**815 KAR 15:025. New installations, general design, construction, and inspection criteria for boilers, pressure vessels, and pressure piping.**

RELATES TO: KRS Chapter 236

STATUTORY AUTHORITY: KRS 236.030, 236.040, 236.060, 236.110, 236.120, 236.240

NECESSITY, FUNCTION, AND CONFORMITY: KRS 236.030 requires the commissioner to promulgate administrative regulations that establish standards for the safe construction, installation, inspection, and repair of boilers, pressure vessels, and associated pressure piping. KRS 236.040 requires all boiler and pressure vessels to conform to the rules and regulations formulated by the commissioner and establishes the standards for pressure piping and pressure vessels for human occupancy. KRS 236.110 establishes the inspection requirements for boilers, pressure vessels, and pressure piping. This administrative regulation establishes the design, construction, and inspection requirements of the boiler inspection section for all boilers and pressure vessels not exempted by KRS 236.060.

Section 1. Minimum Standards.

(1) Boilers and pressure vessels. All new boilers and new pressure vessels shall comply with applicable provisions of 815 KAR Chapter 15 and the ASME Boiler and Pressure Vessel Code, 2013 Edition or subsequent editions, as established by KRS 236.040(2), except new boilers and new pressure vessels approved as state specials pursuant to Section 4 of this administrative regulation. All pressure vessels for human occupancy shall comply with the ASME Safety Standard for Pressure Vessels for Human Occupancy, 2012 Edition or subsequent editions, as established by KRS 236.040(3).

(2) ASME stamps. New boilers and new pressure vessels shall be stamped with the applicable certification mark of the ASME Boiler and Pressure Vessel Code.

(3) Installation standard. Installation of all boilers and pressure vessels shall conform to the National Board Inspection Code Part 1, 2015 edition or subsequent editions.

(4) Pressure piping.

(a) All new pressure piping installations connected to the boiler or pressure vessel shall conform to the National Board Inspection Code Part 1, 2015 edition, and the applicable standards referenced in this subsection, as established by KRS 236.040(2):

1. ASME Code for Power Piping, B31.1, 2012 edition or subsequent editions;
2. ASME Code for Process Piping, B31.3, 2012 edition or subsequent editions;
3. ASME Code for Refrigeration Piping and Heat Transfer Components, B31.5, 2013 edition or subsequent editions;
4. ASME Code for Building Services Piping, B31.9, 2011 edition or subsequent editions; and
5. ASME Code for Hydrogen Piping and Pipelines, B31.12, 2014 edition or subsequent editions.

(b) The maximum allowable design temperature and pressure of the piping system and all of its component parts shall meet or exceed the operating control settings of the boiler or pressure vessel.

(c) If the maximum allowable design temperature or pressure of the boiler exceeds the maximum design limits of the piping system or any of its component parts, the pipe and its components shall not be used unless the following conditions are met:

1. The temperature and pressure controls on the boiler are permanently set to prevent operation in excess of the design limits of the piping system; and
2. Safety valve or valves shall be installed on the boiler, pressure vessel, or the piping system to protect the system from excess pressure or temperature.

(5) Welded piping joints. Welded joints in pressure piping shall be installed by qualified welders in accordance with the ASME Code, Section IX, as required by the standards referenced in subsection (4) of this section.

Section 2. Manufacturer's Data Report.

(1) A manufacturer's data report on all boilers of steel construction and all pressure vessels constructed in accordance with the ASME Boiler and Pressure Vessel Code shall be filed with the National Board of Boiler and Pressure Vessel Inspectors unless the boiler or pressure vessel is exempted by KRS 236.060 or the pressure vessel has an ASME "UM" certification mark. A pressure vessel with an ASME "UM" certification mark may be registered with the National Board of Boiler and Pressure Vessel Inspectors.

(2) The boilers and pressure vessels required to be filed with the National Board in subsection (1) of this section shall include the National Board registration number on the manufacturer's date plate.

Section 3. Installation Inspection or First Inspection and State Registration of New Boilers and Pressure Vessels.

(1) Installation inspection. New installations of boilers, pressure vessels, and associated pressure piping shall be inspected by the department for compliance with applicable ASME Boiler and Pressure Vessel Code requirements, the National Board Inspection Code, and this administrative regulation.

(2) Notification of inspection.

(a) If an inspection is required by this administrative regulation, the owner or user shall prepare each boiler, pressure vessel, and pressure piping system for inspection pursuant to this administrative regulation and the National Board Inspection Code, Part I.

(b) The owner or user shall prepare for and apply a hydrostatic pressure or other leak test on the date if requested by the boiler inspector, special boiler inspector, or owner-user inspector.

(c) Inspections shall be conducted within seven (7) days of the date of notification.

(3) Inspection times. Except as established in 815 KAR 15:027, inspections made by boiler inspectors shall be conducted during normal business hours of the department between 8:00 a.m. and 4:30 p.m. Monday through Friday.

(4) Contractor availability. The boiler and pressure vessel contractor shall be available to the boiler inspector, physically or electronically, at the time of the inspections.

(5) State registration. Upon completion of the installation or at the time of first inspection, a Commonwealth of Kentucky registration number shall be assigned to the boiler or pressure vessel and shall be applied to the boiler or pressure vessel with a metal tag showing the registration number. This tag shall be securely affixed near the manufacturer's name plate or data plate.

(6) Non-registered boilers and non-registered pressure vessels. Boiler inspectors, special boiler inspectors, and owner-user inspectors shall notify the department within thirty (30) days of locating any non-registered boiler or non-registered pressure vessel.

(7) General welding.

(a) If welded assembly has been used, the installing boiler and pressure vessel contractor shall produce the following for the boiler inspector's, special boiler inspector's, or owner's piping inspector's review:

1. The welding procedures; and

2. Proof of qualification and continuity records for the welders and welding operators.

(b) The boiler and pressure vessel contractor shall be responsible for the quality of the welding.

(8) Welded piping joints. Welded joints in pressure piping shall be visually inspected for complete and full root penetration, soundness of the weld and freedom from undercutting,

cracking, or other surface imperfections in accordance with the requirements of the applicable ASME B31 Code section. If the visual inspection reveals a potential defect, the boiler inspector, special boiler inspector, or owner's piping inspector may require other nondestructive tests, such as radiography, to be performed by the contractor to verify the soundness of the weld. All tests or retests required by the boiler inspector, special boiler inspector, or owner's piping inspector shall be at the owner's or boiler and pressure vessel contractor's expense.

(9) Hydrostatic pressure test for boilers and pressure vessels.

(a) A hydrostatic pressure test, when applied to a boiler or pressure vessel, shall conform to the testing procedures and pressures as specified in the original code of construction. The pressure shall be under proper control so that in no event shall the required test pressure exceed the testing requirements listed in the original code of construction.

(b) During the hydrostatic pressure test, the safety valve or valves shall be removed. If the safety valve or valves cannot be removed, then each valve disc shall be held down by means of a testing clamp and not by screwing down the compression screw upon the spring.

(c) The minimum temperature of the water used to apply a hydrostatic test shall not be less than ambient temperature, but in no case less than seventy (70) degrees Fahrenheit, and the maximum temperature shall not exceed 120 degrees Fahrenheit.

(d) If the only purpose of the test is to determine tightness, the test pressure shall be equal to the relieving pressure of the safety valve having the lowest relief setting.

(10) Pressure test for pressure piping. Pressure piping systems installed in association with the boiler or pressure vessel shall be inspected for proper materials, adequate pressure, and temperature ranges for the boiler or pressure vessel operation and for adequate support and tightness as established in this subsection.

(a) Hydrostatic and pressure leak tests.

1. Except as stated in paragraph (b), hydrostatic or other leak tests shall be performed on the pressure piping system connected to the boiler or pressure vessel and shall conform to the procedures and test pressures outlined in the original code of construction.

2. Non-destructive testing shall be used if hydrostatic or leak testing cannot be performed.

3. Original mill material stencils and markings used to verify material shall be legible at the time of inspection. Pipe, including welding joints, shall not be painted or covered prior to inspection.

(b) Alternative testing.

1. The following piping systems shall be inspected visually under in-service conditions:

a. Compressed air systems with a MAWP of 200psi or less, a pipe diameter of two (2) inches or less, and no welded joints;

b. Hydronic heating or process systems with a MAWP of 100psi or less, a pipe diameter of two (2) inches or less, and no welded joints;

c. Steam condensate systems with a MAWP of 50psi or less, a pipe diameter of two (2) inches or less, and no welded joints;

d. Non-ammonia refrigeration with a pipe diameter of two (2) inches or less and no welded joints; and

e. Cryogenic piping with a pipe diameter of two (2) inches or less and no welded joints.

2. Sufficient openings shall be made in any insulation to determine pipe material. Welded piping joints shall not be covered with insulation prior to inspection.

3. Pipe may be painted prior to inspection if the owner or user provides documentation of materials that make up the pipe to the inspector. Welded joints shall not be painted prior to inspection.

(c) Code compliance. Pressure piping inspections shall include determining compliance with applicable ASME B31 Code including material specifications for the piping and component parts. The boiler and pressure vessel contractor shall provide documentation to the boiler inspector, special boiler inspector, owner's piping inspector, or owner-user inspector showing that:

1. The materials used and method of construction meets the manufacturer's procedures and specifications; and

2. The system is utilizing the materials and equipment specified within the temperature and pressure ranges set forth in the design and as required by this administrative regulation.

Section 4. State Special.

(1) Boilers and pressure vessels of special design, which are equivalent to but are not eligible to be stamped to the ASME Code, shall meet the requirements of this section. The prospective owner or user who desires approval of the boiler installation or pressure vessel installation as a state special shall comply with the procedures established in this administrative regulation for each case.

(a) Prior to installation and operation of the boiler or pressure vessel, the proposed owner, user, or the owner's authorized agent shall make written application for permission to install the boiler or pressure vessel. The application shall be submitted to the commissioner.

(b) To establish ASME Boiler and Pressure Vessel Code equivalency, the following data, material, and information shall be submitted with the application for state special approval:

1. Detailed shop drawings and welding details of the proposed construction. All materials shall be in the English language and United States units of measurements listed in the ASME Code;

2. Design calculations and supporting data, which shall include pressure (psi), temperature (deg. F.), use, and other service conditions;

3. Specifications for all construction materials shall conform to the applicable ASME Code standards or their suitable equivalent. If reference is made to a standard or specification of a country other than the United States, a copy shall be attached to indicate how the material is considered equivalent;

4. Copies of the welding procedures to be used and welding qualification test reports for each welding operator or welder to be used. The procedures and tests required in this paragraph shall be made in accordance with the ASME Boiler and Pressure Vessel Code, Section IX, "Welding Qualifications;"

5. If the design exceeds ASME Boiler and Pressure Vessel Code limitation, then API 579/ASME FFS-1, 2007 or later edition shall be used to determine equivalency of the submission;

6. Design drawings and calculations shall be certified by a mechanical engineer holding a professional engineer certification with a background in boilers and pressure vessels;

7. The manufacturer of the vessel shall identify the inspection agency responsible for the shop inspections and shall submit an equivalent ASME manufacturer's data report for the proposed vessel; and

8. The shop inspection agency shall furnish the qualifications of the authorized inspector assigned to make the shop inspections.

(2) Upon completion of the boiler or pressure vessel, a manufacturer's data report, signed by the manufacturer and authorized inspector, shall be submitted to the jurisdictional authorities containing the equivalent type data required by the ASME Boiler and Pressure Vessel Code. ASME Boiler and Pressure Vessel Code data report forms shall not be used.
(3) Upon arrival in the Commonwealth of Kentucky, the boiler or pressure vessel shall be inspected before installation by a boiler inspector to verify compliance with this section.

Section 5. General Requirements.

(1) Safety appliances. The safety appliances required by these administrative regulations shall not be removed or tampered with except for the purpose of making repairs. The resetting of safety valves shall be done by a V-R stamp holder.

(2) Additional Hazards. If an additional hazard is possible by exposure of a pressure vessel to fire or other unexpected sources of external heat, supplemental pressure relieving devices shall be installed capable of protecting against excessive pressure. These supplemental pressure relieving devices shall be capable of preventing the pressure from rising more than twenty-one (21) percent above the MAWP.

(3) Pressure relieving device.

(a) A pressure relieving device shall be constructed, located, and installed so that the device is readily accessible for inspection and repair and cannot be readily rendered inoperative; and

(b) A pressure relieving device shall be selected so that the intended service of the pressure relieving device corresponds with the boiler or pressure vessel on which the pressure relieving device is installed.

(4) Relieving capacity. The minimum relieving capacity of the safety valve(s) or safety relief valve(s) shall be equal to or exceed the maximum output of the boiler.

(5) Omission or removal of pressure relieving device.

(a) If a pressure relieving device is omitted or removed, the device shall be omitted or removed in accordance with ASME Section VIII, Division 1, UG-140, Appendix M and ASME Section VIII, Division 2, Part 9, or Division 3, Part KR.

(b) If a pressure relieving device is omitted or removed pursuant to the standards established in subparagraph 1. of this paragraph, except ASME Section VIII, Division 1, Appendix M., the Boiler Inspection Section shall be notified prior to the omission or removal, and prior to the pressure vessel being placed in service.

(c) The required documentation of calculations pursuant to paragraph (a) in this subsection shall be submitted to the Boiler Inspection Section for review and acceptance or rejection of the proposed omission or removal.

(6) Location of discharges to atmosphere. The discharge of safety valves, blowoff pipes, and other outlets shall be located to prevent injury to persons and property.

(7) Boiler external piping.

(a) Boiler external piping shall be attached in accordance with ASME Section I and B31.1.

(b)

1. If two (2) or more boilers with manholes are connected to a common steam or high temperature water main or header, all welded external piping from the boiler out to the second stop valve shall be installed by a manufacturer or contractor authorized to use any one (1) of the ASME Code symbol stamps for pressure piping, power boilers, or assembly stamps.

2. The piping or fittings, adjacent to the welded joint farthest from the boiler, shall be stamped with the pressure piping, power boiler, or assembly code symbol stamp of the ASME when approved by the boiler inspector, special inspector, or owner-user inspector.

(8) Manually fired boilers.

(a) Gauge cocks. Each manually fired boiler shall comply with ASME Section I, except a manually fired boiler built before the publication of the 1991 Addenda to ASME Section I (1989 Edition), shall have three (3) or more gauge cocks located within the range of the visible length of the water glass, except if the boiler has two (2) water glasses with independent connections to the boiler located on the same horizontal lines and not less than two (2) feet apart. Two (2) gauge cocks shall be sufficient for boilers not over thirty-six (36) inches in diameter in which the heating surface does not exceed 100 square feet.

(b) Fusible plugs. A fire-actuated fusible plug, if used, shall conform to the requirements of ASME Section I, Paragraphs A-19, A-20 and A-21.

(9) Clearance.

(a) If boilers or pressure vessels are replaced or new boilers or new pressure vessels installed in either existing or new buildings, a minimum of two (2) feet shall be provided on all service sides. Boiler and pressure vessels having manholes shall have five (5) feet clearance between the manhole opening and any wall, ceiling, or piping that will prevent a person from entering the boiler or pressure vessel.

(b) Boilers shall be installed to:

1. Allow adequate space for their proper operation and their appurtenances;

2. Allow inspection of all surfaces, tubes, water walls, economizer, piping, valves, and other equipment; and

3. Allow for necessary maintenance and repair.

(c) A boiler or pressure vessel subject to external corrosion shall be installed so that there is sufficient access to all parts of the exterior to permit proper inspection of the exterior surfaces, or the boiler or pressure vessel shall have a connection so that the vessel can be readily removed from its location for inspection.

(d) If a cylindrical vessel is installed in a vertical position and subject to corrosion, the bottom head, if dished, shall be concave to pressure to facilitate proper drainage.

(e) The installed boiler or pressure vessel shall be located so that the data plate shall be accessible to the boiler inspector, special inspector, or owner-user inspector and shall not be obstructed by insulation or other covering not readily removable.

(10) Emergency shutdown switches.

(a)

1. Installations of power boilers, heating boilers, or hot water supply boilers shall have a manually operated remote boiler shutdown switch or circuit breaker located near the boiler room door, inside or outside of the boiler room, and marked for easy identification. Consideration shall also be given to the type and location of the switch to safeguard against tampering.

2. If there is more than one (1) door to or from the boiler room, a switch shall be located at each door.

3. A cover plate may be used to prevent accidental activation of the shutdown switch, if the cover plate is easily opened or removed.

4. If a shutdown switch is activated, the shutdown switch shall require a manual reset.

5. The shutdown switch shall cause the display or indicator lights on a boiler to turn off, or otherwise indicate that the boiler has been shut down.

6. If a new boiler is installed in an existing boiler room, all existing boilers shall be connected to the emergency shutdown switch.

(b) A power boiler or heating boiler installed prior to July 1, 2015 shall be exempt from paragraph (a) of this subsection unless the power boiler or heating boiler installed prior to July 1, 2015 is located in a hospital, rest home, school, day care, jail, mental institution, or similar institutional facility.

(c) Paragraph (a) of this subsection shall not apply to manufacturing and power generating facilities.

Section 6. Incorporation by Reference.

(1) The "National Board Inspection Code", 2015 Edition, is incorporated by reference.

(2) This material may be inspected, copied, or obtained, subject to applicable copyright law, at the Department of Housing, Buildings and Construction, Division of Plumbing, Boiler Section, 500 Mero Street, Frankfort, Kentucky 40601, Monday through Friday, 8 a.m. to 4:30 p.m.

(20 Ky.R. 2753; 2975; eff. 5-18-1994; TAm eff. 8-9-2007; 42 Ky.R. 1621; 2109; eff. 2-5-2016; 44 Ky.R. 813, 1335; eff. 1-5-2018; TAm eff. 5-29-2020; Cert to Am, filing deadline 6-2-2026.)