Crown Castle

Airflow management, loop optimization and drycooler retrofit New York, NY



\$216,737 TOTAL INCENTIVE

> 953,071 kWh TOTAL ANNUAL KWh SAVED

(\$) 1.4 years PROJECT PAYBACK

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This is a sure way to get reliability and save on operating costs. It was one of the most successful energy-efficient upgrades we have ever done."

JAMES SOUTHARD Sr. Facilities Engineer Crown Castle Data Center

PROJECT OVERVIEW

A tenant of 111 8th Avenue's landmark colocation facility, Crown Castle's 16,000 square foot data center space faced significant operational inefficiencies. A provider of towers, small cells and fiber, Crown Castle needed better mechanical systems to continue delivering premium service for its own customers. The challenges this energy project tackled included:

DATA CENTER

- Supply air short circuiting back to the CRACs
- Pumps constantly running due to no ability to control loop pressure
- Continuously running dry coolers
- CRAC overuse resulting in wasted energy and cost

SOLUTIONS + RESULTS

- 4 CRAC units turned off, saving 602,000 kWh
- 93% of airflow now directed in front of the rack vs mixing into hot aisle air streams
- 2 pumps running at 50-75% vs 3 at 100%
- Real-time Power Usage Effectiveness (PUE) metrics
- Granular monitoring and control over HVAC equipment based upon sensed temperature and humidity











OPERATIONAL IMPROVEMENTS

To address these inefficiencies, the data center engineering team at Fairbanks Energy developed the following custom-designed solutions:

- Airflow management including intelligent system logic in existing BMS, blanking panels, containment and perforated tiles.
- Loop optimization to match flow requirements using speed drives and 2-way valves.
- **Drycooler fan retrofits** including Electronically Commutated motors (EC motors). Important to this New York City building, our team engineered a retrofit solution, rather than full replacement.

While energy and financial savings delivered a short payback period for the project and continuous annual savings for this colocation tenant, the operational gains are an additional result.

Integrating all power and HVAC equipment into the Building Management System now enables the data center engineers much greater visibility and control over the HVAC environment. Accurate readings and regular reporting from equipment through this energy project mean better operational choices and sharper decision making for this colocation facility moving forward.

The Crown Castle data center operations team had an existing BMS which Fairbanks Energy modified with intelligent system logic and redesigned the reporting functions to reflect the most useful metrics or reports the team was looking for, including monitoring cold aisles and turning on the CRACs in the event of a CRAC common alarm or cold aisle temperatures going above a certain, pre-determined threshold.

ROOFTOP RETROFIT

Located in the heart of Manhattan, the rooftop at 111 8th does not have elevator access. With such limited room at the building's exterior, crane access was also out of the question. A complete replacement of the drycoolers that had started displaying issues to the colocation team was not possible.

As a solution, Fairbanks Energy engineers retrofitted three 150 Ton drycoolers with 42 drycooler fans to EC motor technology with the ability to modulate motor speed up or down depending on the load. Additionally, the valving for the drycoolers were changed to motorized units controlled by the BMS to allow for automatic failover and rotation.

Because of this design, the data center went from 3 drycoolers always running to 2 running with fans at 30-50% speed.

