

When I've been on a troubleshooting expedition and get the problem identified, there are usually questions from the customer. This is the story of one of the more memorable ones.

I got a call from a facility manager (we'll call him Brian because that's his name) for a municipality about a new recreation complex that had a problem with the domestic hot water (DHW) system. The staff were driving him crazy with their complaints and the usual suspects who were involved in the project had not come up with a solution, so he asked me to look at it.

It was a day's drive to get to the recreation complex site. I asked Brian to email the relevant mechanical system details so I could do some research before I made the trip. After looking things over, I believed I knew what was the problem.

The DHW generation was from the boiler system through a double-wall, shell-and-tube heat exchanger. The piping/component arrangement shown on the drawings was wrong in a few important ways. My conclusion was the boiler water could be flowing backwards through the heat exchanger. Instead of being fed with hot boiler supply it would be getting not-so-hot boiler return water. This would kneecap the heat exchanger capacity and the DHW would be more like DLW (domestic lukewarm water).

Even though I believed I had identified the problem I still had to make the trip. In this case, I knew the fix would not be cheap so I had to see the system to confirm that the contractor had installed it as designed and there were no other issues that might be causing the problem. I had to make sure I had it right. It was also an opportunity to visit my Mom.

When I arrived at the site, I told Brian what I suspected was happening. He was incredulous. When I got out my infrared thermometer and confirmed that the boiler flow through the heat exchanger seemed to be coming out hotter than it went in, and that neither temperature was high enough to generate the DHW temperature required, he went from incredulous to upset.

We spent some time in the mechanical room going over what had to be done to fix the problem and as we were leaving, Brian suddenly stopped and asked, 'How the hell could they balance it when it's flowing backwards?'

I said it was a good question, and that he should ask it of the balancing contractor. I don't know if he ever did but I've always wondered what their answer would have been. Some questions are tough to tap dance around.