

Boiler Tips

1. While modern boiler installations tend to be highly sophisticated with many self-monitoring and self-regulating features, it pays to maintain and follow a rigid maintenance and inspection schedule. Studies have shown that, on average, 7% of boiler fuel costs are a direct result of poor maintenance. The following boiler maintenance tips have been adapted from the Cleaver-Brooks Boiler Room Guide, an extensive document referring to various topics including General Boiler Description; Inspections; Start-up; Routine Operations; Shutting Down; and Theory of Combustion and Thermodynamics.



- Know your equipment. Keep the boiler manufacturer's manual and data in a special file and ensure that staff consults this information whenever in doubt.
- Maintain complete records. Individual components should be listed on indexed cards or computer data base by model, serial number and date of installation.
- Establish a regular boiler inspection schedule.
- Establish and use boiler log sheets.
- Establish and keep written operating procedures updated. A detailed start-up procedure is essential in standardizing boiler room routine.
- Emphasize good housekeeping.
- Keep electrical equipment clean.
- Maintain adequate fresh air supply. Filters must be kept clean. In severe winter weather, the room may need to be heated to an acceptable ambient temperature.
- Keep accurate fuel records.

2. Power Boilers

(Steam pressure set above 15 pounds per square inch) require an internal inspection every 12 months. This means both the watersides and firesides must be opened and cleaned prior to visual inspection by a certified inspector. It is important that owners or operators also remove plugs and caps to water column piping and low water cutoff devices to verify pipe connections are free and clear of mud, sludge or other obstructions. After the inspection, a certified inspector may indicate satisfactory conditions on an inspection report, provide a report copy to the owner/operator and submit the original report to Commerce. Upon receipt, Commerce issues a permit to operate (PTO) that shall be posted on the premises by the owner or operator.

Steam Heating Boilers

(Steam pressure set at or below 15 pounds per square inch) require an external inspection every 36 months. This means a visual inspection by a certified inspector can be completed while the boiler is in operation. Although it is a recommended maintenance item, owners are not required to remove plugs and caps to water column piping and low water cutoff devices to verify pipe connections are free and clear of mud and sludge. After the inspection, a certified inspector may indicate satisfactory conditions on the inspection report to issue a PTO. The inspector will provide a report copy to the owner/operator and submit the original report to Commerce. Upon receipt, Commerce may issue a PTO that shall be posted on the premises by the owner or operator.

Hot Water Heating Boilers

(set pressure 0-160 pounds per square inch and maximum 250° F temperature) require an external inspection every 36 months similar to the steam heating boilers above.

3. Boiler Maintenance Tips

Responsibility

- Owners are responsible to obtain/maintain documentation on equipment, assure code
- Compliance and safe operation.

New installations

- Boilers must be American Society of Mechanical Engineers (ASME) constructed and identified with proper stamping on the nameplate.
- Contractors must submit Installation Registration form, SBD-6314 to Commerce.
- An inspection, registration B# on the boiler, and an inspection report submittal by certified inspector are required.
- A valid PTO is needed and must be posted during operation.

Existing installations

- Keep boiler room clean.
- Assure adequate/sound boiler piping supports, foundations and settings for all equipment.
- Maintain clearances for operation, repair, and maintenance as recommended by manufacturer.
- Make provisions for easy access to ladders/runways/controls, safe exiting and egress in the boiler room.
- Protect the water supply to the boiler by an approved back-flow preventer and keep floor drains free and clear.
- Repair leaking steam, water, fuel and other boiler connections, and minimize pump leakage.
- Maintain valves, fittings, assure allowances for thermal expansion, and properly insulate applicable piping.
- Identify or mark piping systems including flow direction or post a current piping diagram.
- Check fuel system and test boiler safety devices per manufacturer's recommendations.
- Provide ventilation and adequate "combustion air " for all fired appliances in the boiler room.
- Clean and inspect exhaust venting, breeching and chimney to assure proper draft to remove combustion gases.
- Provide boiler water analysis and chemical treatment to prevent corrosion, pitting and scale.
- Test safety or relief valves by lifting test lever at least once a year.
- Obtain the services of a trained, knowledgeable boiler operator or provide training for the operator.
- Keep a boiler operation log.

Steam Boilers

- A stop valve in both the steam supply and return line for repairs or isolation.
- A pressure gauge for steam boilers (connected with a siphon and graduated 1 ½ -2 times the safety set pressure).
- At least one safety valve on steam boilers to prevent excessive pressure.
- Two pressure controls on steam boilers (one high limit and one operating control).
- At least one low water cut-off on all steam boilers.
- A water column/site glass on all steam boilers with properly sized blow down valves to flush and clean.

- At least one bottom blow-down valve to remove mud and scale. (Two valves when over 100 Pounds (per) Square Inch (PSI)).

Hot Water Boilers

- A stop valve in both the boiler supply and return line for repairs or isolation.
- A pressure/temperature gauge for hot water boilers (graduated 1 1/2 –3 1/2 times relief valve set pressure).
- At least one relief valve on hot water boilers to prevent excessive pressure.
- Two temperature controls on hot water boilers (one high limit set at maximum 250 ° F and one operating control).
- At least one low water cut-off on hot water boilers over 400,000 British Thermal Units (BTU) heat input.
- An expansion tank on hot water heating boilers to allow for expansion/contraction of water in the system.
- At least one bottom blow-down valve to remove sediment from the boiler bottom.

4. Water Treatment and Maintenance Tips For Low-Pressure Boilers

Monitor Start-Up: Don't expect to fire the boiler at the beginning of the heating season and then walk away for days or weeks. The probability of something happening to the boiler is highest during the start-up period.

Water Treatment: Water treatment to control corrosion is a must for all low-pressure steel boilers. If you have a cast-iron boiler, it is important to use pure water and to keep the system as tight as possible. The only way to determine the quality of the water used in your system is by sampling and testing. Once an analysis is made, a plan of action can be developed to properly treat your boiler water.

Leakage: Preventive maintenance, including periodic inspection of the system to detect leakage, must be performed. Corrective action can be taken before minor leakage becomes a major boiler repair.

Reference:

<http://www.uniongas.com/business/otherci/techsol/heating/boiler/boilermaintenance.asp>

<http://www.commerce.state.wi.us/newsletter/04jan/boilermaintainance.html>

http://www.emcins.com/emcrm/insights_newsletters/insight04v26/watertreatment.htm