Preparing for Internal Boiler Inspections

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Thorough periodic boiler inspections are in line with best industry practices to ensure the boiler's safe and reliable operating condition.

How often you should have your boiler inspected varies according to jurisdictional law, so it's important to be familiar with your state and local regulations. Recommended frequencies range from one to five years, or at the inspector's discretion in the event of problems.

During an internal boiler inspection, the inspector conducts a thorough examination of the boiler's waterside and fireside conditions. All accessible boiler surfaces are visually examined for age, damage and proper installation.

Prepare for an Internal Inspection

Follow these steps to be prepared for an internal boiler inspection:

- De-energize the fuel supply and ignition systems, using lock-out/tag-out procedures.
- Don't drain the water until the boiler has been sufficiently cooled.
- Cool and thoroughly clean the boiler before the inspection.
- Disconnect pipes or valves to eliminate leakage of steam or hot water into the boiler.
- Remove products of combustion from fireside surfaces.

You will also want to follow these and other safety checks:

- Adhere to all applicable governmental, state, regional and local rules and safety regulations.
- Follow all proper lock-out/tag-out procedures.
- Do not allow entry until atmospheric test results are maintained at acceptable levels.

If the inspector finds deficiencies, you will be notified and asked to correct them, based on code requirements or in line with best industry practices.

Resource

National Board Inspection Code (NBIC), www.nationalboard.org/Index.aspx?pageID=4

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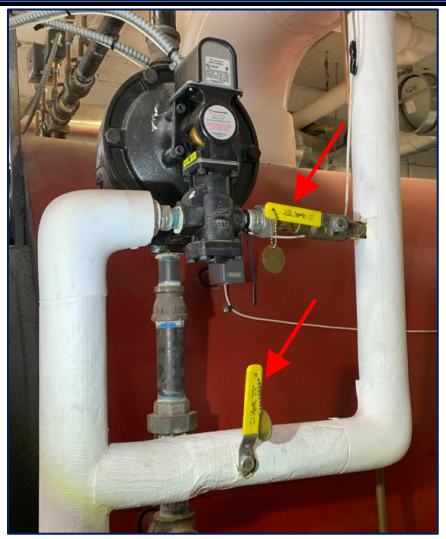
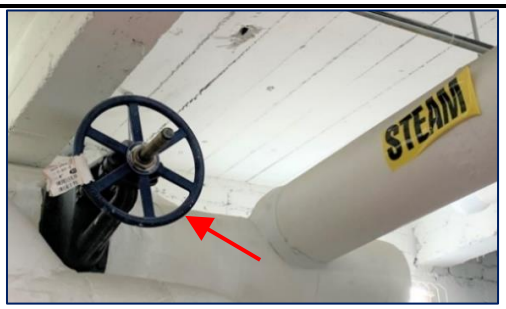
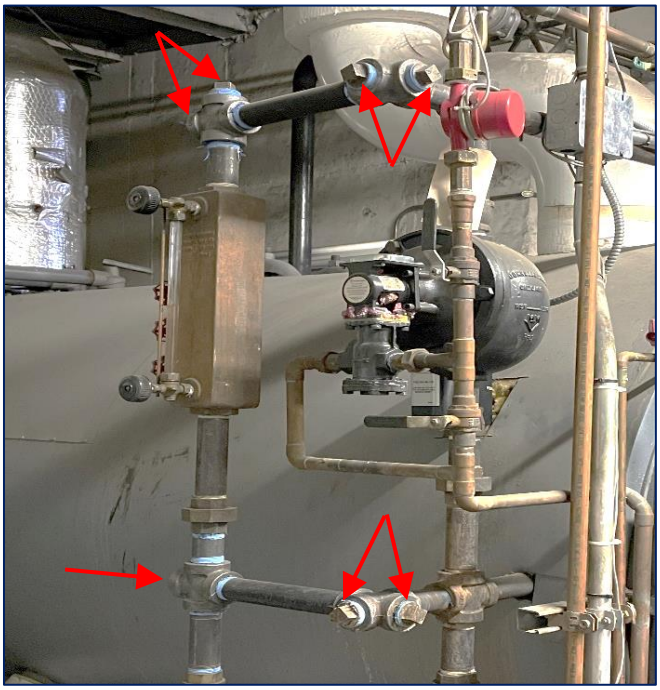
Internal Boiler Inspection Preparation Examples

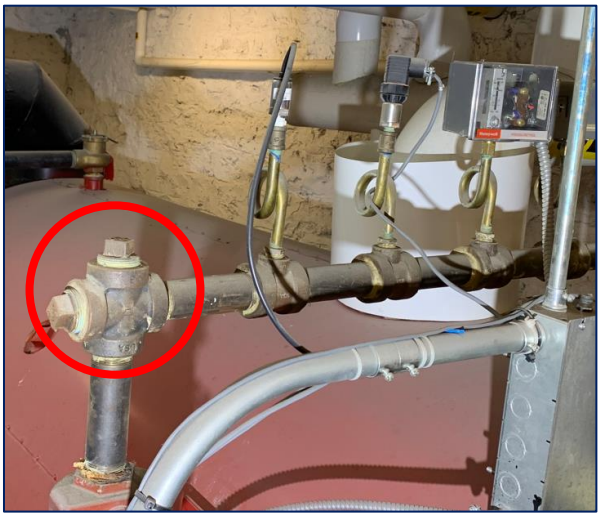
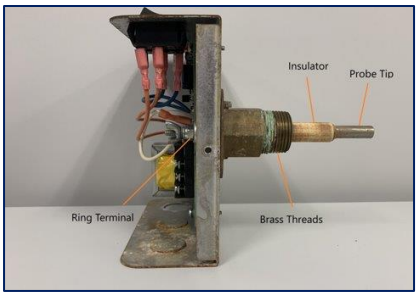
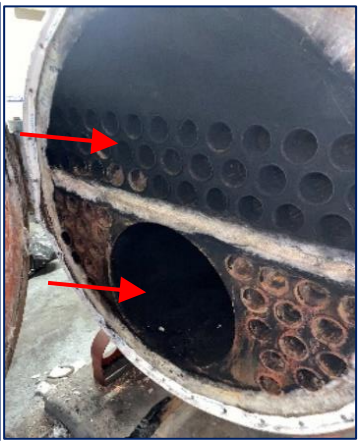
This document is provided to assist you in identifying typical boiler components that must be prepared prior to internal inspection of boilers. We recommend that preparations for an internal inspection be performed by qualified personnel with boiler service experience in adherence with the boiler manufacturer's recommendations. The boilers in your facility may differ in design with the examples provided in this document. Please review this document with a qualified boiler resource to ensure that the corresponding components on your boilers are properly prepared for inspection.

	Description	Example Photo
1	**Energy Source Isolation:** Example of standard lock-out / tag-out kit components, placed on secured energy sources to protect humans against accidental energy release during inspections. Please discuss any questions or concerns about proper lock-out /tag-out techniques and equipment with your inspector prior to preparation of the boiler.	
1A	**Electrical Energy Source Isolation:** Examples of electrical disconnects (emergency shutdown switch and circuit breakers) used to shut-off the boiler's electrical supply.	 **Circuit Breaker Panel**  **Emergency Switch**

	Description	Example Photo
1B	**Fuel Energy Source Isolation:** Examples of fuel supply shut-off valves (gas and oil) used to stop fuel flow to the boiler's burner.	Gas  Oil 
1C	**Water Source Isolation:** Example of feedwater supply shut-off valves used to stop water flow into boiler.	
1D	**Steam/Hot-water Energy Source Isolation:** Example of stop valves used to isolate the boiler from the system as-well-as steam/hot-water being generated by other boilers connected to a common header. When a header is shared, a free-blow drain valve between closed stop valves is opened.	 

	Description	Example Photo
1E	**Boilers with Common Connection Points:** Example of boilers connected by a common header with shared bottom blowdown lines (see "Boiler Drainage/Isolation" below).	
1F	**Chemical Injection Line Isolation:** Example of chemical injections systems used for boiler water treatment that are isolated before internal inspections.	
2	**Boiler Drainage/Isolation:** Example of bottom blowdown valve used to drain water from boiler and isolate boiler from shared bottom blowdown lines after draining. *To avoid boiler damage,* ***waiting until the boiler has sufficiently cooled before draining is recommended****. This usually takes at least 24 hours, sometimes longer.* **Caution: Contents may be hot and under pressure**	

	Description	Example Photo
3	**Waterside Inspection Openings:** Examples of boiler manway and handhole normally opened to allow inspection of the boiler's water side. *The boiler's waterside should be cleaned to remove all loose scale and flush out all sediments. We recommend using new gaskets whenever manways or handholes are reinstalled to prevent leaks.*	  Manway Handhole
4A	**Water Column Inspection Openings:** The arrows point to cross-tee plugs normally opened to allow internal inspection of the water column's piping.	

	Description	Example Photo
4B	**Pressure Control Inspection Openings:** The circle highlights cross-tee plugs on the water column that are normally opened to allow internal inspection of piping that pressure controls rely on.	
5	**Low Water Cutoffs (LWCO)** Example of: **a.** Float-type LWCO opened to inspect the condition of the float and float chamber. **b.** Probe-type LWCO removed from boiler to inspect its probe. **Caution: Do not let LWCO float/control head assembly hang from its wire.**	 a. Float-Type LWCO  b. Probe-Type LWCO
6	**Fireside Inspection Openings:** Demonstration fireside access doors removed/opened to allow inspection of the boiler's front and rear tubesheets as well as its furnace tube. *We recommend that fireside surfaces be cleaned of all combustion products (e.g. soot) so that potential metal defects are not obscured by surface deposits.*	 Front Tubesheet  Rear Tubesheet & Furnace Tube

	Description	Example Photo
7	**Boiler Room Preparation for Inspection:** A ladder or proper platforming device should be provided to facilitate inspection of the boiler's topside and elevated components. The boiler room's lighting should be sufficiently bright to maintain a safe working area while performing the internal inspection. The boiler room should be free of clutter and material storage to allow safe and unobstructed movement about the boiler.