875—94.4(89) Steam heating boilers installed before July 1, 1960—requirements. All steam heating boilers installed before July 1, 1960, shall be constructed and installed in accordance with this rule.

94.4(1) Safety valves.

a. Each steam boiler will have one or more safety valves bearing the National Board "HV" stamp of the spring-pop type adjusted and sealed to discharge at a pressure not to exceed 15 psig. Seals will be attached in a manner to prevent the valve from being taken apart without breaking the seal. The safety valves will be arranged so that they cannot be set to relieve at a higher pressure than the maximum allowable working pressure of the boiler. For iron and steel bodied valves exceeding 2-inch pipe size, the drain hole or holes will be tapped not less than 3/8-inch pipe size.

b. The safety valves will be located in the top or side of the boiler. They will be connected directly to a tapped or flanged opening in the boiler, to a fitting connected to the boiler by a short nipple, to a Y-base, or to a valveless header connecting steam or water outlets on the same boiler. Coil or header type boilers will have the safety valve located on the steam outlet end. Safety valves will be installed with their spindles vertical. The opening or connection between the boiler and any safety valve will have at least the area of the valve inlet.

c. Safety valves ½-inch or more in diameter that are installed on a steam boiler will have a hand-lifted device that will positively lift the disk from its seat at least 1/16 inch when there is no pressure in the boiler. The seats and disks will be of noncorrosive material.

d. Safety valves for a steam boiler will be at least ½ inch unless the boiler and radiating surfaces consist of a self-contained unit. Safety valves will not be larger than 4½ inches. The inlet opening will have an inside diameter equal to or greater than the seat diameter.

e. The minimum relieving capacity of the valve or valves will be governed by the capacity marking on the boiler.

f. The minimum valve capacity in pounds per hour will be equal to the steam generation as specified in 481—subrules 92.6(9) and 92.6(10).

g. The safety valve capacity for each steam boiler will be such that with the fuel burning equipment operated at maximum capacity the pressure will not rise more than 5 percent above the maximum allowable working pressure.

h. When operating conditions are changed or additional boiler heating surface is installed, the valve capacity will meet the new conditions.

94.4(2) Steam gages.

a. Each steam boiler will have a steam gage or a compound steam gage connected to its steam space, its water column, or to its steam connection. The gage or connection will contain a siphon or equivalent device that will develop and maintain a water seal that will prevent steam from entering the gage tube. The connection will be so arranged that the gage cannot be shut off from the boiler except by a cock placed in the pipe at the gage and provided with a tee or lever-handle arranged to be parallel to the pipe in which it is located when the cock is open. The connections to the boiler will be not less than ¼-inch standard pipe size, but where steel or wrought-iron pipe or tubing is used, it will be not less than ½-inch standard pipe size. The minimum size of a siphon, if used, will be ¼-inch inside diameter. Ferrous and nonferrous tubing having inside diameters at least equal to that of standard pipe size listed above may be substituted for pipe.

b. The scale on the dial of a steam boiler gage will be graduated to not less than 30 psig nor more than 60 psig. The travel of the pointer from zero to 30 psig pressure will be at least 3 inches on a compound gage, and effective stops will be set at the limits of the gage readings on both the pressure and vacuum sides of the gage.

94.4(3) Water gage glasses.

a. Each steam boiler will have one or more water gage glasses attached to the water column or boiler by means of valved fittings not less than ½-inch pipe size with the lower fittings provided with a drain valve having an unrestricted drain opening not less than ¼-inch diameter to facilitate cleaning. Gage glass replacement will be possible under pressure. Water gage glass fittings may be attached directly to a boiler.

b. The lowest visible part of the water gage glass will be at least 1 inch above the lowest permissible water level recommended by the boiler manufacturer. With the boiler operating at this lowest permissible water level, there will be no danger of overheating any part of the boiler.

c. 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 expected in service.

94.4(4) Water column and water level control pipes.

a. The minimum size of ferrous or nonferrous pipes connecting a water column to a steam boiler will be 1 inch. No outlet connections, except for damper regulator, feedwater regulator, steam gages or apparatus that does not permit the escape of any steam or water, except for manually operated blowdowns, will be attached to a water column or the piping connecting a water column to a boiler. If the water column, gage glass, low-water fuel cutoff or other water level control device is connected to the boiler by pipe and fittings, no shutoff valves of any type will be placed in such pipe, and a cross or equivalent fitting to which a drain valve and piping may be attached will be placed in the water piping connection at every right angle to facilitate cleaning. The water column drainpipe and valve will be not less than ¾-inch pipe size.

b. The steam connections to the water column of a horizontal firetube wrought boiler will be taken from the top of the shell or the upper part of the head, and the water connection will be taken from a point not above the center line of the shell. For a cast iron boiler, the steam connection to the water column will be taken from the top of an end section or the top of the steam header, and the water connections will be made on an end section not less than 6 inches below the bottom connection to the water gauge glass.

94.4(5) Pressure control.

a. In addition to the operating control for normal boiler operation, each individual, automatically fired steam heating boiler will have a high-limit, pressure-actuated combustion control that will cut off the fuel supply to prevent the pressure from rising over 15 psig. The separate controls may have a common connection to the boiler. Upon replacement of the high-limit, pressure-actuated combustion control, controls with manual reset will be installed.

b. In a multiple boiler installation where the operating pressure control may be installed in a header or other point common to all boilers and could be isolated from any or all of the boilers, there will be at least one high-limit, pressure-actuated combustion control mounted on each boiler.

c. No shutoff valve of any type will be placed in the connection to the high-limit, pressure-actuated control. The control or connections will contain a siphon or equivalent device that will develop and maintain a water seal that will prevent steam from entering the control. The connections to the boiler will not be less than ¼-inch standard pipe size, but where steel or wrought-iron pipe or tubing is used, the fittings will be not less than ½-inch standard pipe size. The minimum size of a siphon, if used, will be ¼-inch inside diameter. Ferrous and nonferrous tubing having inside diameters at least equal to that of standard pipe size listed above may be substituted for pipe where a manifold is used for a multiple control. The connection to the boiler will not be less than ¼-inch standard pipe size.

94.4(6) Automatic low-water fuel cutoff or water-feeding device.

a. Each automatically fired steam or vapor system boiler will have an automatic low-water fuel cutoff so located as to automatically cut off the fuel supply when the surface of the water falls to the lowest visible part of the water gage glass. If a water-feeding device is installed, it will be so constructed that the water inlet valve cannot feed water into the boiler through the float chamber and so located as to supply requisite feedwater.

b. A fuel cutoff or water-feeding device may be attached directly to a boiler or in the tapped openings available for attaching a water glass directly to a boiler. Connections in the tapped openings will be made to the boiler with nonferrous tees or "Ys" not less than ½-inch pipe size between the boiler and the water glass so that the water glass is attached directly and as closely as possible to the boiler. The run of the tee or "Y" will take the water glass fittings, and the side outlet or branch of the tee or "Y" will take the fuel cutoff or water-feeding device. The ends of all nipples will be reamed to full-size diameter.

c. Fuel cutoffs and water-feeding devices embodying a separate chamber will have a vertical straightway drainpipe and a blowoff valve not less than ¾-inch pipe size located at the lowest point in the water equalizing pipe connections so that the chamber and the equalizing pipe can be flushed and the device tested.

94.4(7) Stop valves for single steam heating boilers. When a stop valve is used in the supply pipe connection of a single steam boiler, there will be one used in the return pipe connection.

94.4(8) Stop valves for multiple steam heating boilers. A stop valve will be used in each supply and return pipe connection of two or more boilers connected to a common system.
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