HLW-801.7  Safety Relief Valve Discharge Piping.

(a) When a discharge pipe is used, its internal cross-sectional area shall be not less than the full area of the valve outlet or of the total of the valve outlets discharging thereinto, and shall be as short and straight as possible and so arranged as to avoid undue stress on the valve or valves. When an elbow is placed on a safety relief discharge pipe, it shall be located close to the valve outlet.

(b) The discharge from safety relief valves shall be so arranged that there will be no danger of scalding attendants. When the safety relief valve discharge is piped away from the water heater to the point of discharge, there shall be provisions for properly draining the piping and valve body. The size and arrangement of discharge piping shall be such that any pressure that may exist or develop will not reduce the relieving capacity of the relieving devices below that required to protect the water heater.

HLW-805  WATER SUPPLY

HLW-805.1 Connections. Water supply shall be introduced into a water heater through an independent water supply connection. Feedwater shall not be introduced through openings or connections provided for cleaning, safety relief valves, drain, pressure gage, or temperature gage.

HLW-805.2 Pressure. If the water supply pressure to a water heater exceeds 75% of the set pressure of the safety relief valve, a pressure reducing valve is required.

HLW-805.3 Stop Valves. Stop valves should be placed in the supply and discharge pipe connections of a water heater installation to permit draining the water heater without emptying the system.

HLW-809  PROVISIONS FOR THERMAL EXPANSION IN HOT WATER SYSTEMS

HLW-809.1 Expansion Tank. 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 safety relief valve may lift periodically. If an expansion tank is provided, it shall be constructed in accordance with Section VIII, Division 1 or Section X. See Figure HLW-809.1 for a typical acceptable installation (and Table HLW-809.1 for expansion tank capacities). Except for prepressurized diaphragm type tanks, which should be installed on the cold water side, provisions shall be made for draining the tank without emptying the system.

HLW-809.2 Piping. Provisions shall be made for the expansion and contraction of hot water mains connected to water heaters by providing substantial anchorage at suitable points and by providing swing joints when water heaters are installed in batteries, so that there will be no undue strain transmitted to the water heaters. See Figures HLW-809.1 and HLW-809.2 for typical schematic arrangements of piping incorporating strain absorbing joints.

HLW-810  BOTTOM DRAIN VALVE

(a) Each water heater shall have a bottom drain pipe connection fitted with a valve or cock. These shall be connected at the lowest practicable point on the water heater, or to the lowest point on piping connected to the water heater, at the lowest practicable point on the water heater. The minimum size bottom drain valve shall be 3/4 in. (DN 20).

(b) Any discharge piping connected to the bottom drain connection shall be full size to the point of discharge.

<Insert new paragraph (c) from next page>
New paragraph (c):

(c) The bottom drain valve of a potable water heater may be installed in a storage vessel piped directly to the water heater, provided the following requirements are met:

(1) The entire assembly, comprised of a single water heater and a single storage tank, including all controls, safety devices, piping, and fittings, has a common frame or enclosure and shall be listed and labeled by a nationally recognized testing agency for its intended use.

(2) The water heater shall be installed directly on top of the storage vessel.

(3) The drain valve shall be installed at the lowest practical point on the storage vessel.

(4) The minimum size of the bottom drain valve shall be 3/4 in. (DN 20).

(5) The drain on the storage vessel shall meet the requirements of HLW-810(b).