McDonnell & Miller
Hoffman Speciality

# CounterPoint™

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# Ten Reasons Why Steam-Heating Boilers Flood

Having problems with that steam-heating boiler's water line? Is that boiler constantly flooding? Is your customer complaining about not having enough heat when the boiler does flood?

Before you get mad at the automatic water feeder, take some time to look at the possible causes of that flooding problem. Good troubleshooters *never* make decisions until they've examined all the clues.

Here are ten of the most common reasons why steam-heating boilers flood:

**1. The water line surges.** And when it does, it turns the automatic water feeder on and off. Surging begins when the boiler water gets dirty or oily. Much of the dirt and oil will lay on the surface of the boiler water. When the steam tries to break free, it lifts the water, creating the surging. You can see this in the gauge glass.

Since steam systems are open to the atmosphere, you need to clean them from time to time. Get rid of the surging, and you'll usually get rid of the flooding.

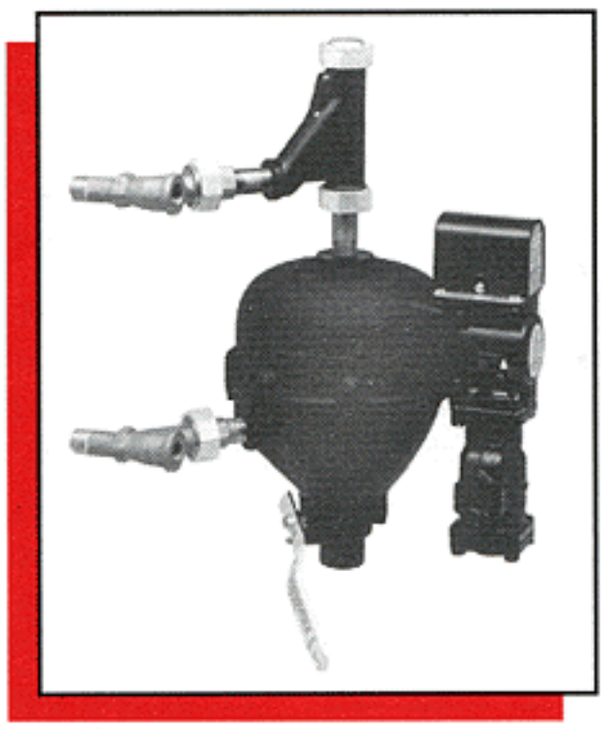
**2. The water's pH is too high.** When steam condenses, it produces carbonic acid, which can eat its way through wet-return lines. Service technicians often add chemicals to steam boilers to keep the pH from sinking too low. But if the pH gets too high it can be just as bad. A pH that is too high causes foaming, and foaming leads to trouble. Too much water flows from the boiler with the steam. That loss of water calls the automatic feeder into action. When the condensate returns, the boiler floods.

A good pH for a steam system ranges between 7 and 9. When the pH reaches 11, the water will foam. This is why old-timers added vinegar to the boilers. Vinegar is acidic, and that helps to bring the pH down.

**3. The boiler has a tankless coil, and it's leaking.** The city water pressure will always be greater than the pressure in a steam heating system. Even the smallest lead in a tankless coil will flood a boiler.

Close the cold-water valve leading to the coil for a few hours and watch the gauge glass. If the flooding stops, you've probably found the culprit. Replace the tankless coil.

**4. The system has a gravity return, and motorized zone valves.** When a motorized zone valve closes on a boiler that's under pressure, the water will back into the return line of the closed zone. That brings on the automatic water feeder. The next time the motorized zone valve opens the condensate returns from the system and floods the boiler.



*McDonnell & Miller's Series 47-2 combination mechanical water feeder/low water cut-offs.*

Install quarter-inch bleed lines around the tops of the motorized zone valves. The bleed lines will let through enough pressure to keep the water from backing out of the boiler, but it won't allow enough steam by to overheat the zone.

**5. The boiler is overfired.** If the flame is too big, the exit velocity of the steam will carry water from the boiler into the system. The automatic water feeder will replace the "missing" water before it has a chance to work its way back into the boiler. When it does, the boiler will flood.

Fire boilers to the connected piping-and-radiation load. No more, and no less.

**6. The automatic water feeder is positioned too high on the boiler.** In an attempt to cover a tankless coil during the summer, some installers will tamper with the McDonnell & Miller Quick-Hook-Up fitting. They'll add nipples and elbows, and cause the feeder to feed at a point that's too high on the gauge glass.

Normally, the feeder should open when the water line drops to a point just above the low-water cutoff's operating position. If the feeder adds too much water (because it sits too high on the gauge glass), the returning condensate will flood the boiler every day.

**7. The feed line is clogged with sediment.** If you're using a float-operated feeder/cutoff combination such as McDonnell & Miller's 47-2, a plugged feed line can create a back-pressure that will keep the feed valve from shutting tightly. City water pressure will bleed through and flood the boiler.

You can diagnose this problem by doing a broken-union test (M&M shows you how in their instructions). If you find a plugged feed line, replace it.

**8. The feeder-bypass valve isn't holding.** The bypass around the feeder lets you fill the boiler quickly, but if the shutoff valve in that line doesn't hold tightly, the boiler will keep taking on water until it floods.

Here again, the broken-union test gives you a quick way of finding out whether that important valve is doing its job. If it's not, replace it.

**9. The piping around the boiler doesn't meet the boiler manufacturer's specs.** Modern boilers make steam very quickly. The piping around the boiler is very important to the production of dry steam. If this piping is wrong, the boiler will throw water into the piping. The automatic water feeder will then replace that water. Before long, the boiler will be flooded.

Take the time to check the piping on the job against what the boiler manufacturer calls for. If it doesn't meet the specs, you'll have to repipe that boiler. This is tough medicine, but it's often the only cure.

**10. Someone is adding water when you're not there.** Never dismiss this as a possible cause. If someone adds water to the boiler in the middle of the steaming cycle, the returning condensate will bring the level water up even higher, and the boiler will flood.

Talk to the home owner or building superintendent. Make sure they understand how a steam boiler works, and what it needs in the way of feed water.

Your McDonnell & Miller representative is always willing to help you solve your steam-heating problems. Call them the next time you need help.