

# OpenBlue Services

## Connected Chillers provides valuable intelligence for improving energy performance



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Four years ago, Johnson Controls was chosen to modernize and provide long-term management of the chillers and central plant system at a major office building in Singapore. The building is home to numerous government departments and Fortune 500 companies.

### The challenge

The contract stipulated a high energy performance guarantee over several years. As part of the modernization, the central plant was renovated, which included installation of four high-efficiency YORK chillers and Metasys BMS (Building Management System). The facility also had other chillers that were incorporated into the new plant. The building accommodates data centers, which takes up a significant portion of the cooling load and operates 24/7/365. The offices and other spaces also fluctuate in occupancy throughout the day. After the initial years, the energy performance of the chiller system suddenly started to drift to between three percent to five percent from optimum. Left uncorrected, this can lead to tens of thousands of dollars in increased electricity costs. The Johnson Controls team undertook building management and control system adjustments

and implemented best-practice plant optimization strategies, but these were not able to eliminate the performance drift.

The team also implemented an extra preventive maintenance service on already well-maintained chillers to eliminate typical risks. This resulted in marginal improvements, but they were not sufficient to make the system meet its high energy performance threshold.

### The solution

Johnson Controls then leveraged the data and fault detection features of Connected Chillers to understand the inner workings of these chillers and diagnose issues that would otherwise require invasive and labor-intensive procedures. Connected Chillers harness the power of digital solutions to precisely monitor asset health. The tool collects, stores and monitors hundreds of data points in real time and continuously scans for fault codes. Johnson Controls field teams routinely use the tool to visualize the impacts of any preventive maintenance activities to ensure the full value is realized.

The Johnson Controls team also includes OpenBlue Chiller Experts who have decades of experience in chillers and connected chiller analytics. They work with field teams and customers to provide expert diagnostics and advisory services to improve maintenance and energy outcomes in chillers.



The OpenBlue Chiller Experts were able to quickly point out a faulty sensor on one of the chillers that was leading to improper control of refrigerant. In a different chiller, they were able to find symptoms of excess oil and water. Not having the right refrigerant flow or oil water mix can impact energy performance.

The Johnson Controls team actioned these insights and was able to correct the issue quickly to restore the operations back to high performance. The use of connected chiller data trends also helped the team identify additional optimization opportunities outside the chillers. These included improvements to cooling tower water set points and building load items that

were unusually fluctuating at a rapid cycle, putting high stress on all systems. Correcting these enabled the team to achieve continuous solid energy performance levels bringing the system back to the expected outcomes.

Connected Chillers has proved to be an invaluable tool for proactive, data-driven maintenance and operational energy savings. Catching these issues quickly also stops issues deteriorating, avoiding expensive maintenance or an adverse impact on the life of chillers.

# OpenBlue

OpenBlue is a complete suite of connected solutions that serves industries from workplaces to schools, hospitals to campuses, and beyond. This platform includes tailored, AI-infused service solutions such as remote diagnostics, predictive maintenance, compliance monitoring, and advanced risk assessments. A dynamic new space from Johnson Controls, OpenBlue is how buildings come alive.

To read more about OpenBlue, visit:  
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