

Kansas Administrative Regulations

Department of Labor

Article 51.—High Pressure Boilers

49-51-6. Safety valves.

(a) Weighted-lever safety valves that have either a seat or a disk that is made of cast iron shall not be used. The owner, user, or installer of the boiler shall replace any valve of this type of construction, when found, with a direct, spring-loaded, pop-type valve that conforms to the applicable standards of the following:

(1) ASME code, section I, rules for construction of power boilers, which is adopted in K.A.R. 49-45-1;

(2) ASME code, section IV, rules for construction of heating boilers, which is adopted in K.A.R. 49-45-5; and

(3) ASME code, section VIII, rules for construction of pressure vessels, division 1, which is adopted in K.A.R. 49-45-29.

(b) Each high pressure boiler shall have at least one safety valve that is approved and certified by the ASME and the national board. If the boiler has more than 500 square feet of water-heating surface or an electric power input of more than 500 kw, the boiler shall have two or more safety valves of the same type.

(c) Each safety valve required in subsection (b) shall be connected to the boiler in a vertical position, shall be independent of any other steam connection, and shall be attached as close as possible to the boiler without unnecessary intervening pipe or fittings. If an alteration is required to conform to this requirement, the owner, user, or installer of the boiler shall be allowed a reasonable period of time in which to complete the work as permitted by the chief inspector.

(d) No valves of any type shall be placed between the safety valve and the boiler or on any escape pipe. If an escape pipe is used, its size shall be at least the same size of the safety valve discharge, and the pipe shall be fitted with an open drain to prevent water from lodging in the upper part of the safety valve or in the escape pipe. Horizontal escape piping that provides adequate gravity drainage shall not normally require the

fitting of an open drain. If an elbow is placed on a safety valve escape pipe, the elbow shall be located close to the safety outlet, or the escape pipe shall be anchored and supported securely. All safety discharges shall be so located or piped to be carried clear of walkways or platforms. If discharge piping is directed downward, the pipe shall terminate no more than six inches above floor level. Plastic discharge piping shall not be used on any safety valve discharge line.

(e) The safety valve capacity of each boiler shall be sufficient to discharge all of the steam that can be generated by the boiler without allowing the pressure of the boiler to rise more than six percent above the boiler's highest pressure to which any valve is set. The pressure of the boiler shall not be allowed to rise more than six percent above the boiler's maximum allowable working pressure.

(f) Each boiler shall have one or more safety valves that are set at or below the maximum allowable working pressure of the boiler. The remaining valves may be set within a range of three percent above the maximum allowable working pressure of the boiler. The range of the settings for all of the safety valves on a boiler shall not exceed 10% of the highest pressure to which any valve is set.

(g) When two or more interconnected boilers are operating at different pressures and with different safety valve settings, the lower-pressure boilers or the interconnected piping shall be equipped with safety valves that have a sufficient capacity to prevent overpressure, considering the maximum generating capacity of all of the boilers.

(h) If a boiler is supplied with feedwater directly from water mains without the use of a feeding apparatus, excluding return traps, a safety valve shall not be set at a pressure greater than 94% of the lowest pressure obtained in the water supply main feeding the boiler. The relieving capacity of all of the safety valves on that boiler shall be checked by one of the three following methods, and, if their relieving capacity is found to be insufficient, additional valves shall be provided:

(1) By making an accumulation test. An accumulation test shall consist of shutting off all other steam discharge outlets from the boiler and forcing the fires to the maximum. The safety valve's relieving capacity shall be sufficient to prevent a rise of pressure in excess of six percent of the boiler's maximum allowable working pressure. This method shall not be used on a boiler with a superheater or reheater;

(2) by measuring the maximum amount of fuel that can be burned and by computing the corresponding steam-generating capacity upon the basis of the heating value of this fuel. These computations shall be made as outlined in the appendix of the ASME code, section I, which is adopted in K.A.R. 49-45-1; or

(3) by measuring the maximum amount of feedwater that can be evaporated.

If either of the methods outlined in paragraphs (h)(1) and (h)(2) is employed, the sum of the safety valve capacities shall be equal to or greater than the maximum evaporative capacity, which is the maximum steam-generating capacity of the boiler.

(i) Top-discharge safety valves shall not be used on any steam boiler.

(Authorized by and implementing K.S.A. 44-916; effective May 1, 1987; amended April 28, 2000; amended Nov. 3, 2006.)

***** Authenticated Kansas Administrative Regulation *****