



## PRE-INSPECTION CHECKLIST FOR LOW PRESSURE STEAM BOILERS

**Notice:** This checklist reflects the most common violations our field inspectors encounter when performing an inspection on low pressure steam boiler installations. We recommend boiler industry personnel have access to a current set of applicable codebooks/jurisdictional laws, such as ASME Boiler Code Section IV, National Board Inspection Code (NBIC), [Chapter 296-104 WAC](#) and [Chapter 70.79 RCW](#) of the State of Washington Boiler and Unfired Pressure Vessels Laws.

<b>REFERENCE</b>		<b><u>COMPLIANCE</u></b>	
		Yes	No
<b>Administration and General Requirements</b>			
<a href="#">RCW 18.27 &amp; RCW 18.106</a>	Contractors must be registered with the Department of Labor & Industries before installing, and making repairs or modifications to any boiler.	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">RCW 70.79.320</a>	Once the installation/reinstallation is complete the owner or user shall not operate the boiler until a “Certification of Inspection” has been issued.	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">WAC 296-104-020</a>	A <a href="#">Boiler/Pressure Vessel Installation or Reinstallation Permit</a> form from must be submitted to the boiler section prior to making the installation/reinstallation of any boiler.	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">WAC 296-104-200</a>	All low-pressure steam boilers shall be constructed, stamped, and installed in conformance with ASME Section IV of the ASME code.	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">WAC 296-104-255 &amp; WAC 296-104-271</a>	The minimum clearance for low pressure steam boilers is determined by the BTU input. This information is specified in the reference WACs.	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">WAC 296-104-302</a>	All boilers installed or refitted after December 1998, shall be equipped with suitable primary safety controls, safety limit switches, and burners and electrical elements as required by a nationally or internationally recognized standard.	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">WAC 296-104-303</a>	A manually operated remote shutdown switch or circuit breaker should be located outside the boiler room door and marked for easy identification.	<input type="checkbox"/>	<input type="checkbox"/>
<a href="#">RCW 79.79.350 &amp; WAC 296-104-700</a>	The owner/user is responsible for fees. All inspection, permit and certificate fees must be submitted to the Dept. before a “Certificate of Inspection” is issued and the boiler is lawful to operate.	<input type="checkbox"/>	<input type="checkbox"/>

**REFERENCE****COMPLIANCE****Yes      No****Instruments, Fittings, and Controls**

<b>ASME Section IV HG-602 (a)</b>	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"/>
<b>ASME Section IV HG-602(a)</b>	The gage shall contain a siphon, or an equivalent device that will develop and maintain a water seal.	<input type="checkbox"/>	<input type="checkbox"/>
<b>ASME Section IV HG-602 (a)</b>	The gage connection to the boiler shall not be less than NPS ¼ 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"/>
<b>ASME Section IV HG-602 (b)</b>	The graduated scale on the dial of a low-pressure steam gage shall be not less than 30 psi or more than 60 psi.	<input type="checkbox"/>	<input type="checkbox"/>
<b>ASME Section IV HG-603 (a)</b>	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"/>
<b>ASME Section IV HG-603 (b)</b>	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"/>
<b>ASME Section IV HG-604 (a)</b>	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"/>
<b>ASME Section IV HG-604 (a)</b>	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"/>
<b>ASME Section IV HG-604 (a)</b>	No shutoff valves shall be placed between the steam boiler and water column.	<input type="checkbox"/>	<input type="checkbox"/>
<b>ASME Section IV HG-604(a)</b>	The water column drain pipe and valve shall be not less than NPS ¾ inch.	<input type="checkbox"/>	<input type="checkbox"/>
<b>ASME Section IV HG-605 &amp; WAC 296-104-301</b>	Each automatically fired steam boiler shall be protected from over pressure by two-pressure-operated controls, the highest which shall be provided with a manual reset.	<input type="checkbox"/>	<input type="checkbox"/>
<b>ASME Section IV HG-605 (c)</b>	No shutoff valves shall be placed between the controls and steam boiler.	<input type="checkbox"/>	<input type="checkbox"/>
<b>ASME Section IV HG-605 (c)</b>	The controls will be protected with a siphon, or an equivalent device that will develop and maintain a water seal.	<input type="checkbox"/>	<input type="checkbox"/>

**REFERENCE****COMPLIANCE****Yes      No****Instruments, Fittings, and Controls (Continued)**

<b>ASME Section IV HG-605 (c) (1)</b>	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"/>
<b>ASME Section IV HG-606 &amp; WAC 296-104-301</b>	Each automatically fired steam boiler shall have two 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. The lowest shall be equipped with a manual reset device. These devices must be independent of the feed water controller.	<input type="checkbox"/>	<input type="checkbox"/>
<b>ASME Section IV HG-606 (c)</b>	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"/>

**REFERENCE****COMPLIANCE****Yes      No****Installation Requirements**

<b>ASME Section IV HG-701.1</b>	Safety valves and safety relief valves shall be located in the top or side of the boiler, but in no case shall the safety valve be located below the lowest permissible water level.	<input type="checkbox"/>	<input type="checkbox"/>
<b>ASME Section IV HG-701.1</b>	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"/>
<b>ASME Section IV HG-701.1</b>	Safety valves and safety relief valves shall be installed with their spindles vertical.	<input type="checkbox"/>	<input type="checkbox"/>
<b>ASME Section IV HG-701.1</b>	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"/>
<b>ASME Section IV HG-701.4</b>	Safety valves and safety relief valves shall not be connected to an internal pipe in the boiler.	<input type="checkbox"/>	<input type="checkbox"/>
<b>ASME Section IV HG-701.5</b>	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"/>
<b>ASME Section IV HG-701.6 (a)</b>	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)**

**ASME Section IV  
HG-701.6 (a)**      A discharge pipe shall be used. Its internal cross-sectional area shall be not less than the full area of the valve outlet.           

**ASME Section IV  
HG-701.6 (a)**      The safety valve discharge shall be as short and straight as possible and so arranged as to avoid undue stress on the valve.           

**ASME Section IV  
HG-701.6 (b)**      The discharge from safety or safety relief valves shall be so arranged that there will be no danger of scalding attendants.           

**ASME 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.           

**ASME Section IV  
HC-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 1 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.           

**ASME Section IV  
HG-715**      Each steam boiler shall have a bottom blowoff 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	Blowoff Pipe Size Inches
Up to 500	¾
501 to 1250	1
1251 to 2500	1 ¼
2501 to 6000	1 ½
6001 and Larger	2

**ASME 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 in. 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.**