

BOILERS

*Administrative Rules of the Texas Department of Licensing and Regulation
16 Texas Administrative Code, Chapter 65
(Effective February 15, 2016)*

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Subchapter A. General Provisions.

65.1. Authority. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

This chapter is adopted under authority of Texas Health and Safety Code, Chapter 755 and Texas Occupations Code, Chapter 51.

65.2. Definitions. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

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

- (1) **Alteration**--A change in the item described on the original Manufacturer's Data Report which affects the pressure containing capability of the pressure retaining item. Nonphysical changes such as an increase in the maximum allowable working pressure (Internal or External), increase in design temperature, or a reduction in minimum temperature of a pressure-retaining item shall be considered an alteration.
- (2) **Application for Certification**--The completed first inspection report.
- (3) **Approved**--Agreed to by the executive director.
- (4) **ASME**--The American Society of Mechanical Engineers Boiler and Pressure Vessel Code, code cases, and interpretations adopted by the council of the society.
- (5) **Authorized Inspection Agency (In-service)**--An entity accredited by the National Board meeting NB-369, "Qualifications and Duties for Authorized Inspection Agencies Performing In-service Activities and Qualifications for Inspectors of Boilers and Pressure Vessels".
- (6) **Authorized Inspection Agency (New Construction--ASME Activities)**--An entity accredited by the National Board meeting the qualification and duties of NB-360, "Criteria for Acceptance of Authorized Inspection Agencies for New Construction".
- (7) **Authorized Inspector**--An inspector employed by an authorized inspection agency holding a commission issued by the executive director.
- (8) **AWP**--The allowable working pressure at which the boiler can safely operate.
- (9) **Board**--The Board of Boiler Rules.
- (10) **"Boiler"** means:
 - (A) a heating boiler;
 - (B) a nuclear boiler;
 - (C) a power boiler;
 - (D) an unfired steam boiler; or
 - (E) a process steam generator.

- (11) **Boiler External Piping**--The piping which begins where the ASME Section I or Section VIII, Division 1, 2, or 3 boiler proper or separately fired superheater terminates at:
 - (A) the first circumferential joint for welding end connections; or
 - (B) the face of the first flange in bolted flange connections; or
 - (C) the first threaded joint in that type of connection; and which extends up to and including the valve or valves required by ASME.
- (12) **Certificate Inspection**--The required internal or external boiler inspection, the report of which is used by the chief inspector to decide whether to issue a certificate of operation.
- (13) **Certificate of Operation**--A certificate issued by the executive director to allow the operation of a boiler.
- (14) **Changeover Valve**--A valve, which allows two redundant pressure relief valves to be installed for the purpose of changing from one pressure relief valve to the other while the boiler is operating and designed such that there is no intermediate position where both pressure relief valves are isolated from the boiler.
- (15) **Chief Inspector**--The inspector appointed in accordance with Texas Health and Safety Code, §755.023.
- (16) **Code**--ASME Code.
- (17) **Commission**--The Texas Commission of Licensing and Regulation.
- (18) **Competent Attendant**--An individual who has been trained to properly operate, start up, shut down, respond to emergencies and maintain control of the boiler in safe operating condition.
- (19) **Condemned Boiler**--A boiler inspected and declared unfit for further service by the chief inspector, the deputy inspector, or the executive director.
- (20) **Department**--Texas Department of Licensing and Regulation.
- (21) **Deputy Inspector**--An inspector appointed by the executive director.
- (22) **Disconnected Boiler**--A boiler in which all fuel, water, steam and electricity are removed from any connection on the boiler. These connections shall provide an isolated gap and the source shall be safely isolated to prevent potential leaks or electrical hazards.
- (23) **Electric Boiler**--A boiler in which the source of heat is electricity, such as an electrode type boiler and an immersion resistance element type boiler.
- (24) **Electrode Type Boiler**--An electric boiler in which heat is generated by the passage of electric current using water as the conductor.
- (25) **Executive Director**--The executive director of the department.
- (26) **Existing Installation**--Any boiler constructed, installed, placed in operation, or contracted for before June 3, 1937.
- (27) **External Inspection**--An inspection of the exterior of a boiler and its appurtenances that is made,

if possible, while the boiler is in operation.

- (28) **Heat Recovery Steam Generator (HRSG)**--A boiler which produces steam where its principle source of thermal energy is a hot gas stream having high ramp rates, such as the exhaust of a gas turbine.
- (29) **Heating Boiler**--A steam heating boiler, hot water heating boiler, hot water supply boiler, or potable water heater that is directly fired with oil, gas, solar energy, electricity, coal, or other solid or liquid fuel.
- (30) **High-Temperature Water Boiler**--A water boiler designed for operation at pressures exceeding 160 pounds per square inch gage (1100 kilopascals) or temperatures exceeding 250 degrees Fahrenheit (121 degrees Celsius).
- (31) **Hot Water Heating Boiler**--A boiler designed for operation at a pressure not exceeding 160 pounds per square inch gage (1100 kilopascals) or temperatures not exceeding 250 degrees Fahrenheit (121 degrees Celsius) at or near the boiler outlet.
- (32) **Hot Water Supply Boiler**--A boiler designed for operation at pressures not exceeding 160 pounds per square inch gage (1100 kilopascals) or temperatures not exceeding 250 degrees Fahrenheit (121 degrees Celsius) at or near the boiler outlet if the boiler's heat input exceeds 200,000 British thermal units per hour (58.6 kilowatts); water temperature exceeds 210 degrees Fahrenheit (99 degrees Celsius); or nominal water-containing capacity exceeds 120 gallons (454 Liters).
- (33) **Immersion Resistance Element Type Boiler**--An electric boiler in which heat is generated by the passage of an electric current through a resistance heating element immersed in water.
- (34) **Inspection Agency**--An authorized inspection agency providing inspection services.
- (35) **Inspector**--The chief inspector, a deputy inspector, or an authorized inspector.
- (36) **Install**--To place, position or fit into position and then to connect, change or modify in such a manner as to bring the boiler into service.
- (37) **Installation**--The act of installing a boiler or associated equipment.
- (38) **Internal inspection**--A complete and thorough inspection of the interior waterside and fireside areas of a boiler as construction allows.
- (39) **Maximum Allowable Working Pressure (MAWP)**--The greatest pressure at which a boiler is designed to operate.
- (40) **Metric (SI)**--An international system of measurement.
- (41) **Metriation**--The process of converting between US customary units and metric (SI) units.
- (42) **Modular Boiler**--A steam or hot water heating assembly consisting of a group of individual boilers called modules, intended to be installed as a unit, with a single inlet and single outlet. Modules may be under one jacket or may be individually jacketed.
- (43) **Multiple Pressure Steam Generator**--A boiler consisting of several sections of heat exchange surface designed for different pressure levels.
- (44) **National Board**--The National Board of Boiler and Pressure Vessel Inspectors.

- (45) **National Board Inspection Code**--The manual for boiler and pressure vessel inspectors published by the National Board.
- (46) **New Installations**--A boiler constructed, installed, or placed in operation after June 3, 1937.
- (47) **Nominal**--The accepted ASME standard used to designate a size or capacity of an item.
- (48) **Non-Code Boiler**--A complete boiler not constructed to the appropriate ASME Code.
- (49) **Nonstandard Boiler**--A boiler that does not qualify as a standard boiler.
- (50) **Nuclear Boiler**--A nuclear power plant system, including its pressure vessels, piping systems, pumps, valves, and storage tanks that produces and controls an output of thermal energy from nuclear fuel and the associated systems essential to the function of the power system.
- (51) **Owner or Operator**--Any person, firm, or corporation owning or operating boilers within the State of Texas.
- (52) **Person**--An individual, corporation, partnership, association or other legal entity.
- (53) **Pool Heater**--A hot water supply boiler or a potable water heater designed to provide hot water to a pool.
- (54) **Portable Power Boiler**--A boiler primarily intended for use at a temporary location.
- (55) **Potable Water Heater**--A boiler designed for operation at pressures not exceeding 160 pounds per square inch gage (1100 kilopascals) and water temperatures not exceeding 210 degrees Fahrenheit (99 degrees Celsius) if the boiler's heat input exceeds 200,000 British thermal units per hour (58.6 kilowatts) or nominal water-containing capacity exceeds 120 gallons (454 liters).
- (56) **Power Boiler**--A high-temperature water boiler or a boiler in which steam is generated at a pressure exceeding 15 pounds per square inch gage (103 kilopascals) for a purpose external to the boiler.
- (57) **Preliminary order**--A written order issued by the chief inspector or any commissioned boiler inspector to require repairs or alterations to render a boiler safe for use or to require that operation of the boiler be discontinued. The Boiler Inspection report which requires repairs to be made or the boiler operation to be ceased which is signed by the chief inspector or a commissioned boiler inspector is a Preliminary Order.
- (58) **Process Steam Generator**--An evaporator, heat exchanger, or vessel in which steam is generated by the use of heat resulting from the operation of a processing system that contains a number of pressure vessels, such as used in the manufacture of chemical and petroleum products.
- (59) **Reinstalled Boiler**--A boiler removed from its original setting and reinstalled at the same location or at a new location without change of ownership.
- (60) **Repair**--The work necessary to restore pressure-retaining items to a safe and satisfactory operating condition.
- (61) **Rules**--The rules promulgated and enforced by the commission in accordance with Texas Health and Safety Code, §755.032 and Texas Occupations Code, Chapter 51.
- (62) **Safety Appliance**--A safety device such as a safety valve or a pressure relief valve for a boiler provided to diminish the danger of accidents.

- (63) **Secondhand Boiler**--A boiler in which the location and ownership have changed.
- (64) **Serious Accident**--An explosion resulting in any degree of distortion to the wall of the boiler or related equipment or damage to the building where the boiler is located. Or, emergency medical services are dispatched to the location of a boiler accident in which one or more persons require on-site medical services, transport to a medical facility or the accident results in a fatality.
- (65) **Special Inspection**--An inspection by the chief inspector or deputy inspector other than those in Texas Health and Safety Code, §§755.025 - 755.027.
- (66) **Stacked Boiler**--A design in which one boiler is placed onto a rack above another boiler, as designed by the boiler manufacturer with a rack nameplate, and as approved by the department.
- (67) **Standard Boiler**--A boiler that bears the stamp of a nationally recognized engineering professional society, or the stamp of any jurisdiction that has adopted a standard of construction equivalent to the standard required by the executive director.
- (68) **Steam Heating Boiler**--A boiler designed for operation at pressures not exceeding 15 pounds per square inch gage (103 kilopascals).
- (69) **System Pressure**--The pressure of the boiler system, which is governed by the highest safety valve or pressure relief valve set pressure as allowed by ASME Code and this chapter.
- (70) **Texas Commission**--Authorization to inspect boilers and enforce Texas Health and Safety Code, Chapter 755, and 16 Texas Administrative Code, Chapter 65, on behalf of the department.
 - (A) **ASME Only Commission**--Only authorizes an inspector to conduct ASME new construction activities.
 - (B) **In-Service Only Commission**--Only authorizes an inspector to conduct boiler in-service activities.
 - (C) **ASME and In-Service Commission**--Authorizes an inspector to conduct both activities in subparagraphs (A) and (B).
- (71) **Unfired Steam Boiler**--An unfired pressure vessel in which steam is generated. The term does not include: vessels known as evaporators or heat exchangers; or vessels in which steam is generated by using the heat that results from the operation of a processing system that contains a number of pressure vessels, as used in the manufacture of chemical and petroleum products.

65.3. Exemptions. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

The requirements of this chapter do not apply to boilers exempted by Texas Health and Safety Code, §755.022.

Subchapter B. Registration--Authorized Inspection Agency.

65.6. Registration--Authorized Inspection Agency With National Board Accreditation. *(Adopted effective February 15, 2016, 41 TexReg 795)*

- (a) A person with national board accreditation may not act as an Authorized Inspection Agency without first registering with the department under this chapter.
- (b) To act as an Authorized Inspection Agency under this section, a person must complete a department-approved registration.

65.7. Registration Renewal--Authorized Inspection Agency National Board Accreditation. *(Adopted effective February 15, 2016, 41 TexReg 795)*

To renew an Authorized Inspection Agency registration under this section, a registrant must:

- (1) complete a department-approved registration renewal; and
- (2) provide proof of accreditation by the National Board.

65.8. Registration--Authorized Inspection Agency Without NB-360 Accreditation. *(Adopted effective February 15, 2016, 41 TexReg 795)*

- (a) Registration as an Authorized Inspection Agency is required for entities not accredited by the National Board under NB-360.
- (b) To be eligible for registration as an Authorized Inspection Agency under this section, an applicant must:
 - (1) complete a department-approved registration form; and
 - (2) submit a current Certificate of Accreditation issued from ISO 17020 "Type A" with ASME non-nuclear Boiler and Pressure Vessel Code for the scope of work performed.

Subchapter C. Boiler Registration and Certificate of Operation--Requirements.

65.12. Boiler Registration and Certificate of Operation Required. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

Except as provided by this chapter, each boiler operated in this state must:

- (1) be registered with the department; and
- (2) have qualified for a current certificate of operation.

65.13. Boiler Installation. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) The owner or operator of a boiler in this state must submit the following to the department within thirty (30) days after completion of a boiler installation.
 - (1) A boiler installation report; and
 - (2) A manufacturer's data report for the boiler.
- (b) The boiler shall not be test-fired or operated prior to the required first inspection.
- (c) Temporary Operating Permit.
 - (1) The owner or operator may request a Temporary Operating Permit on a department-approved form.
 - (2) The owner or operator must pay the applicable fee required under §65.300.
 - (3) Upon arrival from the department the boiler may be operated for thirty (30) days prior to the required initial inspection.

65.14. Inspector Commissions. *(Adopted June 15, 2015, 40 TexReg 3121)*

(a) In-Service Commission. To be eligible for in-service commission, an applicant must:

- (1) submit a completed application on a department-approved form;
- (2) successfully pass a criminal background check;
- (3) pass a written examination approved by the department;
- (4) attend a department-approved boiler orientation program; and
- (5) pay the fee required under §65.300.

(b) Texas ASME Commissions. To be eligible for a Texas ASME commission, an applicant must:

- (1) submit a completed application on a department-approved form;
- (2) successfully pass a criminal background check;
- (3) hold a valid National Board “A” Endorsement Commission; and
- (4) pay the fee required under §65.300.

65.15. Initial Boiler Certification Requirements. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

(a) To be eligible for a certificate of operation each boiler must meet the following:

- (1) comply with §65.200;
- (2) have a completed first inspection report;
- (3) if necessary, complete required repairs; and
- (4) pay the fees required under §65.300.

(b) If the boiler has not been registered with the National Board, the owner or operator may apply to the department for a variance.

(c) Non-code boilers may not be installed or operated without written authorization from the department.

- (1) Non-code boilers, if installed, must be completely replaced to ensure the complete boiler meets or exceeds ASME code and this chapter.
- (2) Installing code compliant parts onto a non-code boiler does not make a non-code boiler ASME code compliant.

Subchapter D. Authorized Inspector.

65.25. Authorized Inspector--Requirements. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

To be an authorized inspector, an applicant must have at least five years’ experience in the construction, installation, inspection, operation, maintenance, or repair of boilers.

65.26. Commission--Renewal and Reinstatement. *(Adopted effective June 15, 2015 40 TexReg 3121)*

- (a) To renew or reinstate an authorized inspector commission, an applicant must:
 - (1) submit a completed application on a department-approved form;
 - (2) successfully pass a criminal background check;
 - (3) participate in all training sessions, if any, required by the department in the twelve (12) month period preceding renewal; and
 - (4) pay the applicable fee required under §65.300. Late renewal fees for registrations issued under this chapter are provided under §60.83 of this title (relating to Late Renewal Fees).
- (b) Non-receipt of a license renewal notice from the department does not exempt a person, or entity, from any requirements of this chapter.

Subchapter E. Examinations and Waiver of Examination.

65.30. Waiver of Examination. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

An applicant for a Texas Commission who is licensed or commissioned in another state that has an examination substantially equivalent to that required by this chapter, as determined by the department, may obtain a commission without examination, if the person:

- (1) submits a completed application on a department-approved form; and
- (2) except for the examination requirement otherwise meets the requirements in Subchapter F.

Subchapter F. Commission Cards.

65.40. Authorized Inspector--Commission Card. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) A commission as an authorized inspector and an identifying commission card may be issued by the department to a person who has met the requirements of §65.14(a) and (b).
- (b) A commission card issued by the department shall only be used while conducting inspection activities within the State of Texas and shall be in the inspector's possession during these activities.
- (c) Written requests for renewals, and applications for new and reinstatements shall specify if the scope of work to be performed will be ASME Code only, In-service only, or both.
- (d) When a request is for new issuance or reinstatement as described in §65.14 and §65.26, the inspector shall attend a mandatory commission approved training program prior to issuance of the commission.
- (e) If a current commission and/or identifying commission card is lost or destroyed, the inspector shall immediately notify the department in writing and a duplicate will be issued without examination or application, upon request and payment of fees under §65.300.
- (f) Within two (2) business days after an inspector's employment terminates:
 - (1) the inspection agency shall notify the department in writing that the inspector no longer works for the agency; and
 - (2) on the final day of employment with the inspection agency, the commission card issued to the inspector is void and shall not be used as authorization to perform or otherwise conduct a boiler

inspection under this chapter.

- (g) The identifying commission card shall be returned to the department by the authorized inspection agency within thirty (30) days after the inspector to whom the commission was issued is no longer employed by the department or the authorized inspection agency.

65.41. Reissuance after Reemployment. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

An inspector, commissioned as provided in this subchapter, shall be entitled to another commission upon leaving the employment of the department and entering the employment of an inspection agency without examination, if the following requirements are met.

- (1) The inspector is employed by the inspection agency within twelve (12) months from leaving the department;
- (2) A Commission application and fee required under §65.300 are submitted to the department; and
- (3) All other requirements have been met for obtaining a commission.

Subchapter G. Application to Operate Portable and Stationary Nonstandard Boilers in the State.

65.45. Portable and Stationary Nonstandard Boilers. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) Operation of a portable or stationary nonstandard boiler is prohibited unless the department has granted approval as a nonstandard boiler used for exhibition, instruction, education, show, display, or demonstration.
- (b) The applicant must:
 - (1) submit a boiler installation report;
 - (2) include a description of the materials, methods of construction, drawings, and such other design information sufficient to establish the MAWP; and
 - (3) pay the fee required under §65.300.
- (c) If the materials submitted under subsection(b)(2) are insufficient to establish the MAWP, the department may require a proof test of the nonstandard boiler in accordance with the edition of the code determined to be most applicable for the method of construction.

Subchapter H. Inspector Standards of Conduct.

65.50. Inspectors--Prohibited Conflicts of Interest. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

Inspectors shall not engage in the sale of any article or device relating to boilers, pressure vessels, or other appurtenances.

65.51. Enforcement of Rules and Code Violation. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

Inspectors are charged with enforcing all provisions of the Texas Health and Safety Code, Chapter 755 and 16 TAC Chapter 65, at all times while conducting boiler inspection and investigation activities.

65.52. Completion of Reports Required. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

Inspectors must properly document findings or violations identified during an inspection and shall include references to applicable law, rules, and procedures violated.

Subchapter I. Inspection of Boilers.

65.60. External Inspection. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

External inspections shall be performed as part of the application for an extension to the inspection interval of Health and Safety Code, §755.026. Otherwise, it shall be conducted in conjunction with the annual internal inspection required in Health and Safety Code, §755.025.

65.61. Inspection of All Boilers Required. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) All boilers not exempted by Texas Health and Safety Code, §755.022 shall be inspected in accordance with Texas Health and Safety Code, §755.025, §755.026, or any applicable rules under this chapter.
- (b) Boilers shall be inspected by the inspection agency that issued an insurance policy to cover a boiler located in this state, or authorized representative. All other boilers shall be inspected by the department.
- (c) Except in the case of an accident or other emergency, no inspection shall be made by the chief inspector or any deputy inspector on a Saturday, Sunday, or legal holiday, unless otherwise directed by the department.
- (d) Boilers shall be inspected prior to the expiration date of the current certificate of operation.
- (e) Boilers not inspected prior to the expiration date of the current certificate of operation will be assessed a late fee in accordance with §65.300 and subject to penalties and sanctions as provided under this chapter.

65.62. Notice of Inspection to Owners or Operators of Boilers. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) All boilers, unless otherwise exempted, shall be prepared for initial inspection, regular inspections, or liquid pressure tests, whenever necessary, by the owner or operator when notified by the inspector.
- (b) The owner or operator shall prepare each boiler, in accordance with §65.210 and §65.211, for an internal inspection and shall prepare for and apply the liquid pressure tests whenever necessary on the date specified by the inspector.

65.63. Extension of Interval between Internal Inspections. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) For the interval between internal inspection to be extended as provided for in Texas Health and Safety Code, §755.026, the following procedure must be followed.
 - (1) Not less than thirty (30) days and not more than sixty (60) days prior to the expiration date of the current certificate of operation, the owner or operator shall submit in a manner prescribed by the department a request for each boiler, stating the desired length of extension, which will be no more than one (1) year from the expiration date of the current certificate of operation, the date of the last internal inspection, and a statement certifying that records are available showing compliance with Texas Health and Safety Code, §755.026, and pay the required fees.
 - (2) The department shall notify the owner or operator and the inspection agency having jurisdiction of the maximum extension period that may be approved.
 - (3) Prior to the expiration of the current certificate of operation, the inspection agency shall review all records, make an external inspection, and submit the external inspection report to the department.

- (4) Upon completion of paragraphs (1) - (3) and payment of all required fees, a new certificate of operation may be issued for the extended period of operation.
 - (5) Violations noted during the external inspection may be cause for denial of the extension request.
 - (6) If the department denies an extension request, the boiler shall be internally inspected prior to the expiration of the certificate of operation, unless authorized in writing to continue operation until an internal inspection can be conducted.
- (b) An additional extension for up to one hundred twenty (120) days may be allowed as provided for in Texas Health and Safety Code, §755.026, when it is established an emergency exists.
- (1) Prior to the expiration date of the current certificate the owner or operator shall submit to the department a request stating an emergency exists with an explanation of the emergency and the date of the last internal inspection. The request shall be submitted along with the inspection agency's external inspection report, confirming compliance with Texas Health and Safety Code, §755.026.
 - (2) The department shall notify the owner or operator and the inspection agency having jurisdiction of the maximum extension period that may be approved.
 - (3) Upon completion of paragraphs (1) and (2) and payment of all required fees, a new certificate of operation may be issued for the extended period of operation.

Subchapter J. Texas Boiler Numbers.

65.70. Texas Boiler Numbers--Required. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) Each boiler must be identified with a single unique department-issued identification number displayed on a tag and located on the boiler next to the ASME name plate. The decal shall remain on the boiler for the life of the equipment.
- (b) After the initial issuance of a tag number, that tag number may not be reassigned or reused.
- (c) All correspondence and inspection reports must reference the boiler identification tag number.
- (d) On request by the department, the inspector must report to the department regarding the issuance and disposal of all tags issued to the inspector.

65.71. Texas Boiler Number--Placement on Boiler. *(Adopted June 15, 2015, 40TexReg 3121)*

- (a) During the first inspection of all boilers, the inspector shall stamp the Texas boiler number, except as provided for in subsections (c) and (d), as near to the original ASME code name plate and required information as practicable.
- (b) The stamping shall consist of the letters "TX" and directly to the right of the TX shall be stamped the Texas boiler number with a five point star stamped immediately adjacent to the first and last digit of the Texas boiler number.
- (c) All hard stamping shall be accomplished by low stress steel dies 5/16 inch (8 millimeters) high and shall be arranged as shown in §65.615, Exhibit 1.
- (d) In addition to the stamping:
 - (1) the corrosion-resistant metal tag shall be applied, as permanently as practicable, to the external

jacket or other covering where the surface temperature exceeds 200 degrees Fahrenheit (93.3 degrees Celsius), or

- (2) the Texas boiler number decal shall be applied where the surface does not exceed 200 degrees Fahrenheit (93.3 degrees Celsius).
- (e) The following types of boilers are exempt from the stamping requirements of subsection (c), ASME code name plates stamped with the HLW designator, cast iron sectional boilers, cast aluminum sectional boilers, water tube boilers with cast headers, and other types of boilers that will be damaged by direct impression stamping.
- (1) These boilers shall be identified with the Texas boiler number decal or corrosion-resistant tag; and
 - (2) The Texas boiler number decal or corrosion-resistant tag shall be applied where the surface does not exceed 200 degrees Fahrenheit (93.3 degrees Celsius).
- (f) Portable or stationary nonstandard boilers shall be identified by the Texas boiler number as described in subsection (b), with an exception that the Texas boiler number decal shall not be applied. The letters "TEXAS SPECIAL" or "TX SPCL" shall identify portable or stationary nonstandard boilers and shall be stamped directly above the Texas boiler number.

65.72. Condemned Boilers. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) Any boiler, stamped or identified with the corrosion-resistant metal tag, having been inspected and declared unsafe by the chief inspector, deputy inspector or executive director, shall be stamped by the inspector with an "X" on the star on either side of the Texas boiler number. The stamped tag identifies/designates the boiler as condemned.
- (b) Any boiler, identified with the Texas boiler number decal, having been inspected and declared unsafe by the chief inspector or deputy inspector, shall be altered/defaced by the inspector by removing the star on either side of the Texas boiler number. The altered/defaced decal identifies/designates the boiler as condemned.

Subchapter K. Reporting Requirements.

65.80. Notification of Changes in Risks and Inspection Agreements. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) All inspection agencies shall notify the department of all boiler risks or inspection agreements written, canceled, or not renewed, within thirty (30) days of the effective date.
- (b) The inspection agency shall immediately notify the department of all boiler risks rejected or suspended, or inspection agreements cancelled or not renewed, because of unsafe conditions and shall immediately notify the department and submit a report of the unsafe conditions giving rise to the rejection, suspension, cancellation, or nonrenewal.
- (c) Notification may be made electronically or manually using the format provided by the department and shall list, by Texas boiler number, all objects affected by the notice.

65.81. Inspection Report Forms. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) At the time of the first inspection of any boiler covered by the provisions of Texas Health and Safety Code, Chapter 755, a first inspection report shall be submitted to the department.

- (b) Subsequent inspection reports shall be submitted to the department.
- (c) External inspections shall be reported to the department if:
 - (1) hazardous conditions affecting the safety of the boiler are found; or
 - (2) the external inspection is a certificate inspection.
- (d) Inspection reports shall be filed in a manner prescribed by the department.

65.82. Defective Conditions Disclosed at Time of External Inspection. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) If there is evidence of a leak or crack, the covering of the boiler shall be removed to satisfy the inspector as to the safety of the boiler.
- (b) If the covering cannot be removed at that time, an inspector may order the operation of the boiler discontinued, until such time as the covering can be removed and proper examination made.

65.83. Boiler Accidents. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) In case of a serious accident, the owner/operator shall immediately notify the chief inspector and authorized inspector.
- (b) Neither the boiler nor any of the parts thereof, shall be removed or disturbed, except for the purpose of saving human life or preventing further damage, before an inspection and investigation has been made by an inspector.
- (c) The authorized inspector shall immediately notify the chief inspector of each boiler accident.
- (d) The chief inspector shall investigate, or cause to be investigated, each boiler accident to the extent necessary to reasonably determine the cause of the boiler accident.
- (e) To the extent necessary to conduct an inspection and subsequent investigation of a boiler accident, the owner/operator shall provide an inspector free access to the boiler and accident area.
- (f) The owner/operator shall provide the chief inspector, deputy inspector and authorized inspector, with fragments, parts, appurtenances, documents, and records necessary to conduct an investigation of the accident.
- (g) The authorized inspector shall submit a report of the boiler accident to the chief inspector. The report shall be submitted in a manner prescribed by the department.
- (h) The chief inspector shall file a final report to the executive director.

65.84. Repair and Alteration Report Forms. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

All repair and alteration report forms shall be filed, by the organization making the repair or alteration, with the department within ninety (90) days after completion of the repair or alteration.

65.85. Interagency Reporting and Requirements. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) Investigators, deputy fire marshals, and inspectors of the Texas Department of Insurance, the Department of State Health Services, and the Commission on Fire Protection who, during routine inspections encounter boilers which are unregistered or in the opinion of the inspector are unsafe, shall report these boilers to the

department in a manner prescribed by the department.

- (b) In the case of unsafe boilers, notification shall also be made to the chief inspector.
- (c) To assist the investigators, deputy marshals and inspectors with their reporting, the department may provide training relating to the boiler law and rules and the department's process for administering the boiler program.

65.86. Authorized Inspection Agencies Reporting Requirements. *(Adopted effective February 15, 2016, 41 TexReg 795)*

Authorized Inspection Agencies must notify the department within ten (10) calendar days after the loss of ASME Certificate of Authorization, NB-360 Certificate of Authorization or NB-369 Certificate of Authorization.

Subchapter L. Responsibilities of the Department.

65.90. Commissions--Authorized Inspector. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

Upon the request of an inspection agency, authorized to do business in this state, a commission as an authorized inspector and an identifying commission card may be issued by the executive director to an inspector in the employment of such inspection agency, provided the inspector has successfully passed the examination as set forth in §65.14. The identifying commission card shall be returned to the chief inspector, when the inspector to whom the commission was issued is no longer employed, within thirty (30) days. An inspector, commissioned as provided in this section, shall be entitled to another commission upon leaving the employment of one inspection agency and entering the employment of another such agency without examination, provided the executive director is notified immediately of such reemployment and provided that a commission reinstatement fee and new application are submitted.

65.91. Overdue Boiler Inspection--Authorized Inspection Agency Referral. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) The department may refer any boiler that is ninety (90) days past its inspection due date to another Authorized Inspection Agency for completion of the past due inspection.
- (b) Any boiler referred under this section shall be assessed the inspection fee established under §65.300, which includes late fees authorized by §60.83 of this title (relating to Late Renewal Fees).
- (c) The department may not make a referral under subsection (a) before January 1, 2016.

Subchapter M. Board of Boiler Rules.

65.100. Board of Boiler Rules--Purpose. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) The purpose of the Board of Boiler Rules is to advise the commission in the adoption of definitions and rules relating to the safe construction, installation, inspection, operating limits, alteration, and repair of boilers and appurtenances.
- (b) Recommendations of the board will be transmitted to the commission by the executive director.

65.101. Board of Boiler Rules--Membership. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) The Board of Boiler Rules is composed of the following 11 members appointed by the presiding officer of the commission, with the commission's approval:
 - (1) three members representing persons who own or use boilers in this state;

- (2) three members representing companies that insure boilers in this state;
 - (3) one member representing boiler manufacturers or installers;
 - (4) one member representing organizations that repair or alter boilers in this state;
 - (5) one member representing a labor union; and
 - (6) two public members.
- (b) All members, except the members appointed under subsection (a)(6), must have experience with boilers. To the extent possible, at least four members should be professional engineers registered in this state.
 - (c) The executive director serves as an ex officio board member.
 - (d) Board members serve for staggered six-year terms, with the terms of three members expiring January 31 of each odd-numbered year.
 - (e) The chief inspector serves as presiding officer of the board.

65.102. Board of Boiler Rules--Removal of Board Members; Vacancy. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) The commission may remove a board member for inefficiency or neglect of official duty.
- (b) A board member's office becomes vacant on the resignation, death, suspension, or incapacity of the member. The presiding officer of the commission shall appoint, in the same manner as the original appointment, a person to serve for the remainder of the unexpired term.

65.103. Board of Boiler Rules--Reimbursement of Expenses. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) A board member may not receive a salary, but is entitled to reimbursement for actual expenses incurred in performing board duties subject to the General Appropriations Act.
- (b) Expenses reimbursed to board members shall be limited to authorized expenses incurred while on board business and traveling to and from board meetings. The least expensive method of travel should be used.
- (c) Expenses paid to board members shall be limited to those allowed by the State of Texas Travel Allowance Guide and the department's policies governing travel allowances for employees.

65.104. Board of Boiler Rules--Board Meetings. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) The board shall meet at least twice each year, at the call of the presiding officer, at a place designated by the board.
- (b) A board decision is not effective unless supported by the vote of at least five board members.

Subchapter N. Responsibilities of the Owner and Operator.

65.200. New Boiler Installations. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) No boiler, except reinstalled boilers and those exempted by Texas Health and Safety Code, §755.022, shall

be installed in this state unless:

- (1) it has been constructed, inspected, and stamped in conformity with the applicable section of the ASME code;
 - (2) it is registered with the National Board of Boiler and Pressure Vessel Inspectors except cast iron or cast-aluminum sectional boilers; and
 - (3) it is approved, registered, and inspected in accordance with the requirements of this chapter.
- (b) A boiler having the standard stamping of another state that has adopted a standard of construction equivalent to the standard of the State of Texas, or a special-designed boiler, may be accepted by the department. Any person desiring to install such a boiler shall file a complete application for the installation of the boiler in compliance with §65.13.
- (c) New boilers, including reinstalled boilers, shall be installed in accordance with the requirements of the latest revision of the applicable section of the manufacturer's recommendations, ASME code and this chapter. These boilers shall be inspected prior to operation or test-firing.

65.201. Secondhand Boiler Installations. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

Secondhand boilers shall meet all the requirements for new installations, including code construction and stamping requirements.

65.202. Maximum Allowable Working Pressure (MAWP). *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) The MAWP for standard boilers shall be determined in accordance with the ASME code under which they were constructed and stamped.
- (b) In no case shall the MAWP of an existing nonstandard boiler be increased to a greater pressure than would be allowed for a new boiler of the same construction.
- (c) The MAWP on the shell of an existing riveted heating boiler shall be determined in accordance with the National Board Inspection Code.

65.203. Maximum In-Service Time for Nonstandard Boilers. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) A nonstandard boiler construction, installed prior to 1937, shall have a maximum in-service time of thirty (30) years, unless the following are accepted:
 - (1) an internal and external annual inspection; and
 - (2) an annual liquid pressure test of one and one-quarter times the MAWP held for a period of at least thirty (30) minutes, during which no distress or leakage develops. At no time, while applying the liquid pressure test, shall the pressure exceed one and one-quarter times the MAWP by more than 6%.
- (b) Any nonstandard boiler having lap-riveted longitudinal joints and operating at a pressure in excess of 50 psig (345 kilopascals) shall have a maximum in service of twenty (20) years; this type of boiler, when removed from the existing setting, shall not be reinstalled for a pressure in excess of 15 psig (103 kilopascals).
- (c) Any boiler having other than a lap-riveted longitudinal joint may be continued in operation without reduction in the MAWP.

65.204. Boiler Reinstallations. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

When a boiler is moved and reinstalled, all fittings and appurtenances must comply with this chapter.

65.205. Required Boiler Personnel. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

A boiler shall be operated and maintained in accordance with the boiler manufacturer's recommended guidelines by a competent attendant, regardless of whether or not it is equipped with automatic feed water regulator, fuel and damper regulator, high-and-low-water alarm, or any other form of automatic control.

65.206. Care of Boiler Room. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) The boiler room shall be free from accumulation of rubbish and materials that obstruct access to the boiler, its setting, or firing equipment.
- (b) The storage of flammable material or gasoline-powered equipment in the boiler room is prohibited.
- (c) The roof over boilers designed for indoor installations, shall be free from leaks and maintained in good condition.
- (d) Adequate drainage shall be provided.
- (e) All exit doors shall open outward.
- (f) It is recommended that the ASME Code, Section VI, covering the care and operation of heating boilers be used as a guide for proper and safe operating practices.
- (g) It is recommended that the ASME Code, Section VII, care and operation of power boilers, be used as a guide for proper and safe operating practices.

65.207. Boiler Foundations and Levels. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) All boilers shall be kept reasonably leveled and must be provided with a substantial foundation such as steel, concrete, brick, or stone.
- (b) The boiler mud rim or bottom of a vertical boiler setting shall not be less than 6 inches (152 mm) from the ground.
- (c) The locomotive-type boiler mud rim or wet bottom shall have the foundation of its setting not less than 12 inches (305 mm) from the floor or ground.
- (d) All boiler mud rims shall be accessible to the inspector.
- (e) Boilers that are not leveled or do not have substantial foundations shall be removed from service until these deficiencies are corrected.
- (f) Supports for boilers shall be masonry or structural steel of sufficient strength and rigidity to safely support the boiler.

65.208. Minimum Clearance. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) All boilers and appurtenances shall be located so that adequate space will be provided for the proper

operation, inspection, maintenance, and repair of the boiler. Manufacturer's recommended clearances must be met.

- (b) A minimum of one foot (305 mm) shall be maintained between the bottom of scotch-type boilers and the foundation or floor.

65.209. Safety Appliances. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) No one shall remove (except temporarily for repair), fail to replace after removal, displace, damage, destroy, carry off, tamper with, or fail to use any safety appliance.
- (b) When the safety appliance has been removed for repair, it can only be replaced on a boiler if it is in proper working order.
 - (1) The safety appliances shall not be set at a pressure in excess of the MAWP stated on the boiler.
 - (2) The seal shall be replaced prior to returning the boiler to service.
- (c) If a boiler is dismantled or moved, prior to returning it to service, all safety appliances must conform to the installation requirements of the boiler law and rules.

65.210. Standards for Internal Boiler Inspections. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) The owner or operator shall prepare a boiler for internal inspection.
- (b) Preparation of the boiler for internal inspection shall include:
 - (1) all water being drawn off;
 - (2) the boiler internal watersides thoroughly washed;
 - (3) removal of loose scale as practicable; and
 - (4) where boilers are equipped with removable internals, these internals need not be completely removed provided assurance exists that deterioration in regions rendered inaccessible by the internals is not occurring to an extent that might constitute a hazard, or to an extent beyond that found in more readily accessible parts of the vessel.
 - (5) All manholes and handholes, washout plugs, and plugs shall be removed for complete inspection, as required by the inspector.
 - (6) The furnace and combustion chambers shall be cooled and cleaned to provide safe access to the inspector.
 - (7) Brickwork and refractory shall be removed as required by the inspector in order to determine the condition of the boiler, headers, furnace, supports, or other parts.
 - (8) The pressure gage shall be removed for cleaning of the siphon and testing, if necessary.
 - (9) All low-water cutoff devices shall be dismantled, cleaned, and prepared for inspection. Probe-type low water cutoff devices shall be removed from the boiler.
 - (10) The cross-tees and plugs shall be removed to ensure complete clearance on the water and steam sides.

- (11) Before removing the manholes or handholes and entering any part of the boiler connected to a common header with other boilers, any leakage of steam or hot water shall be eliminated.
 - (A) The nonreturn and stop valves shall be closed, locked out and tagged out and drain valves between the two valves opened.
 - (B) The feedwater valves must be closed, locked out and tagged out.
 - (C) After draining the boiler, the blowdown valves shall be closed, locked out and tagged out.
 - (D) Blowdown lines, where practicable, shall be disconnected between pressure parts and valves.
 - (E) All vent and drain lines shall be opened.
- (12) Gaskets on manholes and handholes of pressure-retaining items, with exception of access and inspection doors of furnace and convection pass, shall be replaced with new gaskets upon reinstallation.
 - (A) Re-use of gaskets is prohibited.
 - (B) Gaskets shall be installed in accordance with the manufacturer's recommendations.
 - (C) The use of sealing compounds is prohibited on manhole and handhole gaskets on water/steam pressure parts.
- (c) If the boiler is jacketed so that the seams of shells, drums, or domes cannot be seen, enough of the jacketing, setting wall, or other form of casing or housing shall be removed to permit inspection to determine the safety of the boiler, provided such information cannot be determined by other means.

65.211. Preparation of Nonstandard Boilers for Inspection. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

Nonstandard boilers shall be prepared for inspection as described in §65.210, with the following additional requirements.

- (1) External lagging and insulation shall be removed and ultrasonic thickness measurements shall be performed for the first inspection and at five-year intervals for subsequent inspections; and
- (2) Any other inspections or examinations as required by the department shall be performed to determine the condition of the boiler.

65.212. Boiler ASME Code Restamping and Nameplate Replacement. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) Restamping or nameplate replacement shall be in accordance with the National Board Inspection Code and this chapter.
- (b) Requests shall be in writing on a NB-136 form and provide detailed description and stamping information that verifies traceability to the Manufacturer's Data Report.
- (c) Prior to any nameplate replacement or restamping of a boiler, the owner or operator must receive written authorization from the department.

65.213. Hot Water Heating System Restrictions. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

Potable water heaters (HLW stamped boilers), shall not be incorporated into a hot water heating system as a hot water heating boiler.

65.214. Modular Boilers. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

All modular steam heating and hot water heating boilers that meet all of the requirements of ASME Section IV, HG-716, shall be registered with a single Texas boiler number.

65.215. Multiple Pressure Steam Generators. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) A multiple pressure steam generator that meets the requirements of PG-106.12 shall be registered with a single Texas boiler number.
- (b) All previously registered multiple pressure steam generators with multiple Texas boiler numbers shall remain as they were originally registered and a separate inspection report will be completed for each boiler number.

65.216. Stacked Boilers. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

The owner or operator of boilers designed to be stacked, must submit for approval to the department the manufacturer's stacking rack design or fabrication requirements before operating the boiler.

65.217. Variance. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) Requests to waive or modify a rule or code requirement must be submitted on a department-approved variance application form. A separate variance application form shall be submitted for each boiler for which a variance is sought.
- (b) In evaluating a request for variance, the department shall consider whether the variance would be in the public interest, and may consider factors such as the effect of the proposed variance on the public, the burden that compliance imposes on the Owner or Operator, and whether the Owner or Operator has in place a maintenance plan that promotes boiler safety.
- (c) Variance applications shall be submitted by the owner/operator of the boiler, and shall be accompanied by the applicable fee and any supporting documentation such as boiler design plans, photos and code references.
- (d) A denial of a variance application may be appealed to the director of compliance, or designee, in writing within thirty (30) calendar days from issuance, upon payment of the applicable appeal fee. Supporting documentation such as boiler design plans, photos and code references not previously reviewed may be submitted for consideration.
- (e) A denial of a variance appeal from the director of compliance may be appealed to the executive director of the department, or designee, in writing within thirty (30) calendar days of notification of the director of compliance's decision. Supporting documentation such as boiler design plans, photos and code references not previously reviewed may be submitted for consideration.
- (f) When a variance or variance appeal determination has been made, the owner or operator making the submission shall be advised in writing of the determination.
- (g) A denial of a variance appeal from the executive director of the department, or designee, must be submitted in writing within thirty (30) calendar days from receipt of the appeal.
- (h) An approved variance must be posted under glass, next to the certificate of operation, of the boiler for

which it is issued.

Subchapter O. Fees.

65.300. Certificate/Inspection Fees. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) Certificate of operation.
 - (1) On or before expiration date--\$70
 - (2) After expiration date--Late fees for certificates are provided for under §60.83 of this title (relating to Late Renewal Fees).
 - (3) Duplicate--\$25
- (b) Inspections.
 - (1) Heating boilers.
 - (A) With an inspection opening--\$70
 - (B) Without an inspection opening--\$40
 - (2) Other than heating boilers--\$70
- (c) Special inspections or non-standard boiler reviews--\$1,700, which must be received by the department before scheduling the requested special inspection or non-standard boiler review.
- (d) Commission Fees.
 - (1) New--\$50
 - (2) Reinstatement--\$50
 - (3) Renewal--\$50
 - (4) Duplicate--\$25
 - (5) Reissuance after re-employment--\$50
 - (6) Late renewal fees for commissions issued under this chapter are provided under §60.83 of this title (relating to Late Renewal Fees).
- (e) Authorized Inspection Agency/Letter of Recognition.
 - (1) Original Application--\$100
 - (2) Renewal Application--\$100
- (f) Variances--\$50
- (g) Extensions--\$100
- (h) Re-Stamping--\$50

- (i) Boiler Installation Reports--\$25
- (j) Boiler Inspection Fee--\$260
- (k) Temporary Operating Permit Fee--\$50

Subchapter P. Administrative Penalties and Sanctions.

65.400. Administrative Penalties. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

If a person violates any provision of Texas Health and Safety Code, Chapter 755, or a rule, or order of the executive director or commission relating to Texas Health and Safety Code, Chapter 755, will be subject to administrative penalties, administrative sanctions, or both under Texas Health and Safety Code, Chapter 755, Texas Occupations Code, Chapter 51, 16 TAC Chapter 65, and applicable agency rules.

65.401. Sanctions. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) If a boiler has not been properly prepared for an internal inspection or a liquid pressure test as required by the boiler law and rules, the inspector may decline to make the inspection or witness the test, and the certificate of operation shall be withheld until the owner or operator complies with all requirements. Late certificate of operation fees shall apply if the boiler is not inspected prior to the expiration date of the certificate of operation.
- (b) Suspension or revocation of a commission.
 - (1) An inspector's commission may be suspended or revoked by the department for incompetence, untrustworthiness, or falsification of an application or in an inspection report or other requirement under this chapter.
 - (2) An inspector whose commission is revoked must wait at least one year after the revocation date to reapply.

65.402. Enforcement Authority. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

The enforcement authority granted under Texas Occupations Code, Chapters 51 and Texas Health and Safety Code, Chapter 755, and any associated rules, may be used to enforce Texas Health and Safety Code, Chapter 755 and this chapter.

Subchapter Q. Metrication

65.500. Metrication Policy. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) The following provides policy guidelines for the use of US customary units and metric (SI) units. Throughout this chapter, metric (SI) units are identified and placed in parentheses after the US customary units in the text and any associated exhibits.
- (b) There are two rationales when converting between US customary units and metric (SI) units:
 - (1) Soft conversions--A soft conversion is an exact conversion.
 - (A) Example: 200,000 Btu/hr=58.56208 kW

- (B) Example: 120 gallons=454.24944 liters
- (2) Hard conversions--A hard conversion is simply performing a soft conversion and then rounding off within the intended specific range.
 - (A) Example: 200,000 Btu/hr=58.6 kW
 - (B) Example: 120 gallons=454 liters
- (c) Repairs and alterations, when performed, shall be to the specified units used in the original code of construction. If the original units are US customary units, then the repair or alteration shall be to US customary units, and if the original units are metric (SI) units, then the repair or alteration shall be to the metric (SI) units. The selected units shall be used consistently throughout each repair or alteration and all aspects of the work required (i.e. materials, design, procedures, testing, documentation and stamping).
- (d) The following procedure shall be used when converting between US customary units and metric (SI) units.
 - (1) All conversions will be done using a soft conversion;
 - (2) Soft conversions will be reviewed for accuracy;
 - (3) Depending upon a specified value in this chapter, an appropriate degree of precision shall be identified; and
 - (4) Rounding up or down may apply to each conversion to determine the degree of precision needed for each application.

Subchapter R. Technical Requirements.

65.600. Conditions Not Covered by Rules. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) Any owner or operator of boilers or any deputy inspector, authorized inspector, or interested party, may submit in writing an inquiry to the department for an opinion or clarification.
- (b) All conditions not specifically covered by these requirements, shall be treated as new installations or be referred to the chief inspector for instruction.

65.601. General Safety. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) A boiler that is deemed unsafe for operation by the inspector shall be removed from service or placed in a safe condition in the following manner:
 - (1) the Inspector must notify the owner/operator about:
 - (A) the prohibition against operating an unsafe boiler;
 - (B) any insurance policy provisions, if any, that may exclude insurance coverage for operating an unsafe boiler;
 - (C) possible administrative penalties for operating an unsafe boiler; and
 - (D) request the immediate but voluntary shut-down of the boiler; or
 - (2) if the owner/operator refuses to immediately shut the boiler down, before leaving the premise on which the unsafe boiler is located, the Inspector must notify the Chief Boiler Inspector about the

condition of the unsafe boiler.

- (b) Upon receipt of the notice required by subsection (a)(2), the Chief Inspector shall assign a Deputy Inspector to confirm that an unsafe condition exist and, if confirmed, to render the boiler inoperative by placing a red tag on the boiler prohibiting continued operations of the unsafe boiler.
- (c) The continued operation of an unsafe boiler shall subject the owner/operator to administrative penalties as provided for in this chapter.

65.602. Chimneys and Vents. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

All chimney and vents shall be installed in accordance with Boiler Manufacturer recommendations and Chimney/Vent Manufacturer recommendations.

65.603. Boiler Room Ventilation. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) The boiler room must have an adequate and uninterrupted air supply to assure proper combustion and ventilation.
- (b) The combustion and ventilation air may be supplied by either an unobstructed opening or by power ventilators or fans.
 - (1) For a single opening, the opening shall be sized on the basis of one square inch (645 square millimeters) of free area for each 2,000 Btu/hour (.586 kilowatts) input of the combined burners located in the boiler room. For two openings, one commencing not more than 12 inches (304.8 millimeters) from the ceiling of the room and one commencing not more than 12 inches (304.8 millimeters) from the floor of the room, the opening shall be sized on the basis of one square inch (645 square millimeters) of free area for each 3,000 Btu/hour (.879 kilowatts) input per opening of the combined burners located in the boiler room.
 - (2) The power ventilator or fans shall be sized on the basis of 0.2 cfm. (5.6 liters per minute) for each 1,000 Btu/hour (.29 kilowatts) fuel input for the combined burners located in the boiler room. The boiler and the fans shall be interlocked so that the burners will not operate unless a supply of combustion, ventilation and dilution air as required by the boiler manufacturer's recommendations.
- (c) Boilers of a sealed combustion design by the manufacture.
 - (1) When a boiler(s) in the boiler room is of a sealed combustion design by the manufacture of the boiler and the required ventilation opening is not provided, the boiler room shall be equipped with a manual reset type Carbon Monoxide Detector. The Carbon Monoxide Detector and boiler shall be interlocked so that the burners will not operate when the measured level of CO rises above 100ppm. The Carbon Monoxide detector shall disable the appliance burners upon loss of power to the detector.
 - (2) When the boiler room is configured to include both designs, i.e. a boiler(s) of a sealed combustion design by the manufacture of the boiler and a boiler(s) that is not of a sealed combustion design by the manufacture of the boiler, the requirements in A or B below shall be met.
 - (A) The boiler room shall be in compliance with subsection (b)(1) or (b)(2).
 - (B) The boiler(s) that is not of the sealed combustion design is required to meet the ventilation requirement of subsection (b)(1) or (b)(2). The boiler(s) that are of the sealed combustion design are required to meet the ventilation requirement of subsection (c)(1).

- (d) Carbon Monoxide Detectors shall be calibrated every eighteen months and a record of calibration shall be posted in a conspicuous place.

65.604. Location of Discharge Outlets. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

Pressure relief valve, blowdown pipes, and other outlets shall be discharged to a safe point.

65.605. Electric Steam Boilers--Generators. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) A cable at least as large as one of the incoming power lines to the generator shall be provided for grounding the generator shell. This cable shall be permanently fastened on some part of the generator and shall be grounded in an approved manner.
- (b) A suitable screen or guard shall be provided around high voltage bushings, and a sign posted warning of high voltage. This screen or guard shall be so located so that it prevents accidental contact with the high voltage circuit.
- (c) In electric boilers of the submerged-electrode type, the water gage glass shall be located to indicate the water levels both at start-up and under maximum load conditions as established by the manufacturer.
- (d) Electric boilers of the resistance-element type shall have at least one gage glass. The lowest visible water level in the gage glass shall be at least 1 inch (25 mm) above the lowest permissible water level as determined by the manufacturer. Each boiler of this type shall be equipped with an automatic low-water cutoff to cut off the power supply before the surface of the water falls below the visible level in the gage glass.
- (e) Tubular gage glasses on electric boilers shall be equipped with protective rods or shields.
- (f) The minimum relieving capacity for pressure relief valves on electric boilers shall be 3 1/2 pounds (24 kilopascals) of steam per hour per kilowatt input.
- (g) All electric boilers shall be internally examined through the electric heating element, removable cover, inspection opening or handhole as construction allows.

65.606. Atmospheric Vents, Gas Vents, Bleed or Relief Lines for Power Boilers, Unfired Steam Boilers and Process Steam Generators with Supplemental Firing. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) Gas pressure regulators not incorporating integral vent limiters, and all other gas train components requiring atmospheric air pressure to balance a diaphragm or other similar device, shall be provided with a connection for a vent line.
 - (1) The vent lines in subsection (a) shall be:
 - (A) sized in accordance with the component manufacturer's instructions; and
 - (B) at least the same size as the vent outlet of the device.
 - (2) Where there is more than one gas pressure regulator at a location, each gas pressure regulator shall have a separate vent. The vent lines may be manifolded in accordance with accepted engineering practices to minimize back pressure in the event of a diaphragm failure (see subsections (c) and (d)).
 - (3) A gas pressure regulator shall not be vented into the boiler flue or exhaust system.

- (b) Gas pressure relief valves may discharge into common manifolding only with other gas vent, bleed, or relief lines. When manifolded, the common vent line shall have a cross-sectional area not less than the area of the largest vent line plus 50% of the areas of the additional vent lines.
- (c) Atmospheric vent lines, when manifolded, shall be connected into a common atmospheric vent line, having a cross-sectional area not less than the area of the largest vent line, plus 50% of the areas of the additional vent lines.
- (d) Atmospheric vent lines shall not be connected to any common or manifolded gas vent, bleed, or relief lines.
- (e) All vent and relief lines shall be:
 - (1) piped to the outdoors at a safe point of discharge, so there is no possibility of discharged gas being drawn into the air intake, ventilating system, or openings of any structure or piece of equipment;
 - (2) shall extend sufficiently above any structure, so that gaseous discharge does not present a fire hazard; and
 - (3) a means shall be provided at the terminating point to prevent blockage of the line by foreign material, moisture, or insects.

65.607. Power Boilers, Excluding Unfired Steam Boilers and Process Steam Generators. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) Safety valves and pressure relief valves.
 - (1) The use of weighted-lever safety valves, or safety valves having either the seat or disk of cast iron, is prohibited.
 - (2) Each boiler shall have at least one safety valve and, if it has more than 500 square feet (47 square meters) of water heating surface or has electric power input more than 1,100 kilowatts, it shall have two or more safety valves. These valves shall be "V" stamped per ASME Code.
 - (3) Safety valves or pressure relief valves shall be connected so as to stand in the upright position, with spindle vertical. The opening or connection between the boiler and the safety valve or pressure relief valve shall have at least the area of the valve inlet.
 - (4) The valve or valves shall be connected to the boiler, independent of any other steam connection, and attached as close as practicable to the boiler without unnecessary intervening pipe or fittings.
 - (5) Except for changeover valves as defined in §65.1(13), other valve (s) shall not be placed:
 - (A) between the required safety valve or pressure relief valve or valves and the boiler; or
 - (B) in the discharge pipe between the safety valve or pressure relief valve or valves and the atmosphere.
 - (6) When a discharge pipe is used, it shall be:
 - (A) at least full size of the safety valve discharge; and
 - (B) fitted with an open drain to prevent water lodging in the upper part of the safety valve or discharge pipe.
 - (7) When an elbow is placed on a safety valve discharge pipe:

- (A) it shall be located close to the safety valve outlet; and
 - (B) the discharge pipe shall be securely anchored and supported.
- (8) In the event multiple safety valves discharge into a common pipe, the discharge pipe shall be sized in accordance with ASME Code, Section I, PG-71.
- (9) All safety valve or pressure relief valve discharges shall be located or piped to a safe point of discharge, clear from walkways or platforms.
- (10) If a muffler is used on a pressure relief valve, it shall have sufficient area to prevent back pressure from interfering with the proper operation and discharge capacity of the valve. Mufflers shall not be used on High-Temperature Water Boilers.
- (11) The safety valve capacity of each boiler must allow the safety valve or valves to discharge all the steam that can be generated by the boiler without allowing the pressure to rise more than 6.0% above the highest pressure to which any valve is set, and to no more than 6.0% above the MAWP. For forced-flow steam generators with no fixed steam and waterline, power-actuated relieving valves may be used in accordance with ASME Code, Section I, PG-67.
- (12) One or more safety valves on every drum type boiler shall be set at or below the MAWP. The remaining valve (s) may be set within a range of 3.0% above the MAWP, but the range of setting of all the drum mounted pressure relief valves on a boiler shall not exceed 10% of the highest pressure to which any valve is set.
- (13) 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.
- (14) In those cases where the boiler is supplied with feedwater directly from water mains without the use of feeding apparatus (not to include return traps), no safety valve shall be set at a pressure higher than 94% of the lowest pressure obtained in the supply main feeding the boilers.
- (b) Feedwater supply.
- (1) Each boiler shall have a feedwater supply, which will permit it to be fed at any time while under pressure, except for automatically fired miniature boilers that meet all of the following criteria:
- (A) the boiler is "M" stamped per ASME Code, Section I;
 - (B) the boiler is designed to be fed manually;
 - (C) the boiler is provided with a means to prevent cold water from entering into a hot boiler; and
 - (D) the boiler is equipped with a warning sign visible to the operator not to introduce cold feedwater into a hot boiler.
- (2) A boiler having more than 500 square feet (47 square meters) of water heating surface, shall have at least two means of feeding, one of which should be a pump, injector, or inspirator. A source of feed directly from water mains at a pressure of at least 6.0% greater than the set pressure of the safety valve with the highest setting may be considered as one of the means of feeding. 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 immediate shutoff of heat input if the feedwater is interrupted.

- (3) Feedwater shall not be discharged close to riveted joints of shell or furnace sheets or directly against surfaces exposed to products of combustion or to direct radiation from the fire.
- (4) Feedwater piping to the boiler shall be provided with a check valve near the boiler and a stop 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 stop valve on the branch to each boiler between the check valve and the source of supply. Whenever a globe valve is used on the feedwater piping, the inlet shall be under the disk of the valve.
- (5) 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 boiler and the check valve, and both shall be located as close to the boiler as is practicable. Best practice is that no stop valve be placed in the supply and return pipe connections of a single boiler installation.
- (6) Where deaerating heaters are not used, best practice is that the temperature of the feedwater be not less than 120 degrees Fahrenheit (49 degrees Celsius), to avoid the possibility of setting up localized stress. Where deaerating heaters are used, best practice is for the minimum feedwater temperature be not less than 215 degrees Fahrenheit (102 degrees Celsius), so that dissolved gases may be thoroughly released.

(c) Water level indicators.

- (1) Each boiler, except forced-flow steam generators with no fixed steam and waterline, and high-temperature water boilers of the forced circulation type that have no steam and waterline shall have at least one water gage glass.
- (2) Except for electric boilers of the electrode type, boilers with a MAWP over 400 psig three (3) megapascals shall be provided with two water gage glasses, which may be connected to a single water column or connected directly to the drum.
- (3) Two independent remote level indicators may be provided instead of one of the two required gage glasses for boiler drum water level indication, when the MAWP is above 400 psig three (3) megapascals. When both remote level indicators are in reliable operation, the remaining gage glass may be shut off, but shall be maintained in serviceable condition.
- (4) In all installations where direct visual observations of the water gage glass(es) cannot be made, two remote level indicators shall be provided at operational level.
- (5) The gage glass cock connections shall not be less than 1/2 inch nominal pipe size (15 mm).
- (6) No outlet connections, except for damper regulator, feedwater regulator, drains, steam gages, or apparatus of such form as does not permit the escape of an appreciable amount of steam or water there from, shall be placed in the pipes connecting a water column or gage glass to a boiler.
- (7) The water column shall be fitted with a drain cock or drain valve of at least 3/4 inch nominal pipe size (20 mm). The water column blowdown pipe shall not be less than 3/4 inch nominal pipe size (20 mm), and shall be piped to a safe point of discharge.
- (8) Connections from the boiler to remote level indicators shall be at least 3/4 inch nominal pipe size (20 mm), to and including the isolation valve, and at least 1/2 inch (13 mm) OD tubing from the isolation valve to the remote level indicator. These connections shall be completely independent of other connections for any function other than water level indication.

- (d) Low-water fuel cutoff and water feeding devices.
- (1) All automatically fired steam boilers, except boilers having a constant attendant, who has no other duties while the boiler is in operation, shall be equipped with approved low-water fuel cutoffs.
 - (A) These devices shall be installed in such a manner that they cannot be rendered inoperative by the manipulation of any manual control or regulating apparatus.
 - (B) In boilers with a fixed water line, the low-water fuel cutoff devices shall be tested regularly by lowering the water level sufficiently to shut off the fuel supply to the burner when the water level reaches the lowest safe level for operation. Boilers that do not have a fixed water line shall be equipped with a flow sensing device, thermal couple or expansion ring that is listed by a nationally recognized testing agency to prevent burner operation at a flow rate inadequate to protect the boiler unit against overheating.
 - (C) The low-water cutoff shall be rated for a pressure and temperature equal to or greater than the MAWP and temperature of the boiler.
 - (D) For High-Temperature Water Boilers requiring forced flow circulation, an approved flow sensing device shall be installed on the outlet, as close to the boiler as possible.
 - (2) When a low-water fuel cutoff and feedwater pump control is combined in a single device, an additional separate low-water fuel cutoff shall be installed. The additional control shall be wired in series electrically with the existing low-water fuel cutoff.
 - (3) When a low-water fuel cutoff is housed in either the water column or a separate chamber it shall be provided with a blowdown pipe and valve not less than 3/4 inch nominal pipe size (20 mm). The arrangement shall be such that when the water column is blown down, the water level in it will be lowered sufficiently to activate the lower-water fuel cutoff device.
 - (4) If a water feed device is utilized, it shall be constructed to prevent feedwater from entering the boiler through the water column or separate chamber of the low-water fuel cutoff.
- (e) Pressure gages.
- (1) Each boiler shall have a pressure gage that is readable.
 - (A) The dial of the pressure gage shall be graduated to approximately double the pressure at which the safety valve is set, but in no case, less than one and one-half times this pressure.
 - (B) The pressure gage shall be connected to the steam space, to the water column, or its steam connection.
 - (C) A valve or cock shall be placed in the gage connection adjacent to the gage.
 - (D) An additional valve or cock may be located near the boiler providing it is locked or sealed in the open position.
 - (E) No other shutoff valves shall be located between the gage and the boiler.
 - (F) The pipe connection shall be of ample size and arranged so that it may be cleared by blowing down.

- (G) For a steam boiler, the gage or connection shall contain a siphon or equivalent device which will develop and maintain a water seal that will prevent steam from entering the gage tube.
- (2) Each boiler shall have a valved connection at least 1/4 inch nominal pipe size (6 mm) connected to the steam space for the exclusive purpose of attaching a test gage when the boiler is in service to test the accuracy of the pressure gage.
- (f) Stop valves.
 - (1) Each steam outlet from a boiler (except safety valve connections) shall be fitted with a stop valve located as close as practicable to the boiler.
 - (2) When a stop valve is located that allows water to accumulate, ample drains shall be provided. The drain shall be piped to a safe location and shall not be discharged on the boiler or its setting.
 - (3) When boilers provided with manholes or other similar opening that permits access for human occupancy and that are connected to a common steam main, the steam connection from each boiler shall be fitted with two stop valves, with an ample drain between them. The discharge of the drain shall be visible to the operator while manipulating the valves and shall be piped clear of the boiler setting. Best practice is for the first valve to be an automatic nonreturn valve (set next to the boiler), and a second valve of the outside-screw-and-yoke type.
- (g) Blowdown connection.
 - (1) The construction of the setting around each blowdown pipe shall permit free expansion and contraction. These setting openings must be sealed without restricting the movement of the blowdown piping.
 - (2) All blowdown piping, when exposed to furnace heat, shall be protected by firebrick or other heat-resisting material, and constructed to allow the piping to be inspected.
 - (3) Each boiler shall have a blowdown pipe, fitted with a valve or cock, in direct connection with the lowest water space. The piping shall be run full size without the use of a reducer or bushings and shall not be galvanized. Cocks shall be of gland or guard type and suitable for the pressure allowed. The use of globe valves shall be in accordance with ASME code.
 - (4) When the MAWP exceeds 100 psig (700 kilopascals), the piping shall be at least schedule 80 steel and shall not be galvanized. Each blowdown pipe shall be provided with two valves or a valve and cock, such valves and cocks shall be adequate for design conditions of the boiler.
 - (5) All fittings between the boiler and blowdown valve shall be of steel or extra-heavy malleable iron. In case of renewal of blowdown pipe or fittings, they shall be installed in accordance with the requirements of the applicable section of the ASME code.
 - (6) It is recommended that blowdown tanks be designed, constructed, and installed in accordance with National Board recommended rules for boiler blowoff equipment.
- (h) Boiler external piping. All boiler external piping, as referenced in the ASME code, shall be examined for compliance to the boiler's code of construction and shall be documented in the appropriate block on the inspection report.
- (i) Provisions for thermal expansion for High-Temperature Water Boilers.
 - (1) An airtight tank or other suitable air cushion that is consistent with the volume and capacity of the

system shall be installed. Expansion tanks shall be constructed in accordance with the ASME Code, Section VIII, Division 1, and the pressure and temperature ratings of the tank shall be equal to or greater than the pressure and temperature ratings of the system pressure. A pressure relief valve shall be installed with a set pressure at or below the MAWP of the expansion tank. Alternately the boiler pressure relief valve may be used provided the expansion tank's MAWP is equal to or lower than the set pressure of the pressure relief valve.

- (2) Provisions shall be made for draining the tank without emptying the system, except for pre-pressurized tanks.
- (3) If the expansion tank was originally equipped with a sight glass, the sight glass and sight glass valves shall be in working condition at all times, and the water level shall be maintained as per the manufacturer's recommendations.

65.608. Unfired Steam Boilers. (*Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795*)

- (a) Unfired steam boilers referred to in §65.2 are shown in §65.615, Exhibits 2 and 3.
- (b) Unfired steam boilers shall be constructed in accordance with ASME Code, Section I, or ASME Code, Section VIII, Division 1, 2 or 3.
 - (1) Unfired steam boilers constructed to ASME Code, Section VIII, Division 1, 2 or 3, shall meet jurisdictional limits established in §65.615, Exhibit 2.
 - (2) Unfired steam boilers constructed to ASME Code, Section I, shall meet jurisdictional limits established in §65.615, Exhibit 3.
- (c) Safety valves and pressure relief valves.
 - (1) The use of weighted-lever safety valves, or safety valves having either the seat or disk of cast iron, is prohibited.
 - (2) Each ASME Code, Section VIII, Division 1, 2 or 3, unfired steam boiler shall:
 - (A) have all pressure relief valves fabricated in accordance with ASME Code, Section VIII, Division 1 or Section I; and
 - (B) have at least one pressure relief valve.
 - (C) Isolation valves may be installed between the unfired steam boiler and the safety valve in accordance with §65.615, Exhibit 2.
 - (D) Full-area stop valves may be installed on the inlet side of a safety valve in accordance with §65.615, Exhibit 2. A full-area stop valve may be installed on the discharge of the safety valve when connected to a common header. Stop valves shall be car sealed or locked in the open position.
 - (E) One or more safety valves on every unfired steam boiler shall be set at or below the MAWP. The remaining valves, if any, shall be set within the range specified and have the capacity required by the applicable section of the ASME Code.
 - (3) Each ASME Code, Section I, unfired steam boiler shall have one safety valve and if it has more than 500 square feet (47 square meters) of water heating surface, it shall have two or more safety valves.

- (A) The valve or valves shall be connected to the boiler, independent of any other steam connection, and attached as close as practicable to the boiler without unnecessary intervening pipe or fittings.
 - (B) Valves, except a changeover valve as defined in §65.2(14), shall not be placed between the required safety valve or pressure relief valve or valves and the boiler nor on the discharge pipe between the safety valve or pressure relief valve and the atmosphere.
 - (C) The safety valve capacity of each unfired steam boiler must allow the safety valve or valves to discharge all the steam that can be generated by the boiler without allowing the pressure to rise more than 6.0% above the highest pressure to which any valve is set, and to no more than 6.0% above the MAWP.
- (4) When a discharge pipe open to the atmosphere is used, it shall be at least 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 discharge piping. The drain or drains shall be piped to a safe point of discharge. When an elbow or fitting is installed on the discharge pipe it shall be located close to the safety valve outlet. The discharge pipe shall be securely anchored and supported. All safety valve discharges shall be located or piped to a safe point of discharge clear from walkways or platforms. If a muffler is used on a pressure relief valve, it shall have sufficient area to prevent back pressure from interfering with the proper operation and discharge capacity of the valve.
- (5) When two or more unfired steam 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.
- (6) Safety valve and pressure relief valve mountings.
- (A) For ASME Code, Section I installations, pressure relief valves shall be connected so as to stand in the upright position, with spindle vertical. The opening or connection between the boiler and the pressure relief valve shall have at least the area of the valve inlet.
 - (B) For ASME Code, Section VIII, Division 1 installations, pressure relief valves normally should be installed in the upright position, with spindle vertical. Where space or piping configurations preclude such an installation, the valve may be installed in other than the vertical position, provided that:
 - (i) the valve design is satisfactory for such position;
 - (ii) the media is such that material will not accumulate at the inlet of the valve; and
 - (iii) drainage of the discharge side of the valve body and discharge piping is adequate.
- (d) Feedwater supply.
- (1) Each unfired steam boiler shall have a feedwater supply which will permit it to be fed at any time while under pressure.
 - (2) Feedwater piping to the unfired steam boiler constructed to ASME Code, Section I, shall be provided with a check valve near the boiler and a stop 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 stop valve on the branch to each boiler between the check valve and the source of supply. Whenever a

globe valve is used on the feedwater piping, the inlet shall be under the disk of the valve.

- (3) Where deaerating heaters are not used, it is recommended that the temperature of the feedwater be not less than 120 degrees Fahrenheit (49 degrees Celsius), to avoid the possibility of setting up localized stress. Where deaerating heaters are used, it is recommended that the minimum feedwater temperature be not less than 215 degrees Fahrenheit (102 degrees Celsius), so that dissolved gases may be thoroughly released.

(e) Water level indicators.

- (1) ASME Code, Section I, unfired steam boilers with a MAWP of 400 psig three (3) megapascals or less, shall have at least one gage glass. For a MAWP over 400 psig three (3) megapascals, shall have two required gage glasses. When two gage glasses are required, one of the gage glasses may be replaced by two independent remote level indicators that are maintained in simultaneous operation while the boiler is in service.
- (2) Each steam drum of an ASME Code, Section VIII, Division 1 unfired steam boiler, irrespective of pressure and temperature, shall be provided with one direct reading water level indicator (water gage glass), or two independent remote level indicators, that are maintained in simultaneous operation while the boiler is in service.
- (3) In all installations where direct visual observations of the water gage glass(es) cannot be made, two remote level indicators shall be provided at operational level.
- (4) The gage glass cock connections shall not be less than 1/2 inch nominal pipe size (15 mm).
- (5) No outlet connections, except for feedwater regulators, drains, steam gages, or apparatus of such form as does not permit the escape of an appreciable amount of steam or water therefrom, shall be placed in the pipes connecting a water column or gage glass to a boiler.
- (6) The water column shall be fitted with a drain cock or drain valve of at least 3/4 inch nominal pipe size (20 mm). The water column blowdown pipe shall not be less than 3/4 inch nominal pipe size (20 mm) and shall be piped to a safe point of discharge.
- (7) Connections from the unfired steam boiler to remote level indicators shall be at least 3/4 inch nominal pipe size (20 mm), to and including the isolation valve, and at least 1/2 inch (13 mm) OD tubing from the isolation valve to the remote level indicator. These connections shall be completely independent of other connections for any function other than water level indication.

(f) Low-water cutoffs, alarms and feed regulating devices.

- (1) The owner/operator is responsible for the design and installation of any low water protection devices as required to prevent damage to the unfired steam boiler. All installed low water cutoffs, alarms and feeding devices shall be designed for pressure and temperature equal to or greater than the MAWP of the unfired steam boiler.
- (2) When a low-water cutoff, and/or alarm is housed in either the water column or a separate chamber, it shall be provided with a blowdown pipe and valve not less than 3/4 inch nominal pipe size (20 mm). The arrangement shall be such that when the water column is blown down, the water level in it will be lowered sufficiently to activate the low-water cutoff and/or alarm device.
- (3) Should an unfired steam boiler be installed in a system without a local and constant attendant, and it is not a fail-safe design, it shall be provided with a low-water cutoff as required for power boilers.

- (g) Pressure gages.
 - (1) Each unfired steam boiler shall have a pressure gage that is readable. The dial of the pressure gage shall be graduated to approximately double the pressure at which the safety valve is set, but in no case, less than one and one-half times this pressure. The pressure gage shall be connected to the steam space, to the water column, or its steam connection. A valve or cock shall be placed in the gage connection adjacent to the gage. An additional valve or cock may be located near the boiler providing it is locked or sealed in the open position. No other shutoff valves shall be located between the gage and the boiler. The pipe connection shall be of ample size and arranged so that it may be cleared by blowing down. The gage or connection shall contain a siphon or equivalent device which will develop and maintain a water seal that will prevent steam from entering the gage tube.
 - (2) Each unfired steam boiler, must have a valved connection at least 1/4 inch nominal pipe size (8 mm), connected to the steam space for the exclusive purpose of attaching a test gage when the boiler is in service to test the accuracy of the pressure gage.
- (h) Stop valves.
 - (1) Each steam outlet from an ASME Code, Section I unfired steam boiler, shall be fitted with a stop valve located as close as practicable to the boiler.
 - (2) When a stop valve is located such that it allows water to accumulate, ample drains shall be provided. The drain shall be piped to a safe location and shall not be discharged on the boiler or its setting.
 - (3) When boilers that are provided with manholes or other similar openings that permit access for human occupancy are connected to a common steam main, the owner or operator shall ensure that the boiler to which entry is being made is completely isolated from the steam main. This may be accomplished with the use of two stop valves with an ample drain between them, with a full isolation blind or removal of piping such that the boiler is no longer connected to the steam main.

65.609. Process Steam Generators. *(Adopted effective June 15, 2005, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) Some process steam generators referred to in §65.2, are shown in §65.615, Exhibits 4 and 5.
- (b) The steam collection or liberation drums of a process steam generator shall be constructed in accordance with the American Society of Mechanical Engineers (ASME) Section VIII, Division 1, Division 2, or Division 3. As an alternate, the process steam generator may be constructed to ASME Code, Section I.
- (c) When the owner/operator elects to construct a process steam generator to ASME Code, Section I, the limits as shown in §65.615, Exhibits 4 and 5, are as defined in the rules of ASME Section I.
- (d) Safety valves and pressure relief valves.
 - (1) The use of weighted-lever safety valves or safety valves having either the seat or disk of cast iron is prohibited.
 - (2) Each ASME Code, Section VIII, Division 1 or Division 2, steam collection or liberation drum of a process steam generator, shall have at least one safety valve designed for steam service in accordance with applicable ASME Code of Construction. The valve body drain shall be open and piped to a safe point of discharge.
 - (A) The installation of full-area stop valves between the steam collection or liberation drum

of a process steam generator and the safety valve is permitted as depicted in §65.615, Exhibits 4 and 5. A full-area stop valve may be installed on the discharge of the safety valve when connected to a common header. Stop valves shall be car sealed or locked in the open position.

- (B) One or more safety valves on every steam collection or liberation drum of a process steam generator shall be set at or below the MAWP. The remaining valves, if any, shall be set within the range specified and have the capacity required by the applicable ASME code.
- (3) Each ASME Code, Section I, process steam generator, shall have one safety valve and if it has more than 500 square feet (47 square meters) of water heating surface, it shall have two or more safety valves. ASME Code, Section I, safety valves shall be applicably stamped.
- (A) The valve or valves shall be connected to the steam collection or liberation drum of the process steam generator, independent of any other steam connection, and attached as close as practicable to the steam collection or liberation drum without unnecessary intervening pipe or fittings.
 - (B) No valves, except as defined in §65.2(14), of any description shall be placed between the required safety valve or pressure relief valve or valves and the steam collection or liberation drum, nor on the discharge pipe between the safety valve or pressure relief valve and the atmosphere.
 - (C) The safety valve capacity of each process steam generator, shall allow the safety valve or valves to discharge all the steam that can be generated by the process steam generator without allowing the pressure to rise more than 6.0% above the highest pressure to which any valve is set, and to no more than 6.0% above the MAWP.
- (4) When a discharge pipe open to the atmosphere is used, it shall be at least 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 discharge piping. The drain or drains shall be piped to a safe point of discharge. When an elbow or fitting is installed on the discharge pipe it shall be located close to the safety valve outlet. The discharge pipe shall be securely anchored and supported. All safety valve discharges shall be located or piped to a safe point of discharge clear from walkways or platforms. If a muffler is used on a pressure relief valve, it shall have sufficient area to prevent back pressure from interfering with the proper operation and discharge capacity of the valve.
- (5) When two or more steam collection or liberation drums of process steam generators, operating at different pressures and safety valve settings are interconnected, the lower pressure process steam generator(s) or interconnected piping shall be equipped with safety valves of sufficient capacity to prevent overpressure, considering the maximum generating capacity of all of the process steam generators.
- (6) Safety valve and pressure relief valve mountings.
- (A) For ASME Code, Section I installations, safety valves or pressure relief valves shall be connected so as to stand in the upright position, with spindle vertical. The opening or connection between the boiler and the safety valve or pressure relief valve shall have at least the area of the valve inlet.
 - (B) For ASME Code, Section VIII, Division 1 or Division 2 installations, safety valves or pressure relief valves normally should be installed in the upright position, with spindle vertical. Where space or piping configurations preclude such an installation, the valve may be installed in other than the vertical position, provided that:

- (i) the valve design is satisfactory for such position;
 - (ii) the media is such that material will not accumulate at the inlet of the valve; and
 - (iii) drainage of the discharge side of the valve body and discharge piping is adequate.
- (e) Feedwater supply.
 - (1) Each steam collection or liberation drum of a process steam generator shall have a feedwater supply which will permit it to be fed at any time while under pressure.
 - (2) Feedwater piping to a process steam generator constructed to ASME Code, Section I, shall be provided with a check valve near the process steam generator and a stop valve or cock between the check valve and the process steam generator. When two or more process steam generators are fed from a common source there shall also be a stop valve on the branch to each process steam generator between the check valve and the source of supply. Whenever a globe valve is used on the feedwater piping, the inlet shall be under the disk of the valve.
 - (3) Where deaerating heaters are not used, best practice is that the temperature of the feedwater be not less than 120 degrees Fahrenheit (49 degrees Celsius), to avoid the possibility of setting up localized stress. Where deaerating heaters are used, best practice is that the minimum feedwater temperature be not less than 215 degrees Fahrenheit (102 degrees Celsius), so that dissolved gases may be thoroughly released.
- (f) Water level indicators.
 - (1) ASME Code, Section I, process steam generators with a MAWP of 400 psig three (3) megapascals or less shall have at least one gage glass. For a MAWP over 400 psig three (3) megapascals, shall have two required gage glasses. When two gage glasses are required, one of the gage glasses may be replaced by two independent remote level indicators that are maintained in simultaneous operation while the process steam generator is in service.
 - (2) Each steam collection or liberation drum of an ASME Code, Section VIII, Division 1, Division 2, or Division 3 process steam generator, irrespective of pressure and temperature, as shown in §65.615, Exhibits 4 and 5, shall be provided with one direct reading water level indicator (water gage glass) or two independent remote level indicators that are maintained in simultaneous operation while the process steam generator is in service.
 - (3) In all installations where direct visual observations of the water gage glass(es) cannot be made, two remote level indicators shall be provided at operational level.
 - (4) The gage glass cock connections shall not be less than 1/2 inch nominal pipe size (15 mm).
 - (5) No outlet connections, except for feedwater regulator, drains, steam gages, or apparatus of such form as does not permit the escape of an appreciable amount of steam or water therefrom, shall be placed on the pipes connecting a water column or gage glass on the steam collection or liberation drum of a process steam generator.
 - (6) The water column shall be fitted with a drain cock or drain valve of at least 3/4 inch nominal pipe size (20 mm). The water column blowdown pipe shall not be less than 3/4 inch nominal pipe size (20 mm) and shall be piped to a safe point of discharge.
 - (7) Connections from the steam collection or liberation drum of a process steam generator to remote

level indicators shall be at least 3/4 inch nominal pipe size (20 mm), to and including the isolation valve, and at least 1/2 inch (13 mm) OD tubing from the isolation valve to the remote level indicator. These connections shall be completely independent of other connections for any function other than water level indication.

(g) Low-water cutoffs, alarms and feed regulating devices.

- (1) The owner/operator is responsible for the design and installation of any low water protection devices as required, to prevent damage to the process steam generator. All installed low water cutoffs, alarms and feeding devices, shall be designed for a pressure and temperature equal to or greater than the MAWP and temperature of the process steam generator steam collection or liberation drum.
- (2) When a low-water cutoff, and/or alarm is housed in either the water column or a separate chamber, it shall be provided with a blowdown pipe and valve not less than 3/4 inch nominal pipe size (20 mm). The arrangement shall be such that when the water column is blown down, the water level in it will be lowered sufficiently to activate the low-water cutoff and/or alarm device.
- (3) Should a steam collection or liberation drum of a process steam generator be installed in a system without a local and constant attendant, and it is not a failsafe design, it shall be provided with a low-water cutoff as required for power boilers.

(h) Pressure gages.

- (1) Each steam collection or liberation drum of a process steam generator shall have a pressure-indicating device that is readable from the primary operating station. The range shall be graduated to approximately double the pressure at which the safety valve is set, but in no case, less than one and one-half times this pressure. The pressure-indicating device shall be connected to the steam space, or to the water column, or its steam connection. A valve or cock shall be placed in the gage connection adjacent to the gage. An additional valve or cock may be located near the steam collection or liberation drum of the process steam generator. No other shutoff valves shall be located between the gage and the steam collection or liberation drum of the process steam generator. The pipe connection shall be of ample size and arranged so that it may be cleared by blowing down or flushing. The pressure-indicating device shall be provided with a siphon or equivalent device, which will develop and maintain a water seal that will prevent steam from entering the pressure-indicating device.
- (2) Each steam collection or liberation drum of a process steam generator, shall have a valved connection at least 1/4 inch nominal pipe size (8 mm), connected to the steam space for the purpose of attaching a test gage when the process steam generator is in service, to test the accuracy of the pressure-indicating device.

(i) Stop valves.

- (1) Each steam outlet from an ASME Code, Section I, process steam generator, shall be fitted with a stop valve located as close as practicable to the steam collection or liberation drum of the process steam generator.
- (2) When a stop valve is located that allows water to accumulate, ample drains shall be provided. The drain shall be piped to a safe location and shall not be discharged on the process steam generator or its setting.
- (3) When boilers that are provided with manholes or other similar openings that permit access for human occupancy are connected to a common steam main, the owner or operator shall ensure that the boiler to which entry is being made is completely isolated from the steam main. This may be

accomplished with the use of two stop valves with an ample drain between them, with a full isolation blind or removal of piping such that the boiler is no longer connected to the steam main.

65.610. Nuclear Boilers. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) Nuclear boilers shall be inspected in-service by the owner or operator, in accordance with ASME Boiler and Pressure Vessel Code, Section XI.
- (b) The owner or operator shall engage the services of an inspection agency, qualified in accordance with American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME) N626.1, licensed by the Texas State Board of Insurance, and authorized to provide inspection services by the department.
- (c) The department shall assign, after receipt of the completed N-3 owner's data report, a state serial number to the nuclear boiler.
 - (1) All N-5 data reports for piping systems and N-3 owner's data reports shall be filed with the department.
 - (2) National Board registration described in §65.200 is not required.
- (d) The certificate of operation will be issued after receipt of the preservice inspection summary report and prior to commercial service. The summary report shall include all activities required by ASME Code, Section XI, except for the results of examinations or test of items obtainable only during power ascension testing. These items shall be filed as an amendment to the summary report within sixty (60) days of the completion of the power ascension testing. The items identified to be submitted in the amendment, shall be agreed upon by mutual consent as provided for in subsection (k), prior to power ascension testing and issuance of the certificate of operation.
- (e) The in-service inspection plan shall be submitted to the department by the owner or operator prior to commercial service.
- (f) The department shall review the in-service inspection plan and select those items necessary to verify compliance with Texas Health and Safety Code, Chapter 755 and ASME Code, Section XI. Items selected for verification shall be from within the verification boundary of the nuclear boiler consisting of the components and component supports of the systems illustrated in §65.615, Exhibit 6.
- (g) The department shall, upon reasonable notification by the owner or operator, of in-service inspection activities to be accomplished during any outage on items selected in subsection (h), coordinate with the owner or operator the verification activities.
- (h) The department shall review and maintain summary reports of the in-service inspections that are submitted by the owner or operator in accordance with ASME Code, Section XI.
- (i) Repairs and/or replacements shall conform to the requirements of ASME Code, Section XI.
- (j) The owner or operator shall, in case of serious accidents to a nuclear boiler involving a breach of the pressure boundary integrity of components included in §65.615, Exhibit 6, immediately notify the chief inspector by the most expeditious means available and report the nature of the accident. The chief inspector shall assess the nature of the accident, formulate inspection activities as required, and coordinate these activities with the owner or operator and as necessary with other state and federal agencies having jurisdiction.
- (k) If exceptions or situations arise, which are not specifically addressed in this section or other sections of the

boiler law and rules, or in ASME Code, Section XI, the owner or operator shall contact the chief inspector for guidance or interpretation.

65.611. Heating Boilers. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

(a) Steam Heating Boilers.

(1) Safety valves.

- (A) Each steam boiler shall have one or more safety valves, that are identified with applicable designator with the ASME Certification Mark of the spring pop type, adjusted and sealed to discharge at a pressure not to exceed 15 psig (103 kilopascals). 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 MAWP of the boiler. A body drain connection below seat level shall be provided. For valves exceeding 2 1/2 inch nominal pipe size (65 mm), the drain hole or holes shall be tapped not less than 3/8 inch nominal pipe size (10 mm). For valves 2 1/2 inch nominal pipe size (65 mm) or less, the drain hole shall not be less than 1/4 inch (6 mm) in diameter.
- (B) Each safety valve 3/4 inch nominal pipe size (20 mm) or over, used on a steam boiler, shall have a substantial lifting device, which will positively lift the disk from its seat at least 1/16 inch (1.6 mm), when there is no pressure on the boiler. The seats and disks shall be of suitable material to resist corrosion.
- (C) No safety valve for a steam boiler shall be smaller than 1/2 inch nominal pipe size (15 mm). No safety valve shall be larger than 4 1/2 inches nominal pipe size (15 mm). The inlet opening shall have an inside diameter approximately equal to, or greater than, the seat diameter.
- (D) The minimum relieving capacity of valve or valves shall be governed by the capacity marking on the boiler.
- (E) 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 1,000, 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 §65.615, Exhibit 7. For cast iron boilers, the minimum valve capacity shall be determined by the maximum output method. In every case, the safety valve capacity for each steam boiler shall be such that with the fuel burning equipment installed, and operated at maximum capacity, the pressure cannot rise more than 5psig (35 kilopascals) above the MAWP.
- (F) Safety valve piping. No valve shall be placed between the safety valve and the boiler or on the discharge pipe between the safety valve and the atmosphere. When a discharge pipe is used, it shall be full size and fitted with an open drain to prevent water from lodging in the upper part of the safety valve or pressure relief valve or in the discharge pipe. When an elbow is placed on the safety valve discharge pipe, it shall be located close to the valve outlet. The discharge pipe shall be securely anchored and supported, independent of the valve. If a muffler is used on a pressure relief valve, it shall have sufficient area to prevent back pressure from interfering with the proper operation and discharge capacity of the valve.
- (G) Safety valves and pressure relief valves shall be installed on the boiler with spindles

positioned vertically. The opening or connection between the boiler and any safety valve or pressure relief valve shall have at least the area of the valve inlet.

- (2) Feedwater connections.
 - (A) Feedwater 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 or water treatment shall not be introduced through openings or connections provided for inspection or cleaning, safety 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.
- (3) Low-water fuel cutoffs and water feeding devices.
 - (A) All automatically fired steam boilers, except boilers having a constant attendant, who has no other duties while the boiler is in operation, shall be equipped with approved automatic low-water fuel cutoffs installed in such a manner that they cannot be rendered inoperative by the manipulation of any manual control or regulating apparatus.
 - (B) The MAWP of all low water fuel cutoff devices shall be set at or above the boiler stamped MAWP.
 - (C) When low-water fuel cutoff and feedwater pump controls are combined in a single device, an additional separate low-water fuel cutoff shall be installed. The additional control shall be wired in series electrically with the existing low-water fuel cutoff.
 - (D) When a low-water fuel cutoff is housed in either the water column or a separate chamber, it shall be provided with a blowdown pipe and valve, not less than 3/4 inch nominal pipe size (20 mm). The arrangement shall be such that when the water column is blown down, the water level in it will be lowered sufficiently to activate the low-water fuel cutoff device.
 - (E) If a water feed device is utilized, it shall be constructed to prevent feedwater from entering the boiler through the water column or separate chamber of the low-water fuel cutoff.
- (4) Pressure gages.
 - (A) Each steam heating boiler shall have a pressure gage connected to the device exterior to the boiler. The gage shall be of sufficient capacity to keep the gage tube filled with water and arranged so that the gage cannot be shut off from the boiler except by a cock with tee or lever handle placed in a 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 a steam heating boiler pressure gage shall be graduated to not less than 30 psig (207kilopascals) nor more than 60 psig (414 kilopascals). The travel of the pointer from zero to 30 psig (207 kilopascals) pressure shall be at least three inches.
- (5) Stop valves.
 - (A) Single steam heating boilers. When a stop valve is used in the supply pipe connection of a single steam heating boiler, there shall be one used in the return pipe connection.

- (B) Supply and return line. Each supply and return line to a steam heating boiler, which may be entered while adjacent boilers are in operation, shall be fitted with either two stop valves with ample drain between or a stop valve and figure 8 blank. The blank shall be installed between the stop valve and the boiler.
 - (C) Type of stop valve. When stop valves over two inches in size are used, they shall be of the outside screw-and-yoke rising stem type or of such other type as to indicate at a distance whether it is closed or open by the position of its stem or other operating mechanism. The wheel may be carried either on the yoke or attached to the stem. If the valve is of the plug cock type, it shall be fitted with a slow opening mechanism and an indicating device and the plug shall be held in place by a guard or gland.
- (6) Bottom blowdown or drain valve.
- (A) Bottom blowoff valve. Each steam heating boiler shall have a bottom blowoff connection fitted with a valve or cock, connected to the lowest water space practicable with a minimum size as shown in §65.615, Exhibit 8. The discharge piping shall be full size to the point of discharge. Boilers having a capacity of 25 gallons (95 liters) or less are exempt from these requirements.
 - (B) Drain valve. Each boiler shall have one or more drain connections, fitted with valves or cocks connecting to the lowest water containing spaces. The minimum size of the drain piping, valves, and cocks shall be 3/4 inch nominal pipe size (20 mm). The discharge piping shall be full size to the point of discharge. When the blowoff connection is located at the lowest water containing space, a separate drain connection is not required.
 - (C) Minimum pressure rating. The minimum pressure rating of valves and cocks used for blowoff or drain purposes shall be at least equal to the pressure stamped on the boiler, but in no case less than 30 psig (207 kilopascals). The temperature rating of such valves and cocks shall not be less than 250 degrees Fahrenheit (121 degrees Celsius).
- (7) Water gage glasses.
- (A) Each steam heating boiler shall have one or more water gage glasses attached to the water column or boiler, by means of valved fittings not less than 1/2 inch nominal pipe size (15 mm). The lower fitting shall have a drain valve of the straightway type, with opening not less than 1/4 inch (8 mm) diameter to facilitate cleaning. Gage glass replacement shall be possible under pressure.
 - (B) Transparent material, other than glass, may be used for the water gage, provided that the material will remain transparent and has proved suitable for the pressure, temperature, and corrosive conditions encountered in service.
- (8) Piping, Fittings and Valves.
- (A) All piping, fittings and valves on the steam line, shall have a pressure rating equal to or greater than the MAWP of the boiler and a temperature rating of no less than 250 degrees Fahrenheit (121 degrees Celsius).
 - (B) All piping, fittings and valves other than the steam line, shall have a minimum pressure and temperature rating equal to or greater than the maximum expected pressure and temperature that may be reached.
- (b) Hot Water Heating Boilers.

- (1) Pressure relief valves.
 - (A) Each hot water heating boiler shall have at least one pressure relief valve, of the automatic reseating type, identified with the ASME Certification mark with the “V” or “HV” designator ASME Code Symbol, and set to relieve at or below the MAWP of the boiler.
 - (B) When more than one pressure relief valve is used on a hot water heating boiler, the additional valve or valves shall have a set pressure within a range not to exceed 6 psig (42 kilopascals) above the MAWP of the boiler up to and including 60 psig (414 kilopascals), and 5.0% for those having a MAWP exceeding 60 psig (414 kilopascals).
 - (C) Pressure relief valves shall be spring loaded and shall be set and sealed, so that they cannot be reset without breaking the seal. A body drain connection below seat level shall be provided. For valves exceeding 2 1/2 inch nominal pipe size (65 mm), the drain hole or holes shall be tapped not less than 3/8 inch nominal pipe size (10 mm). For valves of 2 1/2 inch nominal pipe size (65 mm) or less, the drain hole shall not be less than 1/4 inch (6 mm) diameter.
 - (D) Each pressure relief valve shall have a substantial lifting device, which will positively lift the disk from its seat at least 1/16 inch (1.6 mm) when there is no pressure on the boiler.
 - (E) Seats and disks of pressure relief valves shall be made of a suitable material to resist corrosion. No materials likely to fail due to deterioration or vulcanization, when subjected to saturated steam temperature corresponding to capacity test pressure, shall be used for any part.
 - (F) No pressure relief valve shall be smaller than 3/4 inch nominal pipe size (20 mm) nor larger than 4 1/2 inch nominal pipe size (115 mm) except that boilers having a heat input not greater than 15,000 Btu/hr (4.4 kilowatts) may be equipped with a rated pressure relief valve of 1/2 inch nominal pipe size (15 mm). 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 inch (6 mm) diameter or its equivalent area.
 - (G) 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 the basis of pounds of steam generated per hour per square foot of boiler heating surface as given in §65.615, Exhibit 7. For cast iron boilers the minimum valve capacity shall be determined by the maximum output method.
 - (H) In every case, the pressure relief valve capacity for each boiler with a single pressure relief valve shall be such that, with the fuel burning equipment installed and operated at maximum capacity, the pressure cannot rise more than 10% above the MAWP. When more than one pressure relief valve is used, the overpressure shall be limited to 10% above the set pressure of the highest set valve.
 - (I) Pressure relief valve piping. No valve shall be placed between the pressure relief valve and the boiler or on the discharge pipe between the pressure relief valve and the drain. When a discharge pipe is used, it shall be full size and fitted with an open drain to prevent water from lodging in the upper part of the pressure relief valve or in the discharge pipe. When an elbow is placed on the pressure relief valve discharge pipe, it

shall be located close to the valve outlet. The discharge pipe shall be securely anchored and supported, independent of the valve. Mufflers shall not be used on hot water heating boilers.

- (J) Pressure relief valves and safety valves shall be installed on the boiler with spindles positioned vertically. The opening or connection between the boiler and any pressure relief valve or safety valve shall have at least the area of the valve inlet.

(2) Makeup water connections.

- (A) Makeup water or water treatment shall be introduced into a boiler through the return piping system or through an independent makeup water connection, which does not discharge against parts of the boiler exposed to direct radiant heat from the fire. Makeup water or water treatment shall not be introduced through openings or connections provided for inspection or cleaning, pressure relief valve, pressure gage, or temperature gage.
- (B) Makeup water 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 between the check valve and the piping system.

(3) Low-water fuel cutoffs and water feeding devices.

- (A) All automatically fired hot water heating boilers shall have an automatic low-water fuel cutoff that has been designed for hot water service, and it shall be so located as to automatically cut off the fuel supply when the surface of the water falls to a level below the normal waterline established.
- (B) The MAWP of all low water fuel cutoff and flow sensing devices shall be set at or above the boiler stamped MAWP.
- (C) When low-water fuel cutoff and feedwater pump controls are combined in a single device, an additional separate low-water fuel cutoff shall be installed. The additional control shall be wired in series electrically with the existing low-water fuel cutoff.
- (D) When a low-water fuel cutoff is housed in either the water column or a separate chamber it shall be provided with a blowdown pipe and valve not less than 3/4 inch nominal pipe size (20 mm). The arrangement shall be such that when the water column is blown down, the water level in it will be lowered sufficiently to activate the low-water fuel cutoff device.
- (E) As there is no normal water line to be maintained in a hot water heating boiler, any location of the low-water fuel cutoff above the lowest safe water level established by the boiler manufacturer is satisfactory.
- (F) All automatically fired hot water heating boilers, when installed in a forced circulation system and not under continuous attendance, shall be equipped in the manner described in this subsection. A coil-type boiler or a water-tube boiler requiring forced circulation to prevent overheating of the coils or tubes shall have a flow sensing device which is listed by a nationally recognized testing agency to prevent burner operation at a flow rate inadequate to protect the boiler unit against overheating.
- (G) If a water feed device is utilized, it shall be constructed to prevent feedwater from entering the boiler through the water column or separate chamber of the low-water fuel cutoff.

- (4) Pressure and Temperature gages.
- (A) Each hot water heating boiler shall have a pressure or altitude gage connected to it or to its flow connection, which cannot be shut off from the boiler except by a cock with tee or lever handle placed in a 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 to not less than 1 1/2 nor more than 3 1/2 times the pressure at which the pressure relief valve is set. The gage shall be provided with effective stops for the indicating pointer at the zero point and at the maximum pressure point.
 - (C) Piping and tubing for pressure or altitude gage connections shall be of nonferrous metal when smaller than 1 inch nominal pipe size (25 mm).
 - (D) Each hot water heating boiler shall have a thermometer or temperature gage located and connected, that it shall be readable, and shall be located so that it shall at all times indicate the temperature of the water in the boiler at or near the outlet. If placed on the outlet piping, it must be located between the stop valve and the boiler.
- (5) Stop valves.
- (A) Stop valves shall be located at an accessible point in the supply and return pipe connections near the boiler nozzle of a single hot water heating boiler installation to permit draining the boiler without emptying the system.
 - (B) When the boiler is located above the system and can be drained without draining the system, stop valves may be eliminated.
 - (C) Type of stop valve. When stop valves over two inches in size are used, they shall be of the outside screw-and-yoke rising stem type or of such other type as to indicate at a distance whether it is closed or open by the position of its stem or other operating mechanism. The wheel may be carried either on the yoke or attached to the stem. If the valve is of the plug cock type, it shall be fitted with a slow opening mechanism and an indicating device and the plug shall be held in place by a guard or gland.
- (6) Drain valve.
- (A) Each hot water heating boiler shall have one or more drain connections, fitted with valves or cocks connecting to the lowest water containing spaces. The minimum size of the drain piping, valves, and cocks shall be 3/4 inch nominal pipe size (20 mm). The discharge piping shall be full size to the point of discharge. When the blowoff connection is located at the lowest water containing space, a separate drain connection is not required.
 - (B) Minimum pressure rating. The minimum pressure rating of valves and cocks used for blowoff or drain purposes shall be at least equal to the pressure stamped on the boiler, but in no case less than 30 psig (207 kilopascals). The temperature rating of such valves and cocks shall not be less than 250 degrees Fahrenheit (121 degrees Celsius).
- (7) Provisions for thermal expansion.
- (A) Heating systems with open expansion tank – An indoor overflow from the upper portion of the expansion tank shall be provided in addition to an open vent, the indoor overflow

to be carried within the building to a suitable plumbing fixture or basement.

(B) Closed heating system.

- (i) If the system is of closed type, an airtight tank or other suitable air cushion that is consistent with the volume and capacity of the system shall be installed.
- (ii) If the system is designed for a working pressure of 30 psig (207 kilopascals) or less, the tank shall be suitably designed for a minimum hydrostatic pressure of 75 psig (520 kilopascals).
- (iii) Expansion tanks for systems designed to operate above 30 psig (207 kilopascals) shall be constructed in accordance with the ASME Code, Section VIII, Division 1, or Section X, and the pressure and temperature ratings of the tank shall be equal to or greater than the pressure and temperature ratings of the system pressure. A pressure relief valve shall be installed with a set pressure at or below the MAWP of the expansion tank. Alternately the boiler pressure relief valve may be used provided the expansion tank's MAWP is equal to or lower than the set pressure of the pressure relief valve.
- (iv) Provisions shall be made for draining the tank without emptying the system, except for pre-pressurized tanks.
- (v) If the expansion tank was originally equipped with a sight glass, the sight glass and sight glass valves shall be in working condition at all times, and the water level shall be maintained as per the manufacturer's recommendations.

(8) Piping, Fittings and Valves.

- (A) All piping, fittings and valves on the boiler supply and return lines shall have a pressure rating equal to or greater than the MAWP of the boiler and a temperature rating of no less than 250 degrees Fahrenheit (121 degrees Celsius).
- (B) All piping, fittings and valves other than the boiler supply and return lines shall have a minimum pressure and temperature rating equal to or greater than the maximum expected pressure and temperature that may be reached.

(c) Hot Water Supply Boilers.

(1) Pressure relief valves.

- (A) Each hot water supply boiler shall have at least one pressure relief valve, of the automatic reseating type, identified with the ASME certification mark with the "V" or "HV" designators, and set to relieve at or below the MAWP of the boiler.
- (B) When more than one pressure relief valve is used on a hot water supply boiler, the additional valve or valves shall be officially rated and may have a set pressure within a range not to exceed 6 psig (42 kilopascals) above the MAWP of the boiler up to and including 60 psig (414 kilopascals), and 5.0% for those having a MAWP exceeding 60 psig (414 kilopascals).
- (C) Pressure relief valves shall be spring loaded. Pressure relief valves shall be set and sealed so that they cannot be reset without breaking the seal. A body drain connection below seat level shall be provided. For valves exceeding 2 1/2 inch nominal pipe size (65 mm), the drain hole or holes shall be tapped not less than 3/8 inch nominal pipe size (10 mm).

For valves of 2 1/2 inch nominal pipe size (65 mm) or less, the drain hole shall not be less than 1/4 inch (6 mm) diameter.

- (D) Each pressure relief valve shall have a substantial lifting device which will positively lift the disk from its seat at least 1/16 inch (1.6 mm) when there is no pressure on the boiler.
 - (E) Seats and disks of pressure relief valves shall be made of a suitable material to resist corrosion. No materials likely to fail due to deterioration or vulcanization, when subjected to saturated steam temperature corresponding to capacity test pressure, shall be used for any part.
 - (F) No pressure relief valve shall be smaller than 3/4 inch nominal pipe size (20 mm) nor larger than 4 1/2 inch nominal pipe size (115 mm) except that boilers having a heat input not greater than 15,000 Btu/hr (4.4 kilowatts) may be equipped with a rated pressure relief valve of 1/2 inch nominal pipe size (15 mm). 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 inch (6 mm) diameter or its equivalent area.
 - (G) 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 the basis of pounds of steam generated per hour per square foot of boiler heating surface as given in §65.615, Exhibit 7. For cast iron boilers, the minimum valve capacity shall be determined by the maximum output method.
 - (H) In every case, the pressure relief valve capacity for each boiler with a single pressure relief valve shall be such that, with the fuel burning equipment installed and operated at maximum capacity, the pressure cannot rise more than 10% above the MAWP. When more than one pressure relief valve is used, the overpressure shall be limited to 10% above the set pressure of the highest set valve.
 - (I) Pressure relief valve piping. No valve shall be placed between the pressure relief valve and the boiler nor on the discharge pipe between the pressure relief valve and the drain. When a discharge pipe is used, it shall be full size and fitted with an open drain to prevent water from lodging in the upper part of the pressure relief valve or in the discharge pipe. When an elbow is placed on the pressure relief valve discharge pipe, it shall be located close to the valve outlet. The discharge pipe shall be securely anchored and supported, independent of the valve. Mufflers shall not be used on hot water supply boilers.
 - (J) Pressure relief valves and safety valves shall be installed on the boiler with spindles positioned vertically. The opening or connection between the boiler and any pressure relief valve or safety valve shall have at least the area of the valve inlet.
- (2) Makeup water connections.
- (A) Makeup water or water treatment shall be introduced into a boiler through the return piping system or through an independent makeup water connection which does not discharge against parts of the boiler exposed to direct radiant heat from the fire. Makeup water or water treatment shall not be introduced through openings or connections provided for inspection or cleaning, pressure relief valve, pressure gage, or temperature gage.

- (B) Makeup water 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 between the check valve and the piping system.
- (3) Low-water fuel cutoffs and water feeding devices.
- (A) All automatically fired hot water supply boilers shall have an automatic low-water fuel cutoff that has been designed for hot water service, and it shall be so located as to automatically cut off the fuel supply when the surface of the water falls to a level below the normal waterline established.
 - (B) The MAWP of all low water fuel cutoff and flow sensing devices shall be set at or above the boiler stamped MAWP.
 - (C) When low-water fuel cutoff and feedwater pump controls are combined in a single device, an additional separate low-water fuel cutoff shall be installed. The additional control shall be wired in series electrically with the existing low-water fuel cutoff.
 - (D) When a low-water fuel cutoff is housed in either the water column or a separate chamber it shall be provided with a blowdown pipe and valve not less than 3/4 inch nominal pipe size (20 mm). The arrangement shall be such that when the water column is blown down, the water level in it will be lowered sufficiently to activate the low-water fuel cutoff device.
 - (E) As there is no normal water line to be maintained in a hot water supply boiler, any location of the low-water fuel cutoff above the lowest safe water level established by the boiler manufacturer is satisfactory.
 - (F) All automatically fired hot water heating boilers, when installed in a forced circulation system and not under continuous attendance, shall be equipped in the manner described in this subsection. A coil-type boiler or a water-tube boiler requiring forced circulation to prevent overheating of the coils or tubes shall have a flow sensing device which is listed by a nationally recognized testing agency to prevent burner operation at a flow rate inadequate to protect the boiler unit against overheating.
 - (G) If a water feed device is utilized, it shall be constructed to prevent feedwater from entering the boiler through the water column or separate chamber of the low-water fuel cutoff.
- (4) Pressure and Temperature gages.
- (A) Each hot water supply boiler shall have a pressure or altitude gage connected to it or to its flow connection which cannot be shut off from the boiler except by a cock with tee or lever handle placed in a 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 to not less than 1 1/2 nor more than 3 1/2 times the pressure at which the pressure relief valve is set. The gage shall be provided with effective stops for the indicating pointer at the zero point and at the maximum pressure point.
 - (C) Piping and tubing for pressure or altitude gage connections shall be of nonferrous metal when smaller than 1 inch nominal pipe size (25 mm).
 - (D) Each hot water supply boiler shall have a thermometer or temperature gage located and

connected so that it shall be readable, and shall be located so that it shall at all times indicate the temperature of the water in the boiler at or near the outlet. If placed on the outlet piping, it must be located between the stop valve and the boiler.

- (5) Stop valves.
 - (A) Stop valves shall be located at an accessible point in the supply and return pipe connections near the boiler nozzle of a single hot water supply boiler installation to permit draining the boiler without emptying the system.
 - (B) When the boiler is located above the system and can be drained without draining the system, stop valves may be eliminated.
 - (C) Type of stop valve. When stop valves over two inches in size are used, they shall be of the outside screw-and-yoke rising stem type or of such other type as to indicate at a distance whether it is closed or open by the position of its stem or other operating mechanism. The wheel may be carried either on the yoke or attached to the stem. If the valve is of the plug cock type, it shall be fitted with a slow opening mechanism and an indicating device and the plug shall be held in place by a guard or gland.

- (6) Drain valve.
 - (A) Each hot water supply boiler shall have one or more drain connections, fitted with valves or cocks connecting to the lowest water containing spaces. The minimum size of the drain piping, valves, and cocks shall be 3/4 inch nominal pipe size (20 mm). The discharge piping shall be full size to the point of discharge. When the blowoff connection is located at the lowest water containing space, a separate drain connection is not required.
 - (B) Minimum pressure rating. The minimum pressure rating of valves and cocks used for blowoff or drain purposes shall be at least equal to the pressure stamped on the boiler, but in no case less than 30 psig (207 kilopascals). The temperature rating of such valves and cocks shall not be less than 250 degrees Fahrenheit (121 degrees Celsius).

- (7) Provisions for thermal expansion.
 - (A) If a system is equipped with a check valve or pressure reducing valve in the cold water inlet line, consideration should be given to the installation of an airtight expansion tank or other suitable air cushion. Otherwise, due to the thermal expansion of the water, the pressure relief valve may lift periodically.
 - (B) If an expansion tank is provided, it shall be constructed in accordance with the ASME Code, Section VIII, Division 1 or Section X, and the pressure and temperature ratings of the tank shall be equal to or greater than the pressure and temperature ratings of the system pressure. Except for pre-pressurized tanks, which should be installed on the cold water side, provisions shall be made for draining the tank without emptying the system.
 - (C) If the expansion tank was originally equipped with a sight glass, the sight glass and sight glass valves shall be in working condition at all times, and the water level shall be maintained as per the manufacturer's recommendations.

- (8) Piping, Fittings and Valves.
 - (A) All piping, fittings and valves on the boiler supply and return lines shall have a pressure rating equal to or greater than the MAWP of the boiler and a temperature rating of no less

than 250 degrees Fahrenheit (121 degrees Celsius).

- (B) All piping, fittings and valves other than the boiler supply and return lines shall have a minimum pressure and temperature rating equal to or greater than the maximum expected pressure and temperature that may be reached.

(d) Potable Water Heaters (ASME Code HLW).

(1) Pressure relief valves.

- (A) Potable water heaters (tank type) shall have at least one officially rated temperature and pressure relief valve, or one officially rated pressure relief valve, set to relieve at or below the maximum allowable pressure of the heater. No pressure relief valve shall be smaller than 3/4 inch nominal pipe size (20 mm). The valve (s) shall be marked with the ASME Code Symbol "V" or "HV". At no time shall the temperature probe of the temperature and pressure relief valve be removed or modified.
- (B) The pressure relief valve shall have a capacity equal to or exceeding the rated burner input of the heater. The relieving capacity for electric water heaters shall be 3,500 Btu/hr (1.0 kilowatts) per kilowatt of input.
- (C) The ASME Btu rating on the valve shall be used to determine the relieving capacity.
- (D) Pressure relief valves shall be connected directly to the heater within the top 6 inches of the tank.
- (E) Pressure relief valves may be installed vertically or horizontally. The center line of the horizontal connection shall be no lower than 4 inches from the top of the shell.
- (F) Pressure relief valves shall not be connected to an internal pipe in the heater, or to a cold water feed line connected to the heater.
- (G) Pressure relief valve piping. No valve shall be placed between the pressure relief valve and the boiler nor on the discharge pipe between the pressure relief valve and the drain. When a discharge pipe is used, it shall be full size and fitted with an open drain to prevent water from lodging in the upper part of the pressure relief valve or in the discharge pipe. When an elbow is placed on the pressure relief valve discharge pipe, it shall be located close to the valve outlet. The discharge pipe shall be securely anchored and supported, independent of the valve. Mufflers shall not be used on potable water heaters.

(2) Water supply.

- (A) Water supply shall be introduced into a water heater through an independent water supply connection. Water shall not be introduced through openings or connections provided for cleaning, pressure relief valves, drains, pressure gage or temperature gage.
- (B) If the water supply pressure to a hot water heater exceeds 75% of the set pressure of the pressure relief valve, a pressure reducing valve is required.

(3) Flow sensing device.

- (A) All automatically fired potable water heaters, when installed in a forced circulation system and not under continuous attendance, shall be equipped in the manner described in this subsection. A coil-type boiler or a water-tube boiler requiring forced circulation to

prevent overheating of the coils or tubes shall have a flow sensing device which is listed by a nationally recognized testing agency to prevent burner operation at a flow rate inadequate to protect the boiler unit against overheating.

- (B) The MAWP of all flow sensing devices shall be set at or above the boiler stamped MAWP.
- (4) Gages.
- (A) Temperature gages. Each hot water heater shall have a thermometer located and connected at or near the outlet that is readable. The thermometer shall at all times indicate the temperatures of the water in the hot water heater. If placed on the outlet piping, it must be located between the stop valve and the boiler.
 - (B) Pressure gages. Each hot water heater that is of the coil type or water tube shall have a pressure gage located as close to the boiler as possible that is graduated to not less than 1 1/2 or more than 3 1/2 times the pressure at which the pressure relief valve is set.
- (5) Stop valves. Stop valves should be placed in the supply and discharge pipe connections of the hot water heater installation to permit draining the heater without emptying the system.
- (6) Drain valves. Each hot water heater shall have a bottom drain pipe connection fitted with a valve or cock connected to the lowest water space practical. The minimum size bottom drain shall be 3/4 inch nominal pipe size (20 mm).
- (7) Provisions for thermal expansion.
- (A) If a system is equipped with a check valve or pressure reducing valve in the cold water inlet line, consideration should be given to the installation of an airtight expansion tank or other suitable air cushion. Otherwise, due to the thermal expansion of the water, the pressure relief valve may lift periodically.
 - (B) If an expansion tank is provided, it shall be constructed in accordance with the ASME Code, Section VIII, Division 1 or Section X, and the pressure and temperature ratings of the tank shall be equal to or greater than the pressure and temperature ratings of the system pressure.
 - (C) Except for pre-pressurized tanks, which should be installed on the cold water side, provisions shall be made for draining the tank without emptying the system.
 - (D) If the expansion tank was originally equipped with a sight glass, the sight glass and sight glass valves shall be in working condition at all times, and the water level shall be maintained as per the manufacturer's recommendations.
- (8) Piping, Fittings and Valves.
- (A) All piping, fittings and valves on the boiler supply and return lines shall have a pressure rating equal to or greater than the MAWP of the boiler and a temperature rating of no less than 210 degrees Fahrenheit (99 degrees Celsius).
 - (B) All piping, fittings and valves other than the boiler supply and return lines shall have a minimum pressure and temperature rating equal to or greater than the maximum expected pressure and temperature that may be reached.

65.612. Repair and Alterations. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February*

- (a) Repairs and alterations shall conform to the current edition of the National Board Inspection Code (NBIC) and shall be acceptable to the inspector, except that repairs and alterations may be performed by the following, provided the intended work is within the scope of the issued certificate of authorization:
 - (1) holders of a certificate of authorization from the National Board of Boiler and Pressure Vessel Inspectors for use of the R repair symbol stamp; or
 - (2) owner/operators of boilers who have been issued a certificate of authorization by the department .
 - (A) Issuance of the certificate of authorization will be made upon submission of an application, on forms provided by the department.
 - (B) Review of the applicant's program and facilities initially and at subsequent three-year intervals will be done.
 - (i) The review will determine the applicant has a documented program to control repairs and/or alterations conforming to minimum requirements established by the department.
 - (ii) The review will require demonstration of the applicant's ability to perform repairs and/or alterations by implementing on representative work the requirements of the written program.
 - (iii) The guidelines of the NBIC for the quality control system are a minimum, except that an Authorized Inspection Agency is not required and the Repair and Alteration forms are issued by the department. The National Board's forms shall not be used by these certificate holders.
- (b) Derating a boiler's MAWP and/or allowable temperature (in accordance with the NBIC), shall be approved by the department prior to commencement of the alteration. If the derating is approved, the MAWP and/or allowable temperature shall not be increased without prior approval from the department.
- (c) Non-welded repairs.
 - (1) Replacement parts made of plate material used for pressure retaining shall require material test reports (MTR). Traceability to the MTR must be maintained at all times.
 - (2) Replacement parts fabricated by welding shall be certified, stamped with the appropriate ASME Code symbol and inspected by an authorized inspector as required by the ASME Code.
 - (3) When a non-welded repair involves the replacement of cast or forged parts that are identified with the ASME Code symbol at the time of casting or forging, these parts shall be replaced with cast or forged parts that are identified with the ASME Code symbol or so certified by the manufacturer to be in accordance with the original code of construction.
 - (4) All other materials shall not require MTR's, provided the material is identified with the material specification, grade, lot and rating as required by the material or product specification and the ASME Code.
 - (5) When used parts are utilized for non-welded repairs, it is the repair organization's responsibility to ensure the parts are identified as required above.
 - (6) Boiler tubes shall be replaced with tubes of the allowed material and in accordance with the original

code of construction.

- (d) Lap seam cracks. The shell or drum of a boiler in which a typical lap seam crack is discovered along a longitudinal riveted lap-type joint shall be immediately and permanently discontinued for use under pressure. A lap seam crack is the typical crack frequently found in lap seams, which extends parallel to the longitudinal joint and is located either between or adjacent to rivet holes.
- (e) Plugging of boiler tubes (excluding tubes in headers of economizers, evaporators, superheaters, or reheaters).
 - (1) Tube plugs shall be made of a material which is compatible with the material of the boiler tube being plugged and shall be welded into place, or manufactured to be expanded into the tube sheet or drum.
 - (2) Plugging boiler tubes on Fire Tube Boilers fabricated in accordance with ASME Section I or IV.
 - (A) Best practice is not to plug a boiler tube in a Fire Tube Boiler. If a Fire Tube Boiler tube is plugged, the following criteria shall apply.
 - (B) Plugging boiler tubes that are adjacent to another plugged boiler tube is prohibited.
 - (C) No more than 10% of the total number of boiler tubes shall be plugged.
 - (D) All non-expanded boiler tube plugs shall be welded into place.
 - (E) All plugged boiler tubes shall be replaced prior to the next required Certificate Inspection.
 - (3) Plugging boiler tubes on Water Tube Boilers, Unfired Boilers, or Process Steam Generators.
 - (A) No more than 10% of the boiler generating tubes may be plugged. Additional tubes may be plugged after approval is obtained from the Original Equipment Manufacturer or an Engineer experienced in boiler design. The scope of the approval is limited to the plugging of the tubes and shall consider the operational effect on the water side pressure boundary or membrane and the effect on the combustion process throughout the boiler.
 - (B) No Water Wall tubes may be plugged, where the tube forms a separation wall between products of combustion and the outside atmosphere or a separation of the gas passes in a multiple (gas) pass boiler.

65.613. Liquid Pressure Tests. *(Adopted effective June 15, 2015, 40 TexReg 3121; amended effective February 15, 2016, 41 TexReg 795)*

- (a) When there is a question or doubt about the extent of a defect found in a boiler, the inspector may require a liquid pressure test.
- (b) In preparing a boiler for a liquid pressure test, the boiler shall be filled with water to the stop valve and all air vented off. If the boiler to be tested is connected with other boilers that are under pressure, such connections shall be blanked off unless they have double stop valves on all connection pipes with a drain between.
- (c) During a liquid pressure test of a boiler, the safety valve or valves shall be removed or each valve disc shall be held to its seat by means of a testing clamp and not by screwing down the compression screw under the spring.

- (d) The metal temperature for the pressure test shall not be less than 60 degrees Fahrenheit (16 degrees Celsius), unless the owner provides information on the toughness characteristics of the material for a lower test temperature, but the maximum metal temperature shall not exceed 120 degrees Fahrenheit (50 degrees Celsius), unless a higher temperature is specified and is acceptable to the inspector.
- (e) When a liquid pressure test is to be applied after inspection, the pressure shall be as follows.
 - (1) For all cases involving the question of tightness, the pressure shall be no more than the set pressure of the safety valve or valves having the lowest setting.
 - (2) For all cases involving the question of safety, the pressure applied shall not exceed the lesser of that which was required by the original code of construction, or the pressure equal to that which results in an applied stress no greater than 90% of the specified minimum yield stress at test temperature of the material as published by ASME Code, Section II, Part D, current edition.
- (f) A liquid pressure test shall be held for a minimum of fifteen (15) minutes at the required pressure without leakage
- (g) The actual pressure in the boiler shall not exceed 1.5 x MAWP.

65.614. Authority to Set and Seal Safety Appliances. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

- (a) All safety and pressure relief valves for ASME Sections I, IV, and VIII Division 1 boilers must be repaired, tested, set, and sealed by one of the organizations listed in this section, provided the scope of the issued certificate of authorization covers the work to be performed.
- (b) The following organizations are authorized to set and seal safety appliances:
 - (1) an organization holding a valid V, HV, or UV certificate of authorization, as appropriate, issued by the American Society of Mechanical Engineers (ASME); or
 - (2) an organization holding a valid VR certificate of authorization issued by the National Board of Boiler and Pressure Vessel Inspectors; or
 - (3) an organization holding a valid owner/operator certificate of authorization issued by the department to repair, test, set and seal safety appliances for boilers meeting the requirements of this chapter only at the approved owner/operators facilities. Such authorization may be granted or withheld by the department.
 - (A) If authorization is granted and proper administrative fees as provided for in §65.300, are paid, a certificate of authorization will be issued, expiring on the triennial anniversary date. The certificate shall indicate authorization to repair ASME Sections I, IV, or VIII valves, as verified by testing and as covered by the repair organization's quality control manual.
 - (B) The applicant should apply to the department for renewal of authorization and reissuance of the certificate six (6) months prior to the date of expiration.
 - (C) The owner/operator certificate of authorization is renewable every three (3) years. Before issuance or renewal of the certificate of authorization, the repair organization and its facilities are subject to a review and demonstration of its quality control system by an inspector. Original code books and the National Board's Pressure Relief Device Certifications (NB-18), as required to set and seal safety appliances, shall be available during the review of the quality control system.

- (D) Before the owner/operator certificate of authorization may be issued or renewed, two valves which have been repaired by the applicant must successfully complete operational verification tests as follows:
- (i) visual examination to ensure the quality of material and workmanship;
 - (ii) verification that critical parts meet the valve manufacturer's specifications. Critical parts that are replaced must be fabricated to the valve manufacturer's specifications. Critical parts which require repair shall meet the valve manufacturer's specifications;
 - (iii) tightness tests and verification; and
 - (iv) set pressure test and verification.
- (E) The purpose of the tests is to ensure that the function and operation of the valves meet the requirements of the applicable section of the ASME Code to which they are manufactured. Should any of the valves fail to meet the applicable requirements, the test shall be repeated on two valves for each valve that failed. Failure of any of these valves shall cause the applicant to investigate and document the cause of failure and state what corrective action has been taken to prevent future recurrences. Retest of the original valve is acceptable. Following proper implementation of this corrective action and after satisfactory performance, permission to receive the certificate of authorization will be granted.
- (F) Field repairs are defined as any repair conducted outside a fixed repair shop location. Field repairs may be conducted with the aid of mobile facilities with repair capabilities with or without testing capabilities. Field repairs may be conducted in owner/operator facilities without the use of mobile facilities. Organizations that obtain the owner/operator certificate of authorization for in-shop/plant repairs may also perform field repairs to safety and pressure relief valves provided that:
- (i) qualified technicians perform such repairs;
 - (ii) an acceptable quality control system covering field repairs is maintained; and
 - (iii) periodic audits of the work carried out in the field are made by quality control personnel of the certificate of authorization holder to ensure that the requirements of the quality control system are met.
- (G) Provided the provisions in subparagraph (F)(i) - (iii) are met, verification testing of field repaired valves shall not be required.
- (H) Organizations that perform field repairs only must demonstrate field repair capabilities to an inspector before the certificate of authorization may be issued or renewed. Two valves must be repaired in the field and successfully complete verification tests as described in subparagraph (D) and (E). A quality control manual as required in subparagraph (J), must be prepared describing all field repair activities.
- (I) Repair of a safety and pressure relief valve is considered to be the replacement, remachining, or cleaning of any part, lapping of seat and disc, or any other operation which may affect the flow passage, capacity, function, or pressure retaining integrity. Disassembly, reassembly, and/or adjustments which affect the safety or pressure relief valve function are also considered a repair. The initial installation, testing, and adjustments of a new safety valve or a pressure relief valve in a boiler are not considered

a repair.

- (J) In general, the quality control system shall describe and explain what documents and procedures the owner/operator will use to validate a valve repair. Before issuance or renewal of the owner/operator certificate of authorization, the applicant must meet all requirements, including an acceptable written quality control system. The basic elements of a written quality control system shall be those described in §65.615, Exhibit 9.
 - (i) The written quality control system shall also include provisions for making revisions, enabling the system to be kept current as required.
 - (ii) A review of the applicant's quality control system will be performed by an inspector. The review will include a demonstration of the implementation of the applicant's quality control system.
 - (iii) Each applicant to whom a certificate of authorization is issued, shall maintain thereafter a controlled copy of the accepted quality control manual with the inspector. Except for changes which do not affect the quality control program, revisions to the quality control manual shall not be implemented until such revisions are acceptable to the inspector.

- (K) It is essential that owner/operator valve repair organizations ensure that personnel making repairs to safety and pressure relief valves are knowledgeable and qualified. The owner/operator shall provide documented training with minimum qualification requirements for the valve repair position. Specific requirements to be included in an individual's training are as follows:
 - (i) working knowledge of the organization's quality control manual;
 - (ii) working knowledge of the applicable requirements; and
 - (iii) working knowledge of the technical aspects and mechanical skills for valves being repaired or tested.

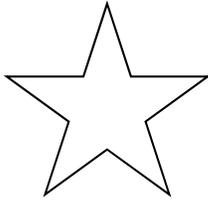
- (L) Performance testing of repaired valves.
 - (i) For shop valves, a test stand shall be used. The test stand shall be of a size and design to ensure clean, consistent, and repetitive pop action and response to blowdown adjustment, if possible. Test gages shall be connected to the test stand in such a manner as to indicate true pressure at the inlet of the valve being tested. Test gages shall be maintained and calibrated, at least every ninety (90) days, to a minimum of one-half of 1.0% accuracy over the upper 80% of full scale range. The use of digital gages is acceptable. All calibrations shall be documented and traceable to national standards.
 - (ii) Valves marked for liquid service shall be set according to the applicable manufacturer's specification.
 - (iii) Valves marked for steam service or having special internal parts for steam should be tested with steam. However, valves for steam service may be tested with air or nitrogen for correct opening (popping), pressure setting, and, if possible, blowdown adjustment, provided the differential in popping pressure between steam and air or nitrogen, as specified in the quality control manual, are applied to the popping point.

- (iv) Valves which are repaired in place shall be tested to demonstrate set pressure.
 - (v) For valves which are repaired in place, a device (hydraulic, pneumatic, etc.) may be used to apply an auxiliary lifting load on the spring to a valve for testing purposes and/or making adjustments. Calibrated testing equipment shall be used and detailed testing procedures followed. In such cases, the manufacturer's recommendations shall be used to establish blowdown.
- (M) When a safety or pressure relief valve is repaired, a metal repair tag, as described in the quality control manual, shall be attached to the valve. As a minimum, the information on the tag will include the valve identification number, set pressure, date of repair, and certificate of authorization number.

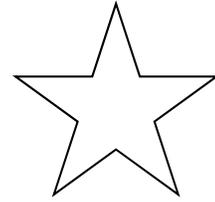
65.615. Exhibits 1-9. *(Adopted effective June 15, 2015, 40 TexReg 3121)*

The following Exhibits are integral components of the subchapter and incorporated for all purposes.

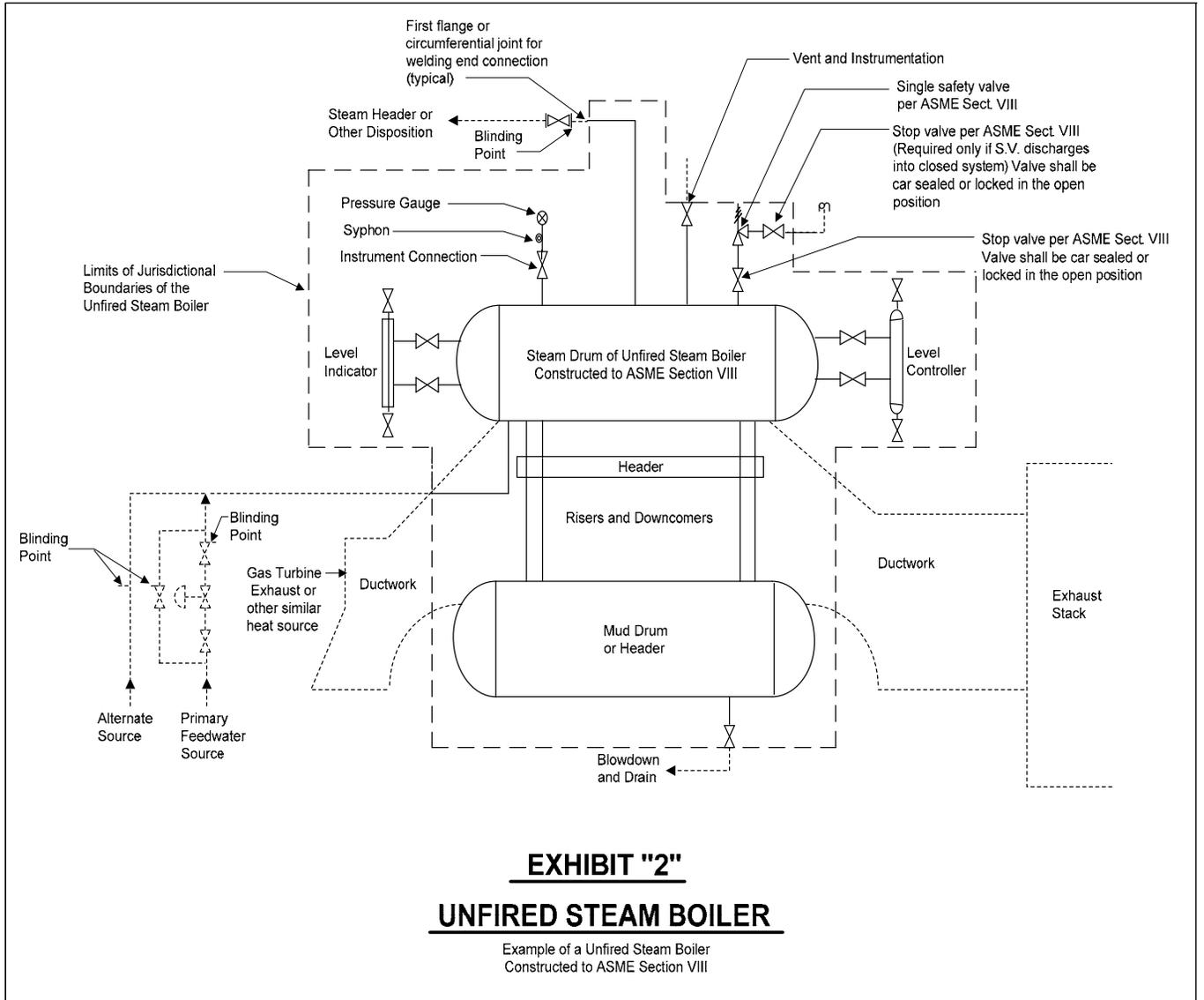
(1) Exhibit 1--Hard Stamping



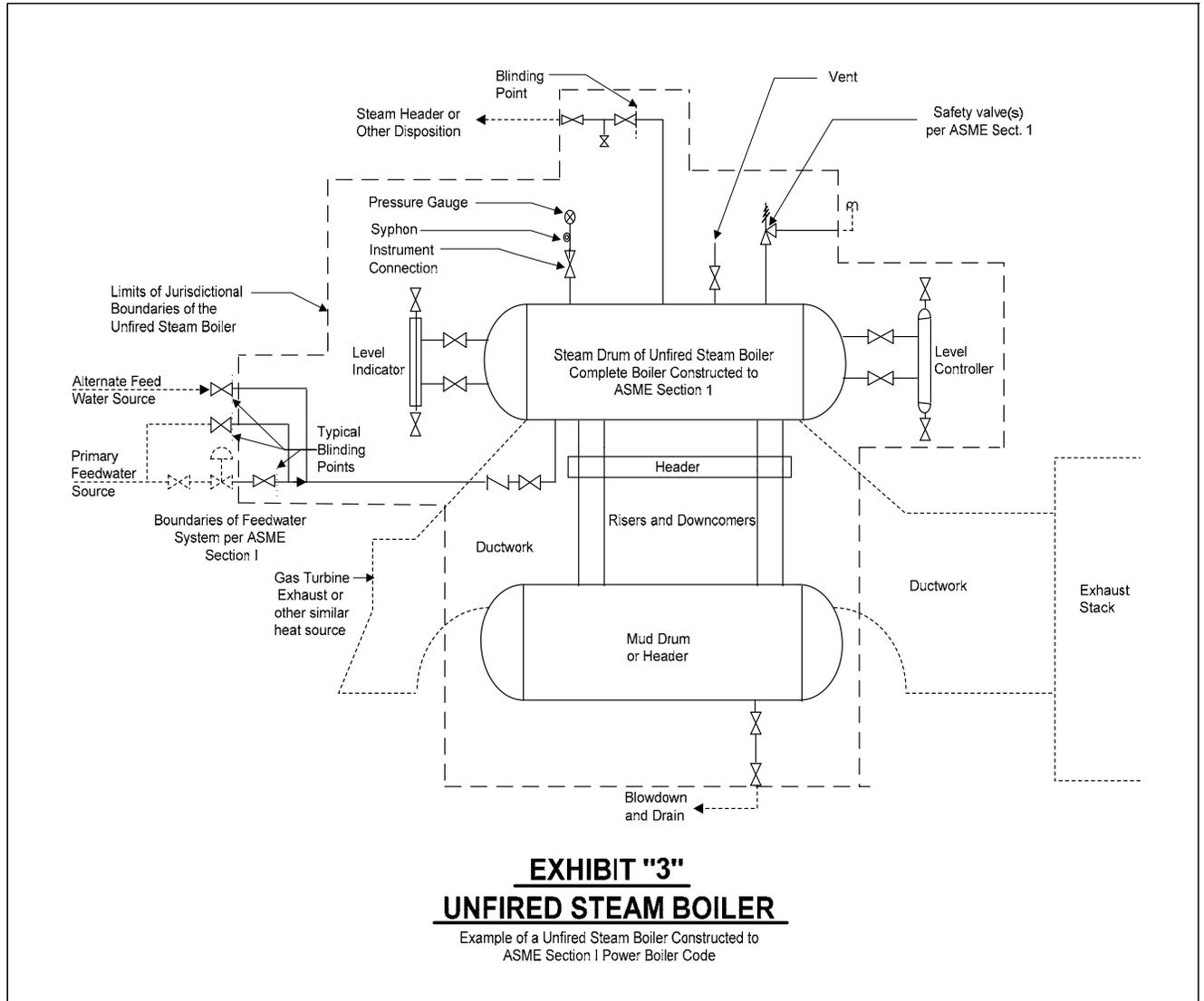
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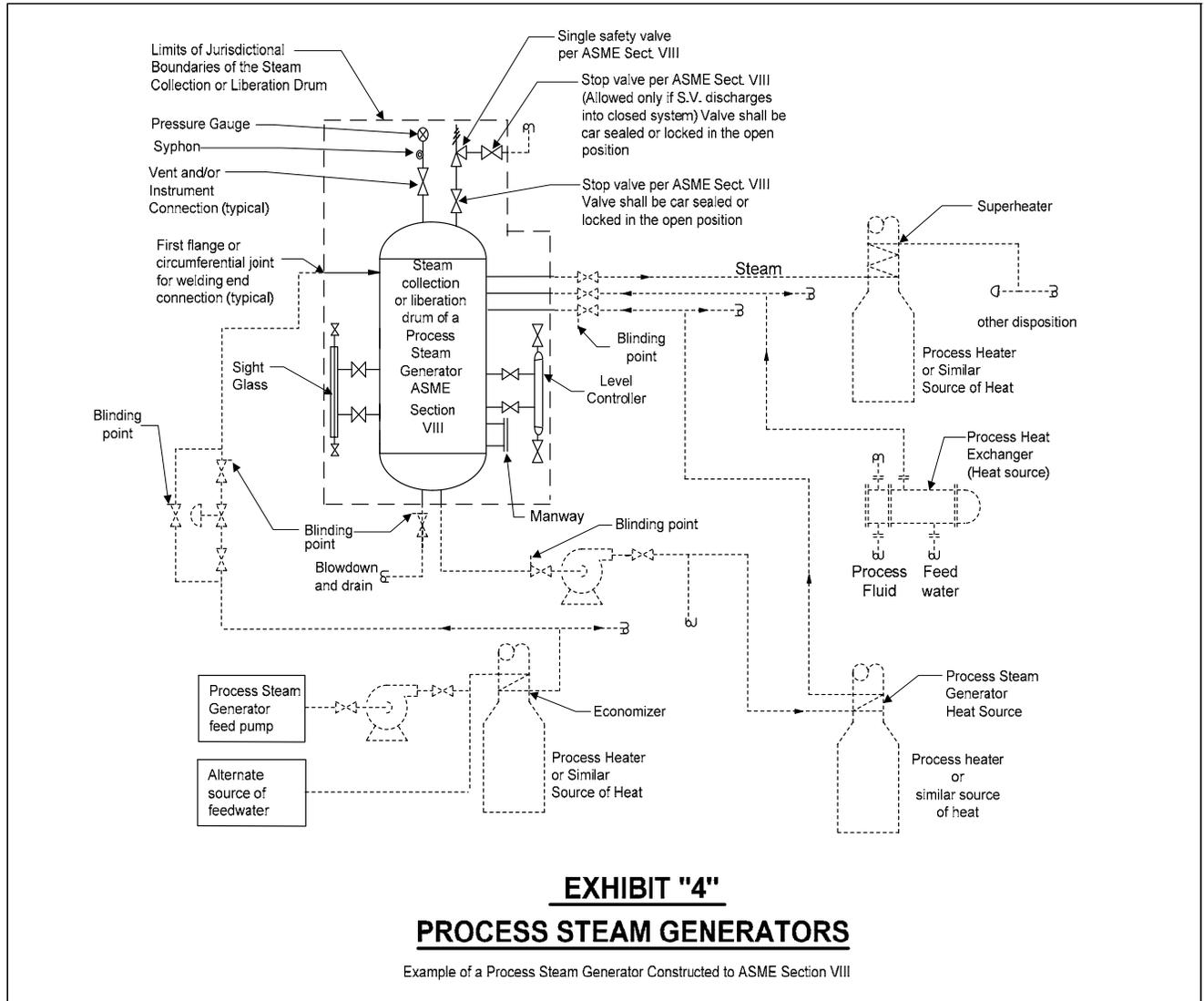
(2) Exhibit 2--Unfired Steam Boiler Constructed to ASME Section VIII



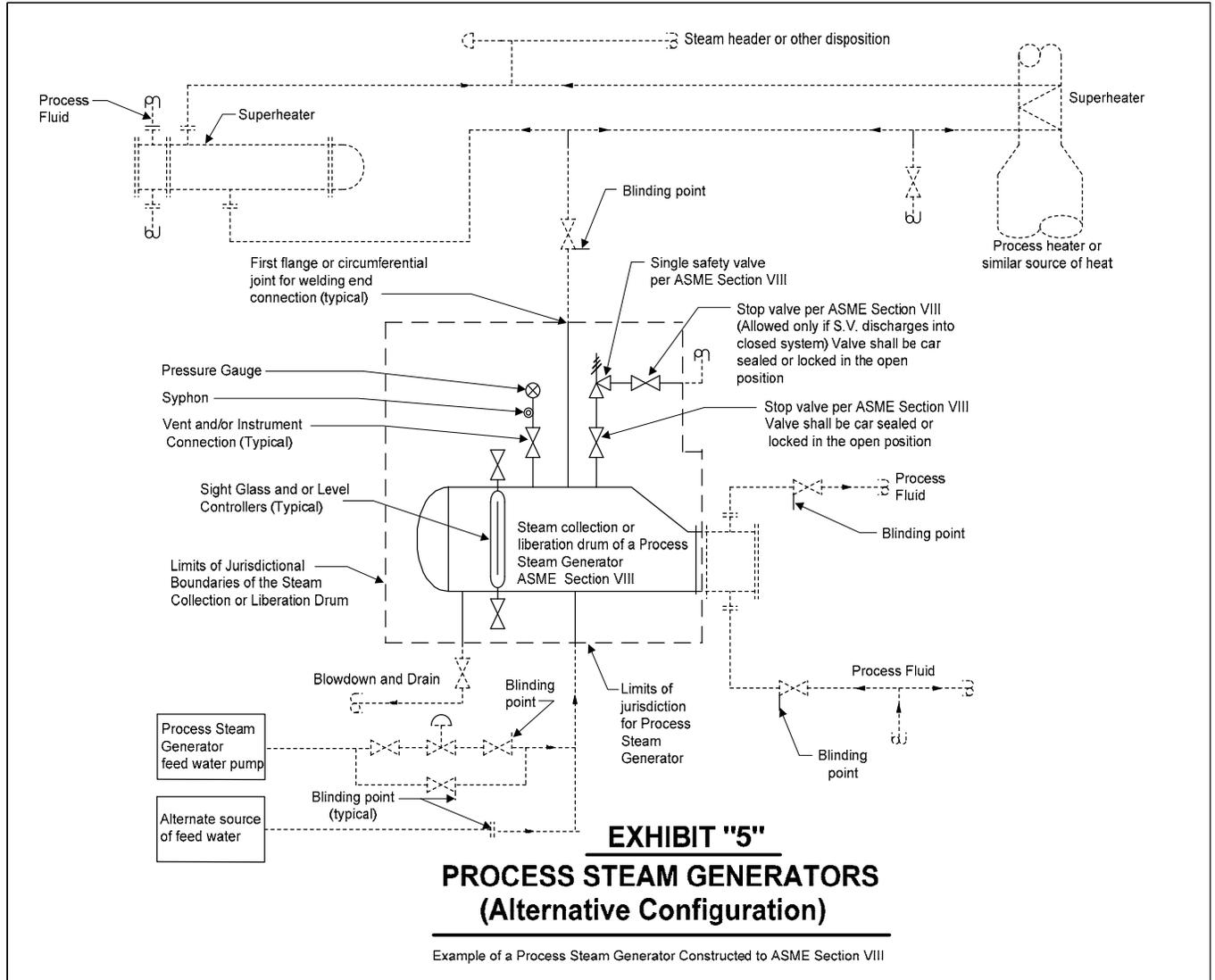
(3) Exhibit 3--Unfired Steam Boiler Constructed to ASME Section I Power Boiler Code



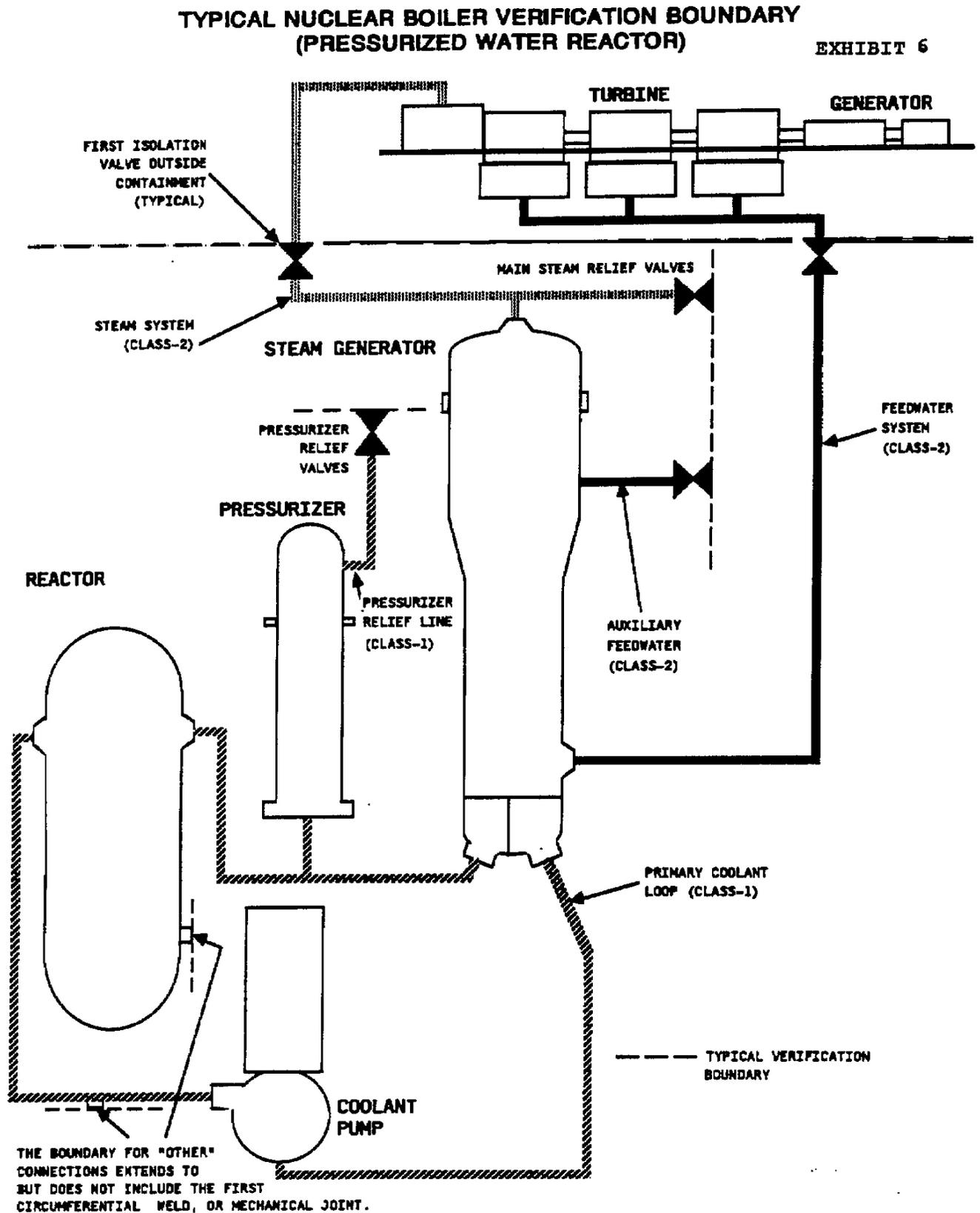
(4) Exhibit 4--Process Steam Generator



(5) Exhibit 5--Process Steam Generator (Alternative Configuration)



(6) Exhibit 6--Typical Nuclear Boiler Verification Boundary



(7) Exhibit 7--Minimum Pounds of Steam per Hour

**MINIMUM POUNDS OF STEAM PER HOUR
PER SQUARE FOOT (METER) OF HEATING SURFACE**

	Firetube Boilers	Watertube Boilers
Boiler Heating Surface		
Hand fired	5 (24)	6 (29)
Stoker fired	7 (34)	8 (39)
Oil, gas or pulverized fuel fired	8 (39)	10 (49)
Waterwall Heating Surface		
Hand fired	8 (39)	8 (39)
Stoker fired	10 (49)	12 (59)
Oil, gas, or pulverized fuel fired	14 (68)	16 (78)

Note: The minimum safety valve or safety relief valve relieving capacity for electric boilers shall be 3 ½ lb/hr/kw (1.6 kg/hr/kw) input.

(8) Exhibit 8--Size of Bottom Blowoff Piping, Valves, and Cocks

SIZE OF BOTTOM BLOWOFF PIPING, VALVES, AND COCKS

Minimum Required Safety Valve Capacity lb. (kg) of Steam/Hr.	Blowoff Piping Valves, and Cocks Size, min. in. (mm)
(Note)	
Up to 500 (226)	$\frac{3}{4}$ (20)
501 to 1,250 (227 to 567)	1 (25)
1,251 to 2,500 (568 to 1184)	1 $\frac{1}{4}$ (32)
2,501 to 6,000 (1185 to 2721)	1 $\frac{1}{2}$ (40)
6,001 (2722) and Larger	2 (50)

Note: To determine the discharge capacity of safety relief valves in terms of Btu, the relieving capacity in lbs. of steam/hr. is multiplied by 1,000.

(9) Exhibit 9--Basic Elements of a Written Quality Control System

1.0 Basic Elements of a Written Quality Control System

1.1 This outline sets the requirements of the Boiler Section for a written quality control system for repairers of ASME safety and safety relief valves.

1.2 Control Copy

A controlled copy of the written quality control system shall be submitted to the inspector. Revisions shall also be submitted for acceptance prior to being implemented.

1.3 Sample Forms

Forms used in the quality control system shall be included in the manual with a written description. Forms exhibited should be marked SAMPLE and completed in a manner typical of actual valve repair procedures.

1.4 Individuality Important

It is extremely important that the manual describe and the operation implement the system of each individual firm while meeting the requirements of the owner/operator certification program.

1.5 Quality Control Manual Requirements

It is essential that each valve repair organization develop its own quality control system which meets the requirements of each organization. Some of these requirements are, but not limited to:

1.5.1 Title Page

The title page shall include the name and address of the company to which the certificate of authorization is to be issued.

1.5.2 Revision Log

A revision log is required to assure revision control of the quality control manual. The log should contain sufficient space for date, description and section of revision, company approval, and chief inspector or authorized inspector acceptance.

1.5.3 Contents Page

The contents page should list and reference, by paragraph and page number, the subjects and exhibits contained therein.

1.5.4 Statement of Authority and Responsibility

A statement of authority and responsibility shall appear on company letterhead, dated and signed by an officer of the company verifying that only ASME Code stamped safety and safety relief valves will be repaired and returned to a condition equivalent to the standards for new valves. To ensure this is attained, the requirements of the written quality control system shall include as a minimum:

- 1.5.4.1** the title of the individual responsible to ensure that the quality control system is followed and has the authority and organizational freedom to effect the responsibility;
- 1.5.4.2** if there is disagreement in the implementation of the written quality control system, the matter is to be referred to a higher authority in the company for resolution; and
- 1.5.4.3** the title of the individual authorized to approve revisions to the written quality control system and the method by which such revisions are to be submitted to the authorized inspector for acceptance before implementation.

1.5.5 Organization Chart

The organization chart shall include all departments or divisions within the company that perform functions affecting the quality of the valve and show the relationship.

1.5.6 Scope of Work

The scope of work section should clearly indicate the scope and type of valve repairs the organization is capable of and intends to carry out, and should include the types and sizes of valves which can be repaired. In addition, the testing media (steam, air, water, etc.) and pressure ranges should be included. The scope can be limited by engineering, machine tools, welding processes, heat treatment facilities, testing facilities, nondestructive examination (NDE) techniques, or qualified personnel.

1.5.7 Drawings and Specification Control

The drawings and specification control system shall provide procedures assuring that applicable drawings, specifications, and instructions required are used for valve repair, inspection, and testing.

Specific reference should be made to the materials used for the repair of various valve parts (PG-73.2.3, Section I and UG-136(b)(3), Section VIII Division 1 of the ASME Code).

Mechanical requirements shall comply with the ASME Code. See applicable Code section.

1.5.8 Material and Part Control

The material and part control section shall describe purchasing of parts from the valve manufacturer, if applicable, and of material with request for mill test certification as required. It shall also describe receiving, storage, and issuing.

- 1.5.8.1** State the title of the individual responsible for the purchasing of all material.
- 1.5.8.2** State the title of the individual responsible for certification and other records as required.
- 1.5.8.3** All incoming material and parts shall be checked for conformance with the purchase order, and where applicable, the material specifications or drawings. Indicate how material or part is identified and how identity is maintained by the quality control system.
- 1.5.8.4** All critical parts shall be fabricated to the valve manufacturer's specifications. Critical parts are defined as any part which may affect the flow passage, capacity, or valve function.
- 1.5.8.5** When the original manufacturer's nameplate is missing or illegible, or when valve parts are no longer available from the manufacturer, a system will be in place to provide positive valve identification or replacement.

1.5.9 Repair and Inspection Program

The repair and inspection program section shall include reference to a document (such as a report, traveler, or check list) which outlines the specific repair and inspection procedures used in the repair of safety and safety relief valves. Provisions shall be made to retain this document for a period of at least five (5) years as a part of quality control traceability documents.

- 1.5.9.1** Each valve or group of valves shall be accompanied by the document referred to above for processing through the plant.
- 1.5.9.2** The document referred to above should include material check, reference to items such as the welding procedures specifications (WPS), fitup, NDE technique, heat treatment, and pressure test methods to be used. There should be a

space for "sign-offs" at each operation to verify that each step has been properly performed.

- 1.5.9.3** The system shall include a method of controlling the repair or replacement of critical valve parts. The method of identifying each spring shall be indicated.

1.5.10 Welding, NDE, and Heat Treatment

The quality control manual is to indicate the title of the person(s) responsible for the development and approval of the welding procedure specifications and their qualifications and the qualifications of welders and welding operators. It is essential that only welding procedure specifications and welders or welding operators qualified to the requirements of the ASME Boiler and Pressure Vessel Code, Section IX, be used in the valve repair. Similarly, NDE and heat treatment techniques must be covered in the quality control manual. This section should also include outside contracting for services and qualifications.

1.5.11 Valve Testing and Setting

The system shall include provisions that every valve shall be tested, set, and all external adjustments sealed according to the requirements of the applicable ASME Code section.

The seal shall identify the repair organization. Abbreviations or initials shall be permitted, provided such identification is acceptable to the authorized inspector.

1.5.12 Valve Repair Tags

An effective system shall be established to ensure proper tagging of each valve. The manual shall include a description of the tag or a drawing.

1.5.13 Calibration of Measurement and Test Gages

The calibration of measurement and test gage system shall include the periodic calibration of measuring instruments and pressure gages.

Pressure gages used for setting valves are to be checked periodically (indicate frequency) by authorized quality control personnel. The method of gage testing is to be indicated and results recorded.

Periodically, all master gages shall be calibrated, preferably but not necessarily, to measuring equipment traceable to the National Bureau of Standards.

1.5.14 Training of Valve Repair Personnel

The certificate holder shall describe a system of providing and documenting in-house training for persons repairing, testing, setting, and sealing safety valves and safety relief valves. This training shall include and document the following as a minimum:

- 1.5.14.1** a general working knowledge of the organization's quality control manual;
- 1.5.14.2** a general working knowledge of the applicable requirements;
- 1.5.14.3** a general working knowledge of the manufacturer's technical bulletin for valves being repaired, tested, set, and sealed.