



Pump Smarter, Not Harder

On Cape Cod is the quaint, sea-side town of Orleans, MA. Although the ocean wards off the wicked cold that inland towns above the 42nd Parallel often experience – and, in fact, many below it this year – Orleans still has a longer heating season than most towns along the East Coast.

A long heating season and an ailing, inefficient boiler made for a budgetary predicament at Orleans Elementary. But, after years of band-aid fixes, school managers enacted a plan to upgrade the hydronic system.

“The old boiler was at the end of its service life,” said Orleans Facilities Manager Ron Collins. “It was time for an overhaul.”

With the help of mechanical engineers at Taunton, MA-based C.A. Crowley Engineering, Inc., the school received more modulation than what the new mod-con boilers could provide alone.

The new design included Taco self-sensing pumps that take the place of a full-scale controls package, but at a fraction of the cost. Marty Vickey, PE, and Ray Vincent, PE, at Crowley aren't strangers to designing around self-sensing pumps.

“With pumps that can sense and respond to pressure changes within a hydronic system, you not only eliminate DDC controls from the picture, but there are both electric and thermal efficiency gains,” said Vickey.

The original, 30,000 square-foot “56 Wing” of the building uses a primary/secondary system to supply fin-tube baseboard radiators and unit ventilators. Each of the 24 classrooms has its own thermostat. Add plenty of common area and office space to the mix, and there's more than enough going on in the building to justify installation of a



DDC platform.

But there was no room in the budget for controls. And no time, either.

Often, centrifugal pumps are spec'd for maximum flow rate, and they spin literally non-stop for the entire heating season, regardless of whether there's a call for heat or not. This was the case at Orleans Elementary before the retrofit.

“Because the new pumps modulate with building demand, they'll run on average at half design speed,” said Bryan Payne, P.E., regional sales manager at Taco. “That's conservative, because the building is at partial load a vast majority of the time. Even on a design day, most of the hours are spent at low speed.”

The mechanical room at the school now includes a redundant set of three-horsepower Taco SKV2007 SelfSensing pumps. Each includes a motor-mounted variable frequency drive to deliver the precise amount of flow and pressure needed.



The pumps accurately respond to changes in system demand without the need for pressure sensors.

The pump's ability to detect and respond to pressure fluctuation in the system puts it on a level playing field with a DDC controls system coupled with standard variable-speed circulators. “You wire the pumps like factory-packaged equipment, turn it on, and that's it,” said the installer.

According to Payne, the energy consumed to circulate water during the heating season should fall by over 70 percent. ■