Global Healthcare Production Company saves over $1 million annually and improves temperature and humidity control in production areas

Overview

This Global Healthcare Production Facility (GHPF) * is 860,000 square feet.

** Due to confidentiality agreements, we are not able to provide the client name. We will refer to the building as GHPF throughout this case study.*

The Challenge

GHPF develops, manufactures, and sells a diverse range of medical device products. GHPF is also a member of Practice Greenhealth. GHPF adopted a sustainability policy aimed at reducing energy consumption by 20% over 10 years. As part of this policy, GHPF has worked closely with its local utility to implement energy conservation measures, like lighting retrofits. This was the first step; the next was to turbo charge energy savings through new technology.

Cimetrics' Solution

Cimetrics was selected to provide its Analytika Pro solution for GHPF. Cimetrics collaborated with Siemens, GHPF's building automation system provider, to connect to and collect sensor and actuator data from over, 8,500 physical points. Data was collected continuously, 24 hours a day, and 365 days a year, totaling over 800,000 data samples per day.

The following systems were monitored: 100 air handling units, 70 chilled water and hot water pumps, 11 chillers, 14 cooling towers, and more than 375 terminal units.

Over 1,000 Analytika software algorithms continuously analyzed the data to identify opportunities to reduce energy consumption, improve comfort, and reduce operations and maintenance costs.

Experienced Cimetrics engineers leveraged Analytika software to identify opportunities, determine root cause, and calculate annual savings impact. Actionable recommendations were documented and provided to the client both through online and offline channels. Cimetrics' role did not end with providing recommendations; Cimetrics engineers engaged with the client team on a regular basis to help answer questions, coordinate implementation, and provide regular feedback on progress.

Results Achieved

- Financial summary
  - Total energy savings: $1.03 million/year (9% of total annual utility cost)
  - Simple payback: < 6 months
  - Net present value: $1.6 million
- Operational benefits
  - Sustainability and environmental stewardship: Achieved 4,800 metric tons in annual CO_2 emissions reduction, which is the equivalent of taking 1,015 cars off the road.
  - Vendor management: Verified that optimum sequence of operations were programmed into the building automation system (BAS)
  - Compliance: Tight temperature and RH control with reduced energy consumption during winter season.

Example of Fault Detection and Diagnostics: Leaking preheat coil valve

A large air handling unit (AHU) in the building had a leaking preheat valve. As a result, the discharge air temperature from the preheat coil was over 100F, as seen in Figure 1. Consequently, the cooling coil valve was opening to provide mechanical cooling in order for the final AHU discharge temperature to meet setpoint.

This fault was not detected on site because the final discharge from the AHU was meeting setpoint due to mechanical cooling. However, this was detected with Analytika algorithms, and Cimetrics provided specific root cause analysis to direct facilities personnel to the leaking coil valve.

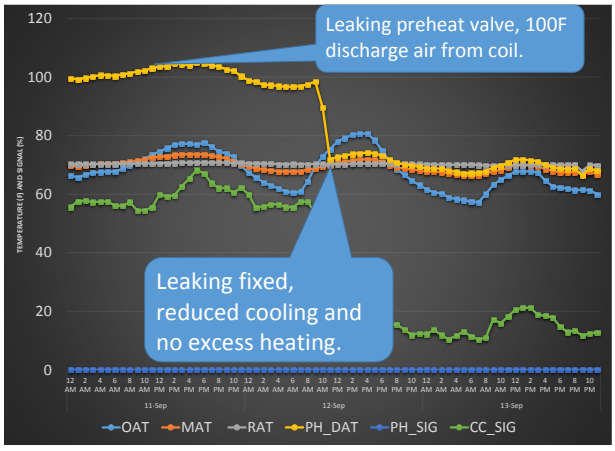

Figure 1: Leaking preheat coil valve

Solution

Cimetrics worked with GHPF facilities personnel to replace the faulty equipment, paid for from their O&M budget.

Annual energy savings achieved: $55,027

Annual carbon emissions reduction: 264 metric tons

Example of Fault Detection and Diagnostics: Chilled water supply temperature set at a constant 40F

The central plant chilled water supply temperature (CHWST) was programmed for 40F at all times, as seen in Figure 2, to allow for adequate dehumidification during the summer hours. However, there was an energy penalty associated with providing CHWST at 40F year round, particularly during cooler months, when little dehumidification is required. Allowing slightly warmer CHWST during cooler months reduces the chiller compressor load and electrical consumption.

This fault was not detected on site because the air handling units and zone controllers were still able to maintain adequate temperature control. However, significant additional compressor power was required to maintain the lower CHWST. This was detected by Analytika due to the extremely low CHWST during winter months.

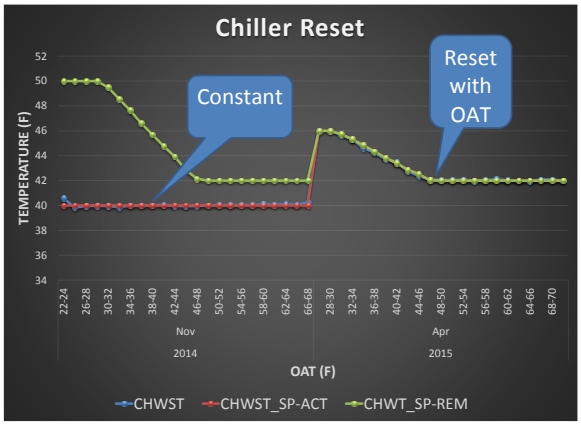

Figure 2: Chiller Reset

Solution

Cimetrics worked with GHPF staff and their controls vendor to reprogram the BAS to implement a CHWST reset strategy, which achieves electrical savings without compromising temperature and relative humidity control throughout the campus.

Annual energy savings achieved: $20,475

Annual carbon emissions reduction: 54 metric tons

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