

I believe the following is a good example of effective troubleshooting and it also covers a couple of my pet peeves – jumping to conclusions and pipeline strainers. To be clear, I'm not opposed to strainers, but I do get upset by how they are often ignored as the source of problems.

I was involved in a boiler upgrade for a small, older condo building and got a call from the contractor the first winter of operation because the building was cold. During the call, he implied that the new boiler was not big enough, which I thought was unlikely.

The boiler had five (5) independent modules, all with modulating fire and the layout was primary-secondary. The boiler installation instructions mandated a pipeline strainer in the boiler primary loop, and it was installed. When I arrived on site, all five modules were firing, which had led to the conclusion that the boiler was undersized.

To prove that the boiler was not undersized, I turned off the other gas loads and clocked the gas meter. The contractor was surprised to find the boiler was firing at about half its rated capacity. So, instead of adding another boiler we had to look for the real problem.

My next move was to check the water temperatures on the primary-secondary H (see Tech Talk No. 5). The boiler outlet temperature was decent, but the secondary supply was significantly lower; too low to keep the building comfortable. This meant the secondary return water was recirculating in the decoupler and driving down the secondary supply temperature. Possible cause - the primary flow was low.

The obvious culprit for the low boiler flow was the strainer. I asked the contractor if it had been checked and he said that they had blown it down. I often get that answer when I ask about strainers so I insist that the screen be pulled out and inspected to be sure it's clean.

The contractor pulled the screen and it was plugged. Once cleaned and replaced, the boiler fired up to 100%, the secondary temperature went to design and the building warmed up.

Why had the boiler been running at reduced capacity instead of going off on high limit? The boiler controller in this case had the smarts to look at both the primary supply and return temperatures and reduce the firing rate if the temperature rise got too high.

Moral of the story; jumping to conclusions about the cause of a problem can blind you to the real solution. And don't *assume* that strainers are clean. Open them up and check.

**Question – what else might have caused the boiler to be firing at less than rated capacity?**