To The Point
Internal Boiler Inspections

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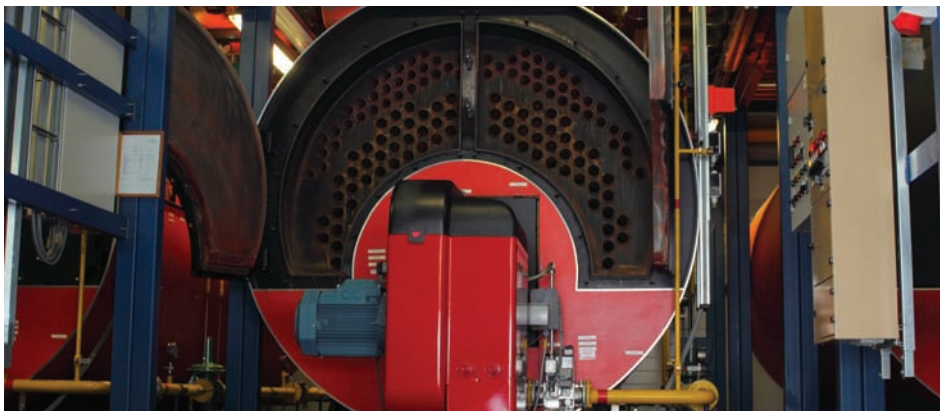

Thorough periodic internal boiler inspections are in line with best industry practices to ensure the boiler's safety and reliability. Inspections are often required in order to comply with local codes and standards.

How Often You Should Have Your Boiler Inspected

Required frequencies for internal boiler inspections vary according to jurisdictional law, so it's important to **be familiar with your state and local regulations.** In general, these are the recommended frequencies for internal inspections:

- High pressure steel boilers with steam pressure greater than 15 PSI: annually, when you renew your operating permit or certificate.
- Low pressure steel boilers with steam pressure 15 PSI or less: every 1 to 3 years.
- Low pressure steel boilers with hot water 160 PSI or less: every 1 to 5 years.
- Based on past or present adverse operating conditions: at the inspector's discretion.
- If the boiler has suffered a significant failure such as a low water dry firing or combustion explosion: immediately.

What to Expect During the Inspection

The inspector will conduct a thorough **examination of the boiler's waterside and fireside conditions,** as the design of the boiler permits. All accessible boiler surfaces–including shells, tubes, and welds–will be visually examined for:

- scale
- erosion
- corrosion
- pitting
- overheating
- cracking

The inspector will also examine sensing lines used in pressure and water level control systems, looking for obstructions that could make the control system inoperative. **controls and safety devices will be examined** to make sure they are properly installed and sized, in accordance with local codes and standards.

Preparing for an Internal Boiler Inspection

Prepare a boiler for internal inspection by following these steps:

- De-energize the fuel supply and ignition systems, using lock-out/tag-out procedures.
- To avoid damage to the boiler, **don't drain the water until the boiler has been sufficiently cooled**. This usually takes at least 24 hours, sometimes longer.
- Drain the water completely from inside the boiler and the waterside; thoroughly flush with fresh water.
- As required by the inspector, **remove manhole and hand-hole plates**, washout plugs and boiler inspection plugs in water column connections.
- **Disconnect pipes or valves** as necessary to eliminate leakage of steam or hot water into the boiler. You may need to install pressure rated blanks.
- Before opening any manhole and entering any part of a boiler connected to a common header in battery with other boilers, **close the required steam or water system stop valves** (including bypass), using lock-out/tag-out procedures.
- Make sure the free-blow valve or vent located between the two steam stop valves is open. This is commonly referred to as a 'double block and bleed' valve arrangement.
- After draining the boiler, close the blow-off valves using lock-out/tag-out procedures or lines may be blanked or sections of pipe removed. Where possible, disconnect blow-off lines between pressure parts and valves, keeping all drains and vent lines open.
- Unless otherwise instructed by the inspector, **thoroughly clean the boiler** before the inspection. **Remove products of combustion** from fireside surfaces. But don't use water – when combined, water and products of combustion can form sulfuric acid, which can damage the boiler.
- It might be necessary to remove brickwork, refractory or other insulating material to allow for a thorough inspection. Check with your inspector.

Inspection Safety

Even after you have followed these steps, the inspector won't enter a boiler unless the additional safety precautions have been taken, which you and the inspector may do together.

Safety checks include, but are not limited to, the following:

- **Follow all applicable governmental, state, regional and local rules and safety regulations** – including your company's safety program and that of the inspector. In the absence of such rules, follow prudent and generally accepted engineering safety procedures that are satisfactory to the inspector.
- Identify and **bring to the inspector's attention potential hazards** associated with entry into the boiler, and be ready to employ an acceptable method for removing or isolating these hazards.
- **Follow proper lock-out/tag-out procedures** and make sure there is no possibility that any energy source or stored energy could be released during the inspection.
- Conduct atmospheric testing and **complete a confined space pre-entry checklist** to make sure it is safe to enter the boiler. Do not allow entry until atmospheric test results are maintained at acceptable levels, which might require additional means of forced ventilation.
- Continually monitor the atmosphere during the inspection.

If the Inspector Finds Deficiencies

If the inspector uncovers deficiencies during the inspection, he or she will note them for you to correct–based on code requirements or in line with best industry practices–to ensure the continued safe and reliable condition of the boiler. In some cases, the inspector may not allow the boiler to return to service until the deficiencies have been corrected.

Conclusion

Preparing the boiler properly for its internal inspection– and knowing what to expect during the inspection–will ensure a thorough and efficient examination. Know the rules and regulations that apply to your boiler, and **don't take shortcuts when it comes to preparing for an inspection**.

Resources

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

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