# **Boiler Maintenance Information**

**Weekly Procedures Should Verify**

* Boiler operation on Call For Heat.
* Normal burner light-off.
* Pump operations.
* Fuel supply.
* Feed water temperature to a nominal 160°F.
* Water treatment and expansion tank.
* Damper operations.
* Combustion air supply.

**Monthly Procedures Should Include**

* Checking the safety relief valve.
* Checking (and lubricating as required) all system motors and pumps.
* Checking and cleaning any strainers.
* Checking all venting and breeching.
* Review burner combustion readings.
* Air separation, water treatment, and expansion systems are operating per manufacturer’s instructions.
* Back flushing the coil on the Domestic Hot Water and Low Temperature models.

Coil models should have their coil back flushed at least monthly (or every 700 hours of operation) for a maximum of five minutes.

**During A Lay-Up Period (Or Annually)**

Always allow the boiler to cool slowly. The water and firesides of the boiler should be inspected to determine their condition. Boilers out of service for extended periods (more than seasonal) should be properly laid-up dry. Ensure that idle boilers are protected from freezing conditions if laid-up wet.

The frequency of cleaning will depend on the effectiveness of the water treatment program, the fuel type and efficiency of the burner settings, and individual characteristics of the site combustion air supply and breeching effectiveness. The time of year and the application will determine how often the boiler is being used.

Inspection should occur at least annually, or whenever a 1/8 inch of scale has built up in the vessel or coil. Initial 30- and 90-day inspections are recommended.

**Waterside Cleaning**

Shut off electrical and water supply to isolate the boiler from the system and then drain and flush the vessel. Remove all inspection clean-out caps and supply/return lines. Inspect interior surfaces to check for signs of corrosion or pitting.

If advanced corrosion is evident, remove the boiler from service and arrange for boiler pressure testing or replacement.

A light coating of scale is acceptable, but deposits or evidence of sludge must be cleaned and water treatment procedures set up immediately. High pressure water spray should be directed at any deposits. Deposits are typically easier to remove while still warm and wet as long as the boiler has drained and cooled enough for maintenance.

Chemical agents may be used, but follow the manufacturer’s instructions. On coil model boilers (LT, TWH, SH-C-LT, or SH-C-TWH) ensure that the product is safe for use on copper.

Inspect the safety relief valve.

If the boiler is not to be returned to service soon, dry the inside with forced warm air and limit exposure to humidity.

If the boiler is to be laid-up wet, then run through at least one full cycle after filling (before isolating from system) to drive off excess oxygen. This will help limit corrosion exposure.

**Fireside Cleaning**

Shut-off electrical and fuel supplies. Disconnect fuel supply and burner assembly. Remove fire door adapter, boiler jacket top, and boiler top plate. Inspect surfaces including turbulators/spirals, interior of fire tubes, and firebox for evidence of soot. Clean and remove all soot from the fireside of the boiler including the fire tubes, which can be done using a powerful vacuum cleaner and brush.

Excessive sooting indicates deficiencies in the fuel supply, burner settings, combustion air supply, or breeching. The system design engineer should be notified and a qualified technician should investigate the situation.
If the spirals (in ATM models) or the turbulators (in HEP models) appear damaged then replace and have the burner inspected and readjusted.

Inspect firebox refractory for cracks or deterioration. Repair with suitable refractory material if required, following the manufacturer’s instructions. Inspect all sealing ribbons and rope and replace as required.

**Common Failures Resulting From Negligence**

* Excessive and untreated makeup water: This causes internal corrosion, scaling and fouling buildup in the boiler tube sheets leading to leaks and cracks.
* Dry firing.
* Defective relief valve, low water cut-off or high limit controls combined with extreme operating conditions.
* Operating with excessive buildup in firetubes, or hydrocarbons in the firebox.
* Operating the 300 series without the baffle and flue spirals.
* Firing rates exceeding the rated input.