inches, but that a complete External and Internal Inspection was made. The name plate, safety valve, drain, pressure gauge, tank bottom, and inspection openings shall be readily visible and accessible if the clearance requirement is to be waived.

(2) In case of vertical Air Tanks, the bottom head if dished shall have the pressure on the concave side to ensure complete drainage.

(3) Vertical Air Tanks with a base ring shall have unobstructed access to the Air Tank bottom for inspection.

(4) Air Tanks in a fixed installation shall be secured to prevent movement.

(5) Steel or another metallic piping and fittings shall be used from the Air Tank outlet to the first block valve and on all vessel penetrations and nozzles.

(6) Air Tanks that can be isolated with block valves shall have a pressure relief valve attached to the Pressure Vessel.

(7) Air Tanks that can be isolated with block valves shall have a pressure gage attached to the Pressure Vessel per 522 CMR 7.00.

(8) The connection to the pressure relief valve shall be as short as possible and not reduced.

(9) The pressure relief valve shall discharge to a safe location.

(10) The pressure relief valve shall be sized to relieve the capacity of all compressors which may operate at one time.

(11) In systems with multiple Air Tanks, all Air Tanks shall have a safety relief valve which lifts at the pressure of that Air Tank with the lowest MAWP or other means shall be provided to prevent pressurizing any Air Tank to a pressure greater than that Air Tank's MAWP.

(12) Air Tanks shall be protected from external corrosion.

(13) Automatic drains may be used in addition to the drain required by 522 CMR 7.00 provided that there is a manual by-pass valve around the automatic drain so that verification of the automatic drain's operation can be made.

(14) All Air Tanks shall be protected by such safety valves and indicating and controlling devices as will ensure their safe operation. These devices shall be so constructed, located, and installed that they cannot readily be rendered inoperative.

7.04: Inspections and Certificates

(1) Application. Whoever owns or uses or causes to be used an Air Tank that comes within the scope of M.G.L. c. 146, § 34, shall make application for inspection prior to installation and operation to the ~~Chief~~Division in a format approved by the ~~Department~~Chief.

(2) Field Inspection.

(a) All First Inspections shall be performed by a District Engineering Inspector before the Air Tank is put into service. All Air Tanks except those listed on 522 CMR 7.01(2) shall be inspected internally biennially thereafter either by a District Engineering Inspector or an Authorized Inspector.

If the installation is found to comply with 522 CMR 7.00, the Department shall issue a Certificate stating the pressure at which the Air Tank will be permitted to operate.

(b) Every Air Tank which has been inspected by a District Engineering Inspector shall be given a noncorrosive metal tag not less than one inch in height attached to the Air Tank with a noncorrosive metal wire secured with a lead seal. Only a District Engineering Inspector may remove the Mass Tag.

(3) An Air Tank which has been relocated shall require a first inspection by a District Engineering Inspector.

(4) Ultrasonic Inspections. Pursuant to M.G.L. c. 146, § 39, an ultrasonic thickness determination ~~shall~~may be permitted in *lieu* of, or in conjunction with, an Internal Inspection for Air Tanks or other receptacles of 36 inches diameter or less. Thickness measurements shall be made in at least eight areas: two on each head and two on both the top and bottom portions of the shell. Thickness determinations indicating significant reduction in material thickness over a general area shall be shown on the inspection report, as well as calculations for the reduction in allowable working pressure. The Authorized Inservice Inspector's employer or the Chief, as applicable, shall be responsible for the

inspector's or the ultrasonic examiner's competency in the use of the ultrasonic thickness gauge, and the examiner's signed report shall be attached to the District Engineering Inspector's or the Authorized Inservice Inspector's ~~or District Engineering Inspector's~~ inspection report. A hydrostatic test shall be applied if required by the District Engineering Inspector or Authorized Inservice Inspector ~~or District Engineering Inspector~~. The pressure applied during the test shall be equal to 1½ times the pressure allowed on the Air Tank or other receptacle. A hammer test may also be applied if there is no pressure on the Air Tank or receptacle.

A significant reduction in material is a reduction in material to less than the minimum allowable thickness. If the thickness is reduced below the minimum allowable thickness, the Air Tank shall be repaired to bring the Air Tank to at least the minimum thickness, or a fitness for service evaluation shall be performed to determine the maximum allowable pressure in accordance with the NBIC.

The examiner's signed report and the ~~Authorized~~Authorized Inservice Inspector's inspection report shall be submitted to the Division in a format approved by the ~~Department~~Chief.

(5) Certificate to Be Posted.

(a) The Department shall issue to the Owner/User of an Air Tank compliant with 522 CMR a Certificate, on the condition that the appropriate fees have been paid. The Certificate shall be protected from dirt, moisture, and contamination and shall be posted in a conspicuous place near where the Air Tank specified therein is located and shall be kept with said Air Tank and shall be always accessible to the District Engineering Inspector or ~~or~~ Authorized Inservice Inspector.~~.~~

(b) The Certificate shall include the name of the ~~insurance company~~Authorized Inspection Agency, the National Board number, the Mass Tag number, the name of the manufacturer, the name of the owner or user, the location, size and number of the Air Tank, the date of inspection and the maximum pressure at which it may be operated, with the signature of the inspector, and shall contain such extracts from the statutes as shall be deemed necessary by the board.

(c) The Certificate shall remain posted while the Certificate is in force, unless a District Engineering Inspector ~~or~~, or an Authorized Inservice Inspector deems the Air Tank or its Appurtenances unsafe or dangerous. If an Air Tank is determined to be unsafe or dangerous, the District Engineering Inspector, ~~or~~ or Authorized Inservice Inspector shall remove the Certificate, and submit such certificate to the Chief, and the Air Tank shall not be operated until such time that a valid Certificate is re-issued.

(6) Inspection Reporting. Pursuant to M.G.L. c. 146, §§ 37 and 38, whoever owns, or uses or causes to be used, any Air Tank, shall report in writing to the Chief the location of such ~~Boiler~~Air Tank~~,~~ before the work of installation of such ~~Boiler~~Air Tank, and annually thereafter; provided, that the Owner/User of an insured ~~Boiler~~Air Tank shall report immediately in writing to the Chief whenever the ~~insurance company~~Authorized Inspection Agency ceases for any cause to inspect the ~~Boiler~~Air Tank.

(7) Reporting by ~~Insurance Companies~~Authorized Inspection Agency.

(a) Pursuant to M.G.L. c. 146, § 38, every ~~insurance company~~Authorized Inspection Agency shall forward to the Chief, within 14 days after each inspection, reports of all Air Tanks inspected by ~~the Authorized Inspectors~~Authorized Inservice Inspectors. Such reports shall be made on a form, and submitted in a format approved by the Chief, and shall contain all orders made by the company regarding such Air Tanks.

(b) All ~~insurance companies~~Authorized Inspection Agencies shall notify the Chief, within 14 days, on a form and submitted in a format approved by the Chief, of all new business or discontinuation of business regarding coverage of registered Air Tanks. All ~~insurance companies~~Authorized Inspection Agencies shall report immediately to the Chief in writing the name of the Owner/User and the location of every Air Tank required to be inspected by M.G.L. c. 146, § 34, upon which they have cancelled or refused insurance, giving the reasons therefor.

(c) The ~~Authorized Inspector~~Authorized Inservice Inspector shall notify the Chief or his or her designee immediately in writing if the ~~Authorized Inspector~~Authorized Inservice Inspector finds that an unsafe and dangerous condition exists resulting in the removal of the Certificate.

(8) Riveted Air Tanks. In determining the maximum allowable working pressure on the shell of lap-riveted Air Tanks over ten years old, the lowest factor of safety to be used shall be as follows:

(a) 5.5 for Air Tanks over 10 and not over 15 years old;
(b) 5.75 for Air Tanks over 15 and not over 20 years old;
(c) 6.0 for Air Tanks over 20 years old.

~~Stamping shall comply with the 2019 *ASME Boiler and Pressure Vessel Code Section VIII, Rules for Construction of Pressure Vessels.*~~

No piping, drains, safety valves, pressure gauges or other Appurtenances shall be connected to threaded openings required for inspection and cleanout purposes. Flanged and/or threaded connections from which piping, instruments or similar attachments can be removed may be used in place of the required inspection openings in accordance with the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section VIII, Rules for Construction of Pressure Vessels.*

7.05: Pressure Relief Valves

(1) All pressure relief valves on Air Tanks shall conform to the ASME and National Board Codes as adopted by 522 CMR 7.00.

(2) All tanks, the contents of which are likely to cause interference with the operation of a pressure relief valve if attached directly to the Air Tank, shall have the pressure relief valve connected in such a manner as to avoid such interference. Intercoolers and aftercoolers shall not be classed as primary vessels but shall be protected by adequate pressure relief valves.

(3) When the pressure relief valve covered by 522 CMR 7.00 is exposed to the elements and freezing temperatures, they shall be located on the discharge pipe from the compressor as near to the Air Tank as practical.

7.06: Gauges and Drains

(1) Pressure Gauge.

(a) Every Air Tank shall have a pressure gauge connected in a manner that the pressure gauge cannot be shut off from the Air Tank except by a cock with T or lever handle, which shall be placed on the pipe near the pressure gauge. Gauge connections shall be of brass pipe and fitting or copper tubing so connected to the system that they will not be exposed to high temperatures due to compression. The minimum copper tubing size used shall be ⅛ inch.

(b) The dial of the pressure gauge shall be graduated to not less than 1½ times the maximum pressure allowed on the Air Tank.

(2) Test Gauge Connection. The Owner/User of the Air Tank shall install a test gauge connection at the request of the District Engineering Inspector or Authorized Inservice Inspector.

(3) Bottom Drain Pipe. Each Air Tank shall have a bottom drain pipe fitted with a valve or cock, of the straightway type, in direct connection with lowest water space practicable, or a pipe may be used extending inward from any other location to within 1/4 in. (6 mm) of the lowest point. The minimum size of pipe and fittings shall be ½ inch except for tanks 20 inches in diameter or less, in which the minimum size of such pipe and fitting shall be ¼ inch iron pipe size. If a plug cock is used, the plug shall be held in place with a guard or gland.

7.07: Welded Repairs, Major Repairs, Alterations

No Repairs or Alterations shall be done by the welding process without the prior approval of an Authorized Inspector. All reconstruction including Repairs and Alterations performed to bring the Air Tank to the original code of construction shall be done in accordance with the NBIC.

In no case shall heat be used to bring the metal to a dull red color around an inspection port or other opening for removing threaded attachments. Evidence of bringing the metal to a dull red color may require the immediate removal from service of the Air Tank until supporting documentation is submitted to the Board by a Massachusetts registered Professional Engineer.

All welded repairs and alterations performed to the Air Tank shall be done in accordance with the provisions of M.G.L. c. 146 §2 and NBIC Part 3 *Repairs and Alterations*, and shall be performed by an accredited "R" Certificate Holder. It is the responsibility of the Owner/User or Engineer in Charge to ensure that all repairs and

alterations are performed in accordance with 522 CMR 7.00. Signed copies of completed Form R-1 and Form R-2, together with attachments, shall be submitted to the Division, in a format approved by the Chief. Copies shall be made available to the Division or an Authorized Inspection Agency upon request. Distribution of Form R-1 and Form R-2 and attachments shall be the responsibility of the organization performing the repair.

REGULATORY AUTHORITY

522 CMR 7.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

(522 CMR 8.00: RESERVED)

522 CMR 9.00: REFRIGERATION AND AIR CONDITIONING SYSTEMS

Section

9.01: Scope

(1) Scope. The application of 522 CMR 9.00 is intended to ensure the safe design, construction, installation, operation, and inspection of every Rrefrigeration and Aair Ceonditioning system that comes within scope of M.G.L. c. 146, § 45A.

(2) Purpose. The purpose of 522 CMR 9.00 is to provide reasonable safety for life, limb, health, and property by adopting such rules and regulations in accordance with nationally recognized standards of engineering practice which will properly influence future progress and development in rRefrigeration and aAir Ceonditioning systems.

(3) Requirements. The requirements of 522 CMR 9.00 shall apply to all rRefrigeration and aAir eConditioning sSystems and Appurtenances that come within the scope of M.G.L. c. 146, § 45A excluding the following:

(a) Systems in railway trains;
(b) Systems in motor vehicles;
(c) Systems in private residences;
(d) Systems in apartment houses of less than five apartments;
(e) Systems under the jurisdiction of the United States;
(f) Agricultural, horticultural or floricultural purposes; and
(g) Systems having less than 20 tons capacity.

(4) Field Inspections. All First Inspections shall be performed by a District Engineering Inspector or an Authorized Inservice Inspector or a District Engineering Inspector before the Refrigeration or Air Conditioning Systems are put into service. Field inspections of Refrigeration orand Air Conditioning Systems in Massachusetts shall be made annually thereafter by a District Engineering Inspector or an Authorized Inservice Inspector.

9.02: Construction

All Refrigeration andor Air Conditioning Systems under the scope of 522 CMR 9.00 shall be initially constructed in accordance with *ASHRAE 15 Safety Standards for Refrigeration Systems* and *ASHRAE 34 Designation and Safety Classification of Refrigerants for the Installation of Refrigeration Systems* and *ANSI/IIAR 2, Standard for Equipment, Design and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems*.

9.03: Installation

In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts *ASHRAE 15-2019 Safety Standards for Refrigeration Systems* and *ASHRAE 34-2019 Designation and Safety Classification of Refrigerants for the Installation of Refrigeration Systems* ~~and ANSI~~and ANSI/*IIAR Standard 4-2020, American National Standard for Installation of Closed-Circuit Ammonia Refrigeration Systems*.

9.04: Inspection

(1) Application. Whoever owns or uses or causes to be used a Refrigeration or A~~a~~ir C~~e~~onditioning S~~s~~ystem that comes within the scope of M.G.L. c. 146, § 45A, shall make application for inspection prior to installation and operation to the Division ~~Chief~~ in a format approved by the ~~Department~~Chief.

(2) Annual Inspections. When a Refrigeration or Air Conditioning System is installed, a field inspection shall be performed before it is put into service, and the Refrigeration or Air Conditioning System shall be inspected annually thereafter by a District Engineering Inspector or an Authorized Inservice Inspector ~~or a District Engineering Inspector~~.

Refrigerant detector(s), alarm(s) and the refrigeration mechanical room ventilating systems shall be tested annually and in accordance with manufacturer's specifications. Records supporting that such periodic testing was performed on Refrigeration Systems 20 tons capacity or greater shall be made available upon request by a District Engineering Inspector or an Authorized Inservice Inspector ~~or District Engineering Inspector~~ during the annual inspection.

(3) Prescribed Pressure. A Refrigeration or Air Conditioning System shall not be operated in excess of the prescribed pressure. If the Refrigeration or Air Conditioning System is constructed and installed in accordance with 522 CMR prescribed by the Board, the District Engineering Inspector or Authorized Inservice Inspector shall issue a Certificate stating the maximum pressure at which the system will be permitted to operate.

(4) Certificate to Be Posted.

(a) The Department shall issue to the Owner/User of a Refrigeration or Air Conditioning System compliant with 522 CMR a Certificate, on condition that the appropriate fees have been paid. The Certificate shall be protected from dirt, moisture, and contamination and shall be posted in a conspicuous place near where the Refrigeration or Air Conditioning System specified therein is located and shall be kept with said Refrigeration or Air Conditioning System, and shall be always accessible to the District Engineering Inspector or Authorized Inservice Inspector.

(b) The Certificate shall include the name of the ~~insurance company~~Authorized Inspection Agency, the National Board number, the Mass Tag number, the name of the manufacturer, the name of the owner or user, the location, size and number of the

Refrigeration or Air Conditioning System, the date of inspection and the maximum pressure at which it may be operated, with the signature of the inspector, and shall contain such extracts from the statutes as shall be deemed necessary by the board.

(c) The Certificate shall remain posted while the Certificate is in force, unless a District Engineering Inspector or an Authorized Inservice Inspector deems the Refrigeration or Air Conditioning System or its Appurtenances unsafe or dangerous. If a Refrigeration or Air Conditioning System is determined to be unsafe or dangerous, the District Engineering Inspector or Authorized Inservice Inspector shall remove the Certificate, and submit such certificate to the Chief, and the Refrigeration or Air Conditioning System shall not be operated until such time that a valid Certificate is re-issued.

(5) Inspection Reporting. Pursuant to M.G.L. c. 146, § 45A, whoever owns, or uses or causes to be used, any Refrigeration or Air Conditioning System, shall report in writing to the Chief the location of such Refrigeration or Air Conditioning System, before the work of installation of such Refrigeration or Air Conditioning System, and annually thereafter; provided, that the Owner/User of an insured Refrigeration or Air Conditioning System shall report immediately in writing to the Chief whenever the ~~insurance company~~Authorized Inspection Agency ceases for any cause to inspect the Boiler.

(6) Reporting by ~~Insurance Companies~~Authorized Inspection Agency.

(a) Pursuant to M.G.L. c. 146, § 45A, every ~~insurance company~~Authorized Inspection Agency shall forward to the Chief, within 14 days after each inspection, reports of all Refrigeration and Air Conditioning Systems inspected by the ~~Authorized Inspectors~~Authorized Inservice Inspectors. Such reports shall be made on a form, and submitted to the Division in a format approved by the Chief and shall contain all orders made by the company regarding such Refrigeration or~~and~~ Air Conditioning Systems.

(b) All ~~insurance companies~~Authorized Inspection Agencies shall notify the Chief, within 14 days, on a form and submitted in a format approved by the Chief, of all new business or discontinuation of business regarding coverage of registered Refrigeration and Air Conditioning Systems. All ~~insurance companies~~Authorized Inspection Agencies shall report immediately to the Chief in writing the name of the Owner/User and the location of every Refrigeration and Air Conditioning System required to be inspected by M.G.L. c. 146, § 45A, upon which they have cancelled or refused insurance, giving the reasons therefor.

(c) The Authorized Inspector shall notify the Chief or his designee immediately in writing if the Authorized Inspector finds that an unsafe and dangerous condition exists resulting in the removal of the Certificate.

(d) ~~Insurance companies~~Authorized Inspection Agencies shall report the location and owner's information, and the type and amount (pounds) of refrigerant used for all refrigeration and air conditioning systems.

(7) Welding. All welding done on any Refrigeration or~~and~~ Air Conditioning System or piping covered by 522 CMR 9.00 shall be performed by a welder qualified according to the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section IX, Welding, ~~and~~ Brazing and Fusing Qualifications*.

(8) Electrical. A person holding a license as a refrigeration technician may connect or disconnect for the purpose of installation, alteration, repair or replacement, any device or control required by rules and regulations of the Board to be a part of a Refrigeration or Air Conditioning installation, or being an integral part of the Refrigeration or Air Conditioning equipment at the connection on such device, control or part to be repaired or replaced, from the first disconnect in. The first disconnect is the wall plug or nearest electrical disconnect to the Refrigeration or Air Conditioning equipment.

(9) Plumbing. An individual who is licensed in compliance with M.G.L. c. 146, § 85 as a refrigeration technician may connect or disconnect for the purpose of alteration, repair or replacement of controls downstream of the equipment gas shutoff valve any device or control that is regulated by 522 CMR or is an integral part of the Refrigeration or Air Conditioning equipment.

REGULATORY AUTHORITY

522 CMR 9.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

CHAPTER 10.00: MATERIAL SPECIFICATIONS

Section

10.01: Scope and Application

10.01: Scope and Application

(1) In accordance with the provisions of M.G.L. c. 146, § 2, the Board herewith adopts by reference the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section II, Materials, Parts A, B, C, and D*.

(2) 522 CMR 10.00 shall be applicable to the manufacture and construction of all High Pressure/Power Boilers, nuclear vessels and piping, Low Pressure/Heating Boilers, and unfired Pressure Vessels subject to the provisions of M.G.L. c. 146.

REGULATORY AUTHORITY

522 CMR 10.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

522 CMR 11.00: WELDING SPECIFICATIONS

Section

11.01: Scope and Application

11.01: Scope and Application

(1) In accordance with the provisions of M.G.L. c. 146, §§ 2 and 35, the Board adopts by reference the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section IX, Welding, Brazing, and Fusing ~~and Brazing~~ Qualifications*.

(2) 522 CMR 11.00 shall be applicable to all High Pressure/Power Boilers, nuclear vessels and piping, Low Pressure/Heating Boilers, and unfired Pressure Vessels subject to the provisions of M.G.L. c. 146.

REGULATORY AUTHORITY

522 CMR 11.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

522 CMR 12.00: FIBERGLASS-REINFORCED PLASTIC PRESSURE VESSELS

Section

12.01: Scope and Application

(1) In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts by reference the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section X, Fiber-Reinforced Plastic Pressure Vessels*.

(2) 522 CMR 12.00 shall be applicable to the Construction, Fabrication, Qualifying Designs and Procedures, Testing, Inspection, Marking, Stamping, and Reports of Fiberglass-reinforced Plastic Pressure Vessels as used for the storage of compressed air and gases used for refrigeration, subject to the provisions of M.G.L. c. 146.

REGULATORY AUTHORITY

522 CMR 12.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

(522 CMR 13.00 AND 14.00: RESERVED)

522 CMR 15.00: NATIONAL BOARD INSPECTION CODE

Section

15:01: Scope and Application

15.01: Scope and Application

(1) In accordance with the provisions of M.G.L. c. 146 § 2, the Board adopts the ~~2019~~2021 NBIC as formulated and published, as it directly relates to Boilers, Pressure Vessels, and their Appurtenances.

(2) The NBIC applies to the inspection, installation, and alteration or repair of Boiler and Pressure Vessels.

(3) Hydrostatic/Pressure Test Requirements. All Repairs and Routine Repairs shall be pressure tested in accordance with the 2021 NBIC *Part 3, Repairs and Alterations*. If applicable the District Engineering Inspector or Authorized Inspector shall approve the pressure that is to be applied, in accordance ~~to~~with M.G.L. c. 146. Air or compressed gas pressure tests shall not be acceptable without the approval of the Chief or his or her designee. A vacuum test may be permitted if authorized by the Authorized Inspector.

(4) Inspector Presence. If the District Engineering Inspector or Authorized Inspector cannot be present during a Routine Repair, the District Engineering Inspector or Authorized Inspector may waive the ~~in process~~in-process involvement provided that the repair company's designee and the Owner/User or his or her designee shall witness and document the results of the test. The results of the test shall be made available upon request by the Chief or his or her designee.

(5) 2021 NBIC *Part I, Installation* 1.6.9, Carbon Monoxide (CO) Detector/Alarm. Where required by other specialized codes, an owner or user shall install a carbon monoxide (CO) detector/alarm in the proper location(s). Said requirements shall be enforced by the appropriate authority having jurisdiction.

REGULATORY AUTHORITY

522 CMR 15.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

522 CMR 16.00: CONTROLS AND SAFETY DEVICES FOR AUTOMATICALLY FIRED BOILERS (ASME CODE CSD-1), PART CG: GENERAL, PART CM: TESTING AND MAINTENANCE, PART CW: STEAM AND WATERSIDE CONTROL

Section

16.01: Scope and Application

(1) In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts the ~~2018~~2021 *ASME CSD-1, Controls and Safety Devices for Automatically Fired Boilers, Part CG: General, Part CM: Testing, and Part CW: Steam and Waterside Control*.

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

(1) In accordance with the provisions of M.G.L. c. 146, § 2, the Board adopts the *NFPA 85 Boiler and Combustion Systems Hazards Code* – 2019 Edition. 522 CMR 16.02 shall apply to all Boilers equal to or greater than 12.5 million ~~BTU/hr~~Btu/hr.

(2) Requirements. 522 CMR 16.02 shall apply to Boilers restricted to the following services: Single burner Boilers, multiple burner Boilers, stokers, and atmospheric fluidized-bed Boilers with a fuel input rating of 12.5 million ~~BTU/hr~~Btu/hr or greater, to pulverized fuel systems, to fired and unfired steam generators used to recover heat from combustion turbines (heat recovery steam generators (HRSGs)), and to other combustion turbine exhaust systems.

REGULATORY AUTHORITY

522 CMR 16.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

522 CMR 17.00: PIPING

Section

17.01: Purpose

522 CMR 17.00 is necessary to protect the lives, property and public safety of the people of the Commonwealth, and to help in the conservation of our natural resources and environment, by the proper installation, modification, and disassembly for re-use of piping systems and/or equipment used to generate energy, heat, cooling, manufactured products, and for the conveyance and storage for liquids, solids, industrial gases, and chemical and petroleum products.

17.02: Scope

All piping systems covered by 522 CMR 17.00 shall be constructed using the following standards:

For Power Piping: *ASME B31.1*-2020 *Power Piping*, the American National Standard Code for Power Piping. This is piping typically found in electric power generating stations, industrial and institutional plants, geothermal heating systems, and central and district heating and cooling systems.

For Process Piping: *ASME B31.3-~~2018~~2020 Process Piping*, the American National Standard Code for Process Piping. This piping is typically found in petroleum refineries, chemical, pharmaceutical, textile, paper, semiconductor, and cryogenic plants, and related processing plants and terminals.

For Refrigeration Piping and Heat Transfer Components: *ASME B31.5-2019 Refrigeration Piping and Heat Transfer Components*, the American National Standard Code for Refrigeration Piping and Heat Transfer Components. This piping is typically used for piping refrigerants and secondary coolants.

For Building Services Piping: *ASME B31.9-2020 Building Service Piping*, the American National Standard Code for Building Service Piping. This piping is typically found in industrial, institutional, commercial, and public buildings, and in multi-unit residences, which does not require the range of sizes, pressures, and temperatures covered in *ASME B31.1*-2020 *Power Piping*.

17.03: Covered Piping Systems (CPS)

(1) Definition. Covered piping systems (CPS) are piping systems on which condition

assessments are to be conducted. As a minimum for electric power generating stations, the CPS also include NPS 4 (DN 100) and larger piping in other systems that have a design temperature greater than 750°F (400°C) or a design pressure greater than 1,025 psi (7.1 MPa).

(2) Requirements. A program shall be established to provide for the assessment and documentation of the condition of all CPS. A condition assessment shall be performed at periodic intervals as determined by an engineering evaluation. Covered piping systems (CPS) shall be included in a Condition Assessment Program as defined in ASME B31.1-2020. Documentation shall include a statement as to any actions necessary for continued safe operation.

(3) Records. All records pertaining to the condition assessment of CPS shall be kept on file at the location of the CPS, and shall be maintained and accessible to the Division and ~~Authorized Inspectors~~Authorized Inspection Agencies for the life of the piping systems. The condition assessment records shall consist of, but are not ~~be~~ limited to:

(a) Any procedures required by para. 139
(b) Any condition assessment documentation required by para. 140
(c) Original, as-built, as-modified, or updated piping drawings
(d) Original, as-built, as-modified, or updated pipe support drawings
(e) Results from piping stress or flexibility analysis
(f) Piping system diagrams (flow, piping and instrumentation, and/or process diagrams)
(g) Valve and other inline equipment data used in original piping design stress analysis
(h) Additional documentation requirements as identified in paras. 141.2 through 141.5
(i) Details of specially designed components (refer to para. 104.7.2), including details of the design, design method, dimensions, weight, and materials; details of the manufacture, fabrication, and welding; and details of the component examinations

REGULATORY AUTHORITY

522 CMR 17.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80

CHAPTER 18.00: CONTINUING EDUCATION

Section

18.01: Scope and Application

(1) Engineers and Firemen. In accordance with the provisions of M.G.L. c. 146, § 49, the Department shall promulgate regulations which shall require the renewal of engineer, firemen, and special licenses every five years. All engineers and firemen licensed by the Commonwealth to operate Boilers shall demonstrate completion of 30 hours of continuing education at or through an institution or organization approved by the Marshal, in consultation with the Chief, during each five-year period preceding each license renewal.

All engineers and firemen shall submit to the Department a certificate of completion from any department approved institution or organization that they have completed 30 hours of continuing education, when renewing their engineer's or fireman's license. The 30 hours of continuing education shall be completed before an engineer or fireman licensee can renew his or her license, in an active status.

A final certificate of completion shall be from one institution or organization for all hours required by statute. Approved organizations or institutions may provide credit to individuals who wish to transfer from one organization/institution to another in the middle of a course. The organization or institution may give credit to individuals provided they can produce verifiable proof that they participated in approved continuing education sessions.

Engineers and firemen shall complete the full 30 hours of continuing education with the same institution or organization, whether or not said institution or organization may conduct the course at different locations. If an institution or organization cannot provide the full 30 hours to ensure license renewal, the engineer or fireman may transfer his or her continuing education training to another institution or organization, provided they comply with 522 CMR 18.01.

Upon transfer of continuing education training to another institution or organization, the institution or organization which provided the continuing education shall provide the individual with a certificate evidencing the number of hours successfully completed by the individual at that institution. Other organizations or institutions shall accept this certificate as proof of the hours accumulated to date when issuing the final certificates of completion. Only final certificates of completions shall be accepted by the Department. Transfer certificates shall not be submitted to the Department.

Licenses not renewed by their expiration date shall become void and shall after one year be reinstated only by re-examination of the licensee. This provision does not apply to licenses renewed with an "inactive" status.

All Massachusetts Engineer and Fireman licensees, upon completion of 30 hours of continuing education, will receive from that institution or organization a uniform certificate, approved by the Marshal, in consultation with the Chief, which they will retain and furnish the same to the Department, if so requested. They may also receive matter, approved by the Marshal or his or her designee, which shall be affixed to their license application upon renewal.

(2) Special-to-have-charge and Special-to-operate Licenses. Individuals licensed to operate Boilers under a special-to-have-charge, or special-to-operate license shall demonstrate completion of six hours of continuing education at or through an institution or organization approved by the Marshal, in consultation with the Chief, during each five-year period preceding each license renewal.

18.02: Definitions

The terms defined in 522 CMR 1.02 are hereby adopted and incorporated for use in 522 CMR 18.00. In addition, the following terms as used in 522 CMR 18.00 are defined as follows:

Approved: Approved by the Marshal, in consultation with the Chief, which comply with 522 CMR 18.00.

Gas Turbine: A device using combustion gasses directly in a turbine. The basic components consist of a compressor, combustor, and turbine. Fuel used is natural gas, high-quality fuel oil, synthetic gas or liquefied coal.

Guest Speaker: Any individual who participates in the instruction of a continuing education program under the request and direct personal supervision of a duly licensed and registered Instructor or monitor of any approved continuing education program for engineers and firemen.

Instructor: Any duly licensed and registered person who instructs any continuing education program for engineers or firemen. An Instructor shall hold the same grade of Massachusetts engineer or fireman license to the level of course he or she is instructing; no credit shall be awarded for any programs or courses instructed by a person holding a lesser grade license, unless they are a guest speaker approved by the Instructor or Monitor. Instructors shall only be credited hours for the actual non-redundant time that they have spent actively participating in the instruction of the program.

Monitor: A Massachusetts engineer who oversees and has been appointed as the administrator for any approved continuing education program for engineers and firemen.

It is not required that the Monitor be physically present in each class. All Monitors shall hold a Massachusetts Engineers license of equal or greater grade of the Instructors of any approved program. A Monitor shall only be credited hours for the actual non-redundant time that he or she has spent actively participating in the instruction or design of the program.

18.03: Requirements of Institutions or Organizations

The following provisions shall be met for any institution or organization to have a continuing education program considered for approval:

(1) A copy of all curricula, quizzes, training material, and certificates of completion to be used shall be provided to the Department.

(2) Continuing education shall not be divided into training increments of less than two hours unless approved by the Marshal, in consultation with the Chief.

(3) Curricula shall contain the minimum topics and associated hours for those topics as listed in 522 CMR 18.04.

(4) All courses shall be monitored by a Massachusetts engineer of equal or greater grade of Massachusetts license, who shall verify by his or her signature on each participants' certificate of completion that all persons issued such certificate have fully participated in the applicable program. Instructors shall only be credited hours for the actual non-redundant time that they have spent actively participating in the instruction of the program.

(5) Method of Verification. Each program shall provide a means to ensure certificate authenticity. Such means may include, but shall not be limited to:

(a) Institution embossment of certificate;
(b) Computer data transfer of program participants;
(c) Signature verification; and/or
(d) Numbering certificates.

(6) Certificates of completion shall contain the following:

(a) Name of participant;
(b) Address of participant;
(c) Massachusetts license grade and number of participant;
(d) Hours of continuing education completed by participant;
(e) Name and address of the institution or organization acting as continuing education provider;
(f) Licensed Massachusetts engineer's legible signature verifying participation hours listed; and
(g) Said licensed Massachusetts engineer's license number.

(7) Correspondence and On-line Course Curriculum for Continuing Education. Each program that contains an approved Correspondence or Online curriculum shall document a protocol that the Monitor of the program will utilize to ensure each participant is the actual person engaged in such curriculum. It shall be the responsibility of the Monitor to verify the completion of the Correspondence or Online courses by the participant.

18.04: Curriculum

(1) Engineers and Firemen Requiring 30 Hours of Continuing Education. The following topics shall be covered in any approved curriculum with the recommended time spent each topic:

(a) M.G.L. c. 146 and 522 CMR, with particular attention to M.G.L. c. 146, §§ 46 through 56 and 522 CMR 2.00.

1. Topic Description: M.G.L. c. 146 as it pertains to the licensing of engineers and firemen; operation, maintenance, inspection and repair of Boilers.
2. Purpose: To ensure that all engineers and firemen have a thorough knowledge of Massachusetts General Laws and regulations as pertain to Boilers and turbines.
3. Recommended Time Allotted: Two hours.
4. Recommended Instructional Methods: Lectures, discussion, and test.
5. Recommended Texts: M.G.L. c. 146 and 522 CMR.

Recommended topics, or topics as approved by the Marshal, may include but are not limited to the following:

(b) Steam Boiler Operation.

1. Topic Description: Safe Boiler operation, including safe operation and maintenance practices of all Appurtenances.
2. Purpose: To ensure that all engineers and firemen have a thorough knowledge of safe Boiler operation and maintenance of all Appurtenances.
3. Recommended Time Allotted: Eight hours.
4. Recommended Instructional Methods: Lectures, discussion, and test.
5. Recommended Texts:

a. Boiler Operator's Guide - ISBN #0-07-036574-1
b. Stationary Engineering - ISBN #0-8269-4443-4
c. Powerplant Engineering - ISBN #0-07-019106-9
d. *ASME Code Section VII, Recommended Guidelines for the Care of Power Boilers*
e. B & W "Steam" - ISBN #09634570-0-4

(c) Steam Turbine Operation.

1. Topic Description: Safe turbine operation, including safe operation and maintenance practices of all Appurtenances.
2. Purpose: To ensure that all engineers and firemen have a thorough knowledge of safe turbine operation and maintenance of all Appurtenances.
3. Recommended Time Allotted: Eight hours.
4. Recommended Instructional Methods: Lectures, discussion, and test.
5. Recommended Texts:
   a. Boiler Operator's Guide - ISBN #0-07-036574-1
   b. Stationary Engineering - ISBN #0-8269-4443-4
   c. Powerplant Engineering - ISBN #0-07-019106-9
   d. B & W "Steam" - ISBN #09634570-0-4

(d) NBIC; *ASME Boiler and Pressure Vessel Code Sections I, IV*; *ASME Code for Pressure Piping B31.1 Power Piping*

1. Topic Description: The structure and review of the NBIC as well as the ASME Codes as it relates to Boiler construction.
2. Purpose: To ensure that all engineers and firemen have a working knowledge of the NBIC and ASME Codes.
3. Recommended Time Allotted: Four hours.
4. Recommended Instructional Methods: Lectures, discussion, and test.
5. Recommended Texts:

   a. NBIC
   b. *ASME Boiler and Pressure Vessel Code Sections I, IV*
   c. *ASME Code for Pressure Piping B31.1 Power Piping*

(e) Gas Turbines.

1. Topic Description: Gas Turbine design and operation, including safe operation and maintenance practices of all Appurtenances.
2. Purpose: To ensure all engineers and firemen have a working knowledge of Gas Turbine construction, operation, and maintenance, as they relate as an Appurtenance of a Boiler.
3. Recommended Time Allotted: Four hours.
4. Recommended Instructional Methods: Lectures, discussion, and test.
5. Recommended Texts: As determined by the Department.

(2) Special-to-have-charge and Special-to-operate Licenses Requiring Six Hours of Continuing Education. The following topics shall be covered in any approved curriculum with the recommended time spent on each topic:

(a) M.G.L. c. 146, 522 CMR, with particular attention to M.G.L. c. 146, §§ 46 through 56 and 522 CMR 2.00.

1. Topic Description: M.G.L. c. 146 as it pertains to the licensing of engineers and fireman; operation, maintenance, inspection and repair of Boilers.
2. Purpose: To ensure that all engineers and fireman have a thorough knowledge of Massachusetts General Laws and regulations as pertain to the licenses they hold.
3. Recommended Time Allotted: Two hours.
4. Recommended Instructional Methods: Lectures, discussion, and test.
5. Recommended Texts: M.G.L. c. 146 and 522 CMR.

(b) Steam Boiler Operation.

1. Topic Description: Safe Boiler operation, including safe operation and maintenance practices of all Appurtenances.
2. Purpose: To ensure that all engineers and fireman have a thorough knowledge of safe Boiler operation and maintenance of all Appurtenances.
3. Recommended Time Allotted: Four hours.
4. Recommended Instructional Methods: Lectures, discussion, and test.
5. Recommended Texts:

a. Boiler Operator's Guide - ISBN #0-07-036574-1
b. Stationary Engineering - ISBN #0-8269-4443-4
c. *ASME Code Section VII, Recommended Guidelines for the Care of Power Boilers*
d. B & W "Steam" - ISBN #09634570-0-4

18.05: Miscellaneous Provisions

(1) Any Massachusetts engineer, fireman or individual with a Special-to-have-charge or Special-to-operate license who falsifies or misrepresents any certificate of completion shall be subject to a Department hearing which may result in the suspension or revocation of his or her license.

(2) Any Massachusetts engineer, fireman or individual with a Special-to-have-charge or Special-to-operate license may, upon written request at the time of renewal of his or her license, request that such license be placed in inactive status until such time that he or she satisfies the continuing education requirements necessary to renew his or her license. Individuals making such request shall submit the renewal fee as required by statute at the time of request.

(3) Inactive licenses prohibit those engineers or firemen from legally operating or to be in charge of any steam Boiler or turbine/engine so long as the license is inactive.

(4) Engineer, fireman, Special-to-have-charge or Special-to-operate licenses not renewed, either active or inactive, at expiration date shall become void and shall after one year be reinstated only by re-examination of the licensee.

(5) Any Instructor added to a program, after a program has been approved, shall be approved by the Marshal or his or her designee.

(6) Monitors and Instructors who are approved to conduct continuing education shall keep uniform records of attendance of licensees following the format provided by the Department, for a period of five years after the issuance of the licensee's certificate of completion. They shall be responsible for the security of all uniform certificates and other Marshal-approved matter and the proper issuance thereof. Strict and accurate attendance records shall be kept and submitted to the Department, at its request, for review. The Department shall keep records of the issuance of uniform certificates and other matter as it relates to the approved programs. The falsification of attendance records and the fraudulent issuance of certificates or other Department matter shall be grounds for initiating formal proceedings under M.G.L. c. 146, § 59 and c. 30A.

REGULATORY AUTHORITY

522 CMR 18.00: M.G.L. c. 146, § 49

522 CMR 19.00: PORTABLE BOILERS

Section

19.01: Scope and Application.

522 CMR 19.00 applies to all temporary use portable Boilers.

(1) The Owner/User of a portable Boiler is responsible for ensuring his or her Boiler is in compliance with 522 CMR 19.00.

(2) All portable Boilers covered by M.G.L. c. 146 shall conform to the construction rules of the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Sections I and Section IV* as applicable.

(3) Any portable Boiler brought into the Commonwealth from another jurisdiction shall be inspected as follows:

(a) The First Inspection for any portable steam Boiler shall be performed by a District Engineering Inspector and such Boiler shall be issued a state number from the Department.
(b) Any portable Boiler which has a current valid Massachusetts Certificate shall receive prior to operation an External Inspection under pressure performed by District Engineering Inspector or an Authorized Inservice Inspector ~~or District Engineering Inspector~~.

(4) Any portable Boiler already in the Commonwealth may be moved to another location within the Commonwealth under the following conditions:

(a) The portable Boiler has previously received a First Inspection by a District Engineering Inspector and been assigned a state ~~B~~boiler number;
(b) The portable Boiler has been Internally Inspected by a District Engineering Inspector or an Authorized Inservice Inspector ~~or District Engineering Inspector ww~~within the past year;
(c) Hot water Boilers shall have been Internally Inspected within the past three years by a District Engineering Inspector or an Authorized Inservice Inspector ~~or District Engineering Inspector~~;
(d) An operational inspection under pressure of a Low Pressure/Heating Boiler is conducted by a District Engineering Inspector or an Authorized Inservice Inspector ~~or District Engineering Inspector~~;
(e) An operational inspection under pressure of a High Pressure/Power Boiler is conducted by a District Engineering Inspector or an Authorized Inservice Inspector ~~or District Engineering Inspector~~; and/or

(f) All engineers and firemen in charge of a portable Boiler shall notify the Department in writing, within seven days of their appointment, of the location of the portable Boiler of which they are in charge. When accepting or leaving a position as an engineer or fireman in charge, the engineer or fireman shall notify the Department within seven days.

(5) Hot water Low Pressure/Heating Boilers shall receive an External Inspection operating under pressure by a District Engineering Inspector or an Authorized Inservice Inspector ~~or District Engineering Inspector~~ at the location of installation.

(6) The company shall notify the ~~Department~~Division in a format approved by the ~~Department~~Chief in advance or as soon as practicable when they are bringing a portable Boiler into the Commonwealth or moving a Boiler to a new location.

(7) High Pressure/Power Boilers shall be trimmed to meet the following requirements: The discharge from the blowdown systems (bottom, surface, or LWCOs) shall be directed to either a blowdown tank on the portable trailer or hard piped to a blowdown tank at the location.

(8) High Pressure/Power Boilers shall have certification for the Boiler external piping as defined in the ~~2019~~2021 *ASME Boiler and Pressure Vessel Code Section I, Rules for Construction of Power Boilers*. This shall be documented as follows:

(a) On the Boiler's ASME required manufacturer's data report forms;
(b) Stamped on the PP Piping;
(c) On a name plate attached to the Boiler or PP Piping; or
(d) With manufacturer's documentation demonstrating that the piping or hoses comply with the maximum pressure and temperature ratings of the Boiler.

(9) Low Pressure/Heating Boilers shall have the blow offs and drains discharge to a safe location.

(10) In cases where the Boiler may be set up for multiple controls (high and low pressure operation), only one set of controls shall be physically connected to control the burner. All other controls shall be physically disconnected and removed. A change of service from high pressure to low pressure or low pressure to high pressure shall require a re-inspection and a new Certificate, and the safety valve shall be changed to reflect the proper MAWP.

(11) Installed ~~B~~boiler controls shall be designed for the intended range of operation. High pressure controls shall not be reset to function as low pressure controls.

(12) Where required by M.G.L. c. 146 and 522 CMR, the appropriate license for the Engineer in Charge and the Operator of the portable Boiler shall be posted on site.

(13) The location of installation shall be noted in the inspection form.

REGULATORY AUTHORITY

522 CMR 19.00: M.G.L. c. 146, §§ 1 to 51, 56 to 64, 66 to 80