

Pre-Inspection Checklist for Low Pressure Steam Boilers

Notice: This checklist reflects the most common violations BB&PVC field inspectors encounter when performing an inspection on low pressure steam boiler installations. It is suggested that boiler industry personnel have access to a current set of applicable codebooks/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	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.	<input type="checkbox"/>	<input type="checkbox"/>
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.	<input type="checkbox"/>	<input type="checkbox"/>
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.	<input type="checkbox"/>	<input type="checkbox"/>
N.J.S.A. 34:7-23	All low pressure boiler fuel trains shall comply with the requirements of ASME CSD-1.	<input type="checkbox"/>	<input type="checkbox"/>
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.	<input type="checkbox"/>	<input type="checkbox"/>

REFERENCE**COMPLIANCE**
YES NO**Instruments, Fittings, and Controls**

Section IV HG-602	Each steam boiler shall have a steam gage or a compound steam gage connected to its steam space or to its water column or to its steam connection.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-602	The gage shall contain a siphon.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-602	The gage connection to the boiler shall not be less than NPS ½ inch. Where steel or wrought iron pipe is used the gage connection to the boiler shall not be less than NPS ½ inch.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-602	The scale on the dial of a low pressure steam gage shall be graduated to not less than 30 psi nor more than 60 psi.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-603	Each steam boiler shall have one or more water gage glasses attached to the water column or boiler by means of valved fittings not less than NPS ½ inch, with the lower fitting provided with a drain valve to facilitate cleaning.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-603	The lowest visible part of the water gage glass shall be at least 1 inch above the lowest permissible water level recommended by the boiler manufacturer.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-604	The minimum size of ferrous or nonferrous pipes connecting a water column to a steam boiler shall be 1 inch.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-604	The water column piping shall have a cross or equivalent fitting at every right angle turn to facilitate cleaning.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-604	No shutoff valves shall be placed between the steam boiler and water column.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-604	The water column drain pipe and valve shall be not less than NPS ¾ inch.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-605	Each automatically fired steam boiler shall have a control that will cut off the fuel supply when the pressure reaches an operating limit, which is less than the maximum allowable pressure.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-605	No shutoff valves shall be placed between the controls and steam boiler.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-605	The controls will be protected with a siphon.	<input type="checkbox"/>	<input type="checkbox"/>

REFERENCE**COMPLIANCE**
YES NO**Instruments, Fittings, and Controls (continued)**

Section IV HG-605	The control connection to the boiler shall not be less than NPS ¼ inch, if steel or wrought iron pipe is used it shall not be less than NPS ½ inch.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-606	Each automatically fired steam boiler shall 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.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-606	Fuel cutoffs and water feeding devices embodying a separate chamber shall have a vertical drain pipe and a blow-off valve not less than NPS ¾ inch, located at the lowest point in the water equalizing pipe connections so that the chamber and equalizing pipe can be flushed and the device tested.	<input type="checkbox"/>	<input type="checkbox"/>

Installation Requirements

Section IV HG-701	Safety valves and safety relief valves shall be located in the top or side of the boiler.	<input type="checkbox"/>	<input type="checkbox"/>
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.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-701	Safety valves and safety relief valves shall be installed with their spindles vertical.	<input type="checkbox"/>	<input type="checkbox"/>
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.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-701.4	Safety valves and safety relief valves shall not be connected to an internal pipe in the boiler.	<input type="checkbox"/>	<input type="checkbox"/>
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.	<input type="checkbox"/>	<input type="checkbox"/>
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.	<input type="checkbox"/>	<input type="checkbox"/>

REFERENCE**COMPLIANCE**
YES NO**Installation Requirements (continued)**

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.	<input type="checkbox"/>	<input type="checkbox"/>
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.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-703.1	Provisions shall be made for the expansion and contraction of steam mains connected to boilers by providing substantial anchorage at suitable points and by providing swing joints when boilers are installed in batteries.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-703.2	The return pipe connections of each boiler supplying a gravity return steam heating system shall be so arranged as to form a loop so that the water in each boiler cannot be forced out below the safe water level.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-705	Feedwater or water treatment shall be introduced into a steam boiler through the return piping system.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-705	Feedwater or water treatment shall not discharge directly against parts of the steam boiler exposed to direct radiant heat from the fire.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-705	The feedwater pipe shall be provided with a check valve near the steam boiler and a stop valve or cock between the check valve and the steam boiler or between the check valve and the piping system.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-710	In lieu of a check valve in the feedwater line, a back flow preventive device may be used if the device's minimum pressure rating is equal to the pressure stamped upon the steam boiler, and the temperature rating of such device including all internal components is not less than 250°F. If the backflow preventer does not meet these requirements a check valve shall be installed in addition to the back flow preventer.	<input type="checkbox"/>	<input type="checkbox"/>
Section IV HG-710	When a stop valve is used in the supply pipe connection of a single steam boiler, there shall be one used in the return pipe connection.	<input type="checkbox"/>	<input type="checkbox"/>

REFERENCE

COMPLIANCE
YES NO

Installation Requirements (continued)

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 upon 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-325 All cast iron steam boilers shall be provided with washout openings to permit the removal of any sediment. Washout plugs shall not be smaller than NPS ½ 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.

Section IV HG-715 Each steam boiler shall have a bottom blow-off connection fitted with a valve or cock connected to the lowest water space practicable with a minimum size as shown in the following table:

Minimum Required Safety Valve Capacity (Lb of Steam/Hr)	Blow-off Pipe Size (Inches)
Up to 500	¾
501 to 1250	1
1251 to 2500	1¼
2501 to 6000	1½
6001 and larger	2

Section IV HG-715 Steam boilers having a capacity of 25 gal or less are exempt from the above valve sizing requirements, except that they must have a ¾ NPS minimum drain valve connected to the lowest water containing space.

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