



- Poor maintenance or a defective low water cutoff causes the most boiler incidents.
- Routine maintenance is critical to ensure a boiler system remains reliable, safe and efficient.
- If there is not a boiler room operator on staff, contact a reputable local service organization to perform regular maintenance.

A Checklist of Boiler Maintenance Tasks

According to a study conducted by the National Board of Boiler and Pressure Vessel Inspectors, poor maintenance practices or a defective low water cutoff causes most boiler incidents, including those that result in injuries and building damage.

Routine maintenance is critical to ensure a boiler system remains reliable, safe and efficient. Below are recommendations for daily, weekly, monthly, semi-annual and annual tasks. As always, follow your manufacturer's recommendations for routine maintenance.

Daily Maintenance

- Blow down the bottom of the boiler.
- Blow down the water column(s) and open the drain slowly to prevent float damage.
- Track boiler pressure and temperature, especially at the steady state to determine if it's keeping up with the load.
- Take a stack temperature reading to determine how efficiently the boiler is operating. A well-tuned boiler should have a stack temperature ranging between 50 – 100 degrees above the steam or water temperature.
- Routinely check the gas pressure coming into the gas pressure regulator and also its downstream pressure.
- For a hydronic boiler, monitor the supply and return temperatures, which are essential control variables that dictate load satisfaction based on the engineer's design.
- Look through the boiler's sight port in the furnace and observe the flame for any evidence of impingement and possible sooting.
- Observe the water softener, dealkalizer, chemical feed system and any other equipment that supports the boiler to ensure proper operation and required levels of salt and chemicals.
- Take water samples on a regular basis and compare them to the recommendation.

Weekly Maintenance

- Conduct an evaporation test on the low water level control(s) to ensure proper operation and burner shutoff at the low water point.
- Check the condition of the gauge glass on the low water cutoff for wear and etching.
- Check the operation of the fuel supply valves.
- Check the single point positioning system on the burner; if applicable, look for wear, slip and hysteresis.
- Observe the operating and modulating controls, and while watching the pressure gauge, see if they are turning on and off at their respective set points.
- Pull out the flame scanner to ensure the burner shuts off at the prescribed time.
- Check the indicating or running lights and alarms to make sure they are functioning properly.
- Assess the motors for noise and vibration.
- Look for leaks of fuel, water or flue gas.
- Check the high- and low-gas-pressure switches and the combustion air proving switch.

Monthly Maintenance

- Check the burner's diffuser for any deformation, burning or cracking.
- Check the burner's pilot tube that contains the electrode that provides the spark for pilot ignition.
- Check the free movement of the air damper device or devices.
- Check the entire outside of the boiler for signs of hot spots.

Semi-Annual Maintenance

- Remove and inspect the low water cutoff bowl and its interconnecting piping.
- Pay close attention to the condition of the head assembly's wiring and switches.
- Check the pump alignment on all the base-mounted pumps in the boiler room, and reset combustion using a combustion analyzer for reading O₂, CO and NO_x emissions.

Annual Maintenance

- Properly shut down the boiler and open the access doors to expose the fireside of the boiler.
- Thoroughly clean the tubes and tube sheets.
- Inspect the insulating materials, looking for any degradation.
- Check the refractory. Cracks in the refractory insulation of 1/8" or less are okay.
- On the waterside, look for heavy scaling and bridging of the tubes with scale.
- Look for evidence of oxygen corrosion.
- Check the gas valves and conduct the safety test recommended by the valve manufacturer.
- Check the safety valve to make sure there is no sign of leakage.
- On the control panel, ensure that all of the electrical connections are tight.
- Inspect accessories such as the vented feedwater receiver, deaerator and chemical feed systems, if these are part of the boiler system.

Many times, it takes a boiler system failure to serve as a reminder of the importance of routine maintenance. If there is not a boiler room operator on staff, contact the boiler service representative who sold you the equipment or contact a reputable local service organization to perform regular maintenance. It is well worth the cost.

To learn more about routine boiler room maintenance, watch this [webinar](#). To locate a Cleaver-Brooks representative near you, visit cleaverbrooks.com.