Belimo Energy Valve™ at the University of New Brunswick, Canada

Efficiency that Fits to a T

Low Delta T is a costly problem in many large-scale facilities, and on sprawling university campuses with central chilled water plants, it can often be a major source of inefficiency. Low Delta T occurs when the supply and return chilled water temperature across an HVAC system is less than the chiller's design calls for. Oversized, damaged, fouled, or degraded air-handling coils are often the main cause, however, poor system balance and/or improperly installed and controlled air handlers can also contribute to it as well. Low Delta T can often result in the need for additional chilling units even though cooling load hasn't increased, and as a result, there is significant opportunity to take advantage of savings by utilizing products that protect against it. This was evident on two separate structures at the University of New Brunswick in Fredericton, Canada, where Belimo Energy Valves helped achieve real-world savings through optimization of chiller operations.

Building type	Academic
Project type	Renovation
Trade	University
Products	Belimo Energy Valve

Initial situation

The University of New Brunswick's Energy Management division has been investing in energy conservation methods for nearly 30 years. After speaking with Belimo representatives in early 2012 about how the Energy Valve could reduce power consumption by improving chiller performance and eliminating low Delta T, the decision was made to install one as an experimental project on an air-handling unit in the University's 22,667 SF Information Tech Center (ITC) building. Host to the University's Computer Science department, the primary purpose of the air-handling unit in the ITC building is to provide a comfortable learning environment in offices and classrooms for faculty and staff.

Project requirements

Because the use of the Belimo Energy Valve at the University was experimental, the project's only requirements were to install the valve in a cost-effective manner, improve chiller performance, and achieve measurable energy savings.

Belimo solution

The ITC building's existing air-handling system featured a 3-way bypass valve with a large chilled water loop that resulted in high pump rates and excessive energy usage. As a result, it was an ideal location to take advantage of the benefits provided by the Belimo Energy Valve. With the coil's design flow of 126 GPM, the Belimo 2 ½" Energy Valve was the most appropriate option for the replacement of the bypass valve, and because it records, regulates, balances, and saves all measurement data, it allowed personnel within UNB's Energy Management division to accurately view its performance in real-time.

The Energy Valve's patented Power Control and Belimo Delta T Manager also helped engineers optimize the operation of the coil by maintaining the Delta T. In addition to the standard analog signal and feedback wiring, the Energy Valve communicates its data to the Building Management System via BACnet MS/TP or BACnet IP. The built-in web server collects up to 13 months of data that can be downloaded to external tools for further optimization.

With an integrated BTU meter that provides accurate coil performance data, the valve would provide energy officials at the university with the ability to verify system performance during commissioning and act as a baseline standard for system performance over time.

Customer benefit/ results

- Savings resulting from the optimization of chiller operations in the air-handling unit using the Belimo Energy Valve at the ITC building were estimated to be over $1,200 per year with a payback period of approximately 4 years.
- Installation of the Energy Valve was completed by an outside contractor in less than one day; resulting in minimal manpower costs.
- Engineers had improved transparency and control of the heat exchange process through the Energy Valve's built-in Power Control and Delta T Manager.
- Since its installation in November of 2012, the Energy Valve has performed flawlessly with no setbacks or breakdowns.

Customer satisfaction

As a result of the savings achieved at the ITC building, coordinators in the University's Energy Management division decided to move forward with the installation of a 2nd Belimo Energy Valve on a separate 92,680 SF campus building known as Bailey Hall in November of 2013. When asked about the possibility of installing additional valves throughout the campus, Energy Coordinator Tim Cross said: "The primary goal of Energy Management at the University is to control and reduce energy consumption on campus and to enhance the learning environment through improved comfort by operating buildings and equipment in the most efficient manner possible. We've been very pleased that such an emergent technology like the Belimo Energy Valve has helped us achieve that goal. The two Energy Valves currently in place on campus were simple to install and have demonstrated a proven ability to improve HVAC efficiency. Throughout the future, we will be working with our stakeholders to identify more opportunities around campus where additional Energy Valves can be installed."

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