

PORTLAND INTERNATIONAL AIRPORT



In the mid-90's, the Portland International Airport (PDX) had just completed a major terminal expansion project, which introduced two secondary chilled water distribution loops and converted the system from constant to variable flow. Concerned about chilled water control and valve rangeability at the time, they elected to install standard balancing valves with two conventional control valves in a parallel configuration at many large air handlers.

After the expansion was complete, they found that as the cooling load varied from day to night, the system started hunting dramatically and cycled on and off each morning. This made operation difficult, and resulted in comfort issues as the chilled water supply temperature varied widely. Despite using typical balancing practices and better than average control methods, the system still didn't have the precise flow control required to maintain stable low load operation. On top of that, they started having problems with terminal units in variable flow heating hot water system (especially those located near the head end of the system). Units calling for full heat, hence design flow, tended to be starved for water if secondary pumps were not also operating at design head pressure. Use of pressure dependent balancing and control valves in variable flow/variable pressure system were viewed as the main cause of problems.

CASE STUDY

FAST FACTS

LOCATION

Portland, OR

INDUSTRY

Airport

SQ. FOOTAGE SERVED

1.5M sq. ft.

CAMPUS TRAFFIC

30th busiest airport in the US; 18M people per year

VALVES INSTALLED

1000 valves over the last 18 years

CASE STUDY



THE SOLUTION

When PDX began planning for their next expansion project, a change had to be made. Airports are unique in that their loads quickly change when airplanes arrive, so they can't depend on circuit setters and conventional control valves to redistribute water based on these conditions. Although Flow Control Industries was fairly new at the time, word was spreading about the impact of the pressure independent DeltaPValve®. The facility engineers were most concerned with valve rangeability, so after learning that DeltaPValves offered high turndown and excellent control throughout the full range of operation, they identified a test installation.

A single DeltaPValve® was installed, monitored and compared to a standard, equal percentage control valve. The DeltaPValve® showed the rangeability they desired, and also maximized the coil delta T at part load conditions. On top of that, the pressure independent valve had the unique ability to maintain required flow despite fluctuations in system pressure. By 1998, their standard valves were getting very expensive due to first cost and recurring balancing expenses, so combining the test results with a desire to simplify system operation led to their commitment to use DeltaPValves exclusively.



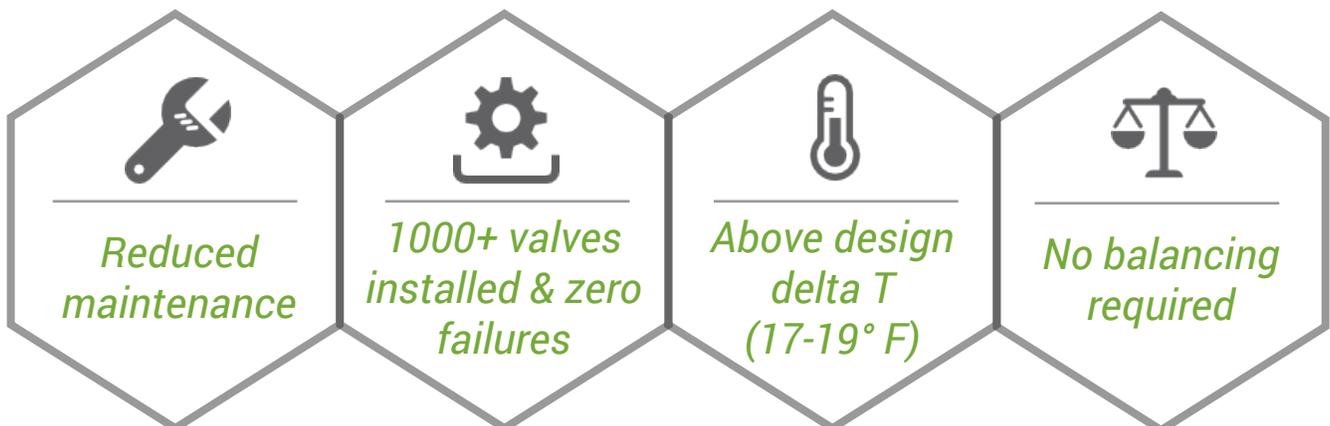
“DeltaPValves are very effective. With so many other issues to deal with on a day to day basis – this is one we shouldn’t have to worry about, and with DeltaPValves, we don’t.”

- Bruce Fellows, Facilities Engineer @ Port of Portland

THE RESULTS

The Phase II expansion added central plant capacity, connected the chilled water secondary loops and added larger distribution pumps. New coil standards were adopted for a 15°F design delta T, and with the DeltaPValve® introduction the effect was immediate. The system began running smoothly, and the average chilled water system delta T increased above design to 17-19°F. While Portland isn’t often on the radar for extreme load conditions, the unique airport environment as a multi-tenant, multi-use facility creates additional challenges for operation. With DeltaPValves, the maintenance crew didn’t have to worry about balancing and could focus on other projects.

Since committing to DeltaPValves in 1998, PDX has installed nearly 1,000 valves throughout the heating and chilled water systems, with no failures. With more expansion on the horizon, DeltaPValves are a key strategy to ensure their systems continue to provide stable and reliable operation behind the scenes, essential for providing the best traveler experience.



About Flow Control Industries, Inc.

Flow Control Industries, Inc. (FCI) is a specialty manufacturer of high-performance pressure independent control valves, delivering energy efficient products and services through a consultative process to increase building value and lower total cost of ownership (TCO).

The DeltaPValve®, FCI's flagship product, was developed by founder and Chairman Paul Skoglund, P.E. over 20 years ago when he realized that more effective valves could revolutionize mechanical system efficiency. As an industry pioneer, Paul was the first to create the patented design, development and application of pressure independent control valves.

Since the release of the first DeltaPValve®, FCI's team of world class engineers has worked to improve its design, efficiency and overall effectiveness. This focus and dedication has propelled the DeltaPValve® to the top of the industry, being the only variable flow hydronic system that GUARANTEES ΔT .

DeltaPValves are used in projects all over the world and are consistently saving customers millions of dollars in first costs, operating costs and deferred capital costs.