

SteamTeam®

Bell & Gossett®
McDonnell & Miller™

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Boiler maintenance can heat up your sales.

Funny how the people who change their smoke detector batteries every year and car oil every 3,000 miles let their boilers go year after year without even a thought of preventive maintenance. Then the boiler breaks down in the middle of winter, and you get an emergency phone call.

You can generate additional business, and help homeowners avoid unpleasant surprises, by offering boiler preventive maintenance service. Regular maintenance saves your customers money on fuel and replacement parts, and can also prevent potential hazards. Use the following "refresher" tips to create your own boiler maintenance program.

First, remember that hot water, steam, gas-fired, and oil-fired boilers each have special maintenance requirements. Oil-fired boilers in particular need more frequent inspection. Also, any boiler used to heat domestic water is operating year-round and should be inspected at least twice a year.

In general, a thorough boiler inspection/maintenance program involves checking:

- Fuel system - for proper operation, leaks and controls
- Combustion system - for boiler and exhaust leaks and signs of overheating
- Heating system - for leaks, uneven heating and zone balancing
- Circulator pump - for quiet operation
- Water - for cleanliness
- Gauges - for accuracy. Compare to a standard gauge.
- Expansion tanks - for proper pressure
- Controls - Follow the manufacturer's recommended procedures
- Safety devices - Inspect safety relief valves, temperature and pressure controls, low water and flow-sensing devices

Manufacturers typically recommend specific procedures for inspecting their safety devices. Some general guidelines:

1. McDonnell & Miller low water cut-offs with self-cleaning probe should be removed and inspected and the probes cleaned or replaced every five years. Controls without self-cleaning probes should be checked every year.



Series RB-24E Low Water Cut-off for residential hot water boiler with self-cleaning probe

2. Mechanical feeders - remove and clean the strainer and the cartridge. Replace if necessary.



247-2 Mechanical Feeder/LWCO combination

3. Float-type controls - inspect the float mechanism and clean. Replace if necessary.



Series 150S LWCO-pump controller

4. Forced circulation copper boilers have flow switches in lieu of low water cut-off. Remove for inspection and clean every year. Check for deterioration of paddle and replace if necessary.



Series FS4-3 general purpose flow switch

Yes, it takes time and effort to remove and clean probes, floats, bellows or paddles, but if you skip this step, expect Saturday evening service calls. Inspect all controls and safety devices. Customers will appreciate your diligence when their boiler operates more efficiently and safely - and your business benefits, too.

For more information on boiler controls, or any steam or hot water heating questions, contact your local McDonnell & Miller Representative.

<http://mcdonnellmiller.com/sales-service/>

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Updating old steam systems with a modern boiler feed unit? Don't forget return lag time.

A customer who recently installed a boiler feed unit was surprised to see a dramatic increase in makeup water use. Investigation showed the feed water was being lost through the unit's overflow a few times a day. The customer called us to discuss, presuming the unit didn't have enough storage. True, but far from the whole story.

It turned out the customer had replaced a very old boiler with one offering the same capacity. So far, so good. But as long as they were replacing the boiler and related piping, they also decided to abandon the system's vacuum heating unit and install a new boiler feed unit. Their boiler guy, unaware of the abandoned vacuum unit, provided what the customer requested: a unit sized to the boiler. Uh-oh.

As you may recall from past newsletters, one benefit of vacuum heating units is increased differential pressure between the positive pressure of the boiler and the sub-atmospheric pressure in the unit's condensate receiver. This increased differential moves steam through the system quickly; the steam doesn't have to push air out of the way. The vacuum heating unit also allows for smaller pipes, located where you wouldn't normally put them... like below grade. The vacuum can lift condensate out of wetted returns—but without the vacuum, that condensate returns only when the static pressure before wetted returns increases to a sufficient amount to push water through by the weight of the column of water.

So the building was taking longer to heat because of piping restrictions and lack of increased differential pressure. In turn, either the new boiler feed unit or the feeder on the boiler itself had to add water to keep the boiler steaming as the steam slowly made its way to the



Boiler Feed Series CMED with B Pumps

end of the system, condensed and came back. Plus, the new, modern boiler lacked the old boiler's large water chest, since today's higher-efficiency boilers use significantly less water.

In short, everyone missed a system sizing component. Boiler feed receivers should be sized to handle the condensate volume equal to the system lag time. Without the old vacuum, lag time increased. But once heat was established and the boiler shut down, all the extra makeup water was condensing and being returned. Since the boiler didn't need more steam, the feed unit didn't feed, and the extra makeup water from the beginning of cycle was being returned and running out the overflow to the drain. When the boiler started up again, so did the whole cycle.

Rather than taking things at face value and swapping an X# boiler horsepower boiler for a high-efficiency X# boiler horsepower boiler, the customer and provider should have looked at the entire system—keeping in mind the benefit lost when the vacuum unit was removed. You can determine

system lag time by observing the actual time required for condensate to begin returning once the boiler has begun steaming. The system time lag volume is the amount of condensate developed by the system during the timed period. A five-minute storage is fairly typical for systems up to 200 BHP, or 6,900 lbs. per hour. Larger systems should have 10 minutes storage or more.

Remember also that system lag time is greater for a single-story building or a multi-building complex than for a single multiple-story building.

An undersized boiler feed receiver leads to condensate overflow upon system shutdown. Steam in the system condenses and returns to the receiver at this time. It's best to retain this condensate; it contains heat and is as pure as distilled water. Therefore, size the receiver to contain the condensate without overflow. Oversizing the receiver won't cause any system problems, but initial costs are higher. This is eventually offset by the preservation of condensate, reduced chemicals to treat the system, and less fresh water required for makeup.



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