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Pre-Inspection Checklist for Hot Water Heating or Hot Water Supply Boilers

Notice: **This checklist reflects the most common violations BB&PVC field inspectors encounter when performing an inspection on low pressure hot water heating and supply boiler installations. It is suggested that boiler industry personnel have access to a current set of applicable codebooks, regulations, and jurisdiction laws, such as:** the American Society of Mechanical Engineers (ASME) Section IV and Section VI for Heating Boilers; the National Board Inspection Code (NBIC); the New Jersey Statutes Annotated, N.J.S.A. 34:7-1, N.J.S.A. 34:7-14; and the New Jersey Administrative Code, N.J.A.C. 12:90.

Administration and General Requirements

REFERENCE		COMPLIANCE YES	COMPLIANCE NO
N.J.A.C. 12:90-4.2 NBIC	A minimum clear space of eighteen inches (18”) shall be provided on all sides of the boiler. As a minimum, all other sides shall comply with the boiler manufacturer’s installation instructions for clearances to combustible materials.	☐	☐
N.J.S.A. 34:7-20 N.J.S.A. 34:7-23	The owner or user of any boiler required to be inspected upon installation/reinstallation shall not operate the boiler until a certificate-inspection has been made.	☐	☐
N.J.S.A. 34:7-23 N.J.A.C. 12:90-4.3	All low pressure steam boilers shall be constructed, stamped, and installed in conformance with Section IV of the ASME code.	☐	☐
ASME CSD-1 CG-500	Completion of the Installer’s Verification of Function Testing and Operation of Controls and Safety Devices for Boilers Rated Up to 12,499,999 Btu/hr is required. Form BPVC-INST.101 Rev 3.2010.	☐	☐

REFERENCE		COMPLIANCE YES	NO
	Instruments, Fittings, and Controls		
Section IV HG-611	Each hot water heating or hot water supply boiler shall have a pressure or altitude gage connected to it or its flow connection.	☐	☐
Section IV HG-611	The scale on the dial of the pressure or altitude gage shall be graduated approximately to not less than 1½ nor more than 3½ times the pressure at which the safety relief valve is set.	☐	☐
Section IV HG-611	Piping or tubing for pressure or altitude gage connections shall be of nonferrous metal when smaller than NPS 1 inch.	☐	☐
Section IV HG-612	Each hot water heating or hot water supply boiler shall have a thermometer so located and connected that it shall be easily readable. The thermometer shall be so located that it shall at all times indicate the temperature of the water in the boiler at or near the outlet.	☐	☐
Section IV HG-613	Each automatically hot water heating or hot water supply boiler shall be protected from over-temperature by two temperature-operated controls.	☐	☐
Section IV HG-613	Each individual automatically hot water heating or hot water supply boiler shall have a high temperature limit control that will cut off the fuel supply to prevent the water temperature from exceeding its marked maximum water temperature at the boiler outlet. This control shall be constructed to prevent the temperature setting above the maximum.	☐	☐
Section IV HG-613	Each individual automatically hot water heating or hot water supply boiler or each system of commonly connected boilers without intervening valves shall have a control that will cut off the fuel supply when the system water temperature reaches a preset operating temperature, which shall be less than the maximum water temperature.	☐	☐
Section IV HG-614	Each automatically fired hot water boiler with heat input greater than 400,000 Btu/hr 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 the lowest safe permissible water level established by the boiler manufacturer.	☐	☐

REFERENCE		COMPLIANCE YES	NO
	Instruments, Fittings, and Controls (continued)		
Section IV HG-614	A coil-type boiler or a watertube boiler with a heat input greater than 400,000 Btu/hr requiring forced circulation to prevent overheating of the coils or tubes shall have a flow-sensing device installed in lieu of a low-water fuel cutoff to automatically cut off the fuel supply when the circulating flow is interrupted.	☐	☐
	Installation Requirements		
Section IV HG-701	Safety valves and safety relief valves shall be located in the top or side of the boiler.	☐	☐
Section IV HG-701	Coil or header type boilers shall have the safety valve or safety relief valve located on the steam or hot water outlet end.	☐	☐
Section IV HG-701	Safety valves and safety relief valves shall be installed with their spindles vertical.	☐	☐
Section IV HG-701	The opening or connection between the boiler and any safety valve and safety relief valve shall have at least the area of the valve inlet.	☐	☐
Section IV HG-701.4	Safety valves and safety relief valves shall not be connected to an internal pipe in the boiler.	☐	☐
Section IV HG-701.5	No shutoff of any description shall be placed between the safety or safety relief valve and the boiler, or on discharge pipes between such valves and the atmosphere.	☐	☐
Section IV HG-701.6	A discharge pipe shall be used. Its internal cross-sectional area shall be not less than the full area of the valve outlet.	☐	☐
Section IV HG-701.6	The discharge from safety or safety relief valves shall be so arranged that there will be no danger of scalding attendants.	☐	☐
Section IV HG-701.6	The safety valve discharge shall be as short and straight as possible and so arranged as to avoid undue stress on the valve.	☐	☐
Section IV HG-701.7	Hot water heating or supply boilers limited to a water temperature of 210°F may have one or more officially rated temperature and pressure safety relief valves installed. If additional valves are used they shall be temperature and pressure safety relief valves.	☐	☐

REFERENCE		COMPLIANCE YES	NO

Installation Requirements (continued)

Section IV HG-701.7	When the temperature and pressure safety relief valve is mounted directly on the boiler with no more than 4 in. maximum interconnecting piping, the valve may be installed in the horizontal position with the outlet pointing down.	☐	☐
Section IV HG-703.1	Provisions shall be made for the expansion and contraction of hot water mains connected to boilers by providing substantial anchorage at suitable points and by providing swing joints when boilers are installed in batteries.	☐	☐
Section IV HG-705	Makeup water may be introduced into a hot water boiler through the piping system or through an independent connection.	☐	☐
Section IV HG-705	The water flow from the independent connection shall not discharge directly against parts of the boiler exposed to direct radiant heat from the fire.	☐	☐
Section IV HG-705	The 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.	☐	☐
Section IV HG-705	In lieu of a check valve in the makeup water line, a back flow preventive device may be used if it meets the requirements established by the Boiler Regulation Advisory on Backflow Preventers issued by the BB&PVC.	☐	☐
Section IV HG-709.2	On closed heating systems an expansion tank shall be installed that will be consistent with the volume and capacity of the system.	☐	☐
Section IV HG-709.2	Expansion tanks for systems designed to operate above 30 psi shall be constructed in accordance with ASME Section VIII, Division 1.	☐	☐
Section IV HG-709	Provisions shall be made for draining the tank without emptying the system, except for pre-pressurized tanks.	☐	☐
Section IV HG-709	For single hot water heating boilers stop valves shall be located at an accessible point in the supply and return pipe connections as near the boiler nozzle as is convenient.	☐	☐

REFERENCE		COMPLIANCE YES	NO

Installation Requirements (continued)

Section IV HG-709	When the boiler is located above the system and can be drained without draining the system, stop valves may be eliminated.	☐	☐
Section IV HG-710.3	A stop valve shall be used in each supply and return pipe connection of two or more boilers connected to a common system.	☐	☐
Section IV HG-710.4	The minimum pressure rating of all valves or cocks shall be at least equal to the pressure stamped on the boiler, and the temperature rating of such valves or cocks including all internal components, shall be not less than 250°F.	☐	☐
Section IV HG-715	Each hot water boiler shall have one or more drain connections, fitted with valves or cocks connecting to the lowest water containing spaces.	☐	☐
Section IV HG-715	The minimum size of the drain piping, valves, and cocks shall be ¾ inch. The discharge piping shall be full size to the point of discharge.	☐	☐
Section IV HC-325	All cast iron hot water boilers shall be provided with washout openings to permit the removal of any sediment. Washout plugs shall not be smaller than NPS 1½ inch for boilers having gross internal volume more than 5 cu ft. Washout plugs shall not be smaller than 1 inch for boilers having gross internal volume not more than 5 cu ft.	☐	☐

NOTE: Make certain that all items listed above are in compliance prior to requesting an inspection on a new or reinstalled boiler.

Please contact the BB&PVC if you have any questions regarding this document.