Control Strategy has University of North Florida Seeing ORANGE

The University of North Florida (UNF) chilled water plant gives new meaning to the term “Florida orange.” At first glance it looks as though the chilled and condenser water piping were laden with large, orange-colored tropical fruit. But the assortment of brightly colored Belimo control valves is in place throughout the plant (and campus) to save the university energy and labor. It’s part of a carefully orchestrated control strategy, developed and implemented by the Campus, the engineering community, and Facility Automation Solutions in Jacksonville, Florida that gives plant personnel computerized remote control over chilled water and cooling tower operation.

This design has been under the very explicit requirements set forth by Wallace Harris, Associate Director of Facilities at UNF. According to Harris, labor savings has been the primary incentive for the multitude of actuated control valves at the UNF chiller plant.

With over 50 valves in the plant alone, facility personnel can seamlessly mix and match chiller and cooling tower operation via the Andover Continuum building management system (BMS) according to load or other requirements. For example, if a tower needs service or cleaning, the system will automatically switch over to another cooling tower cell.

With actuated valve control over (5) 1000-ton chillers and (10) 500-ton cooling towers, UNF is equipped with a lot of operational flexibility – all of which is completely automated through the actuated valves and BMS.

“We’ve tried to leverage automation to keep from buying labor. So I don’t have to have a man out there physically turning a valve on or off. It’s much cheaper this way,” said Harris.

The system automatically makes the necessary changes should any of the hot or chilled water equipment go into fault. Harris and other facility staff receive e-mail and text notifications from the Andover system of any critical alarms, but there is no “babysitting” of equipment.

Automation Equals Optimization

There’s a significant energy advantage to all this automation. Most importantly, UNF isn’t pumping water through cooling towers when they don’t need to. If return water temperatures to the chillers are low, they can take one or more cooling towers off line without danger of overflowing a basin, which would lead to more unnecessary energy use. There are both two-position and modulating valves in place, so the plant can accurately vary flow through the cooling towers while maintaining set points and minimizing energy consumption.

The valves and actuators also help UNF take advantage of a heat recovery system that recovers the heat rejected from the cooling towers and uses it for

hot water reheat. This offsets some of the additional energy required to reheat the chilled water after it has been overcooled for dehumidification purposes.

"There are multiple valves that dictate which cooling tower gets linked to the heat recovery package. The control system automatically adjusts so that the cooling tower with the greatest load is the one that feeds the heat recovery system" said Dave Sarratori, Construction Manager with Facility Automation Solutions. "This is particularly useful since the chilled water system is required for year-round dehumidification."

Approximately 2.2 million square feet of UNF building space is fed off of the central chilled water system. The system is all variable flow, so Belimo pressure independent valves are also utilized throughout the campus to automatically regulate flow through air handlers, variable air volume boxes, and other terminal units regardless of changes in load or pressure. These automatic adjustments not only eliminate a lot of balancing labor, they help UNF save pump energy.

Why So Much Orange?

UNF doesn't simply have an affinity for the color orange. The affinity is for Belimo, particularly because of the product reliability and service the company has provided. This goes for both UNF and for Facility Automation Solutions, which have over 30 years of combined experience using Belimo products.

"We just like the overall service and support we get from Belimo," said Brad Howald, President of Facility Automation Solutions. "They never try to push anything back on us. They take responsibility for their products and that in turn gives us and our clients confidence in them."

For Wallace Harris that confidence has been built largely on the reliable performance of the product. Several years ago when he decided to experiment with Belimo pressure independent technology, the valves delivered exactly what was promised.

"They said the flow would be this, and it was. Once they were installed we were able to verify that they worked exactly as designed."

Service and reliability seem like small things – obvious things – for an equipment supplier to provide but over the years Brad Howald has come to hold certain companies in high esteem because of their willingness to resolve problems. Some companies, said Howald, are just as likely to "bury their head in sand and hope a problem goes away" rather than work with his company to help solve it. Belimo, however, has consistently proven itself as a partner.

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