



KAIZEN FDD FAN SPEED ALTERATION IN A NYC SKYSCRAPER

CLIENT OVERVIEW

The property management team who manages an eight-acre, six-building mixed-use complex in New York City wishes to make their buildings truly smart. As part of this endeavor, they want to implement advanced technology to add value and enhance the experience for their tenants.

BENEFITS



By fixing the faulty pressure sensors, it was estimated that for all 70 AHUs in this large building, the client could save more than \$43,000 per year or 430,000 kWh of energy. This would also prevent about 305,000 kg of CO2 emissions, which is similar to avoiding burning over 337,000 pounds of coal in the US..



THE PROJECT

In the HVAC system, controllers adjust the ventilation supply fans based on a static pressure sensor in the supply ducts at the end of the longest run. The sensors control the duct static pressure based on the readings from these end of line sensors.

THE CHALLENGE

When the pressure is high, the fans slow down. When the pressure is low, the fans speed up. As part of the analysis of the BAS data integrated into CopperTree's Kaizen analytics platform, it was determined that an end of line sensor was faulty since it was measuring negative pressure of more than 0.1 in WC when the fans were not running.

THE SOLUTION

With VFDs, motors can run faster than 60 Hz, which is called an overspeed condition (the maximum speed is 90 Hz according to NIH DRM 6.2.4.2). These types of conditions were being observed in this building as the fans were continuously trying to keep up with the perceived lack of pressure caused by the faulty sensors. Due to the affinity law, a fan that is running at a higher speed uses far more energy than the same fan running at a lower speed. The unnecessarily high fan speed was causing a large waste of energy. Kaizen FDD suggested solutions to the client, such as to calibrate or replace faulty pressure sensors and to adjust the fan speed to keep the pressure at the desired setpoint.