

Oklahoma Department of Labor

Oklahoma Boiler and Pressure Vessel Safety Act

40 O.S. § 141.1, *et seq.*

Boiler and Pressure Vessel Rules

OAC 380:25

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Melissa McLawhorn Houston Commissioner of Labor

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Oklahoma Boiler and Pressure Vessel Safety Act
40 O.S. § 141.1, et seq.
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OAC 380:25

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Oklahoma Boiler and Pressure Vessel Safety Act

40 O.S. § 141.1 Short Title – Definitions

This act shall be known and may be cited as the "Boiler and Pressure Vessel Safety Act", and, except as otherwise herein provided, shall apply to all boilers and pressure vessels. For the purpose of this act, the following definitions apply:

1. "Boiler" means a closed vessel in which water is heated, steam is generated, steam is superheated, or any combination thereof, under pressure or vacuum, for external use to itself, by the direct application of heat. The term "boiler" includes fired units for heating or vaporizing liquids other than water where these units are separate from processing systems and complete within themselves:
 - a. "power boiler" means a boiler in which steam or other vapor is generated at a pressure of more than fifteen (15) pounds per square inch gauge, or as further defined in American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section I,
 - b. "high-temperature water boiler" means a water boiler intended for operation at pressures in excess of one hundred sixty (160) pounds per square inch gauge; or temperatures in excess of two hundred fifty degrees Fahrenheit (250° F), or as further defined in American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section I,
 - c. "low pressure steam boiler" means a steam boiler operating at pressures not exceeding fifteen (15) pounds per square inch gauge, or as further defined in American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section IV,
 - d. "hot water heating boiler" means a heating boiler operating at pressures not exceeding one hundred sixty (160) pounds per square inch gauge - one thousand one hundred three (1,103) kilopascals and/or temperatures not exceeding two hundred fifty degrees Fahrenheit (250° F), one hundred twenty-one degrees Celsius (121° C), at or near the boiler outlet, or as further defined in American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section IV,
 - e. "hot water supply boiler" means a supply boiler operating at pressures not exceeding one hundred sixty (160) pounds per square inch gauge - one thousand one hundred three (1,103) kilopascals and/or temperatures not exceeding two hundred fifty degrees Fahrenheit (250° F), one hundred twenty-one degrees Celsius (121° C), at or near the boiler outlet, or as further

- defined in American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section IV, and
- f. "hot water supply heater" means a closed vessel in which water is heated by the combustion of fuels, electricity or any other source and withdrawn for use external to the system at pressures not exceeding one hundred sixty (160) pounds per square inch gauge and shall include all controls and devices necessary to prevent water temperature from exceeding two hundred ten degrees Fahrenheit (210° F), ninety-eight point nine degrees Celsius (98.9°C);
 2. "Pressure vessel" means a vessel in which pressure is obtained from an external source or by the application of heat other than those vessels defined in paragraph 1 of this section or as further defined in American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section VIII, Division I;
 3. "Certificate of operation" means an annual certificate, unless otherwise provided for in this act, issued by the Commissioner of Labor permitting the operation of a boiler or pressure vessel which has been inspected as provided for in this act;
 4. "Steam lines" means piping of welded construction in which steam is contained and/or transported at a pressure in excess of fifteen (15) pounds per square inch gauge; and
 5. "Commissioner" means the Commissioner of Labor or the Commissioner's duly authorized representative.

40 O.S. § 141.2 Exemptions

- A. This act shall not apply to the following boilers, hot water heaters and pressure vessels:
 1. Pressure vessels used for the transportation of compressed gases if constructed and operated in compliance with specifications and regulations of the United States Department of Transportation or of the Corporation Commission of Oklahoma and any unfired pressure vessels used as containers for liquefied petroleum gases and subject to the jurisdiction of the United States Department of Transportation or the Oklahoma Liquefied Petroleum Gas Administration or successor agencies;
 2. Pressure vessels containing air located on vehicles operating pursuant to regulations of other jurisdiction authorities;
 3. Pressure vessels having an internal or external operating pressure not exceeding fifteen (15) pounds per square inch gauge - one hundred three (103) kilopascals gauge with no limit on size;
 4. Pressure vessels having an inside diameter not exceeding six (6) inches (152mm) with no limitation on pressure;

5. Pressure vessels with a nominal water containing capacity of one hundred twenty (120) gallons or four hundred fifty (450) liters or less, to be used for domestic supply purposes, for containing water under pressure including those containing air, the compression of which serves only as a cushion;
6. Pressure vessels containing water heated by steam or other indirect means when none of the following limitations is exceeded:
 - a. a heat input of two hundred thousand (200,000) British thermal units per hour - fifty-eight thousand six hundred (58,600) watts,
 - b. a water temperature of two hundred ten degrees Fahrenheit (210° F), or
 - c. a water containing capacity of one hundred twenty (120) gallons - four hundred fifty (450) liters;
7. Pressure vessels which may be classified as pressure containers which are integral parts of components of rotating or reciprocating mechanical devices such as pumps, compressors, turbines, generators, engines and hydraulic or pneumatic cylinders where the primary design considerations and/or stresses are derived from the functional requirements of the device, or structures whose primary function is the transport of fluids from one location to another within a system of which it is an integral part, i.e., piping systems;
8. Hot water supply boilers which are directly fired with oil, gas or electricity when none of the following limitations are exceeded:
 - a. a heat input of two hundred thousand (200,000) British thermal units per hour - fifty-eight thousand six hundred (58,600) watts,
 - b. a water temperature of two hundred ten degrees Fahrenheit (210° F), or
 - c. a water containing capacity of one hundred twenty (120) gallons - four hundred fifty (450) liters;
9. Boilers and pressure vessels under federal control and railroad locomotive boilers;
10. Pressure vessels located on remote sites and limited to oil and natural gas gathering facilities or processing plants that have fewer than ten buildings intended for human occupancy per one-fourth (1/4) square mile and where the closest building is at least two hundred twenty (220) yards from any vessel;
11. Pressure vessels in the care, custody and control of research facilities and used solely for research purposes which require one or more details of noncode construction or which involve destruction or reduced life expectancy of those vessels; and

12. Hot water supply heaters as defined in subparagraph f of paragraph 1 of Section 141.1 of this title, with piping connections to the potable water supply system which are intended to supply hot water for domestic or commercial purposes other than space heating. However, the Commissioner shall make routine inspections and issue necessary orders regarding existing hot water supply heaters located in facilities or installations owned or operated by the State of Oklahoma or its agencies, counties, municipalities or school districts.
- B. The following boilers and pressure vessels shall be exempt from Sections 141.13 through 141.16 of this title:
1. Pressure vessels not exceeding fifteen (15) cubic feet in volume and two hundred fifty (250) pounds per square inch gauge pressure;
 2. Low pressure steam boilers, hot water heating boilers, hot water supply boilers, hot water supply heaters or pressure vessels which are located in private residences or in apartment houses of less than six-family units; and
 3. Pressure vessels operated entirely full of water or other liquid which is not materially more hazardous than water, provided the temperature of the vessel contents does not exceed one hundred fifty degrees Fahrenheit (150° F) or a pressure of two hundred (200) pounds per square inch gauge.
- C. 1. Either a special inspector or an inspector licensed by the Department of Labor shall inspect exhibitor boilers on an annual basis when exhibitor boilers are being operated at public events. Exhibitor boilers maintained by owner/operators for private use and not for operation for the public shall be exempt from inspection by this state. Annual inspections by this state or a special inspector shall consist of the following:
- a. an internal and external visual,
 - b. threaded openings in the boiler may be inspected, when deemed appropriate, by the inspector after conducting an internal and external visual,
 - c. a hydrostatic pressure test at one and twenty-five one-hundredths (1.25) times the maximum allowable working pressure,
 - d. the maximum allowable working pressure shall not exceed one hundred eighty-five (185) pounds per square inch (psi),
 - e. the ash pan and grates on a dry bottom vessel shall be removed to allow a visual inspection of the crown sheet,
 - f. a visual inspection of the crown sheet on wet bottom boilers,

- g. all boilers shall have a fusible plug that is constructed to the American Society of Mechanical Engineers (ASME) code and indicated by an ASME marking on the filler material. It shall protrude one (1) inch into the water on a fireside fusible plug and no more than one (1) inch on a waterside fusible plug,
 - h. the pressure relief valve shall be National Board capacity certified,
 - i. a gage glass shall be present with a guard to protect the glass, drain valve or petcock, be piped to a safe location, and be operational,
 - j. try cocks shall be located in correlation to the minimum required water level,
 - k. a pressure gage that has been tested and proven accurate at the time of the annual pressure test,
 - l. all piping shall be schedule 80, black pipe (SA-53 B or SA-105 B) from the boiler to the first valve,
 - m. the boiler shall be equipped with two means of supplying feed water while under pressure, and
 - n. all welding to the boiler shall be done by a certified repair organization as accredited and described in Part RA of the National Boiler Inspection Code (NBIC).
2. Exhibitor boilers shall have a nondestructive exam performed once every five (5) years for determining repairs and thin areas that need to be repaired. An inspector from the Department of Labor may perform a random nondestructive exam annually. Results from the exam may be used by the inspector to waive any time remaining on the five-year period. A nondestructive exam shall meet the following requirements:
- a. on a dry bottom boiler, no less than 150 readings shall be taken,
 - b. on a wet bottom boiler, no less than 180 readings shall be taken,
 - c. this exam shall include the areas surrounding the crown sheet stays and any areas subject to corrosion,
 - d. a loss of metal that is greater than forty percent (40%) of the original boiler plate thickness in an area greater than three (3) inches in diameter shall be considered to be a thin area and shall need to be repaired prior to any operation,
 - e. exams shall be by a certified professional pursuant to applicable provisions of law of this state,
 - f. no exam shall be by a certified professional that has a vested interest in the boiler that is being examined,

jobbers, dealers or individuals selling, renting or leasing or offering for sale, rent or lease or operation, any boiler or pressure vessel which is within the scope of this act meets the requirements of this act, rules and regulations hereinafter adopted. Any manufacturer, jobber, dealer or individual found to be in violation of this section shall be subject to any current penalty as herein provided;

3. The Commissioner of Labor shall formulate rules and regulations which may permit the use of boilers and pressure vessels which were in operation in this state prior to the date upon which the first rules and regulations under this act pertaining to existing installations become effective, or during the twelve-month period immediately thereafter; and
 4. The rules for inspection, maintenance and repair of installed boilers and pressure vessels shall be based upon and follow generally accepted national standards as promulgated by the National Board of Boiler and Pressure Vessel Inspectors or by the American Petroleum Institute Pressure Vessel Inspection Code as a minimum as relates to boiler and pressure vessels.
- B. Promulgation. The rules and regulations and any subsequent amendments thereto formulated or adopted by the Commissioner of Labor shall be adopted in accordance with the Oklahoma Administrative Procedures Act, except that the rules applying to the construction of new boilers and pressure vessels shall not become mandatory until six (6) months after their promulgation by the Commissioner.

40 O.S. § 141.4 Application of Rules and Regulations

- A. Twelve (12) months from the date upon which the rules and regulations under this act become effective, all new boilers and pressure vessels for use in this state shall conform to such rules and regulations.
- B. If a boiler or pressure vessel is of special design or construction, and cannot comply with the construction requirements of the rules and regulations of this act, a special installation and operating permit may be granted by the Commissioner of Labor at his discretion, provided the user presents evidence acceptable to the Commissioner.
- C. Welded steam lines - Downstream steam lines fabricated or repaired by welding, operated at in excess of fifteen (15) pounds per square inch gauge shall be fabricated, inspected and tested in accordance with applicable rules and regulations.

**40 O.S. § 141.5 Maximum Allowable Working Pressure –
Determination – Exemptions – Special Permit**

- A. The maximum allowable working pressure of a boiler stamped with the American Society of Mechanical Engineers Code symbol or a pressure vessel stamped with the American Society of Mechanical Engineers or American Petroleum Institute - American Society of Mechanical Engineers Code symbol shall be determined by the applicable sections of the code under which it was constructed and stamped.
- B. The maximum allowable working pressure of a boiler or pressure vessel which is not stamped and does not carry the ASME or the API-ASME Code symbol shall be computed in accordance with standard engineering practice using a factor of safety established by rules adopted by the Commissioner of Labor.
- C. This act shall not be construed as in any way preventing the use, sale or reinstallation of a boiler or pressure vessel referred to in subsection B of this section, provided the Commissioner of Labor gives a specific ruling that such boiler or pressure vessel conforms to its rules and regulations, and provided further, upon inspection it has been found to be in safe condition.
- D. If a boiler or pressure vessel is of historical significance and cannot comply with the construction requirements of the rules and regulations of this act, a special installation and operating permit may be granted by the Commissioner.

**40 O.S. § 141.6 License Required – Exemptions – Fee – Evidence
of Qualifications – Hearings – Violations**

- A. All firms or corporations engaged in the service, repair and/or installation of boilers or pressure vessels located in this state shall be licensed by the Commissioner to perform such work. Provided, no license shall be required for any firms or corporations engaged in the service, repair and/or installation of hot water supply heaters as provided in paragraph 12 of subsection A of Section 2 of this act. The Commissioner of Labor shall abide by any existing code of installation presently adopted or as may be hereinafter adopted by this state or its agencies or by any county, municipality or school district as pertains to hot water supply heaters. The annual license fee shall be payable in advance on or before January 31 of each calendar year. Each firm or corporation must furnish evidence suitable to the Commissioner that they are qualified to perform such work.
- B. All hearings for the issuance or revocations of license under this section shall comply with the Oklahoma Administrative Procedures Act.
- C. Any person who shall violate any of the provisions of this act or who violates any rule or order of the Commissioner pursuant to this act shall be guilty of a misdemeanor, and in addition thereto, may be

enjoined from continuing such action. Each day upon which such violation occurs shall constitute a separate violation.

40 O.S. § 141.7 Bureau of Boiler Inspection – Establishment – Personnel – Powers and Duties

- A. There is hereby established a bureau of boiler inspection in the Department of Labor under the direction of the chief boiler inspector, who shall have at the time of appointment a valid commission issued in accordance with the constitution and bylaws of the National Board of Boiler and Pressure Vessel Inspectors and shall be responsible to the Commissioner of Labor or his duly authorized representative for the supervision, inspection and testing of boilers and pressure vessels throughout the state.
- B. The bureau of boiler inspection shall be furnished with sufficient personnel, deputy inspectors and clerical aides to perform the assigned duties with the limits prescribed by the Commissioner of Labor.
- C. Powers. The chief boiler inspector and deputy inspectors, under the supervision of the Commissioner of Labor, shall:
 - 1. Take action necessary for the enforcement of this act and these rules and regulations;
 - 2. Keep a complete record of the name and address of the owner or user, location, type, dimensions, maximum allowable working pressure, age, dates of installation and last-recorded inspection of all boilers and pressure vessels to which this act applies;
 - 3. Make available upon request copies of the rules and regulations promulgated by the Department;
 - 4. Issue, suspend or revoke for cause, certificates of operation as provided for in Section 14 of this act; and
 - 5. Cause the prosecution of violators of the provisions of this act, rules and regulations.

40 O.S. § 141.8 Deputy Boiler Inspectors

- A. The chief boiler inspector shall employ deputy inspectors, subject to approval of the Commissioner of Labor, who shall be responsible to the chief boiler inspector and who shall have at the time of appointment a valid commission issued in accordance with the constitution and bylaws of the National Board of Boiler and Pressure Vessel Inspectors.
- B. The deputy inspectors may at the Commissioner's discretion be appointed in a trainee status provided said trainees successfully complete the examination as defined in Section 10 of this act and receive a valid National Board Commission within eighteen (18) months after appointment.

40 O.S. § 141.9 Certificates of Competency Designating Special Inspectors and Owner-Users Inspectors of Boiler and Pressure Vessels

- A.
 - 1. Certificates of competency designating special inspectors of boilers and pressure vessels shall be issued by the Commissioner upon request of any authorized inspection agency, which has been licensed or registered by the appropriate authority of this state. All such authorized inspection agencies shall provide boiler and pressure vessel insurance coverage and be actively engaged in writing this type coverage in this state;
 - 2. Before receiving a certificate of competency, each inspector shall receive a passing grade on the examination provided for by Section 10 of this act, or shall hold a commission or certificate of competency as an inspector of boilers or pressure vessels from a state that has a standard of examination equal to that of this state, or a commission as an inspector of boilers and pressure vessels issued by the National Board of Boiler and Pressure Vessel Inspectors;
 - 3. Special inspectors shall not receive any salary or expenses from this state, and a certificate of competency shall be valid only as long as such special inspectors are in full-time employment of an authorized inspection agency;
 - 4. Special inspectors may inspect all boilers and pressure vessels insured by their respective authorized inspection agency; and
 - 5. The insurance company shall apply on or before January 31 of each year for renewal of certificates of competency for each special inspector employed who inspects boilers and pressure vessels insured in this state. The fee must accompany application.
- B.
 - 1. Certificates of competency designating owner-user inspectors of boilers or pressure vessels or both shall be issued by the Commissioner upon request of any company operating boilers or pressure vessels or both in this state. The owner-user shall maintain a regularly established inspection department which is under the supervision of one or more technically competent individuals whose qualifications and whose organization and inspection procedures are in accordance with paragraph 4 of subsection A of Section 3 of this act and acceptable to the Commissioner of Labor. Boilers and pressure vessels shall be inspected regularly and in accordance with applicable provisions of the rules and regulations adopted by the Commissioner pursuant to this act;
 - 2. Before receiving a certificate of competency, each inspector shall attain a passing grade on the examination provided for by

- Section 10 of this act, or shall hold a certificate of competency as an inspector from a state that has a standard of examination equal to that of this state, or who holds a valid commission issued in accordance with the constitution and bylaws of the National Board of Boiler and Pressure Vessel Inspectors;
3. A certificate of competency as an owner-user inspector shall be issued only if, in addition to meeting the requirements in paragraph 2 of this subsection, the inspector is continuously employed by the company and is responsible for making inspection of boilers and pressure vessels used by such company;
 4. Owner-user inspectors shall not receive any salary or expenses from this state and a certificate of competency shall be valid only as long as such owner-user inspector is employed full time by a qualified owner-user inspection agency, in accordance with the applicable provisions of the rules and regulations adopted pursuant to this act;
 5. The owner-user inspection agency will apply on or before January 31 of each year for renewal of competency for each owner-user inspector employed in this state. The fee must accompany application; and
 6. Such owner-user inspectors may inspect all pressure vessels operated by their respective companies and, when so inspected, the owners and users of such pressure vessels shall be exempt from the payment to the state of the inspection fees provided for in Section 16 of this act.

40 O.S. § 141.10 Examination of Inspectors

- A. The examination for chief boiler inspector, deputy inspectors, special inspectors or owner-user inspectors, except those owner-user inspectors within the scope of the American Petroleum Institute Pressure Vessel Inspection Code, shall be written and shall be held in accordance with the constitution and bylaws of the National Board of Boiler and Pressure Vessel Inspectors.
- B. A separate written examination for owner-user inspectors within the scope of the American Petroleum Institute Pressure Vessel Inspection Code shall be administered by the Department of Labor based upon the content of the American Petroleum Institute Pressure Vessel Inspection Code and the American Society of Mechanical Engineers Boiler and Pressure Vessel Codes pertaining to pressure vessels.

40 O.S. § 141.11 Suspension of Inspector's Certificate of Competency

An inspector's certificate of competency may be suspended by the Commissioner of Labor after due investigation for the incompetence or

untrustworthiness of the inspector or for the willful falsification of any matter or statement contained in his application, or a report of any inspections made by him. Written notice of any such suspension shall be transmitted by the Commissioner of Labor to the inspector and his employer not more than ten (10) days following the suspension. A person whose certificate of competency has been suspended shall be entitled to an appeal as provided by the Oklahoma Administrative Procedures Act.

40 O.S. § 141.12 Lost, Stolen or Destroyed Certificate of Competency

If a certificate of competency is lost, stolen or destroyed, a new certificate of competency may be issued without reexamination.

40 O.S. § 141.13 Inspection of Certain Boilers and Pressure Vessels

- A. The Commissioner of Labor or the chief boiler inspector, or any deputy inspector, shall have free access, during reasonable hours, to any premises in the state where a boiler or pressure vessel is being constructed for use in, or is being installed in this state for the purpose of ascertaining whether such boiler or pressure vessel is being constructed and installed in accordance with the provisions of the Boiler and Pressure Vessel Safety Act.
- B. Each boiler and pressure vessel covered by the Boiler and Pressure Vessel Safety Act shall be thoroughly inspected as to its construction, installation and condition as follows:
 - 1. Power boilers and high pressure high temperature water boilers shall receive an inspection annually which shall be an internal inspection where construction permits; otherwise it shall be as complete an inspection as possible. Such boilers shall also be externally inspected annually preferably while under pressure;
 - 2. Low pressure steam or vapor heating boilers shall receive an external inspection annually with an internal inspection at least every two (2) years where construction permits;
 - 3. Hot water heating and hot water supply boilers shall receive an external inspection annually with an internal inspection at the discretion of the inspector;
 - 4. Pressure vessels, excluding those within the scope of the American Petroleum Institute Pressure Vessel Inspection Code, subject to internal corrosion and waste heat steam generators shall receive an internal inspection triennially where construction permits. Pressure vessels not subject to internal corrosion shall receive an inspection at intervals set by the Commissioner. Frequency of external inspections of pressure vessels shall be set by the Commissioner;
 - 5. A grace period of two (2) months beyond the periods specified in paragraphs 1, 2, 3 and 4 of this subsection is permitted between

inspections; however, the inspection due date shall not be affected; provided, however, for an entity with two or more boilers or pressure vessels, the Commissioner may allow all inspections of the boilers or pressure vessels to be conducted at that location at the same time;

6. The Commissioner of Labor may provide for longer periods between inspections in the rules for specific boilers and pressure vessels; and
7. Under the provisions of the Boiler and Pressure Vessel Safety Act, the Commissioner of Labor is responsible to provide rules for the safety of life, limb and property and therefore has jurisdiction over the interpretation and application of the inspection requirements as provided for in the rules. Inspection during construction and installation shall certify as to the minimum requirement for safety as defined in the American Society of Mechanical Engineers Code or other construction standards acceptable to the Commissioner of Labor. Inspection requirements of operating equipment shall be in accordance with generally accepted practice and compatible with the actual service condition, such as:
 - a. previous experience, based on records of inspection, performance and maintenance,
 - b. location, with respect to personnel hazard,
 - c. quality of inspection and operating personnel,
 - d. provision for related safe operating controls, and
 - e. interrelation with other operations outside the scope of the Boiler and Pressure Vessel Safety Act.

Based upon the documentation of such actual service conditions by the owner or user of the operating equipment, the Commissioner of Labor may, at his discretion, permit variations in the inspection requirements.

- C. The inspections herein required shall be made by the Commissioner, chief boiler inspector, deputy inspector or a special inspector as provided for in the Boiler and Pressure Vessel Safety Act.
- D. Owner-user inspection of boilers and pressure vessels is permitted provided the owner-user inspection service is regularly established and is under the supervision of one or more individuals whose qualifications are satisfactory to the Commissioner of Labor and said owner-user causes the pressure vessels to be inspected in conformance with the National Board Inspection Code or American Petroleum Institute Pressure Vessel Inspection Code as applicable.
- E. If, at the discretion of the inspector, a hydrostatic test shall be deemed necessary, it shall be made by the owner or user or his licensed representative and witnessed by an inspector as authorized by

the Boiler and Pressure Vessel Safety Act, before a certificate of operation is issued.

- F. All boilers, other than cast iron sectional boilers, and pressure vessels to be installed in this state after the twelve-month period from the date upon which the rules of the Commissioner become effective, shall be inspected during construction as required by the applicable rules by an inspector authorized to inspect boilers and pressure vessels in this state, or if constructed outside of the state, by an inspector holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors.
- G. No person, firm or corporation shall in any manner interfere with the performance of the official duties of any inspector authorized by the Boiler and Pressure Vessel Safety Act.

40 O.S. § 141.14 Inspection Report – Inspection Record – Certificate of Operation – Suspension of Certificate

- A.
 - 1. Each authorized inspection agency employing special inspectors meeting the requirements of subsection A of Section 9 of this act shall, within thirty (30) days following each inspection made by such inspectors, file an exact copy of the report of the inspection with the chief boiler inspector upon appropriate forms as promulgated by the Commissioner of Labor; and
 - 2. Each company operating pressure vessels covered by owner-user inspections service meeting the requirements of subsection B of Section 9 of this act shall maintain in its files an inspection record which shall list, by number and such abbreviated description as may be necessary for identification, each pressure vessel covered by this act, the date of the last inspection of each pressure vessel and the approximate date for the next inspection. The inspection record shall be available for examination by the chief inspector or his authorized representative during business hours. Each such company shall, in addition, file annually with the chief inspector a statement, signed by the individual having supervision over the inspections made during the period covered thereby, stating the number of pressure vessels covered by this act inspected during the year and certifying that each such inspection was conducted pursuant to the inspection requirements provided for by this act. Such annual statement shall be accompanied by a fee equal to that shown in subparagraph c of paragraph 2 of subsection A of Section 16 of this act.
- B. If the report filed pursuant to subsection A of this section shows that a boiler or pressure vessel is found to comply with the rules and

regulations of the Commissioner of Labor and upon direct payment to the Department of Labor by the owner or user of the fee prescribed shall issue the owner or user a certificate of operation. The certificate of operation shall be valid for a period consistent with the inspection frequency as required by Section 13 of this act. In the case of those boilers and pressure vessels covered by paragraphs 1, 2, 3 and 4 of subsection B of Section 13 of this act for which the Commissioner of Labor has established or extended the operating period between required inspections, pursuant to the provisions of paragraph 7 or 8 of subsection B of Section 13 of this act, the certificate of operation shall be valid for a period of not more than two (2) months beyond the period set by the Commissioner. Certificates of operation for boilers shall be posted under glass, or similarly protected, in the room containing the boiler. Pressure vessel certificates of operation shall be posted in like manner, if convenient, or filed where they will be readily accessible for examination by the Commissioner, chief boiler inspector or deputy inspector.

- C. The chief boiler inspector or deputy inspectors may at any time suspend a certificate of operation if the boiler or pressure vessel for which it is issued is deemed a menace to the public safety, or when the boiler or pressure vessel is found not to comply with the rules and regulations herein provided. Each suspension of a certificate of operation shall continue in effect until such boiler or pressure vessel shall have been made to conform to the rules and regulations, and until said certificate of operation shall have been reinstated.

40 O.S. § 141.15 Certificate of Operation Required – Violations

After twelve (12) months for power boilers, twenty-four (24) months for low pressure steam heating, hot water heating and hot water supply boilers, and thirty-six (36) months for pressure vessels following the date on which this act becomes effective, it shall be unlawful for any person, firm, partnership or corporation to operate in this state a boiler or pressure vessel covered by this act, including boilers and pressure vessels covered by owner-user inspection service provided for in Section 14, without a valid certificate of operation. The operation of a boiler or pressure vessel without such certificate of operation, or at a pressure exceeding that specified in such certificate of operation or in violation of this act or the rules and regulations promulgated under it, shall constitute a misdemeanor on the part of the owner, user or operator thereof. Each day of such unlawful operation shall be deemed a separate offense.

40 O.S. § 141.16 Fees

- A. 1. a. Annual certificate of operation fee shall be as follows:
 - (1) with manway state inspector \$75.00
 - (2) without manway state inspector \$50.00

- (3) any size special – or owner/user inspector \$50.00
- (4) each public hot water supply heater (biennially) \$5.00
- (5) each public boiler inspection/certification \$25.00
- b. Only one certificate of operation fee per year may be charged; except an additional fee equal to the certificate of operation fee may be charged for witnessing a hydrostatic test required after repairs, provided a fee equal to the total fees identified in division (1) or (2) of subparagraph a of this paragraph, whichever is appropriate, and subparagraph f of paragraph 2 of this subsection may be charged when the pressure-retaining item is not prepared and ready pursuant to rules promulgated by the Commissioner of Labor at the time of the inspection.
- 2. Other Fees
 - a. hydrostatic test of steam pipeline per day \$150.00
(for each additional half-day or part thereof) \$75.00
 - b. shop review fees \$3,000.00
 - c. licensing fees
 - (1) repair, service, install (annually) \$50.00
 - (2) installer technician (one-time issuance) \$50.00
 - (3) boiler operator (biennially) \$50.00
 - d. certificate of competency fee \$15.00
 - e. examination fee \$50.00
 - f. boiler or pressure vessel inspection fee for certificate inspections by state inspectors \$155.00
 - g. authorized inspector services for weld repairs or alterations, per eight-hour day or part thereof \$300.00
 - h. a fee as established by rule may be assessed for the issuance of duplicate licenses and certificates, not to exceed \$10.00
- B. All institutions owned or operated by the State of Oklahoma or its agencies or by any county, municipality or school district, and such institutions or agencies, and all owners or users of boilers or pressure vessels of historical significance as specified in subsection D of Section 141.5 of this title are exempt from the payment of only those fees provided for in paragraph 2 of subsection A of this section.
- C.
 - 1. Except for the revenue listed in paragraph 2 of this subsection, the Commissioner shall account for and transfer all fees so received to the State Treasury to the credit of the General Revenue Fund, together with a detailed report of same.
 - 2. The Commissioner shall account for and deposit all fee revenue received and listed in this paragraph to the Department of Labor Revolving Fund:

- a. Twenty-five Dollars (\$25.00) of each certificate of operation fee collected under divisions (1), (2) and (3) of subparagraph a of paragraph 1 of subsection A of this section,
 - b. all fees listed in divisions (4) and (5) of subparagraph a of paragraph 1 of subsection A of this section, and
 - c. all fees listed in subparagraphs b, g and h of paragraph 2 of subsection A of this section.
- D. All fees shall be paid directly to the Department of Labor.

40 O.S. § 141.17 Bond

The chief boiler inspector and deputy inspectors shall be bonded in the sum of Five Thousand Dollars (\$5,000.00) conditioned upon faithful performance of duty and true account of all money and proper disposition of all said money.

40 O.S. § 141.18 Accidents and Incidents – Investigation and Inquiry – Notice

- A. The Department of Labor has total jurisdiction over the investigation or inquiry into accidents and incidents arising within the definitions of this act.
- B. It shall be mandatory for all owners, users or operators to immediately notify the Department of Labor and secure the total accident or incident area by whatever means is practical until such time as the Department of Labor representative or a designee of the Commissioner arrives on the scene, except in case of the protection of life or limb as a result of said accident or incident.

40 O.S. § 141.19 Creation of Department of Labor Revolving Fund

There is hereby created in the State Treasury a revolving fund for the Department of Labor to be designated the "Department of Labor Revolving Fund". The fund shall be a continuing fund, not subject to fiscal year limitations, and shall consist of all monies designated for deposit in such fund. All monies accruing to the credit of the fund are hereby appropriated and may be budgeted and expended as directed by the Legislature. Expenditures from the fund shall be made upon warrants issued by the State Treasurer against claims filed as prescribed by law with the Director of the Office of Management and Enterprise Services for approval and payment.

Boiler and Pressure Vessel Rules

SUBCHAPTER 1. GENERAL PROVISIONS

380:25-1-1. Purpose

These rules are promulgated as required by Title 40 O.S. Section 141. They are specific as to definitions, adopted national standards rules and regulations for the safe construction, installation, inspection, operation, maintenance, and repair of boilers, pressure vessels, steamlines and water heaters in Oklahoma.

380:25-1-2. Definitions

The following words and terms, when used in this Chapter, shall have the following meaning, unless the context clearly indicates otherwise.

"The Act" means the Oklahoma Boiler and Pressure Vessel Safety Act, Title 40, Sections 141.1 through 141.20 of the Oklahoma Statutes.

"Accident or incident", means a sudden or accidental breakdown of a boiler or pressure vessel or any part thereof that manifests itself at the time of its occurrence by physical damage to the boiler or pressure vessel necessitating the repair or replacement of the boiler or part thereof. Accident does not mean normal erosion, corrosion, wastage of metal requiring restoration, leaking tubes or weakened metal such as water legs, handhole areas, etc., unless a unique or unusual explosion hazard exists as a result of any failure.

"Alteration" means a change in any item described on the original Manufacturers' Data Report which affects the pressure capability of the boiler or pressure vessel or as further defined in the NBIC or ANSI/API 510 as appropriate.

"ANSI/API 510 Pressure Vessel Inspection Code" means the American National Standard for Pressure Vessels Inspection for the Petroleum and Chemical Process Industries. This Code covers the maintenance, inspection, repair, alteration, and re-rating procedures for pressure vessels within its scope. Copies of the Code may be obtained from the API.

"API" means, as used herein, the American Petroleum Institute, 1220 L Street NW, Washington, D.C. 20005-4070.

"API-ASME Code" means the American Petroleum Institute (API) in conjunction with the ASME Code as used in this Chapter and shall mean the Code for Unfired Pressure Vessels for Petroleum Liquids and Gases.

"Approved" means approved by the Commissioner of Labor or the Chief Inspector.

"ASME Code" means the American Society of Mechanical Engineers Boiler and Pressure Vessel Code with such revisions, amendments, and interpretations thereof as are made, approved, and adopted by the Council

of the Society, and approved and adopted by the Commissioner of Labor. Copies of the Code may be obtained from said Society at 22 Law Dr., Box 2300, Fairfield, NJ 07007-2300.

"Authorized inspection agency" means one of the following:

- (A) A department or division established by a jurisdiction which has adopted and does administer one or more sections of the ASME Code, one of which shall be Section I as a legal requirement, and whose Inspectors hold valid commissions issued by the National Board of Boiler and Pressure Vessel Inspectors;
- (B) An insurance company which has been licensed or registered by the appropriate authority of a state of the United States or a province of Canada to write boiler and pressure vessel insurance and does write, and/or provides inspection service of boilers and pressure vessels in such state or province.
- (C) An owner/user inspection agency as defined in this Section.

"Authorized Inspector" means the Chief Inspector or Deputy Inspector, Special Inspector or Owner/User Inspector.

"Boiler" means a closed vessel in which water is heated, steam is generated, steam is superheated, or any combination thereof, under pressure or vacuum, for use external to itself, by the direct application of heat. The term "boiler" includes fired units for heating or vaporizing liquids other than water where these units are separate from processing systems and complete within themselves.

"Building intended for human occupancy" means:

- (A) A dwelling. For the purposes of this Act, each separate dwelling unit of a multiple dwelling unit building is counted as a separate building intended for human occupancy.
- (B) A building that is occupied by twenty (20) or more persons during normal use.
- (C) A small, well defined outside area that is occupied by twenty (20) or more persons during normal use.

"Certificate inspection" means an inspection, the report of which is used by the Commissioner or the Chief Boiler Inspector as justification for issuing, withholding, or revoking the certificate of operation. This certificate inspection shall be an internal inspection when required; otherwise, it shall be as complete an inspection as possible.

- (A) "Internal inspection" means as complete an examination as can reasonably be made of the internal and external surfaces of a boiler or pressure vessel while it is shut down and manhole plates, handhole plates or other inspection opening closures are removed as required by the Inspector.
- (B) External inspection. An inspection made when a boiler or pressure vessel is in operation, if possible.

"Certificate of competency" means a certificate issued to a person who has passed an examination as provided for in the Act, or to an employee, of an Oklahoma Owner-User inspection agency, who holds an API Certification as an inspector of pressure vessels.

"Certificate of operation" means a certificate issued by the Commissioner for the operation of a boiler or pressure vessel as required by the Act.

"Chief inspector" means the Chief Boiler and Pressure Vessel Inspector appointed under the Act.

"Commission - National Board" means the commission issued by the National Board of Boiler and Pressure Vessel Inspectors to a holder of a certificate of competency who desires to make shop inspections or field inspections in accordance with the National Board By-Laws and whose employer submits the Inspector's application to the National Board for such commission.

"Commissioner" means the Commissioner of Labor or his duly authorized representative.

"Condemned boiler or pressure vessel" means a boiler or pressure vessel that has been inspected and declared unsafe or disqualified by legal requirements by an Inspector, and a stamping or marking designating its condemnation has been applied by the Chief or Deputy Inspector.

"Deputy inspector" means an Inspector appointed by the Chief Boiler Inspector subject to the approval of the Commissioner under the provisions of the Act.

"Downstream welded steamlines" means all welded steam lines operated in excess of 15 psig, not within the scope of Section I of the American Society of Mechanical Engineers Boiler and Pressure Vessel Codes.

"Electric boiler" means a power boiler or heating boiler in which the source of heat is electricity.

"Existing installation" includes any boiler or pressure vessel constructed, installed, placed in operation, or contracted for before twelve (12) months from the date upon which the rules of this Chapter become effective.

"Heat recovery boiler" means a vessel or system of vessels comprised of one or more heat exchanger surfaces used for the recovery of waste heat.

"High-temperature water boiler" means a water boiler intended for operation at pressures in excess of 160 psig and/or temperatures in excess of 250 EF.

"Hot water heating boiler" means a boiler in which no steam is generated, from which hot water is circulated for heating purposes and then returned to the boiler, and which operates at a pressure not exceeding 160 psig (1100 kPa gauge) and/or a temperature of 250 EF (121 EC) at or near the boiler outlet.

"Hot water supply boiler" means a boiler completely filled with water that furnishes hot water to be used externally to itself at pressures not exceeding 160 psig (1100 kPa gauge) or at temperatures not exceeding 250 EF (121 EC) at or near the boiler outlet, or as further defined in American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section IV.

"Hot water supply heater" means a closed vessel in which water is heated by the combustion of fuels, electricity, or any other source and withdrawn for use external to the system at pressures not exceeding 160 psig (1100 kPa gauge) and shall include all controls and devices necessary to prevent water temperatures from exceeding 210 EF (99 EC).

"Jurisdiction" means the State of Oklahoma, which has adopted one or more sections of the ASME Code, one of which is Section I, and maintains a duly constituted Bureau for the purpose of enforcement of such Code.

"Low pressure steam boiler" means a steam or vapor boiler operating at pressure not exceeding 15 psig.

"Measurement - (one-fourth square mile)" means beginning at the pressure vessel measuring north, south, east, and west, the distance of one-fourth (1/4) mile (1320 feet) to establish a square that encompasses 160 acres and a square that measures one-half (2) mile (2640 feet) on each side. The vessel to rest at the center of this square.

"Miniature boiler" means a power boiler or high-temperature water boiler which does not exceed the following limits:

- (A) 16 inches (410 millimeters) inside diameter of shell;
- (B) 20 square feet (1.9 square meters) heating surface (not applicable to electric boilers);
- (C) 5 cubic feet (140 liters) gross volume exclusive of casing and insulation;
- (D) 100 psig (690 kPa gauge) maximum allowable working pressure.

"Minor repairs and maintenance" means minor repairs and/or maintenance that the manufacturer prescribes and which the manufacturer identifies as being performable by the equipment owner or operator.

"National Board" means the National Board of Boiler and Pressure Vessel Inspectors, (NB) 1055 Crupper Avenue, Columbus, Ohio 43229, whose membership is composed of the Chief Boiler Inspectors of jurisdictions who are charged with the enforcement of the provisions of the ASME Code.

"NBIC - National Board Inspection Code" means the manual for Boiler and Pressure Vessel Inspectors published by the National Board. Copies of this code may be obtained from the National Board.

"New boiler or pressure vessel installation" includes all boilers or pressure vessels constructed, installed, or placed in service twelve (12) months from the date upon which the rules of this Chapter become effective.

"Nonstandard boiler or pressure vessel" means a boiler or pressure vessel that does not bear the ASME stamp, the API-ASME stamp, or

the stamp of any jurisdiction which has adopted a standard of construction equivalent to that required by this state.

"Owner or user" means any person, firm, or corporation legally responsible for the safe installation, operation, and maintenance of any boiler or pressure vessel within the jurisdiction.

"Owner/user inspection agency" means an owner or user of boilers or pressure vessels or both, who maintains a regularly established inspection department, whose organization and inspection procedures meet the requirements of the Act and these rules and are acceptable to the Commissioner.

"Owner/user inspector" means an Inspector holding an Oklahoma certificate of competency who is continuously employed as an Inspector by an owner/user inspection agency.

"Portable boiler" means a boiler which is primarily intended for temporary location, and the construction and usage permits it to be readily moved from one location to another.

"Power boiler" means a boiler in which steam or other vapor is generated at a pressure of more than 15 psig (pounds per square inch gauge).

"Pressure retaining item" means any boiler, pressure vessel, piping, or material used for the containment of pressure, either internal or external, as defined in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. The pressure may be obtained from an external source, or by the application of heat from a direct source, or any combination thereof.

"Pressure vessel" means 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 those boilers defined in this Section.

"PSIG" means pounds per square inch gauge.

"Reinstalled boiler or pressure vessel" means a boiler or pressure vessel removed from its original setting and reinstalled at the same location or at a new location without change of ownership.

"Repair" means the work necessary to restore a boiler or pressure vessel to a safe and satisfactory operating condition or as further defined in the NBIC or API 510 as applicable.

"Repair firms" means those firms or corporations licensed by the Commissioner of Labor to perform installations, service, repair and/or alterations to boilers and/or pressure vessels covered by this Act.

"Second-hand boiler or pressure vessel" means a boiler or pressure vessel which has changed both location and ownership since primary use.

"Special inspector" means an Inspector holding an Oklahoma certificate of competency who is regularly employed by an insurance company recognized as an Authorized Inspection Agency.

"Standard boiler or pressure vessel" means a boiler or pressure vessel which bears the stamp of this State; the ASME stamp, the API-ASME stamp, both the ASME and National Board stamp, or the stamp of another jurisdiction which has adopted a standard of construction equivalent to that required by this State.

"Steam heating boiler" means a steam boiler for operation at pressures not exceeding 15 psig (103 kPa gauge).

"Triennially" means, as used herein, at least one inspection within a three (3) year period.

"Waste heat boiler" means an unfired pressure vessel or system of unfired pressure vessels intended for operation in excess of 15 psig steam for the purpose of producing and controlling an output of thermal energy.

SUBCHAPTER 3. ADMINISTRATION

380:25-3-1. Minimum construction standards for boilers and pressure vessels

- (a) **Construction.** All new boilers and pressure vessels, unless otherwise exempt, to be operated in this jurisdiction shall be designed, constructed, inspected, stamped, and installed in accordance with the ASME Code and the latest addenda thereto in effect and these rules and regulations. A copy of the Manufacturers' Data Report, signed by the manufacturer's representative and the National Board commissioned inspector shall be filed with the Chief Boiler Inspector.
- (b) **State special.** If a boiler or pressure vessel proposed for construction cannot bear the ASME and National Board stamping, details in the English language and United States customary units of the proposed construction material specifications and calculations shall be submitted to the Chief Boiler Inspector by the owner or user and approval as "State Special" obtained from the Commissioner before construction is started.
- (c) **Hot water supply heaters.** All new hot water supply heaters covered by the Act shall be designed, constructed, inspected, and identified in accordance with applicable national standards.
- (d) **Exceptions.** In any circumstances other than the above, the owner or user shall contact the Chief Boiler Inspector.

380:25-3-2. Frequency and criteria of inspections of boilers, pressure vessels, and hot water supply heaters

- (a) Power boilers and high-pressure, high-temperature water boilers shall receive a certificate inspection annually which shall be an internal

- inspection where construction permits; otherwise it shall be as complete an inspection as possible. Such boilers shall also be inspected externally annually while under normal operating conditions.
- (b) Low pressure boilers shall receive a certificate inspection annually.
 - (1) Steam or vapor boilers shall have an external inspection; and, an internal inspection every two years where construction permits.
 - (2) Hot water heating and hot water supply boilers shall have an external inspection annually and, where construction permits. an internal inspection at the discretion of the Inspector.
 - (c) Pressure vessels, excluding those within the scope of the American Petroleum Institute Pressure Vessel Inspection Code, subject to internal corrosion and waste heat steam generators shall receive an internal inspection triennially where construction permits, and pressure vessels not subject to internal corrosion shall receive an internal inspection each ten (10) years. All pressure vessels shall be inspected externally triennially (certificates of operation may be issued on a three (3) year basis).
 - (d) Hot water supply heaters shall receive a certificate inspection annually if possible but biennially as a minimum.
 - (e) The frequency and criteria of inspection of pressure vessels within the scope of the American Petroleum Institute, Pressure Vessel Inspection Code shall be as prescribed therein.
 - (f) The original vessel construction shall determine the inspection criteria to be used for internal and external inspections.
 - (g) Based upon documentation of such actual service conditions by the owner or user of the operating equipment, the Commissioner may, at his discretion, permit variations in the inspection frequency requirements as provided in the Act.

380:25-3-3. Notification of inspection

Certificate inspection, as required in Section 380:25-3-2, shall be scheduled prior to the expiration date of the certificate. External inspections may be performed by the Inspector during normal business hours and without prior notification. When as a result of an external inspection or a determination by other objective means, it is the Inspector's opinion that continued operation of the boiler or pressure vessel constitutes a menace to public safety, the Inspector may request an internal inspection or an appropriate pressure test or both to evaluate conditions. In such instances the owner or user shall prepare the boiler or pressure vessel for such inspections or test as the Inspector designates.

380:25-3-4. Adoption of national standards

The following American national standards are hereby adopted:

- (1) Sections I, II, IV, V, VI, VII, VIII Divisions 1, 2, and 3, and IX of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, latest edition and most current addenda and code cases.
- (2) The National Board Inspection Code of the National Board of Boiler and Pressure Vessel Inspectors, latest edition and most current addenda.
- (3) American Petroleum Institute Pressure Vessel Inspection Code, 510.
- (4) The latest edition and most current addenda of CSD -1 Controls and Safety Devices for Automatically Fired Boilers of the American Society of Mechanical Engineers Code, effective July 1, 1995 for newly installed or reinstalled boilers. On installations where there is a conflict between ASME Boiler Code, CSD -1 and these rules, the most stringent requirement must be met.

380:25-3-5. Certificate of competency and identification card

- (a) Upon written request of his/her employer a certificate of competency and an identification card may be issued by the Commissioner of Labor to:
 - (1) The Chief Boiler Inspector and Deputy Inspectors employed by the state.
 - (2) A special Inspector who is regularly employed by an insurance company recognized as an Authorized Inspection Agency.
 - (3) An owner/User inspector who has met all the requirements of the Act and who is continuously employed by a company which operates boilers or pressure vessels or both in this state and which has a valid owner/user inspection agency as provided for in the Act.
 - (4) The inspector in his name and only one employer, whereupon the certificate of competency and valid identification card shall be returned to the Chief Boiler Inspector when the inspector to whom they were issued is no longer employed by the organization employing him at the time that the certificate was issued.
- (b) All new applicants for and current holders of, an Oklahoma certificate of competency will be required to complete an open book questionnaire covering the Oklahoma Boiler and Pressure Vessel Safety Act of 1982 and its amendments, prior to the issuance, or renewal of the certificate of competency.
 - (1) This questionnaire will be required every 5 years.
 - (2) Each new applicant for a certificate of competency will be provided the questionnaire at the time of application.

- (3) Future questionnaires will be made available on or before October 1 of each year to satisfy the 5 years requirement.

380:25-3-6. Conflict of interest

An inspector shall not engage in the sale of any article or device relating to boilers, pressure vessels, or their appurtenances covered by the Act.

380:25-3-7. Inspection reports to be submitted by inspectors (excludes owner/user agencies under the scope of API)

- (a) Inspectors shall submit to the Chief Boiler Inspector an inspection report on form NB-5 for each non-standard boiler or pressure vessel.
- (b) Subsequent inspections of both standard and non-standard boilers and pressure vessels shall be reported on Forms NB-6 or NB-7 of the National Board Inspection Code.
- (c) Inspection reports as required in Section 380:25-3-7(a)&(b), shall be submitted within thirty days from date of inspection.
 - (1) If the insurance company special inspectors have made the required inspection but have not submitted the report to the Bureau of Boiler Inspection within thirty (30) days, the insurance company may be charged a fee equal to that contained in Section 141.16(A)(2)(f) for each month or part thereof they are late.
 - (2) If insurance company special inspectors do not file their inspection reports with the Bureau of Boiler Inspection within ninety (90) days from the date the inspection is due, the Bureau of Boiler Inspection may make the required inspection and charge the insurance company an inspection fee equal to that contained in Section 141.16(A)(2)(g).
- (d) In lieu of forms NB-5, -6, or -7, referred to in this section, reasonable facsimiles approved in advance by the Chief Boiler Inspector may be used.
- (e) In addition, vessel heating surface or BTU (British Thermal Units) input or other data which will determine the maximum output of the unit and the relieving capacity of all safety, relief, or safety relief valves will be shown on all reports.
- (f) All reports of inspection of hot water supply heaters covered by the Act shall be submitted on forms approved by the Commissioner.

380:25-3-8. Insurance companies to notify chief inspector of new, cancelled or suspended insurance on boilers or pressure vessels

All insurance companies shall notify the Chief Boiler Inspector, within thirty days of all boilers or pressure vessels on which insurance is written, cancelled, or not renewed.

380:25-3-9. Special inspectors to notify chief boiler inspector of unsafe boilers and pressure vessels

If a Special Inspector, upon first inspection of a new risk, finds that a boiler or pressure vessel, or any appurtenance thereof, is in such condition that his company would refuse insurance, the company shall IMMEDIATELY notify the Chief Boiler Inspector and submit a report on the defects. If, upon inspection, a Special Inspector finds a boiler or pressure vessel to be unsafe for further operation, he shall promptly notify the owner or user and the Chief Boiler Inspector, stating what repairs or other corrective measures are required to bring the object into compliance with these rules and regulations. Until such corrections have been made no further operation of the boiler or pressure vessel involved shall be permitted. If an inspection certificate for the object is required and is in force, it shall be suspended by the Chief Boiler Inspector. When reinspection establishes that the necessary repairs have been made or corrective actions have been taken and that the boiler or pressure vessel is safe to operate, the Chief Boiler Inspector shall be notified. At that time, a certificate of operation, where applicable, will be issued.

380:25-3-10. Owner/user inspection agency

- (a) Any firm, partnership, or corporation operating boilers or pressure vessels in this jurisdiction may seek approval and registration as an owner/user inspection agency by filing an application with the Chief Boiler Inspector on prescribed forms and request approval by the Commissioner.
 - (1) Owner/user certificates of authorization issued in accordance with the requirements of the National Board of Boiler and Pressure Vessel Inspectors will be reviewed and certificates issued per the requirements of the National Board Inspection Code.
 - (2) Owner/user certificates of registration issued in accordance with the provisions of the American Petroleum Institute Pressure Vessel Inspection Code, API-510, will have no assigned expiration date. API-510 owner/user inspection agencies will be subject to review by the Chief Boiler Inspector or Deputy Boiler Inspector no less than every three years, but in no case shall the interval between reviews be allowed to exceed a period of five years.

- (b) Application and registration shall show the name of such agency and its principal address in this state, and the name and address of the person or persons having supervision over inspections made by said agency. Changes in supervisory personnel shall be reported to the Chief Boiler Inspector within thirty days after any such change.
- (c) Each owner/user inspection agency as required by the provisions of the Act and these rules and regulations shall:
 - (1) Be responsible for conducting inspections of boilers and pressure vessels not exempt by the Act, utilizing only qualified inspection personnel, as required by the Act;
 - (2) Post current Boiler Certificates of Operation on or near the boiler;
 - (3) Execute and deliver to the Chief Inspector and those responsible for the operation of the boiler a true report of each inspection;
 - (4) Promptly notify the Chief Boiler Inspector of any boiler as defined in 380:25-1-2, which does not meet the requirements for safety;
 - (5) Maintain inspection records which will include a list of each boiler and pressure vessel covered by the Act, showing a serial number and such abbreviated descriptions as may be necessary for identification, the date of last inspection of each unit and approximate date for the next inspection, arrived at by applying the appropriate rules to all data available at the time such inspection record is compiled. Regarding frequency and type of inspection, see Section 380:25-3-2. Such inspection record shall be readily available for examination by the Chief Boiler Inspector or his authorized representative during business hours;
 - (6) Make available appropriate National Standards for review at the facility;
 - (7) Have available records concerning qualifications of Inspectors;
 - (8) Clearly establish and document the authority and responsibility of those in charge of the Inspection Department by dated and authenticated organizational and functional charts. Persons performing inspection functions shall have sufficient and well defined responsibility, the authority and the organizational freedom to identify problems and to initiate, recommend and provide solutions;
 - (9) Retain as active, legible, well-documented inspection records as long as the boiler or pressure vessel remains in service.

380:25-3-11. Defective conditions disclosed at time of external inspection

If, upon an external inspection, there is evidence of a leak or crack, sufficient covering of the boiler or pressure vessel shall be removed to

permit the Inspector to satisfactorily determine the safety of the boiler or pressure vessel. If the covering cannot be removed at that time, he may order the operation of the boiler or pressure vessel stopped until such time as the covering can be removed and proper examination made.

380:25-3-12. Owner or user to notify chief inspector of accident

When an accident or incident occurs to a boiler or pressure vessel, the owner or user shall promptly notify the Labor Department. In the event of a personal injury or any explosion, notice shall be given immediately by telephone or other expeditious means, and neither the boiler or pressure vessel, nor any parts thereof, shall be removed or disturbed before permission has been given by the Commissioner or his designee, except for the purpose of saving human life and limiting further damage.

380:25-3-13. Inspection certificate and inspection fees

- (a) If after inspection, boilers or pressure vessels are found to be suitable and to conform to this Chapter and regulations, the owner or user shall pay directly to the Labor Department a fee as prescribed in the Act, and a certificate of operation shall then be issued. Checks or money orders for payment of certificate of operation fees should be made payable to the Department of Labor.
- (b) The Commissioner shall account for and transfer all fees so received to the Treasurer of the State.
- (c) If the owner or user of a boiler or pressure vessel which is required to be inspected refuses to allow an inspection to be made or refuses to pay the fee stipulated above, the inspection certificate shall be suspended by the Chief Boiler Inspector until the owner or user complies with the requirements.
- (d) The owner or user who causes or permits a boiler or pressure vessel to be operated without a valid certificate shall be subject to the penalty as provided for in the Act.

380:25-3-14. Validity of certificates of operation

A certificate of operation issued in accordance with 380:25-3-13 shall be valid until expiration unless some defect or condition affecting the safety of the boiler or pressure vessel is disclosed.

380:25-3-15. Restamping boilers and pressure vessels

When the stamping on a boiler or pressure vessel becomes indistinct, the Inspector shall instruct the owner or user to have it restamped. Request for permission to restamp the boiler or pressure vessel shall be made to the Chief Boiler Inspector and proof of the original stamping shall accompany the request. The Chief Boiler Inspector may grant such authorization. Restamping authorized by the Chief Boiler Inspector shall be done only in the presence of an Inspector, and shall be identical with the original

stamping. If the ASME Code symbol is to be restamped, it may only be done by the original manufacturer of the boiler or pressure vessel in the presence of the Inspector who signed the manufacturers' data report or an authorized inspector employed by the same insurance company employing the original authorized Inspector or the Chief or Deputy Inspectors. Notice of completion of such restamping shall be filed with the Chief Boiler Inspector by the Inspector who witnessed the stamping on the boiler or pressure vessel, together with a facsimile of the stamping applied.

380:25-3-16. Penalty for operation of unsafe boilers or pressure vessels

- (a) If, upon inspection, a boiler or pressure vessel is found to be in such condition that it is unsafe to operate, the Inspector shall notify the Chief Boiler Inspector, and the certificate of operation may be suspended by the Chief Boiler Inspector.
- (b) Any person, firm, partnership, or corporation causing such objects to continue to be operated shall be subject to the penalty provided in the Act.

380:25-3-17. Condemned boilers and pressure vessels

- (a) Any boiler or pressure vessel having been inspected and declared unfit for further service by an Inspector shall be stamped by the Chief Boiler Inspector or a Deputy Inspector on either side of the state number with the letters "XXX" as shown by the following facsimile which will designate a condemned boiler or pressure vessel:
XXXOOOOOXXX
- (b) Any person, firm, partnership, or corporation using or offering for sale or rent a condemned boiler or pressure vessel for operation within this State shall be subject to the penalties provided by the Act.

380:25-3-18. Reinstallation of boilers or pressure vessels

When a standard boiler or pressure vessel located in this state, excluding those under the scope of an owner/user inspection agency, is to be moved outside this State for temporary use or repair, application shall be made by the owner or user to the Chief Boiler Inspector for permission to reinstall the boiler or pressure vessel in this State.

380:25-3-19. Installation, operations, sale or offering for sale of non-standard boilers or pressure vessels

- (a) The installation, operation, sale, or the offering for sale of non-standard boilers or pressure vessels for use in this State is prohibited without permission from the Commissioner.
- (b) A special installation and operating permit may be issued by the Commissioner provided the owner or user presents evidence acceptable to the Chief Boiler Inspector.

380:25-3-20. Installation of used or secondhand boilers or pressure vessels

Before a used or secondhand boiler or pressure vessel may be installed in this State, an inspection must be made by an Inspector authorized by this State. Such boilers and pressure vessels when installed in this State shall be equipped with fittings and appurtenances that comply with the requirements of this Chapter for new installations and except for State of Oklahoma authorized owner/user inspection agencies, the installer shall notify the Bureau of Boiler Inspection prior to the installation.

380:25-3-21. Reinstalled boilers or pressure vessels

When a stationary boiler or pressure vessel is moved and reinstalled, the attached fittings and appurtenances shall comply with the requirements of this Chapter for new installations and except for State of Oklahoma authorized owner/user inspection agencies, the installer shall notify the Bureau of Boiler Inspection prior to the installation.

380:25-3-22. Working pressure for existing installations

Any Inspector may decrease the working pressure on any existing installation using the applicable code as a guideline if the condition of the boiler or pressure vessel warrants it. If the owner or user does not concur with the Inspector's decision, the owner or user may appeal to the Commissioner who may request a joint inspection by the Chief Boiler Inspector or a Deputy Inspector and the Inspector. The Chief Boiler Inspector shall render his report to the Commissioner who shall render the final decision, based upon the data contained in the reports.

380:25-3-23. Repairs and/or alterations

- (a) Except for State of Oklahoma authorized owner/user Inspection Agencies, when alterations and/or welded repairs are to be made, permission shall first be obtained from an authorized inspector, and prior to repairs and/or alterations, notification shall be given to the Bureau of Boiler Inspections by the repairing firm.
- (b) When alterations, re-rating and/or welded repairs are to be made on pressure vessels owned and/or operated by State of Oklahoma authorized Owner/User Inspection Agencies, permission shall first be obtained from an authorized inspector and this permission shall be documented by the owner/user and the repairing firm and shall be available for review by the Chief or Deputy Inspector.
- (c) Prior approval for routine repairs, as defined in the National Board Inspection Code or the American Petroleum Institute Pressure Vessel Inspection Code may be given, provided the requirements for authorization of the applicable code have been met.
- (d) Acceptance for repairs and/or alterations shall be witnessed by an authorized inspector as defined by this Chapter.

- (e) Reports of repairs and/or alterations, other than those considered repairs of a routine nature and those covered under the owner/user inspection program, shall be reported to the Bureau of Boiler Inspection in accordance with the procedures outlined in the National Board Inspection Code. Reports of repairs and/or alterations done under the owner/user inspection agency program shall be maintained by the owner/user inspection agency and shall be available for review by the Chief or Deputy Inspector.
- (f) When repairs and/or alterations involve stamping or nameplate attachment, the stamping or nameplate attachment shall be done in accordance with the National Board Inspection Code or the American Petroleum Institute Pressure Vessel Inspection Code as applicable and shall be witnessed by an authorized inspector.
- (g) Repairs and/or alterations shall be done in accordance with the National Board Inspection Code or the American Petroleum Institute Pressure Vessel Inspection Code as applicable.

380:25-3-24. Riveted patches

In applying riveted patches, the design of the patch and method of installation shall be in accordance with the National Board Inspection Code.

380:25-3-25. Safety appliances

- (a) No person shall attempt to remove or do any work on any safety appliance prescribed by this Chapter while the appliance is subject to pressure unless otherwise provided for by applicable codes.
- (b) Should any of these appliances be removed for repair during an outage of a boiler or pressure vessel, they must be reinstalled and in proper working order before the object is again placed in service.
- (c) No person shall alter any safety valves or safety relief valves or pressure relief devices in any manner to maintain a working pressure in excess of that stated on the boiler or pressure vessel inspection certificate.
- (d) Repair of safety or safety relief valves shall be made only by an organization which holds a valid Certificate of Authorization for use of the National Board "VR" Safety or Safety Relief Valve Repair symbol stamp, or at a properly equipped safety relief valve testing facility, by the valve manufacturer or by the owner if he has facilities acceptable to this jurisdiction.

380:25-3-26. Requirements for new installations

Except for State of Oklahoma authorized owner/user Inspection Agencies, the installer must notify the Bureau of Boiler Inspection prior to installation. No boiler or pressure vessel shall hereafter be installed in this State unless it has been constructed in conformity with the ASME Code and installed in conformity with the requirements of this Chapter except:

- (1) Those exempt by the Act;
- (2) Those outlined by the rules of this Chapter; and
- (3) Those hot water supply heaters constructed to a national standard.

380:25-3-27. Application of state serial numbers

- (a) Upon completion of the installation of a boiler or pressure vessel or at the time of the initial certificate inspection of an existing installation, each boiler or pressure vessel shall be stamped, or otherwise marked or identified, by the Chief Boiler Inspector or Deputy Inspector with a serial number of the state consisting of letters and figures to be not less than 1/4 inch in height and arranged as follows: OK00000
- (b) Hot water supply heaters shall be identified by a pre-numbered label provided by the Department of Labor.

380:25-3-28. Variation

- (a) Any person who believes the requirements promulgated by the Commissioner in this Chapter are unreasonable or impose an undue burden upon the owner or user, may request a variation. The request for variation shall be in writing and shall specify how equivalent safety is to be maintained. The Chief Boiler Inspector or Deputy Inspector may be required to investigate and or inspect and render a report to the Commissioner who may grant such variation from the terms of any requirement of this Chapter provided such special conditions as may be specified are maintained in order to provide equivalent safety.
- (b) When there is reason to believe, or upon receipt of a complaint that a variation does not provide freedom from danger equivalent to the published requirements of this Chapter, the Commissioner, after notice to the owner or user and complainant after such hearing and investigation as it may direct, may continue in force, suspend, revoke, or modify the conditions specified in any variation. No declaration, act or omission of the Commissioner, or of the Chief Boiler Inspector, Deputy Inspector or Special Inspectors other than a written order authorizing a variation as permitted above, shall be deemed to exempt, either wholly or in part, expressly or implied, any owner or user from full compliance with the terms of any rule or regulation.

380:25-3-29. Penalties

Any person, firm or corporation violating any of the provisions of this Chapter shall be guilty of a misdemeanor and subject to a fine to be collected by suit or through compromise as provided for in Title 40, Section 141.1 through 141.18 Oklahoma Statutes, 1982. Each day of such operation in violation of the provisions shall be considered a separate offense.

380:25-3-30. Adoption of CSD-1 Controls and Safety Devices for Automatically Fired Boilers [REVOKED]

SUBCHAPTER 5. EXISTING INSTALLATIONS

Part 1. General Provisions

380:25-5-1. Existing installation defined

The term, "Existing installation", as used in this subchapter is as defined in Section 380:25-1-2.

Part 3. Power Boilers

380:25-5-5. Age limit of existing boilers

- (a) The age limit of any boiler of non-standard construction, installed prior to the date the Act became effective, shall be 30 years except that, after a thorough internal and external inspection, and when required by the Inspector, a hydrostatic pressure test of 1.5 times the allowable working pressure and held for a period of at least 30 minutes, during which no distress or leakage develops, having other than a lap-riveted longitudinal joint may be continued in operation at the working pressure determined by Section 380:25-5-7. The age limit of any non-standard boiler having lap-riveted longitudinal joints and operating at a pressure in excess of 50 psig shall be 20 years. This type of boiler, when removed from an existing setting, shall not be reinstalled for a pressure in excess of 15 psig. A reasonable time for replacement, not to exceed one year, may be granted by the Chief Boiler Inspector.
- (b) The age limit of boilers of standard construction installed prior to the date this law became effective shall be dependent on thorough internal and external inspection and where required by the Inspector, a hydrostatic pressure test not exceeding 1.5 times the allowable working pressure. If the boiler, under these test conditions, exhibits no distress or leakage, it may be continued in operation at the working pressure determined by Section 380:25-5-6.
- (c) The shell or drum of a boiler in which a lap seam crack develops along a longitudinal lap-rivet joint shall be condemned. A lap seam crack is a crack found in lap seams extending parallel to the longitudinal joint and located either between or adjacent to rivet holes.

380:25-5-6. Maximum allowable working pressure for standard boilers

The maximum allowable working pressure for standard boilers shall be determined in accordance with the applicable provisions of the edition of the ASME Code under which they were constructed and stamped or the latest edition of the ASME Code.

380:25-5-7. Maximum allowable working pressure for non-standard boilers

- (a) **Allowable working pressure.** The maximum allowable working pressure of a non-standard boiler shall be determined by the strength of the weakest section of the structure, computed from the thickness of the plate, the tensile strength of the plate, the efficiency of the longitudinal joint or tube ligaments, the inside diameter of the weakest course and the factor of safety allowed by the rules of this Chapter. Non-standard boilers with welded seams shall not be operated at pressures exceeding 15 psig for steam, 30 psig for water.

$$\frac{TS + E}{FRS} = \text{maximum allowable working pressure, psi}$$

where:

- TS = ultimate tensile strength of shell plate, psi
- t = minimum thickness of shell plate, in weakest course, in inches
- E = efficiency of longitudinal joint:

For tube ligaments, E shall be determined by the rules given in Section I of the ASME Code. For riveted construction, refer to the National Board Inspection Code. For seamless construction, E shall be considered 100%.

- R = inside radius of weakest course of shell, (inches) provided the thickness does not exceed 10% of the radius. If the thickness is over 10% of the radius, the outer radius shall be used.

FS = factor of safety allowed by these rules.

- (b) **Tensile Strength.** When the tensile strength of steel or wrought iron shell plates is not known, it shall be taken as 55,000 psig for steel and 45,000 psi for wrought iron.
- (c) **Crushing Strength of Mild Steel.** The resistance to crushing of mild steel shall be taken at 95,000 psi.
- (d) **Strength of Rivets in Shear.**
- (1) When computing the ultimate strength of rivets in shear, the following values in pounds per square inch of the cross-sectional area of the rivet shank shall be used.

		PSI
Iron rivets in single shear	38,000
Iron rivets in double shear	76,000
Steel rivets in single shear	44,000
Steel rivets in double shear	88,000

- (2) When the diameter of the rivet holes in the longitudinal joints of a boiler is not known, the diameter and cross-sectional area of rivets, after driving, may be selected from the following table, or as ascertained by cutting out one rivet in the body of the joint.

SIZES OF RIVETS BASED ON PLATE THICKNESS

Plate-in thickness	<u>1</u> 4	<u>9</u> 32	<u>5</u> 16	<u>11</u> 32	<u>3</u> 8	<u>13</u> 32	<u>7</u> 16	<u>15</u> 32	<u>1</u> 2	<u>9</u> 16	<u>5</u> 8
Diameter of rivet after driving in	<u>11</u> 16	<u>11</u> 16	<u>3</u> 4	<u>3</u> 4	<u>13</u> 16	<u>13</u> 16	<u>15</u> 16	<u>15</u> 16	<u>15</u> 16	<u>11</u> 16	<u>11</u> 16

- (e) **Factors of Safety.** The working pressure shall be decreased by the Inspector if the condition and safety of the boiler warrants it using the applicable code as a guideline. The following factors of safety represent minimum values to be used. The lowest factor of safety permissible on existing installations shall be 4.5, except for horizontal-return-tubular boilers having continuous longitudinal lap seams more than 12 feet in length, the factor of safety shall be 8. When this latter type of boiler is removed from its existing setting, it shall not be reinstalled for pressures in excess of 15 psig.

380:25-5-8. Cast iron headers and mud drums

The maximum allowable working pressure on a water tube boiler, the tubes of which are secured to cast iron or malleable iron headers, or which have cast iron mud drums, shall not exceed 160 psig.

380:25-5-9. Pressure on cast iron boilers

The maximum allowable working pressure for any cast iron boiler, except hot water boilers, shall be 15 psig. See Sections 380:25-5-21, 380:25-5-22, and 380:25-5-24.

380:25-5-10. Safety valves

- (a) The use of weighted-lever safety valves or safety valves having either the seat or disk of cast iron are prohibited; valves of this type of

- construction shall be replaced by direct, spring-loaded, pop-type valves that conform to the requirements of ASME Code Section I.
- (b) Each boiler shall have at least one ASME/National Board certified safety valve, and if it has more than 500 square feet of water-heating surface, or an electric power input of more than 1,100 kw, it shall have two or more safety valves of the same type.
 - (c) The valve or valves shall be connected to the vapor space of the boiler, independent of any other steam connection, and attached as close as possible to the boiler without unnecessary intervening pipe or fittings. Every safety valve or safety relief valve shall be connected so as to stand in an upright position, with spindle vertical. Where alteration is required to conform to this requirement, owners, or users shall be allowed reasonable time in which to complete the work as permitted by the Chief Boiler Inspector.
 - (d) No valves of any description shall be placed between the safety valve and the boiler nor on the discharge pipe, if used. When an escape pipe is used, it shall be at least the full size of the safety valve discharge and fitted with an open drain to prevent water lodging in the upper part of the safety valve or safety valve discharge pipe; it shall be located close to the safety valve outlet or the discharge pipe shall be anchored and supported securely. All safety discharges shall be so located or piped as to be carried clear from walkways or platforms.
 - (e) The safety valve capacity of each boiler shall be such that the safety valve or valves will discharge all the steam that can be generated by the boiler without allowing the pressure to rise more than 6% above the highest pressure to which any valve is set, and in no case to more than 6% above the maximum allowable working pressure.
 - (f) One or more safety valves on every boiler shall be set at or below the maximum allowable working pressure. The remaining valves may be set within a range of 3% above the maximum allowable working pressure, but the range or setting of all the safety valves on a boiler shall not exceed 10% of the highest pressure to which any valve is set.
 - (g) When two or more boilers, operating at different pressures and safety valve settings, are interconnected, the lower pressure boilers or interconnected piping shall be equipped with safety valves of sufficient capacity to prevent overpressure, considering the maximum generating capacity of all boilers.
 - (h) In those cases where the boiler is supplied with feed water directly from water mains without the use of feeding apparatus (not to include return traps), no safety valve shall be set at a pressure greater than 94% or the lowest pressure obtained in the supply main feeding the boiler.

- (i) If the safety valve or safety relief valve capacity cannot be computed or if it is desirable to prove the computations, it may be checked in any one of the three following ways, and if found insufficient, additional capacity shall be provided:
 - (1) By making an accumulation test, which consists of shutting off all other steam discharge outlets from the boiler and forcing the fires to the maximum. The safety valve capacity shall be sufficient to prevent a rise of pressure in excess of 6% of the maximum allowable working pressure. This method should not be used on a boiler with a superheater or reheater;
 - (2) By measuring the maximum amount of fuel that can be burned and computing the corresponding evaporative capacity (steam generating capacity) upon the basis of the heating value of this fuel. These computations shall be made as outlined in the Appendix of the ASME Code, Section I;
 - (3) By measuring the maximum amount of feedwater that can be evaporated. When either of the methods outlined in Section 380:25-5-10(i)-(2) & (3) is employed, the sum of the safety valve capacity shall be equal to or greater than the maximum evaporative capacity (maximum steam generating capacity) of the boiler.

380:25-5-11. Boiler feeding

- (a) Each boiler shall have a feed supply which will permit it to be fed at any time while under pressure.
- (b) A boiler having more than 500 square feet of water heating surface shall have at least two suitable means of feeding, at least one of which shall be a feed pump. A source of feed at a pressure 6% greater than the set pressure of the safety valve with the highest setting may be considered one of the means. Boilers fired by gaseous, liquid, or solid fuel in suspension may be equipped with a single means of feeding water provided means are furnished for the shutoff of heat input prior to the water level reaching the lowest safe level.
- (c) The feedwater shall be introduced into the boiler in such manner that it will not be discharged close to the riveted joints of shell or furnace sheets, or directly against surfaces exposed to products of combustion, or to direct radiation from the fire.
- (d) The feed piping to the boiler shall be provided with a check valve near the boiler and a valve or cock between the check valve and the boiler. When two or more boilers are fed from a common source, there shall also be a valve on the branch to each boiler between the check valve and the source of supply. Whenever a globe valve is used on feed piping, the inlet shall be under the disk of the valve.

- (e) In all cases where returns are fed back to the boiler by gravity, there shall be a check valve and stop valve in each return line, the stop valve to be placed between the boiler and the check valve, and both shall be located as close to the boiler as is practicable. It is recommended that no stop valves be placed in the supply and return pipe connections of a single boiler installation.

380:25-5-12. Water level indicators

- (a) No outlet connections (except for damper regulator, feedwater regulator, low water fuel cutout, drains, steam gauges, or such apparatus that does not permit the escape of an appreciable amount of steam or water therefrom) shall be placed on the piping that connects the water column to the boiler. The water column shall be provided with a valved drain of at least 3/4 inch pipe size, the discharge to be piped to a safe location.
- (b) For all installations where the water gauge glass or glasses are more than 30 feet above the boiler operating floor, it is recommended that remote water level indicating or recording gauges be installed at eye height above the operating floor.

380:25-5-13. Steam gages

- (a) Each steam boiler shall have a steam gage with a dial range graduated to not less than 1.5 times the set pressure of the safety valve, connected to the steam space or to the steam connection to the water column. The steam gage shall be connected to a siphon or equivalent device of sufficient capacity to keep the gage tube filled with water and so arranged that the gage cannot be shut off from the boiler except by a cock placed near the gage and provided with a tee or lever handle arranged to be parallel to the pipe in which it is located when the cock is open.
- (b) When a steam gage connection longer than 8 feet becomes necessary, a shut-off valve may be used near the boiler provided the valve is of the outside-screw-and-yoke type and is locked open. The line shall be of ample size with provision for free blowing.
- (c) Each boiler shall be provided with a 1/4 inch or larger nipple and globe valve connected to the steam space for the exclusive purpose of attaching a test gage when the boiler is in service so that the accuracy of the boiler steam gage may be ascertained.

380:25-5-14. Stop valves

- (a) Each steam outlet from a boiler (except safety valve and water column connections) shall be fitted with at least one stop valve located as close as practicable to the boiler.

- (b) When a stop valve is so located that water can accumulate, ample drains shall be provided. The drainage shall be piped to a safe location and shall not be discharged on the top of the boiler or its setting.
- (c) When boilers provided with manholes are connected to a common steam main, the steam connection from each boiler shall be fitted with two stop valves having ample free blow drain between them. The discharge of the drain shall be visible to the operator while manipulating the valve closest to the boiler and shall be piped clear of the boiler setting. The stop valves shall consist preferably of one automatic nonreturn valve (set next to the boiler) and a second valve of the outside-screw-and-yoke type.

380:25-5-15. Blowoff connection

- (a) The construction of the setting around each blowoff pipe shall permit free expansion and contraction. Careful attention shall be given to the problem of sealing these setting openings without restricting the movement of the blowoff piping.
- (b) All blowoff piping, when exposed to furnace heat, shall be protected by fire brick or other heat resisting material. It shall be so constructed that the piping may be inspected readily.
- (c) Each boiler shall have a blowoff pipe, fitted with a valve or cock, in direct connection with the lowest water space. Cocks shall be of the gland or guard type and suitable for the pressure allowed. The use of globe valves shall not be permitted. When the maximum allowable working pressure exceeds 100 psig, each blowoff pipe shall be provided with two valves or a valve and cock.
- (d) When the maximum allowable working pressure exceeds 100 psig, blowoff piping shall be at least extra heavy steel from the boiler to the valve or valves, and shall be run full size without use of reducers or bushings. The piping shall not be galvanized.
- (e) All fittings between the boiler and blowoff valve shall be of steel. In case of renewal of blowoff pipe or fittings, they shall be installed in accordance with the rules and regulations for new installations. See National Board recommended rules for Boiler Blowoff Equipment.

380:25-5-16. Repairs and renewals of boiler fittings and appliances

Whenever repairs are made to fittings or appliances, or it becomes necessary to replace them, the work shall comply with the requirements for new installations. Galvanized pipe or fittings shall not be used as replacement parts.

380:25-5-17. Conditions not covered by these requirements

All cases not specifically covered by these requirements shall be treated as new installations or may be referred to the Chief Boiler Inspector for instructions concerning the requirements.

Part 5. Heating Boilers

380:25-5-21. Standard boilers

The maximum allowable working pressure of standard boilers shall in no case exceed the pressure indicated by the manufacturer's identification stamped or cast on the boiler or on a plate secured to it.

380:25-5-22. Non-standard riveted boilers

The maximum allowable working pressure on the shell of a non-standard riveted heating boiler shall be determined in accordance with Section 380:25-5-7, Power Boilers, except that in no case shall the maximum allowable working pressure of a steam heating boiler exceed 15 psig, or a hot water boiler exceed 160 psig or 250 °F temperature.

380:25-5-23. Non-standard welded boilers

The maximum allowable working pressure of a non-standard steel or wrought iron heating boiler of welded construction shall not exceed 15 psig for steam. For other than steam service, the maximum allowable working pressure shall be calculated in accordance with Section IV of the ASME Code, but in no case shall it exceed 30 psig.

380:25-5-24. Non-standard cast iron boilers

- (a) The maximum allowable working pressure of a non-standard boiler composed principally of cast iron shall not exceed 15 psig for steam service or 30 psig for hot water service.
- (b) The maximum allowable working pressure of a non-standard boiler having cast iron shell or heads and steel or wrought iron tubes shall not exceed 15 psig for steam service or 30 psig for hot water service.

380:25-5-25. Safety valves/safety relief valves

(a) **Steam boilers.**

- (1) Each steam boiler shall have one or more ASME/National Board stamped and certified safety valves of the spring pop-type, adjusted and sealed to discharge at a pressure not to exceed 15 psig. Seals shall be attached in a manner to prevent the valve from being taken apart without breaking the seal. The safety valves shall be arranged so that they cannot be reset to relieve at a higher pressure than the maximum allowable working pressure on the boiler. A body drain connection below seat level shall be provided by the manufacturer, and this drain shall not be plugged during or after field inspection. For valves exceeding

2 in. pipe size, the drain hole or holes shall be tapped not less than 3/8 in. pipe size. For valves less than 2 in., the drain hole shall not be less than 1/4 in. diameter. Every safety valve or safety relief valve shall be connected so as to stand in an upright position, with spindle vertical.

- (2) No safety valve of a steam boiler shall be smaller than 1/2 in. No safety valve shall be larger than 4 1/2 in. The inlet opening shall have an inside diameter equal to, or greater than, the seat diameter.
- (3) The minimum relieving capacity of the valve or valves shall be governed by the capacity marking on the boiler.
- (4) The minimum valve capacity in pounds per hour shall be the greater of that determined by dividing the maximum BTU output at the boiler nozzle obtained by the firing of any fuel for which the unit is installed by 1000, or shall be determined on the basis of the pounds of steam generated per hour per square foot of boiler heating surface as given in the following table. In many cases a greater relieving capacity of valves than the minimum specified by these rules will have to be provided. In every case, the requirements of Section 380:25-5-25(a)(5) shall be met.

ALL BOILERS
 MINIMUM POUNDS OF STEAM PER HOUR
 PER SQUARE FOOT OF HEATING SURFACE

	Firetube Boilers	Watertube Boilers
Boiler Heating Surface:		
Hand fired	5	6
Stoker fired	7	8
Oil, gas or pulverized fuel fired	8	10
Waterwall Heating Surface:		
Hand fired	8	8
Stoker fired	10	12
Oil, gas or pulverized fuel fired	14	16

Notes for Table:

- 1. When a boiler is fired only by a gas giving a heat value not in excess of 200 BTU per cubic foot, the minimum safety valve or safety relief valve relieving capacity may be based on the value given for handfired boilers above.
- 2. The minimum safety valve or safety relief valve relieving capacity for electric boilers shall be 3.5 pounds per hour per kilowatt input.
- 3. For heating surface determination see ASME Code Section IV.

- (5) The safety valve capacity for each steam boiler shall be such that with the fuel burning equipment installed, and operating at maximum capacity, the pressure cannot rise more than 5 psi above the maximum allowable working pressure.
 - (6) When operating conditions are changed, or additional boiler heating surface is installed, the valve capacity shall be increased, if necessary, to meet the new conditions and be in accordance with Section 380:25-5-25(a)(5). When additional valves are required, they may be installed on the outlet piping provided there is no intervening valve.
 - (7) If there is any doubt as to the capacity of the safety valve, an accumulation test may be run (see ASME Code, Section VI, Recommended Rules for Care and Operation of Heating Boilers).
 - (8) No valve of any description shall be placed between the safety valve and the boiler, nor on the discharge pipe between the safety valve and the atmosphere. THE DISCHARGE PIPE SHALL BE AT LEAST FULL SIZE AND BE FITTED WITH AN OPEN DRAIN TO PREVENT WATER LODGING IN THE UPPER PART OF THE SAFETY VALVE OR IN THE DISCHARGE PIPE. WHEN AN ELBOW IS PLACED ON THE SAFETY VALVE DISCHARGE PIPE, IT SHALL BE LOCATED CLOSE TO THE SAFETY VALVE OUTLET, OR THE DISCHARGE PIPE SHALL BE SECURELY ANCHORED AND SUPPORTED. ALL SAFETY VALVE DISCHARGE SHALL BE SO LOCATED OR PIPED AS NOT TO ENDANGER PERSONS WORKING IN THE AREA.
- (b) **Hot water heating and/or hot water supply boilers.**
- (1) Each hot water heating and/or hot water supply boiler shall have at least one ASME/National Board stamped and certified safety relief valve set to relieve at or below the maximum allowable working pressure of the boiler. Each hot water supply boiler shall have at least one ASME/National Board stamped and certified safety relief valve of the automatic reseating type set to relieve at or below maximum allowable working pressure of the boiler. Safety relief valves ASME/National Board stamped and certified as to capacity shall have pop action when tested by steam. When more than one safety relief valve is used on either a hot water heating or hot water supply boiler, the additional valve or valves shall be ASME/National Board stamped and certified and may be set within a range not to exceed 6 psi above the maximum allowable working pressure of the boiler up to and including 60 psi, and 5 percent for those having a maximum allowable working pressure exceeding 60 psi. Safety relief valves shall be spring loaded. Safety relief valves shall be so arranged

that they cannot be reset at a higher pressure than the maximum permitted by this paragraph. Every safety valve or safety relief valve shall be connected so as to stand in an upright position, with spindle vertical.

- (2) No material liable to fail due to deterioration or vulcanization when subject to saturated steam temperatures corresponding to capacity test pressure shall be used for any part.
- (3) No safety relief valve shall be smaller than 3/4 in. or larger than 4 1/2 in. standard pipe size, except that boilers having a heat input not greater than 15,000 BTU per hour may be equipped with a safety relief valve of 1/2 in. standard pipe size. The inlet opening shall have an inside diameter approximately equal to, or greater than, the seat diameter. In no case shall the minimum opening through any part of the valve be less than 1/4 in. diameter or its equivalent area.
- (4) The required steam relieving capacity, in pounds per hour, of the pressure relieving device or devices on a boiler shall be the greater of that determined by dividing the maximum output in BTU at the boiler nozzle, obtained by the firing of any fuel for which the unit is installed by 1,000, or shall be determined on a basis of pounds of steam generated per hour per square foot of heating surface as given in 380:25-5-25. In many cases, a greater relieving capacity of valves will have to be provided than the minimum specified by these rules. In every case the requirements of Section 380:25-5-25(b)(6) shall be met.
- (5) When operating conditions are changed, or additional boiler heating surface is installed, the valve capacity shall be increased, if necessary, to meet the new conditions and shall be in accordance with Section 380:25-5-25(b)(6). The additional valves required, on account of changed conditions, may be installed on the outlet piping provided there is no intervening valve.
- (6) Safety relief valve capacity for each boiler shall be such that, with the fuel burning equipment installed and operated at maximum capacity, the pressure cannot rise more than 10 percent above the maximum allowable working pressure. When more than one safety relief valve is used, the over pressure shall be limited to 10 percent above the set pressure of the highest set valve allowed by Section 380:25-5-25(a)(1).
- (7) If there is any doubt as to the capacity of the safety relief valve, an accumulation test may be run (See ASME Code, Section VI, Recommended Rules for Care and Operation of Heating Boilers).
- (8) No valve of any description shall be placed between the safety valve and the boiler, nor on the discharge pipe between the

safety valve and the atmosphere. THE DISCHARGE PIPE SHALL BE AT LEAST FULL SIZE AND BE FITTED WITH AN OPEN DRAIN TO PREVENT WATER LODGING IN THE UPPER PART OF THE SAFETY VALVE OR IN THE DISCHARGE PIPE. WHEN AN ELBOW IS PLACED ON THE SAFETY VALVE DISCHARGE PIPE, IT SHALL BE LOCATED CLOSE TO THE SAFETY VALVE OUTLET, OR THE DISCHARGE PIPE SHALL BE SECURELY ANCHORED AND SUPPORTED. ALL SAFETY VALVE DISCHARGE SHALL BE SO LOCATED OR PIPED AS NOT TO ENDANGER PERSONS WORKING IN THE AREA.

(c) **ASME code stamped water heaters.**

(1) Each ASME Code stamped water heater which provides corrosion resistance for supplying potable water for commercial purposes at pressures not exceeding 160 psi and temperatures not in excess of 210°F shall have at least one officially rated safety relief valve or one officially rated pressure temperature relief valve.

(A) **Permissible Mountings.** Safety relief valves shall be connected to the top of water heaters or directly to a tapped or flanged opening in the water heater, to a fitting connected to the water heater by a short nipple, to a Y-base, or to a valveless water heater connecting water outlets on the same heater. Safety relief valves shall be installed with their spindles upright and vertical with no horizontal connecting pipe, except that, when the safety relief valve is mounted directly on the water heater vessel with no more than 4 in. maximum interconnecting piping, the valve may be installed in the horizontal position with the outlet pointed down. The center line of the safety relief valve connection shall be no lower than 4 in. from the top of the shell.

(B) **Requirements for Common Connection for Two or More Valves.**

(i) When a water heater is fitted with two or more safety relief valves on one connection, this connection shall have a cross-sectional area not less than the combined areas of inlet connections of all the safety relief valves with which it connects.

(ii) When a Y-base is used, the inlet area shall be not less than the combined outlet areas. When the size of the water heater requires a safety relief valve larger than 4 1/2 in. diameter, two or more valves having the required combined capacity shall be used. When two or more valves are used on a water

heater, they may be single, directly attached, or mounted on a Y-base.

- (C) **Threaded connections.** A threaded connection may be used for attaching a valve.
 - (D) **Prohibited mountings.** Safety relief valves shall not be connected to an internal pipe in the water heater or a cold water feed line connected to the water heater.
 - (E) **Use of shutoff valves prohibited.** No shutoff of any description shall be placed between the safety relief valve and the water heater, or on discharge pipes between such valves and the atmosphere.
 - (F) **Safety relief valve discharge piping.**
 - (i) A discharge pipe shall be installed on the outlet of a safety relief valve, and when a discharge pipe is used, its internal cross-sectional area shall be not less than the full area of the valve outlet or of the total of the valve outlets discharging thereunto, and shall be as short and straight as possible and so arranged as to avoid undue stress on the valve or valves. When an elbow is placed on a safety relief discharge pipe, it shall be located close to the valve outlet.
 - (ii) The discharge from safety relief valves shall be so arranged that there will be no danger of scalding attendants. When the safety relief valve discharge is piped away from the water heater to the point of discharge, there shall be provisions for properly draining the piping and valve body. The size and arrangement of discharge piping shall be such that any pressure that may exist or develop will not reduce the relieving capacity of the relieving devices below that required to protect the water heater.
- (2) **Water supply.**
- (A) **Connections.** Water supply shall be introduced into a water heater through an independent water supply connection. Feedwater shall not be introduced through openings or connections provided for cleaning, safety relief valves, drain, pressure gage, or temperature gage.
 - (B) **Pressure.** If the water supply pressure to a water heater exceeds 75% of the set pressure of the safety relief valve, a pressure reducing valve is required.
 - (C) **Stop valves.** A stop valve shall be placed in the water supply pipe connection of an ASME code stamped water

heater installation and should be placed in the discharge connection.

- (D) **Bottom drain valve.**
 - (i) Each water heater shall have a bottom drain pipe connection fitted with a valve or cock connected with the lowest water space practicable. The minimum size bottom drain valve shall be 3/4 in.
 - (ii) Any discharge piping connected to the bottom drain connection shall be full size to the point of discharge.
- (E) **Thermometer.** Each installed water heater shall have a thermometer so located and connected that it shall be easily readable. The thermometer shall be so located that it shall at all times indicate the temperature in degrees Fahrenheit of the water in the hot water heater at or near the outlet.

380:25-5-26. Steam gages

- (a) Each steam boiler shall have a steam gage connected to its steam space, its water column, or its steam connection, by means of a siphon or equivalent device exterior to the boiler. The siphon shall be of sufficient capacity to keep the gage tube filled with water and so arranged that the gage cannot be shut off from the boiler except by a cock with a tee or lever handle placed in the pipe near the gage. The handle of the cock shall be parallel to the pipe on which it is located when the cock is open.
- (b) The scale on the dial of a steam gage shall be graduated to not less than 30 psig or more than 60 psig. The gage shall be provided with effective stops for the indicating pointer at the zero point and at the maximum pressure point. The travel of the pointer from zero to 30 psig pressure shall be at least 3 inches.

380:25-5-27. Pressure/altitude gages, and pressure/temperature controls

- (a) Each hot water boiler shall have a pressure or altitude gage connected to it or to its flow connection in such a manner that it cannot be shut off from the boiler except by a cock with a tee or lever handle placed on the pipe near the gage. The handle of the cock shall be parallel to the pipe in which it is located when the cock is open.
- (b) The scale on the dial of the pressure or altitude gage shall be graduated approximately to not less than 1.5 nor more than 3 times the set pressure of the safety relief valve.
- (c) Piping or tubing for pressure or altitude gage connections shall be of nonferrous metal when smaller than 1 inch pipe size.
- (d) Each hot water boiler shall have a thermometer so located and connected that it shall be easily readable when observing the water

pressure or altitude gage. The thermometer shall be so located that it will at all times indicate the temperature in degrees Fahrenheit of the water in the boiler at or near the outlet.

- (e) Each automatically fired steam boiler shall be protected from over-pressure by two pressure-operated controls.
 - (1) Each individual automatically fired steam boiler shall have a safety limit control that will cut off the fuel supply to prevent steam pressure from exceeding the 15 psi maximum allowable working pressure of the boiler. Each control shall be constructed to prevent a pressure setting above 15 psi.
 - (2) Each individual steam boiler or each system of commonly connected steam boilers shall have a control that will cut off the fuel supply when the pressure reaches an operating limit, which shall be less than the maximum allowable pressure.
 - (3) Shutoff valves of any type shall not be placed in the steam pressure connection between the boiler and the controls described in (1) and (2) above. These controls shall be protected with a syphon or equivalent means of maintaining a water seal that will prevent steam from entering the control. The connections to the boiler shall not be less than 1/4 inch standard pipe size, but where steel or wrought iron pipe or tubing is used, they shall not be less than 1/2 inch standard pipe size. The minimum size of a syphon shall be 1/4 inch standard pipe size of 3/8 inch O.D. nonferrous tubing.
- (f) Each automatically fired hot water boiler shall be protected from over-temperature by two temperature-operated controls. Each of these temperature controls shall be constructed to prevent a temperature setting above the allowable of 250 degrees F.
 - (1) Each individual automatically fired hot water boiler shall have a safety limit control that will cut off the fuel supply to prevent water temperature from exceeding the maximum allowable temperature of 250° F at the boiler outlet. In addition, the high limit temperature control shall be constructed to provide safety shutdown and lockout with manual reset when activated.
 - (2) Each individual hot water boiler or each system of commonly connected boilers without intervening valves shall have a control that will cut off the fuel supply when the water temperature reaches an operating limit, which shall be less than the maximum allowable temperature.

380:25-5-28. Water gage glasses

- (a) Each steam boiler shall have one or more water gage glasses attached to the water column or boiler by means of valved fittings. The lower fitting shall be provided with a drain valve of the straightway type with

- opening not less than 1/4 inch diameter to facilitate cleaning. Gage glass replacement shall be possible while the boiler is under pressure.
- (b) Transparent material, other than glass, may be used for the water gage provided that material has proved suitable for the pressure, temperature and corrosive conditions encountered in service.

380:25-5-29. Stop valves and check valves

- (a) If a boiler may be closed off from the heating system by closing a steam stop valve, there shall be a check valve in the condensate return line between the boiler and the system.
- (b) If any part of a heating system may be closed off from the remainder of the system by closing a steam stop valve, there shall be a check valve in the condensate return pipe from that part of the system.

380:25-5-30. Feedwater connections

- (a) Feedwater, make-up water, or water treatment shall be introduced into a boiler through the return piping system or through an independent feedwater connection which does not discharge against parts of the boiler exposed to direct radiant heat from the fire. Feedwater, make-up, or water treatment shall not be introduced through openings or connections provided for inspection or cleaning, safety valve, safety relief valve, surface blowoff, water column, water gage glass, pressure gage or temperature gage.
- (b) Feedwater pipe shall be provided with a check valve near the boiler and a stop valve or cock between the check valve and the boiler or return pipe system.

380:25-5-31. Return pump

Each boiler equipped with a condensate return pump shall be provided with a water level control arranged to automatically maintain the water level in the boiler within the range of the gage glass.

380:25-5-32. Repairs and renewals of fittings and appliances

Whenever repairs are made to fittings or appliances, or it becomes necessary to replace them, the repairs must comply with Section IV of the ASME Code for new construction.

380:25-5-33. Provisions for thermal expansion in hot water systems

- (a) Each water heating system shall be provided with thermal expansion protection. Provisions for thermal expansion shall be in accordance with the applicable Codes and these rules.
- (b) Expansion tanks for use in hot water heating systems shall be consistent with the volume and capacity of the system. If the system is designed to operate at 30 psi or less, the tank shall be suitably designed for a minimum hydrostatic test pressure of 75 psi. Expansion

tanks for systems designed to operate above 30 psi shall be constructed in accordance with ASME Code Section VIII Division I, or ASME Code Section X.

- (c) The minimum capacity of the closed type expansion tank may be determined using the chart in Appendix A.

Part 7. Pressure Vessels

380:25-5-36. Maximum allowable working pressure for standard pressure vessels

The maximum allowable working pressure for standard pressure vessels shall be determined in accordance with the applicable provisions of the edition of the ASME Code or the API-ASME Code under which they were constructed and stamped or the latest edition of the ASME Code.

380:25-5-37. Maximum allowable working pressure for non-standard pressure vessels, except as provided in section 380:25-5-38

- (a) The maximum allowable working pressure of a non-standard pressure vessel shall be determined by the strength of the weakest course computed from thickness of the plate, the tensile strength of the plate, the efficiency of the longitudinal joint, the inside diameter of the course and the factor of safety set by this Chapter.

$\frac{TS \cdot t \cdot E}{R \cdot FS}$ = maximum allowable working pressure, psi

where:

TS = ultimate tensile strength of shell plate, psi (When the tensile strength of carbon steel plate is not known, it may be taken as 55,000 psig for temperatures not exceeding 650 degrees F. For other materials use the lowest stress values for that material from Section VIII of the ASME Code)

t = minimum thickness of shell plate of weakest course, inches

E = efficiency of longitudinal joint depending upon construction

Use the following values:

for riveted joints - calculated riveted efficiency; for fusion-welded and brazed joints:

	Percent
Single lap weld	40
Double lap weld	50
Single butt weld	60
Double butt weld	70
Forge weld	70
Brazed steel	80

R = inside radius of weakest course of shell, (inches) provided

the thickness does not exceed 10% of the radius. If the thickness is over 10% of the radius, the outer radius shall be used.

FS = factor of safety allowed by these rules.

- (b) The minimum factor of safety shall in no case be less than four (4) for existing installations. The working pressure shall be decreased, using the applicable code as a guideline, when deemed necessary by the Inspector to insure the operation of the vessel within safe limits. The condition of the vessel and the particular service to which it is subject will be determining factors.
- (c) The maximum allowable working pressure permitted to formed heads under pressure shall be determined by using the appropriate formulas from ASME Code, Section VIII, and the tensile strength and factors of safety given in Paragraphs 1 and 2(a)&(b).
- (d) The maximum allowable working pressure for non-standard pressure vessels subjected to external pressure shall be determined by the rules of Section VIII of the ASME Code.

380:25-5-38. Non-standard pressure vessels - use of other formulas

Pressure vessels that were not ASME Code stamped but which were constructed of known materials and were designed and constructed in accordance with sound engineering standards, formulas, and practices that provide safety equivalent to the intent of the Code shall be calculated on the same basis as used in the original design.

380:25-5-39. Inspection of inaccessible parts

Where in the opinion of the Inspector, as a result of conditions disclosed at the time of inspection, it may be necessary to remove interior or exterior lining, covering, or brickwork to expose certain parts of the vessel not normally visible, the owner or user shall remove such material to permit proper inspection and to determine remaining thickness.

380:25-5-40. Overpressure protection

Each pressure vessel or pressure vessel system shall be provided with safety, relief, indicating, and controlling devices as necessary to protect against overpressure. These devices shall be so constructed, located, and installed that they cannot readily be rendered inoperative. The relieving capacity of such pressure relief devices shall be adequate to prevent a rise in pressure in the vessel or system of more than 10% above the highest pressure to which any pressure relieving device is set and in no case more than 16% above the maximum allowable working pressure. The opening pressure of the lowest set pressure relieving device shall be no greater than the maximum allowable working pressure of the vessel or system. Where an

additional hazard is involved due to fire or other unexpected sources of external heat, the pressure relief devices shall meet the requirements of ASME Code Section VIII.

380:25-5-41. Repairs and renewals of fittings and appliances

Whenever repairs are made to fittings and appliances or it becomes necessary to replace them, the work must comply with the requirements for new installations.

SUBCHAPTER 7. GENERAL REQUIREMENTS

380:25-7-1. Inspection of boilers and pressure vessels

All boilers and pressure vessels not exempted by the Act or by rules and regulations promulgated under the Act and which are subject to regular inspections, shall be prepared for such inspections as required in Section 380:25-7-2.

380:25-7-2. Preparation for inspection

The owner or user shall prepare each boiler or pressure vessel for inspection, and shall prepare for and apply a hydrostatic or pressure test, whenever necessary, on the date arranged by the Inspector which shall not be less than seven (7) days after the date of notification.

- (1) Boilers. The owner or user shall prepare a boiler for internal inspection in the following manner:
 - (A) Water shall be drawn off and the boiler washed thoroughly;
 - (B) Manhole and handhole plates, washout plugs and inspection plugs in water column connections shall be removed as required by the Inspector. The furnace and combustion chambers shall be cooled and thoroughly cleaned;
 - (C) All grates of internally fired boilers shall be removed;
 - (D) Insulation or brickwork shall be removed as required by the Inspector in order to determine the condition of the boiler, headers, furnace, supports or other parts;
 - (E) The pressure gage shall be removed for testing, as required by the Inspector;
 - (F) Any leakage of steam or hot water into the boiler shall be prevented by disconnecting the pipe or valve at the most convenient point or any appropriate means approved by the Inspector;
 - (G) Before opening the manhole or handhole covers and entering any parts of the steam generating unit connected to a common header with other boilers, the nonreturn and steam stop valves must be closed, tagged, and preferably padlocked, and drain valves or cocks between the two valves opened. The feed valves

must also be closed, tagged, and preferably padlocked, and drain valves or cocks located between the two valves opened. After draining the boiler, the blowoff valve shall be closed, tagged and preferably padlocked. Blowoff lines, where practicable, shall be disconnected between pressure parts and valves. All drains and vent lines shall be opened.

- (2) Pressure vessels. Pressure vessels shall be prepared for inspection to the extent deemed necessary by the Inspector and the applicable procedures outlined in this Section.

380:25-7-3. Boilers and pressure vessels improperly prepared for inspection

If a boiler or pressure vessel has not been properly prepared for an internal inspection, or if the owner or user fails to comply with the requirements for a pressure test as set forth in these rules, the Inspector may decline to make the inspection or test and the Certificate of Operation may be withheld or right to operate revoked, until the owner or user complies with the requirements.

380:25-7-4. Removal of covering to permit inspection

If the boiler or pressure vessel is jacketed so that the longitudinal seams of shells, drums or domes cannot be seen, sufficient jacketing, setting wall, or other form of casing or housing shall be removed, if evidence warrants, to permit reasonable inspection of the seams and other areas necessary to determine the condition and safety of the boiler or pressure vessel, provided such information cannot be determined by other means.

380:25-7-5. Lap seam crack

The shell or drum of a boiler or pressure vessel, in which a lap seam crack is discovered along a longitudinal riveted joint, shall be immediately discontinued from use. Patching is prohibited. (By lap seam crack is meant a crack found in lap seams, extending parallel to the longitudinal joint and located either between or adjacent to rivet holes).

380:25-7-6. Pressure tests

- (a) A hydrostatic pressure test, when applied to boilers or pressure vessels, shall not exceed 1.5 times the maximum allowable working pressure. The pressure shall be under proper control so that in no case shall the required test pressure be exceeded by more than 6%
- (b) During a hydrostatic test the safety valves shall be removed or each valve disk shall be held to its seat by means of a testing clamp and not by screwing down the compression screw upon the spring. A plug device designed for this purpose may be used.

- (c) The minimum temperature of the water used to apply a hydrostatic test shall be not less than 60° F, but the maximum temperature during inspection shall not exceed 120° F.
- (d) When a hydrostatic test is applied to determine tightness, the pressure shall be equal to the normal operating pressure but need not exceed the release pressure of the safety valve having the lowest release setting.
- (e) 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 used providing the precautionary requirements of the applicable section of the ASME Code are followed. In such cases, there shall be agreement between the owner, the Inspector, and the jurisdiction.

380:25-7-7. Automatic low water fuel cutoff and/or water feeding device

- (a) Each automatically fired steam vapor system boiler shall be equipped with two automatic low water fuel cutoff so located as to automatically cut off the fuel supply when the surface of the water falls to the lowest safe water line. The lowest connected water fuel cutoff shall provide safety shutdown and lockout with a manual reset. Each automatically fired hot water heating and/or supply boiler shall be equipped with an automatic low water fuel cut off and/or flow sensing device as required by the ASME Boiler and Pressure Vessel Code and this Act. If a water feeding device is installed, it shall be so constructed that the water inlet valve cannot feed water into the boiler through the float chamber and so located as to supply requisite feedwater. The lowest safe waterline should not be lower than the lowest visible part of the water glass or as otherwise permitted by the applicable ASME Code.
- (b) Such fuel or feed water control device may be attached directly to a boiler or for low pressure boilers to the tapped openings provided for attaching a water glass directly to a boiler, provided that such connections from the boiler are nonferrous tees or Y's not less than 1/2 inch pipe size between the boiler and the water glass, so that the water glass is attached directly and as close as possible to the boiler: the straightway tapping of the Y or tee to take the water glass fittings, the side outlet of the Y or tee to take the fuel cut off or water feeding device. The ends of all nipples shall be reamed to full size diameter.
- (c) Designs embodying a float and float bowl shall have a vertical straight away valve drain pipe at the lowest point in the water equalizing pipe connections by which the bowl and the equalizing pipe can be flushed and the device tested.

380:25-7-8. Pressure reducing valves

- (a) Where pressure reducing valves are used, one or more safety or safety relief valves shall be provided on the low pressure side of the reducing valve when the piping or equipment on the low pressure side does not meet the requirements for the full initial pressure. The safety or safety relief valve shall be located adjoining or as close as possible to the reducing valve. Proper protection shall be provided to prevent injury or damage caused by the escaping fluid from the discharge of safety or safety relief valves if vented to the atmosphere. The combined discharge capacity of the safety or safety relief valves shall be such that the pressure rating of the lower pressure piping or equipment shall not be exceeded in case the reducing valve fails in the open position.
- (b) The use of hand controlled bypasses around the reducing valves is permissible. If a bypass is used around the reducing valve, the safety valve required on the low pressure side shall be of sufficient capacity to relieve all the fluid that can pass through the bypass without overpressuring the low pressure side.
- (c) A pressure gage shall be installed on the low pressure of a reducing valve.

380:25-7-9. Boiler blowoff equipment

- (a) The blowdown from a boiler or boilers that enters a sanitary sewer system or blowdown which is considered a hazard to life or property shall pass through some form of blowoff equipment that will reduce pressure and temperature as required hereinafter.
- (b) All blowoff equipment shall be fitted with openings to facilitate cleaning and inspection.

380:25-7-10. Location of discharge piping outlets

The discharge of safety valves, blowoff pipes and other outlets shall be located and supported so as to prevent injury to personnel.

380:25-7-11. Repairs or alterations

Where repairs or alterations are necessary, an Inspector shall be called for consultation and advice as to the best method of making such repairs or alterations. After such repairs or alterations are made, they shall be reviewed by and found acceptable to an Inspector. Organizations making repairs or alterations shall be qualified in accordance with the Act and this Chapter.

380:25-7-12. Supports

Each boiler and pressure vessel shall be supported by masonry or structural supports of sufficient strength and rigidity to safely support the

boiler or pressure vessel and its contents. There shall be no excessive vibration in either the boiler, pressure vessel or its connecting piping.

380:25-7-13. Boiler door latches

- (a) A watertube boiler shall have the firing doors of the inward opening type, unless such doors are provided with substantial and effective latching or fastening devices or otherwise so constructed as to prevent them when closed, from being blown open by pressure on the furnace side.
- (b) These latches or fastenings shall be of the positive self locking type. Friction contacts, latches, or bolts actuated by springs shall not be used. The foregoing requirements for latches or fastenings shall not apply to coal openings of downdraft or similar furnaces.
- (c) All other doors, except explosion doors, not used in the firing of the boiler, may be provided with bolts or fastenings in lieu of self locking latching devices.
- (d) Explosion doors, if used and if located in the setting walls within seven (7) feet of the firing floor or operating platform, shall be provided with substantial deflectors to divert the blast.

380:25-7-14. Clearance

When boilers are replaced or new boilers are installed in either existing or new buildings, a minimum of at least three (3) feet shall be provided between all sides of the boiler and adjacent walls or other structures. Boilers and pressure vessels having manholes shall have five (5) feet clearance from the manhole opening and any wall, ceiling or piping that will prevent a person from entering the boiler or vessel. Marine type boilers shall have a clearance from the floor level to the bottom of the shell plate of not less than eighteen (18) inches. All boilers and pressure vessels shall be so located that adequate space will be provided for the proper operation of the boilers and pressure vessels and their appurtenances, for the inspection of all surfaces, tubes, waterwalls, economizers, piping, valves and other equipment, and for their necessary maintenance and repair and replacement of tubes.

380:25-7-15. Ladders and runways

When necessary for safety, there shall be a steel runway or platform of standard construction installed across the tops of adjacent boilers or pressure vessels or at some other convenient level for the purpose of affording safe access. When practical, all walkways shall have at least two means of exit, each to be remotely located from the other.

380:25-7-16. Exit from boiler

All boiler rooms exceeding 500 square feet floor area and containing one or more boilers having a fuel burning capacity of 1,000,000 BTU, or equivalent electrical heat input, shall have at least two means of exit. Each

exit shall be remotely located from the other. Each elevation in such boiler room shall have two means of exit, each remotely located from the other.

380:25-7-17. Operation and maintenance

All boilers, pressure vessels, water heaters, and other pressure retaining items subject to the provisions of this act shall be operated and maintained in accordance with the original manufacturer's recommendations and instructions. If the original manufacturer's maintenance and operating instructions and recommendations do not exist, the applicable Recommended Rules for Care of Power Boilers, Section VII and the applicable Recommended Rules for Care and Operation of Heating Boilers, Section VI of the ASME Code shall be used as a guide for proper and safe maintenance and operation.

380:25-7-18. Air and ventilation requirements - combustion air supply and ventilation of boiler room

- (a) A permanent source of combustion and ventilation air, as required by the National Fire Protection Association's National Fuel Gas Code, NFPA 54, latest revision, shall be provided for each boiler room to permit satisfactory combustion of the fuel as well as proper ventilation of the boiler room under normal operating conditions.
- (b) The total requirements of the burners for all fired boilers and pressure vessels, as well as any air required for the operation of other equipment located in the boiler room, including air compressors, clothes dryers, exhaust fans, water heaters, and central heating units must be used to determine the total area, in square feet, in inlet air opening or openings required for the boiler room or machinery room.
- (c) When mechanical ventilation is used, the supply of combustion and ventilation air to the boiler room and the firing device shall be interlocked with the fan so the firing device will not operate with the fan off. The velocity of the air through the ventilating fan shall not exceed 500 feet per minute and the total air delivered shall be equal to or greater than required by (a) of this Section. When a specially engineered system is to be used in supplying combustion and ventilation air to a boiler room or machinery room, such system shall be approved by the chief boiler inspector prior to its installation and use.
- (d) Existing installations that complied with previously accepted standards of the Oklahoma Boiler and Pressure Vessel Safety Act and Boiler and Pressure Vessel Rules are deemed to be satisfactory until such time that it becomes necessary to repair or replace such combustion air supply system or components. When repair and/or replacement is required, such repairs and/or installations shall be performed in accordance with the requirements for new installations.

380:25-7-19. Conditions not covered by these rules and regulations

For any conditions not covered by these requirements, the applicable provisions of the ASME Code or the American Petroleum Institute Pressure Vessel Inspection Code or the National Board Inspection Code, the Chief Boiler Inspector shall be contacted.

SUBCHAPTER 9. DOWNSTREAM WELDED STEAM LINES

380:25-9-1. Welding requirements

Fabrication by welding shall be performed by welders certified as such by the Labor Department. Out of state shop welding shall be performed by welders certified as required by Section IX of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. On site documentation shall be made available to the Chief or Deputy Inspectors.

380:25-9-2. Inspection

Inspection shall include but not be limited to visual inspection of welds and welders stencil on or near the weld, evidence of leaks and a review of documentation.

380:25-9-3. Construction codes available

The construction standard used for fabrication shall be available on site for review by the Chief or Deputy Inspectors.

380:25-9-4. Owner/user inspection

Downstream welded steamlines owned and/or operated by approved owner/user inspection agencies may be inspected, as required by this section, by their owner/user inspectors provided provisions for this inspection are outlined in the inspection procedures of such owner/user inspection agency.

SUBCHAPTER 11. HOT WATER SUPPLY HEATERS MINIMUM INSPECTION CRITERIA

380:25-11-1. General criteria

- (a) Hot water supply heaters located in facilities or installations owned or operated by the State of Oklahoma or its agencies, counties, municipalities, or school districts will be externally inspected annually, regardless of size or heat input. All hot water supply heaters shall meet the requirements of the code adopted by the facility being inspected.
- (b) **Scope of inspection**

- (1) Gas supply line - From the vessel through any controls upstream to the required stop cock.
- (2) Electrical connections - From the vessel to the required electrical cutoff, not to include any permanent wiring installed within the walls of the building containing the unit.
- (3) Cold water inlet line - From the vessel upstream to the required stop valve.
- (4) Hot water outlet line - From the vessel up to and including the second fitting.
- (5) Exhaust vents - All venting or flue piping visible from the hot water supply heater.
- (6) Combustion air supply - Any venting necessary to support combustion for flame heated units.
- (7) General hazards - Any recognized safety hazard involving the hot water supply heater within the immediate area.

SUBCHAPTER 13. LICENSING OF BOILER AND PRESSURE VESSEL SERVICE, REPAIR AND/OR INSTALLERS

380:25-13-1. General

- (a) All businesses, firms or corporations engaged in the service, repair and/or installation of boilers or pressure vessels as required by Title 40 Section 141.6 of the Oklahoma Boiler and Pressure Vessel Safety Act shall be licensed by the Department of Labor.
- (b) All persons engaged in the profession of service, repair and/or installation of boilers or pressure vessels, whether working individually or in the employ of a business, firm or corporation licensed as required by Title 40, Section 141.6 of the Oklahoma Boiler and Pressure Vessel Safety Act, shall be required to pass a written examination administered by the Department of Labor, except that unlicensed persons may assist in the repair, service and installation of boilers and pressure vessels when under the direct supervision of a licensed individual. Except, that those licensed professionals that may be assisting in the installation of a boiler or pressure vessel in a limited capacity, such as certified welders, licensed electricians, etc., shall not be required to possess a boiler installers license.
- (c) These rules shall not be construed as in any way preventing the owner or user of any boiler or pressure vessel from performing minor repairs and maintenance to boilers and pressure vessels under his or her control, providing that all such minor repairs and maintenance are in accordance with the provisions of this Act. Additionally, as regards owner user inspection agencies, routine repairs and maintenance may be determined by the authorized inspector.

380:25-13-2. Application for license

- (a) An application for the service, repair and/or installation of boilers or pressure vessels shall be on forms provided by the Department of Labor and shall give evidence of the applicants past experience within the scope of the license requested, and shall give evidence of their workmanship and skills which would qualify them for the license requested.
- (b) The Chief Boiler Inspector may request an interview with the applicant prior to the issuance of a license.
- (c) The desired scope of license shall be listed on the application for the authorization requested.

380:25-13-3. Qualification for welding, effective January 1, 1989

Any applicant requesting authorization to weld within the scope applied for shall have one of the following types of qualifications in addition to the license required by this act.

- (1) American Society of Mechanical Engineers Certificates of Authorization. An organization in possession of a valid ASME Certificate of Authorization may perform repairs to boilers and/or pressure vessels provided such repairs are within the scope of the organizations quality control system.
- (2) National Board Certificates of Authorization. Repairs to boilers and/or pressure vessels may be performed by an organization in possession of a valid Certificate of Authorization for use of the "R" symbol stamp, issued by the National Board of Boiler and Pressure Vessel Inspectors.
- (3) In lieu of "(1)" or "(2)" above. A repair organization may perform welded repairs to boilers and/or pressure vessels provided the organization has met the requirements as outlined in the National Board Inspection Code for qualification for the National Board "R" Code Symbol Stamp (the reference to the National Board Certificate of Authorization is deleted and the actual obtaining of the "R" stamp is not required). (For those repair firms or organizations which only repair boilers and/or pressure vessels owned and/or operated by state of Oklahoma authorized owner/user inspection agencies, "ANSI/API 510 Pressure Vessel Inspection Code" may be substituted, if applicable, where the National Board is referenced in the NBIC). IN EACH CASE WELDERS, WELDING OPERATORS AND WELDING PROCEDURES SHALL BE QUALIFIED IN ACCORDANCE WITH ASME SECTION IX AND REFERENCING CODES. FIRMS OR ORGANIZATIONS QUALIFYING UNDER THIS PARAGRAPH SHALL HAVE THEIR QUALITY CONTROL SYSTEM REVIEWED TRIENNIALLY.

380:25-13-4. Applicants' business affiliations

An applicant for a license under this rule shall state the name of the business, firm, partnership or corporation under which he intends to carry on business, and he may be the owner, a partner, an officer of a corporation or a supervisory employee of the business, firm, partnership or corporation.

380:25-13-5. License not required [REVOKED]

380:25-13-6. Fee for license

The fee as provided for in Title 40, Section 16, Paragraph 2C shall accompany the application for each license.

380:25-13-7. Annual renewal of license

Licenses issued under this subchapter shall be renewed twelve (12) months from the issue month on their initial or current license, and annually on this anniversary date thereafter.

SUBCHAPTER 15. BOILER AND PRESSURE VESSEL RENTING AND/OR LEASING

380:25-15-1. Rental boiler maintenance

Boilers and/or pressure vessels rented or leased for operation in this State shall be maintained as required by the Act and this Chapter by the rentor or leasor, unless contractual arrangements dictate otherwise.

380:25-15-2. Mobile boiler inspection

In the event a boiler and/or pressure vessel is moved from one location to another location in this state during the certificate of operation term, as a minimum, an external inspection shall be made at the new location by an inspector as defined by the act.

SUBCHAPTER 17. EXAMINATIONS

380:25-17-1. General provisions

- (a) Examinations for commissions from the National Board of Boiler and Pressure Vessel Inspectors and certificates from the American Petroleum Institute shall be conducted on the first Wednesday and one-half day Thursday in March, June, September, and December, provided five or more applications for examination are received by the Chief Boiler Inspector on or before the first work day of the month preceding the month of the examination. Requests for examination, along with the applicable fee, shall be submitted to the Chief Boiler Inspector in accordance with the relevant requirements of the Oklahoma Boiler and Pressure Vessel Safety Act, the National Board of

Boiler and Pressure Vessel Inspectors, and the American Petroleum Institute.

- (b) Examinations for the issuance of a Boiler Operator License will be conducted by the Chief Boiler Inspector, or as a part of a recognized training course.
- (c) Examinations leading to a National Board Commission or a Certificate from the American Petroleum Institute shall be administered by the Chief Boiler Inspector or Deputy Boiler Inspector. Additionally, proctors shall be in accordance with the respective issuing agency's requirements, but at a minimum should include two additional persons from the following:
 - (1) Petroleum Industry, (required for API examinations), and
 - (2) The insurance industry, or
 - (3) The boiler or pressure vessel manufacturers holding a certificate of authorization issued by the ASME or the National Board.

380:25-17-2. National Board Commission examination

Examination leading to a Commission shall be in accordance with the Constitution and Bylaws of the National Board of Boiler and Pressure Vessel Inspectors.

380:25-17-3. American Petroleum Institute examination

Examinations leading to a Certificate shall be in accordance with requirements and procedures of the American Petroleum Institute.

380:25-17-4. Boiler operator license examinations

- (a) Examinations leading to the issuance of a Boiler Operator License shall:
 - (1) Consist of multiple choice, true or false, or essay type questions.
 - (2) Be of the closed book type.
 - (3) Be prepared, distributed and graded by the Department of Labor.
- (b) The minimum passing grade for the examination shall be 70%.
- (c) The test leading to the issuance of a Boiler Operator License shall be administered by the Chief Boiler Inspector or a Deputy Boiler Inspector, or, upon approval by the Department of Labor based upon the criteria set forth in the Department's Body of Knowledge document, by an institution that conducts courses of instruction designed to teach the student that information necessary to become a boiler operator.

SUBCHAPTER 19. BOILER OPERATOR LICENSING

380:25-19-1. Boiler operator licensing

- (a) Any company, corporation, business, school, city, county, or other governmental agency may adopt the boiler operator licensing program herein described, and require that individuals within its employ or jurisdiction abide by these rules when engaged in the operation and maintenance of boilers.
- (b) Any individual may apply for the license herein described.
- (c) No provision of this act shall place a mandatory requirement on any person to be in possession of the Boiler Operator License described in these rules other than those that may be required by individual companies, businesses, or jurisdictional authorities as allowed in 380:25-19-1 (a).
- (d) Application for a Boiler Operator License shall be on forms provided by the Department of Labor.
- (e) Evidence of the satisfactory completion of qualifications for, or the issuance of, a Boiler Operator License, Stationary Engineer License, or other comparable certification from another jurisdictional authority or nationally recognized organization may be used to satisfy all or part of the qualifications outlined in these rules. All such requests shall be subject to the review and approval of the Chief Boiler Inspector. Applicants for a Boiler Operator License must have completed all of the specified license requirements within the five (5) calendar years preceding the examination date.
- (f) A Boiler Operator License will be issued and renewed after the satisfactory completion of the requirements of these rules and the receipt of the licensing fee specified in Section 141.16.A.2.c, of this act. When a Boiler Operator License addressed in these rules is issued as a matter of reciprocity for the possession of a valid license from another jurisdictional authority or national organization, a fee equal to that specified in Section 141.16.A.2.c of this act will be paid to the Department of Labor. A non-refundable fee of \$5.00 per card, may be charged to and shall be collected from each individual who applies for a duplicate or replacement Boiler Operator License.
- (g) A license is valid for a period of two (2) years and shall expire on the last day of the licensee's birth month. Each such license shall be prorated in accordance with the licensing procedures adopted by the Department. A license must designate the name of the holder, the class of the license, the issue date of the license, and the expiration date of the license. Any license issued under this chapter is automatically renewable upon payment of the fee set forth in OAC 380:25-19-1(f). Any license not renewed within 90 days of the

expiration date will be subject to all of the provisions of a new issuance.

- (h) The licenses herein described are applicable to all single burner power boilers, all low pressure steam boilers, all water heating boilers, and all electric boilers. Exemption. This license shall not be applicable to those boilers associated with antique traction engines. The Boiler Operator License herein described does not grant the holder of such license the right to engage in the installation, service and/or repair of boilers for any other company, corporation, organization, facility, person or governmental agency beyond those boilers that the licensee is responsible for as a function of the licensee's permanent employment.
- (i) Jurisdictions adopting the Boiler Operator Licensing requirements in these rules may enact local regulations dealing with requirements for licensed operator attendance, daily checks, documentation of operating parameters, and availability of operators during off duty hours.
- (j) A Boiler Operator License may be suspended by the Commissioner of Labor or his or her designee, after due investigation for the falsification of information contained on the application, incompetence, untrustworthiness, gross carelessness or intoxication while operating or performing maintenance to boilers. Notification of proposed suspension will be provided to the licensee and his or her employer, if known. All proposed suspensions are subject to notice and an opportunity for hearing as provided by the Oklahoma Administrative Procedures Act.
- (k) Boiler Operator License Classes:
 - (1) First Class Boiler Operator License (supervisory level license):
 - (A) Any person holding a First Class Boiler Operator License is qualified to operate and maintain, and to supervise others in the operation and maintenance of all single burner boilers regardless of energy input.
 - (B) Qualifications:
 - (i) A minimum of three years of experience in the operation and maintenance of Power Boilers with a heat input in excess of 12,500,000 btu/hr, and
 - (ii) A minimum of one year experience in a supervisory capacity, with documented responsibility for the supervision of others in the operation and maintenance of boilers in this class, or
 - (iii) The documented satisfactory completion of a course of instruction in Physical Plant Management, the contents of which are agreeable to the Chief Boiler Inspector as a substitute for direct supervision experience, and

- (iv) A letter of recommendation from the current supervisor, or other documentation acceptable to the Chief Boiler Inspector.
 - (v) A passing grade on the Boiler Operator License Examination.
- (2) Second Class Boiler Operator license:
 - (A) In addition to those boilers operable with a Third and Fourth Class Boiler Operator License, any person holding a Second Class Boiler Operator License is qualified to operate and maintain all boilers with energy inputs exceeding 12,500,000 btu/hr. or its equivalent.
 - (B) Qualifications:
 - (i) A minimum of three years documented experience in the direct operation and maintenance of boilers covered by this class of license, one year of which must be with power boilers, or
 - (ii) A minimum of three years of experience in the direct operation and maintenance of boilers as a Third Class Boiler Operator, and
 - (iii) A letter of recommendation from the current supervisor, or other documentation acceptable to the chief Boiler Inspector.
 - (iv) A passing grade on the Boiler Operator License Examination.
- (3) Third Class Boiler Operator License:
 - (A) In addition to those boilers operable with a Fourth Class Boiler Operator license, any person holding a Third Class Boiler Operator License shall be qualified to operate and maintain steam boilers and water heating boilers with a temperature not to exceed 250 F. and a pressure not to exceed 160 psig., Energy inputs shall not exceed 12,500,000 Btu/hr maximum, or its equivalent.
 - (B) Qualifications:
 - (i) A minimum of two years documented experience in the direct operation and maintenance of boilers covered by this class of license, or
 - (ii) A minimum of one year experience in the operation and maintenance of boilers as a Fourth Class Boiler Operator, and
 - (iii) A letter of recommendation from the current supervisor or other documentation acceptable to the Chief Boiler Inspector.
 - (iv) A passing grade on the Boiler Operator License Examination.

- (4) Fourth Class Boiler Operator License:
 - (A) Any person holding a Fourth Class Boiler Operator License is qualified to operate and maintain water heating boilers with a temperature not exceeding 250 F. and a pressure not exceeding 160 psig, any steam boiler operating at 15 psig or below. Energy inputs shall not exceed 5,000,000 btu/hr. maximum or its equivalent.
 - (B) Qualifications:
 - (i) A minimum of one year documented experience in the direct operation and maintenance of boilers and equipment covered by this class of license, or
 - (ii) A minimum of six months experience under the supervision of a qualified boiler operator, or
 - (iii) Completion of an acceptable training course, and
 - (iv) Pass the appropriate written examination.

Appendix A - Expansion Tank Capacity Chart

EXPANSION TANK CAPACITIES FOR FORCED HOT WATER SYSTEMS
(Based on average operating water temperature 195 degrees F, fill pressure 12 psig,
and maximum operating pressure 30 psig)

Tank Capacities, gal		
System Volume gal	Pressurized Diaphragm Type	Nonpressurized Type
100	9	15
200	17	30
300	25	45
400	33	60
500	42	75
1000	83	150
2000	165	300

NOTE: System volume includes volume of water in boiler, radiation, and piping, not including the expansion tank. A procedure for estimating system volume and determining expansion tank sizes for other design conditions may be found in Chapter 12 of the 1996 HVAC Systems and Equipment Volume of the ASHRAE Handbook.