

Case Study:

Chiller Optimization Delivers Outstanding Results for Honeywell's Industrial Campus



Honeywell

The Honeywell Rocky Mount site manufactures

measuring and controlling devices for the aerospace industry. The site has 217,000 square feet of plant area cooled by a chilled water plant with four chillers at a combined capacity of 2,110 RT. The facility management firm responsible for operating the Rocky Mount site central utility plant brought in Hudson's SMARTenergy OPS® in 2013 to optimize the facility's chilled water

system. Five of seven improvement projects identified by SMARTenergy OPS® were implemented with Hudson Global Energy Services (GES) engineering support. These low-cost measures, ranging from chiller staging to reducing the entering condenser water temperature, resulted in annual savings of \$80,000.

Overall, SMARTenergy OPS® delivered verified savings of 25% of chiller system energy operating costs with a one year payback.

Customer

The Honeywell Rocky Mount site, a measuring and controlling device manufacturer in the southeastern U.S., has 217,000 square feet of plant area, cooled by a chilled water plant with four chillers at a combined capacity of 2,110 RT. Chilled water provides both comfort and process cooling. The chilled water plant consumes ~4,500,000 kWh/year, which is almost a quarter of total site energy use. The central utility plant is managed by a facility management company, which is responsible for the plant utility optimization. Since 2013, Hudson engineers have worked closely with Honeywell as part of the facility management team to optimize the Honeywell Rocky Mount site's chilled water system using SMARTenergy OPS®.

Challenge

Honeywell's Rocky Mount site had a Building Automation System (BAS) that did not monitor temperature or flows on individual chillers. In addition, the site did not have access to the data needed for system optimization, such as the cost of chiller plant system operations.

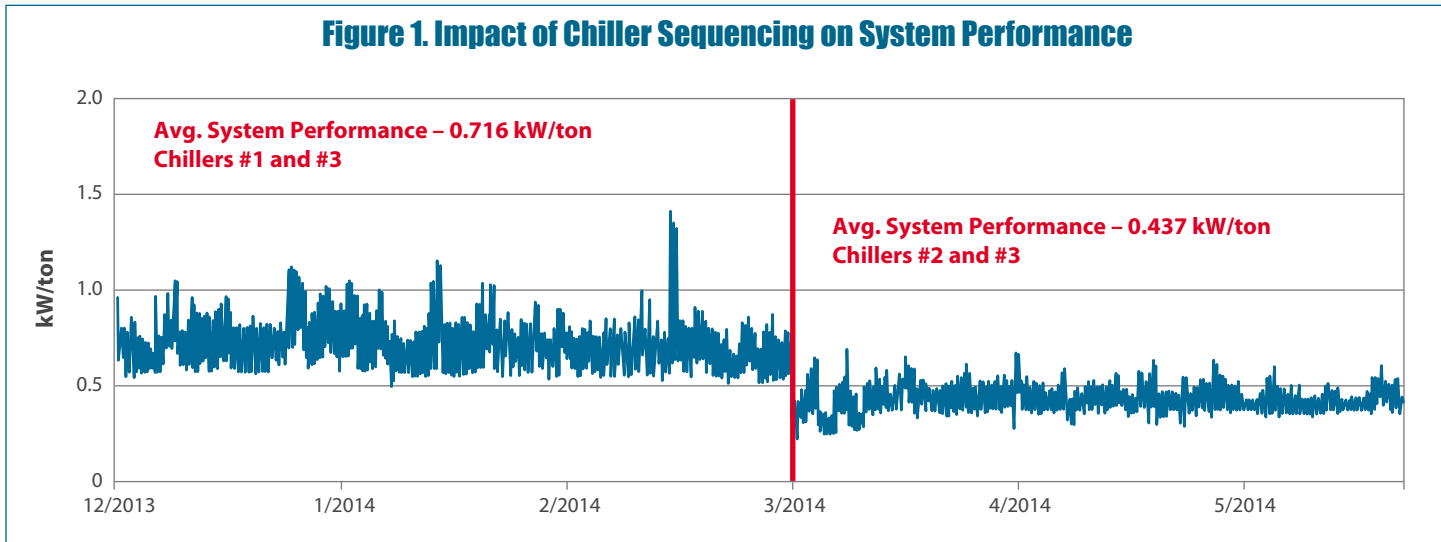
Solution

An integrated approach was developed for the site, which included installation of SMARTenergy OPS® and an onsite energy assessment of the chiller plant system by a Hudson energy engineer.

The SMARTenergy OPS® integrated package included:

- **Managed Software as a Service (MSaaS)** which combines cloud-based analytics with remote engineering expertise.
- **Highly accurate and calibrated sensors** to collect chiller operating data. Data are sent to Hudson's secure servers every 15 minutes.
- Simulation of the actual operating conditions of the four chillers and development of a **Calculated Part Load Value (CPLV)** of each chiller's efficiency. The difference between the actual operating kW/ton and CPLV sets the target for optimization and provides a lost opportunity cost.
- A comprehensive onsite **chilled water assessment**.
- **Verified energy and cost savings**.
- **Fault detection and diagnostics** of heat transfer issues, compressor performance, water flow issues, refrigerant stacking, system alarms and sensor errors.
- **Continuous commissioning**.
- **A tailored refrigerant, oil and water sampling program**. Samples are analyzed at the Hudson AHRI-certified lab, one of only three in the United States, and an engineering report prepared that highlights any issues with the fluids.
- **Dedicated engineering support**.

Figure 1. Impact of Chiller Sequencing on System Performance

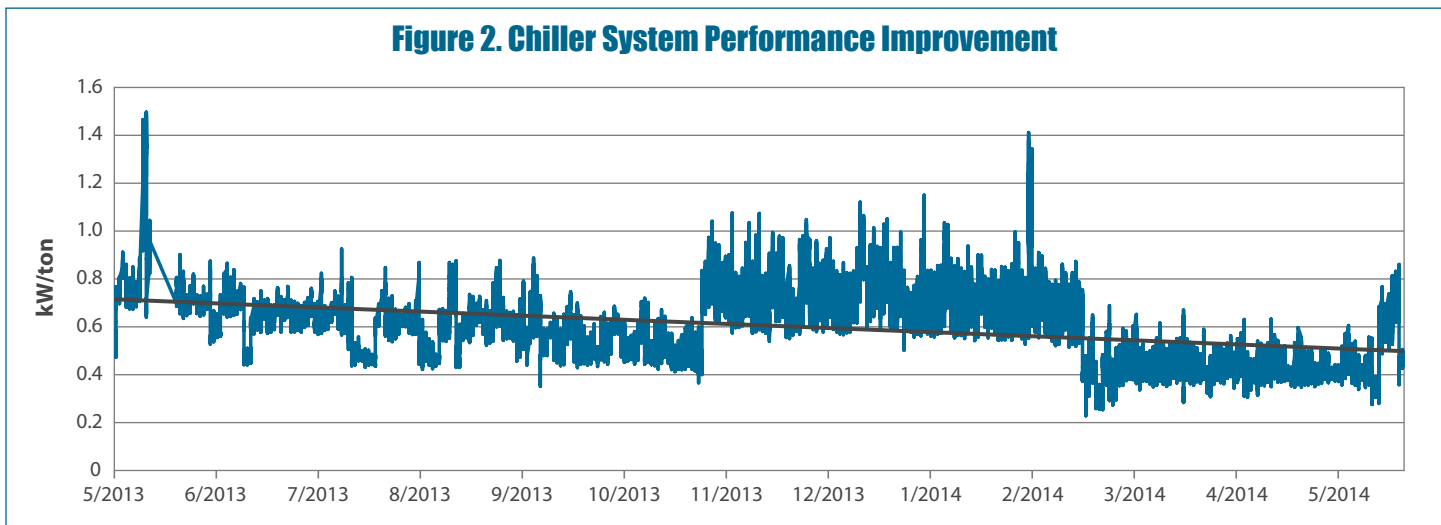


Results

Five of seven improvement projects identified by SMARTenergy OPS[®] were implemented by the facility management team. These were low cost measures, ranging from chiller staging to reducing the entering condenser water temperature. These five projects resulted in **verified savings of 25% of chiller system energy operating costs, a savings of \$80,000, and a one-year ROI**. The site has also implemented Best Practice recommendations, such as maintaining proper refrigerant levels, and putting a chiller chemistry program in place.

The figure above illustrates the impact of one project, Optimizing Chiller Sequencing, based on the information developed through the CPLV analysis¹. The site switched from running chillers 1 and 3 to running chillers 2 and 3. This delivered a **39% operating improvement**, as shown in Figure 1.

Figure 2. Chiller System Performance Improvement



Overall, the Honeywell's Rocky Mount site reduced its chiller plant system energy use by 25%, with a one-year ROI. Figure 2 illustrates the performance improvement achieved on a kW/ton basis as a result of SMARTenergy OPS[®] implementation.

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