JB Tech Talk No. 14: Garbage In, Garbage Out

Variable speed pumping has become commonplace in the hydronics industry and for good reason. But, as with most things, it must be done right to deliver on the promise of improved performance. One of the things that is often done wrong is the location and setpoint of the differential pressure (ΔP) sensor(s) that provide a target for the pump control system to meet. This is the story of a job where that happened.

I did some training for a U.S. company that sold flow control products and got to meet a lot of their representatives. One of them called me about a project in the Washington, D.C. area where they had supplied pressure-independent control valves. He was getting flak because the pumps were running close to flat out even though the load was not high. I don't know why they were blaming *him*, but they were, and he needed help.

I asked him if he could get me some recent trending data on the valve positions and pump speeds. He did and it showed the valves to be modulating below about 35% open and the pumps to be running at a steady speed of about 80%. In other words, not variable speed at all.

My next question was where is the ΔP sensor for the pumps. He had to go to the site to confirm; it was right at the pumps. Bingo! Garbage information in, garbage performance out.

Putting the ΔP sensor at the pump is like strapping the sensor bulb for a boiler high limit aquastat to the gas line. Or taking the oxygen sensor for a fuel-injected engine and putting it in the ashtray. (All cars used to have ashtrays.) It just won't work.

Selecting the location of the sensor, or possibly more than one, requires some analysis based on the system layout. After the locations have been nailed down, the setpoint for each sensor must be calculated based on its location.

The rep was happy to hear what the problem was and couldn't wait to get off the phone with me so he could relay the news to his client. From experience I can tell you that when a problem like this is pointed out and that the sensor must be relocated and the control system reprogrammed the reactions are not good, but there is no getting around that it must be done. Proof again of the old axiom – the cheapest way to do anything is once.

I can hear some of you thinking 'aha, sensor-less variable speed pumping'. It's better than no variable speed pumping, but in my opinion it's not the answer for every application. Accurately placed ΔP sensors with correct setpoints will always provide the best performance.