

## STATE OF OREGON MINIMUM BOILER MAINTENANCE STANDARDS

The following are the minimum maintenance standards for boilers in the State of Oregon. Where the manufacture's maintenance standards are more stringent, the manufacture's recommendations shall be followed.

### **Maintenance responsibilities:**

All maintenance activities shall be recorded in the boiler log and maintained by the owner/user on site for a minimum of five (5) years.

- The boiler **shall not** be left unattended while any tests are being performed.

### **On a monthly interval,** boiler maintenance person shall:

- Test the boiler(s) draft limit control. The method of conducting this test will vary from boiler to boiler depending upon the type of draft limit control on the boiler (if so equipped).
- Test flame detection devices. Check the device for electrical continuity and satisfactory current generation in accordance with the Manufacturer's instructions. Check the operation of the device in accordance with the Manufacturer's instruction and examine for damaged or worn parts.
- Test high-pressure gas interlocks.

### **On semi-annual intervals** (twice a year), boiler maintenance person shall:

- Perform a slow drain test to verify the low water burner cutoff control is functioning properly. To conduct a "slow drain" test of the low water cut-off, turn the feedwater pump(s) off and slowly bottom drain the boiler or let it steam down, while observing the water level in the gage glass. Stand-by watching the water level in the gage glass to make sure the burner shuts down properly. The water can not drop out of sight in the gage glass before the burner shuts down. If the water level does drop out of sight, restart the feed water pump immediately and shut the boiler down until the condition is corrected.

- Test high pressure and/or high temperature controls verifying proper operation and lockout if appropriate.
- Inspect burner components both visually during shutdown and during operation for proper functioning.

**On annual intervals** (once a year), boiler maintenance person shall:

- Test limit controls:
  - High limit steam pressure control shall be tested for proper operation and manual reset function. The boiler's controls must be adjusted to force the boiler pressure high enough to operate the high-pressure control. Then, without resetting the manual reset switch, return the controls to the desired operating pressure. The boiler should not restart until the manual reset is actuated.
  - Test the emergency disconnect switch (if so equipped) by actuating the switch and verifying the burners actual shutdown.
  - Test the "roll-out switch, if the boiler is so equipped.
- Test safety relief valve(s):
  - Safety valves should only be lifted using the try lever with the boiler pressure at least 75% of the safety valves set pressure. The use of a pull cord is suggested rather than by directly pulling by hand because steam and or hot water quite often splatters and can cause serious injury.
  - Another method of safety valve testing is to raise the operating pressure. As the boiler reaches the safety valves set pressure the valve should pop open, relieve the pressure and then the valve should re-set without intervention. The boiler's pressure must not exceed the safety valve set pressure by more than 3%.
- Using a combustion analyzer, determine that the burner is tuned for complete and efficient combustion.
- After cleaning the firesides and watersides of the boiler, do a thorough inspection, looking for corrosion, erosion, cracks or signs of leakage. Inspections must be both internal and external.
- Perform the Manufacturer's recommended burner maintenance.
- Inspect expansion tanks (if applicable) to ensure there is an air cushion on the tank. If the air cushion is being lost during the heating season, check sight glass gaskets and replace if necessary.

- Perform the Manufacturer’s recommended maintenance on all circulating pumps. Check for signs of pump seal leakage, replace pump seals if necessary. Check for vibration when pumps are running and align couplings if needed to minimize vibration and wear.
- Check the gas, and or oil piping from source to burner to ensure it is supported properly and there are no leaks.
- Perform a “hot refractory hold in” test on the flame detection system. With the boiler firing at a high demand, slowly turn the gas valve off. If the burner does not shut down either the flame scanner is defective or it is falsely detecting the hot refractory as a flame.
- Replace vacuum tubes (if used), scanners, or flame rods in accordance with the manufacturer’s recommendations.
- Test the purge air switch. Verify the purge air switch makes and the boilers air dampers are full open during the boilers pre-ignition pre-purge cycle. The pre-purge timing must be sufficient to provide four changes of air in the firebox. Some older boilers are equipped with pre-purge timers and need to also be checked to ensure the boilers firebox is getting four changes of air before ignition.
- Test the low fire start interlock. Verify the low fire start switch is made prior to burner ignition. This switch should not be made at any point in the pre-purge cycle other than at the minimum gas/air position.
- Test rotary cup interlock in accordance with the Manufacturer’s instructions.
- Review gages, thermometers and indicators for malfunction. Replace or have recalibrated if necessary.
- Test pilot and main gas fuel valves for leakage.
- For gas fired boilers, check drip leg and gas strainers.

**As required** boiler maintenance person shall:

- Replace safety relief valve(s) with either new or rebuilt safety. Safety relief valves can only be rebuilt by a company who has a Certificate of Authorization from the American Society of Mechanical Engineers to do so. You must keep all the paperwork that is supplied with either a new or rebuilt valve in the boiler room for the inspectors’ review.
- Replace low water control.

Reference Materials:

- ASME Section VI, Chapter 7
- ASME Section VI, Chapter 8
- ASME Section VI, Exhibit C I, II, and III
- ASME Section VII, Subsection C2
- ASME CSD-1

Obtainable through:

ASME - 800-843-2763

Building Tech Bookstore – 800-275-2665

Powell's Tech Store – 800-878-7323 (option #1)

Approximate cost:	ASME Section VI	\$175.00
	ASME Section VII	\$180.00
	ASME CSD-1	\$ 52.00