PERFORMANCE ANALYTICS LEADS THE WAY TO PROACTIVE MAINTENANCE AT VANCOUVER INTERNATIONAL AIRPORT

LOCATION

Vancouver International Airport, British Columbia, Canada

KAIZEN BENEFITS

Discover operational issues
Establish proactive maintenance strategies
Plan future infrastructure requirements

WHAT IS KAIZEN?

Kaizen is a powerful ongoing commissioning and analytics tool that works in conjunction with your Building Automation System (BAS) and metering systems. Kaizen continuously monitors your building’s performance and energy consumption, measuring it against optimal performance guidelines and its own baseline, alerting you if a fault is detected or if performance is sub-optimal.

OVERVIEW

Over the last thirty years, systems integrator ESC Automation has been providing building automation solutions at Vancouver International Airport (YVR). Voted the Best Airport in North America for the tenth consecutive year in the Skytrax World Airport Awards, YVR is Canada’s second busiest airport having served over 25 million passengers in 2018. More recently, ESC Automation has been working with YVR to improve the operation of several critical systems with enhanced controls and analytics, which would also help reduce potable water consumption on Sea Island – the airport’s home.

“Kaizen Insights will allow us to schedule planned remediation as opposed to emergency response after the fact.”
THE CHALLENGE

Critical systems at the airport include the sanitary sump stations distributed throughout the terminals and apron areas. ESC Automation was approached by YVR for controls expertise as the airport engaged in upgrade initiatives for these stations. The challenge was clear — to provide a robust solution that would not only improve the sanitary stations’ monitoring and control, but also deal with existing issues, including grease build up clogging pipelines and causing lengthy downtimes and costly emergency maintenance to restore sump stations to normal operation.

THE SOLUTION

ESC Automation and YVR’s maintenance department worked closely together to design a comprehensive solution that included custom-built instrumentation panels and Direct Digital Controllers fully integrated with the facilities’ Building Automation System.

These stations are fitted with status indicators and control points, including ultrasonic level sensors, hardwired interlocked float switches, pump amperage status, Hand-Off-Auto switch status and equipment fault indicators. Critical and notification alarms are configured to alert personnel whenever sump levels are high, pumps have failed or are reporting overloads or high-temperature faults.

Fig. 1: Sanitary Sump Station Control System Graphic

This complex control system would require a supervisory platform to monitor each sanitary station’s performance, a perfect job for CopperTree Analytics Kaizen Energy and Fault Detection and Diagnostics (FDD) solution. Already deployed at the airport to continuously monitor HVAC and other building systems, Kaizen would now keep an eye on these critical pieces of equipment, providing valuable insights to airport operations through its interactive performance dashboards.

A key to this successful solution has been the partnership between ESC Automation and YVR, allowing them to share ideas, complete the design and implementation, and fine-tune the system during the commissioning process.

Fig. 2: Sanitary Sump Outflow to Treatment Plant: Anomaly on December 13th shows a spike in water volume that surpassed the baseline.
The performance metrics provided by Kaizen analytics monitors, for instance, unintended inflow water that amounts to wasted water resources. This took place recently as a failed solenoid valve in a station’s automatic wash down let continuous inflow of water. While the inflow dramatically increased, it did not overwhelm the station’s normal operating parameters thus giving no indication of this condition. Kaizen’s ability to breakdown daily outflow rates helped discover this abnormal scenario.

Moreover, the ability to analyze peak and low flow periods aids in the scheduling of flow control measures needed on stations undergoing construction or maintenance work. Having this information not only makes sure the required number of vacuum trucks are available during any given operation, but also helps engineers gain insight into existing loads and capacities critical to future infrastructure planning.

This detailed monitoring has the potential to detect anomalies such as degrading pump outflows indicating possible issues such as grease build up. Proactive preventative measures could be put in place, effectively avoiding a completely clogged system that would require costly remediation services.

![Sanitary Sump Station – Water Volume Breakdown per Pump: Anomaly on December 30th shows a spike in water volume for all three pumps.](image)

CopperTree Analytics believes in providing actionable insights for building automation and energy management professionals.